

ENHANCING DIGITAL EDUCATION IN THE MEDITERRANEAN



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الاتحاد من أجل المتوسط



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FOREWORD

Nasser Kamel Secretary General of the Union for the Mediterranean

Digital education is undeniably a key driver of employability, fostering critical competencies in digital skills, innovation, and the digital economy. Beyond these domains, it plays a pivotal role in addressing global challenges such as environmental protection, climate action, and peace and security. However, a comprehensive survey conducted by the Union for the Mediterranean (UfM) has revealed that digital literacy among staff and students in our region remains limited, and strategic planning for digital education is often lacking. To bridge this gap, respondents to the survey emphasized the importance of enhancing digital readiness through initiatives like promoting robust digital skills training.

In response to this pressing need, the UfM Secretariat organized a series of online training sessions tailored for academic leaders, faculty, staff, and students. The insights and expertise gathered through these efforts are consolidated in the present Guidebook. This publication aims to provide a systematic approach to leveraging digital tools in education and fostering digital skill development. We aspire for it to serve as a valuable resource for Higher Education Institutions (HEIs) to craft effective digital transformation strategies and empower educators with cutting-edge tools that enhance inclusiveness and the quality of teaching.

Looking ahead, we are committed to fostering further collaboration in digital education across the Euro-Mediterranean Higher Education Area. This includes supporting digital transformation plans and advocating for holistic, institution-wide approaches to digital integration. Sharing experiences and exploring the future of higher education are critical, especially as emerging technologies like artificial intelligence and advanced data analytics reshape the educational landscape.

The Union for the Mediterranean continues to facilitate dialogue among policymakers, academia, and industry leaders to address these challenges and seize opportunities for innovation. We are confident that these collaborative efforts will yield meaningful progress and contribute to a more digitally literate, inclusive, and forward-thinking educational ecosystem.

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INTRODUCTION

Since its foundation in 2008, the Union for the Mediterranean (UfM) has prioritised Higher Education and Research. This commitment has led to a notable expansion in networking opportunities, collaborative research, and the mutual recognition of academic qualifications among institutions. In this evolving period for education, we find a compelling opportunity to drive Digital Transformation (DT) forward in Higher Education (HE) across this diverse region.

As DT becomes a strategic focus within HE, it increasingly shapes public discourse and motivates action. Governments and educational institutions are reimagining teaching methodologies to meet the needs of digital societies and the demands of an evolving labour market. This shift opens pathways to innovate and align education with the future, fostering a resilient and adaptable learning ecosystem.

The **Enhancing Digital Education in the Mediterranean** initiative, led by the Union for the **Mediterranean**, has joint efforts with the **Universitat Oberta de Catalunya**, the first fully online university in the world created in 1994. The aim of the initiative is to set the basis of a meaningful dialogue and the exchange of best practices to accelerate the DT of Higher Education Institutions (HEIs) within and among the Mediterranean countries.

The primary objectives of the initiative include:

- Fostering digital transformation awareness toward inclusive hybrid and online learning.
- Presenting frameworks and standards of quality in digital learning.
- Exploring approaches of leadership and management for the implementation of DT strategies.
- Instilling a macro and micro learning design mindset for technology enhanced learning.
- Introducing digital learning technology trends to strengthen pedagogical innovation on digital education.

The initiative is aligned with the UfM's strategic goals and follows the UfM's Report on the Public Consultation on Higher Education (UfM, 2023)¹. The consultation demonstrated that there are many positive developments in HE around the region, but also revealed specific and significant challenges.

In this regard, the Report identified six themes framing Mediterranean cooperation in HE:

- Internationalisation of HEIs
- Governance
- Inclusion
- Digital Education
- Greening and sustainable development
- Employability

In this context, the digitalisation of HEIs emerges as a transformative opportunity, offering significant benefits such as enhancing the learning experience, broadening access to education, fostering innovation, and boosting institutional competitiveness in the global education landscape.

Some of the mentioned benefits include:

- **Increased accessibility** to bridge the digital divide, ensuring that students in all regions have access to resources and opportunities, particularly for underrepresented groups.
- **Personalised learning** by supporting learning experiences customisation.
- **Enhanced collaboration** through communication, networking, and teamwork to build partnerships between institutions, strengthen capacity, and align on shared strategies.
- **Improved engagement** by means of interactive and multimedia options.
- **Efficient management** for the optimisation of resources efficiency.
- **Cost savings** through reduced traditional spending, making education more affordable with less reliance on physical textbooks and decreased commuting.
- **Skill development** that enables students and teachers to acquire digital skills, problem-solving, critical thinking, and adaptability.
- **Innovation and research** fostering innovative teaching methods and student engagement.

As pointed out by the Report on the Public Consultation, any approach to digitalisation of HE systems must focus, at least, on two elements: governance, hence, institutional change, and digital education, in the shape of academic transformation.

1. UfM (2023). *Report on the Public Consultation in view of the 1st Union for the Mediterranean. Ministerial Conference on Higher Education*. Union for the Mediterranean. <https://shorturl.at/X0xNX>

1. OVERVIEW OF DIGITAL EDUCATION IN THE MEDITERRANEAN REGION

Building on the 2007 EuroMed Cairo Declaration², the UfM has been active on dialogue and cooperation in the field of HE along three main axes: academic mobility; employability and quality of education; and cooperation among university networks.

However, the mentioned UfM (2023) report emphasised that there are still deficiencies in the region regarding the overall health of the higher education sector. These were outlined as:

- Asymmetry, non-alignment and unequal distribution of resources among member states.
- Asymmetry and unequal distribution of opportunities within member states.
- Administrative and financial barriers to cooperation and mobility.
- Weak alignment of education to job market needs.
- Lack of a clear, common strategy and unified vision between stakeholders hindering cooperation and collaboration between HEIs.

International organisations such as UNESCO (United Nations Educational, Scientific and Cultural Organisation) and the European Union have launched initiatives to support digital education in the region, including programmes to increase access to technology and training for teachers. The UfM has been instrumental in contributing to many of these efforts.

Hamlaoui and Salhi (2021)³, in their report on the state of the art of digital education in the Mediterranean, underscores the pivotal role of Information and Communication Technology (ICT) in enhancing both access to and the quality of education. It highlights the region's varied socio-political and economic contexts, which significantly influence the integration of digital education. Even with the existing disparities in internet access and technological infrastructure, there is a collective commitment among many nations to harness digital tools for educational reform.

Despite some technological advancements, many countries in the region still struggle with access to education, especially in rural areas, and face gender gaps in enrolment and achievements.

In a complementary vein, the "Future of Higher Education in the Mediterranean" report (UNIMED & ESN, 2023)⁴, shifts the focus to the student perspective on the challenges faced within higher education. This report emphasises the necessity for greater internationalisation, improved governance, and enhanced inclusion within educational institutions. The report calls for streamlined processes for credit recognition and the establishment of solutions to facilitate student mobility across borders. Furthermore, it highlights the importance of digital education, advocating for improved IT infrastructure and digital literacy to bolster digital learning initiatives.

Moreover, the UfM report highlights the importance of digital education in HE within the Mediterranean region, emphasising the need for collaboration, strategic planning, readiness for the future, and addressing legal, ethical, and moral concerns. Fully implementing digital transformation can bring numerous benefits, including increased access to education, improved learning outcomes, and enhanced collaboration between institutions and across borders.

An example of a commitment to DT is Egypt's Education Sector Plan 2023-2027⁵, part of the country's Strategic Vision 2030, which aligns with the Digital Egypt initiative⁶. This plan provides a roadmap for reforming the education system focusing on integrating digital tools and technologies to enhance educational outcomes and accessibility in higher education institutions. Main initiatives include modernising university infrastructure with advanced ICT facilities, promoting digital literacy, and developing online and blended learning programmes. The American University in Cairo (AUC)⁷ supports this vision through its commitment to efficiency, connectivity and adaptability through: resource optimisation, infrastructure and cybersecurity, digitisation, and institutional research and technologies to enhance educational outcomes and accessibility in higher education institutions. Main initiatives include modernising university infrastructure with advanced ICT facilities, promoting digital literacy, and developing online and blended learning programmes. The American University in Cairo (AUC) supports this vision through its commitment to efficiency, connectivity and adaptability through: resource optimisation, infrastructure and cybersecurity, digitisation, and institutional research and effectiveness.

Similarly, Spain's UniDigital Plan⁸ underscores the country's dedication to modernising its university system through DT.

2. UfM (2007, June 18). *Towards a Euro-Mediterranean Higher Education and Research Area. First Ministerial Conference on Higher Education and Scientific Research*. Cairo Declaration. https://ufmsecretariat.org/wp-content/uploads/2012/09/cairo_declaration.pdf

3. Hamlaoui, S. & Salhi, A. (2021). Digital education in the Mediterranean. State of the art and barriers towards cooperation and collaboration. IEMed. *Mediterranean Yearbook 2021* (pp. 295-299). IEMed. <https://shorturl.at/nk9GH>

4. UNIMED & ESN (2023). *The future of higher education in the Mediterranean: The Student's Perspective*. Mediterranean Student Summit 2023. <https://shorturl.at/WZJGH>

5. Education sector plan for Egypt. The Arab Republic of Egypt. *Education Sector Plan 2023-2027*. Ministry of Education and Technical Education, Egypt. <https://shorturl.at/bEylw>

6. Digital Egypt. https://mci.gov.eg/en/Digital_Egypt

7. AUC. *Digital Transformation at American University in Cairo*. <https://www.aucegypt.edu/digital-transformation>

8. Ministry of Universities, Spain. *UniDigital Plan*. <https://espanadigital.gob.es/en/lines-action/unidigital-plan>

Developed by the Ministry of Universities, the plan aims to improve university education quality and reduce the digital divide. It includes ICT infrastructure projects, software development, and strategic coordination to stimulate innovation within universities.

In Tunisia, the National Digital Strategy 2021-2025 is a comprehensive initiative aimed at integrating digitalisation into the country's economic and social development. This strategy includes initiatives to enhance digital infrastructure and integrate advanced technologies into HE. Critical factors include developing digital platforms and educational information systems for online learning, smart education initiatives to build high-performance networks and cloud infrastructure, and ICT talent development to prepare the workforce for the digital economy.

Starting in 2025, Tunisia plans to implement a new digital transformation strategy that will build on the 2021-2025 plan⁹. This new strategy will continue to focus on digitising administrative and public services, fostering the digital economy, supporting innovation and entrepreneurship, enhancing communication network infrastructure, and strengthening legislative and regulatory frameworks to secure cyberspace. An Artificial Intelligence (AI) strategy¹⁰, also set for launch in 2025, aims to integrate AI into key sectors, including health, education, environment, and transport, while advancing digitalisation and promoting open data usage.

In Morocco, the ESRI 2030 PACT33 Plan¹¹ aims to create a new model of Moroccan universities that meets labour market needs and addresses contemporary challenges. It emphasises the digitisation of university administration, pedagogy, and communication. The UM4.0 Program¹², funded by the African Development Bank, supports this vision by enhancing human capital and empowering youth through innovative HE, and it includes constructing new educational facilities, and entrepreneurship support centres.

Jordan's Economic Modernisation Vision 2022-2033¹³ further illustrates the region's commitment to digital transformation. This comprehensive plan aims to support and develop the national economy, with goals to accommodate young people in the labour market and improve global competitiveness. Within the overarching framework, the Smart Jordan initiative focuses on implementing digital learning platforms and developing digital skills, ensuring education systems are resilient and future-ready.

Although many policies are being promoted in several countries of the Mediterranean region with the intention of driving concrete strategies, challenges remain, including unequal access to technology, limited digital literacy skills among students and teachers, infrastructure deficiencies, and limited financial resources. There is also a general lack of cohesive policies and regulations to guide digital transformation efforts.

To surmount these issues, the UfM report recommends the following solutions:

- **Capacity building and peer-learning** supported by regular training, digital coaching, and mentoring.
- **Investment in infrastructure** by increasing funding and innovative resource acquisition.
- **Creating common platforms** facilitating the exchange of information, experiences, and resources.
- **Expanding networks** using shared and mobility platforms.
- **Accreditation of digital education** through the establishment of evaluation and accreditation systems for digital education.
- **Encouraging joint online programs** implementing collaborative online diploma courses and programs.
- **Incentivising through policy** by developing clear strategies and policies for integrating digital education into curricula.
- **Ensuring legal, ethical, and moral guarantees** embedding, teaching, and respecting core values among all HEI stakeholders.

Successfully addressing these challenges and harnessing the advantages of digital transformation requires a comprehensive commitment from the entire institution to embrace change.

1.1. Institutional change

Higher education institutions must define their pedagogical, organisational, and technological models to meet the diverse needs of students and educators. This requires a strategic commitment and a holistic approach, including quality assurance mechanisms for the delivery of high-quality education and a strategic leadership to drive the successful implementation of DT initiative.

Defining the educational model from a technological perspective requires rethinking processes to positively impact the educational community. University leaders need to engage stakeholders in deep reflection to shape the organisational structure and management processes.

Fundamental questions include the defining characteristics of the institution, the profile of the e-learning student, the role of the teaching staff and the evolution of the current educational model.

The technological model should support the pedagogical and organisational models, requiring digital literacy from staff and students. This requires awareness raising to overcome resistance to digital transformation. Ensuring quality education requires new strategies, rethinking teaching and learning methods and implementing effective quality assurance processes for virtual environments.

1.2. Academic transformation

Institutions frequently encounter doubts and fears when they embark on digital transformation, making it crucial to build the capacity of academics, researchers, and educators. This process involves enabling educators to adapt to online and blended learning environments by developing specific skills that are necessary for success.

Addressing these challenges requires several critical actions, including increasing digital literacy among teachers, which empowers them to design and update digital curricula effectively. Educators should also focus on creating engaging learning environments that foster student participation and effectively assess student learning through formative assessments and feedback mechanisms.

Overall, the emphasis lies in providing educators with the tools and strategies needed to integrate digital technologies into their teaching methodologies, thereby promoting effective communication and cultivating supportive, engaging learning environments. This comprehensive approach aims to enhance the overall learning experience and facilitate successful DT.

2. THE GUIDEBOOK AND ITS PURPOSE

This guide aims to complement and expand on the webinars designed by the UOC in collaboration with the UfM, targeting leaders, administrators, faculty, and researchers from Mediterranean region countries involved in the digital transformation of their educational institutions. The webinars provided an initial 12-hour foundational training, which is now supplemented by this guide. It includes eight sections divided into two parts, corresponding to the eight sessions that are recorded and available on the UfM website.

It serves as a valuable resource for all stakeholders involved in the project as well as for other institutions in the region seeking to implement digital transformation strategies. Its primary goal is to foster collaboration and guide common strategies while tackling the challenges of digital transformation in higher education. Moreover, it outlines the significance of digital transformation for HEIs, and discusses key features including pedagogical models, organisational strategies, and technological infrastructure.

As mentioned above, the guidebook provides a detailed overview of the eight training sessions, each including objectives, key reflection questions, visual summaries, cited references, and recommended resources.

Each part and the corresponding sections of this guide are briefly described below.

The first part covers sections 1 to 4 and is addressed to senior academic leaders and teaching staff of the HEIs in the Mediterranean region. It focuses on the different models of ICT use in education and their affection into organisational models, the digital transformation of HEIs, the required leadership skills to make it possible and, finally, the importance of quality assurance in digital higher education.

SECTION 1: Educational Models Based on ICT introduces various models of educational digitalisation to help institutions implement process changes, aiming to positively impact the educational community.

SECTION 2: Digital Transformation Frameworks and Models covers digital transformation frameworks and models for higher education, emphasising a comprehensive overhaul of institutional culture and processes.

SECTION 3: Leadership and Management focuses on strategic leadership, institutional change management, and implementation processes in digital transformation within HEIs.

SECTION 4: Quality in Higher Education explores the impact of digital transformation on quality assurance systems in higher education.

The second part covers sections 5 to 8 and is aimed at teaching and research staff. It focuses on the necessary skills to design digital learning models and how to apply the Universal Design Learning Guidelines to digital education, also taking into account the promotion of inclusive education by considering various dimensions of diversity, including gender. This includes the newest trends in technology-enhanced learning such as micro-credentials, AI and learning analytics to enhance teaching and learning, and will be instructed about international quality certification and standards related to online and blended courses.

SECTION 5: Learning Design Models equips participants with the knowledge and tools to create effective, engaging, and inclusive educational experiences in higher education.

SECTION 6: Digital Teaching and Learning Transformation focuses on building an effective framework for digital learning in HEIs, emphasising competency-based education and the use of active pedagogies for skills and knowledge development and.

SECTION 7: Trends in Technology-Enhanced Learning provides an overview of the latest trends in technology-enhanced learning, focusing on practical applications and their role in achieving inclusive, equitable, and quality education.

SECTION 8: Quality in Online Learning Courses addresses the quality of online courses and programmes focusing on creating engaging and effective online learning environments.

9. Digital Tunisia. <https://www.ticad8.tn/content/11/digital-tunisia>

10. Njaya, S. (2024, November 13). *New Digital Transformation and AI Strategy*. Wearotech.africa. <https://www.wearotech.africa/en/fts-uk/tech-stars/tunisia-announces-new-digital-transformation-and-ai-strategy>

11. Taouil, K. (2024, October 3). *Morocco's ESRI 2030 PACT33 Plan. ESRI Pact 2030 in action for a new model of Moroccan universities*. Atalayar. <https://shorturl.at/rLV8w>

12. African Development Bank (2024, April 19). *Transformation Support Programme for a Moroccan Digital, Entrepreneurial and Inclusive University (UM 4.0) (Report no. P-MA-IAD-003)*. <https://www.afdb.org/en/documents/morocco-transformation-support-programme-moroccan-digital-entrepreneurial-and-inclusive-university-um-40-project-appraisal-report>

13. SEconomic Modernisation Vision. *Smart Jordan*. <https://www.jordanvision.jo/en/site/drivers?id=4>



Watch the webinar here

SECTION 1 EDUCATIONAL MODELS BASED ON ICT

Authors: Lourdes Guàrdia & Marcelo Maina

1. INTRODUCTION

Educational models based on ICT focus on harnessing technology as a pivotal force in reshaping education. These models seamlessly integrate ICT to enhance flexibility, accessibility, and personalisation in learning, supporting diverse modalities such as blended, online, and hybrid learning. Through the use of digital tools, institutions can create student-centred, scalable educational experiences that foster collaboration, innovation, and the development of essential 21st-century skills, effectively addressing the needs of today's learners and adapting to the rapidly changing educational landscape.

This section introduces the concept of educational models supported by ICT and explores various modalities that can be implemented based on specific contexts and identified needs. After selecting the most suitable modality for each context, it is essential to make key decisions regarding which key components of the educational model will be transformed, the required actions, necessary resources and strategies, and the impact these changes will have on the roles of stakeholders involved in the transformation process.

To highlight the positive impact on the educational community, we will provide a concise overview of how technology, serving as a catalyst for educational change, can be integrated into teaching, learning, curriculum design, and institutional processes.

2. OBJECTIVES

- Examine the **changing role of teachers** in digital classrooms, focusing on the shift from lecturer to facilitator and the use of technology to support **student-centred learning** and active teaching methodologies.
- Explore the **skills and tools students need in digital environments**, along with how digital tools **personalise learning** through adaptive systems.
- Outline the **impact of ICT on curriculum and learning design** by highlighting the opportunity to create more meaningful proposals promoting 21st-century skills.
- Highlight the importance of **collaboration between educators, technologists, and curriculum designers** to create cohesive digital learning experiences.
- Analyse and apply **technology-driven strategies** that initiate and accelerate transformative changes in educational delivery and learner experience.

3. INTRODUCTION TO EDUCATIONAL DIGITALISATION MODELS

Higher Education Institutions (HEIs) are increasingly turning to digitalisation as a catalyst for transformative change. Digitalisation in education extends far beyond the adoption of new technologies; it involves rethinking how institutions operate, how teaching and learning are delivered, and how students engage with their educational journey. At the heart of this transformation are several models of educational digitalisation that provide frameworks for institutions to implement process changes, with the overarching goal of positively impacting the entire educational community—students, faculty, and administrators alike.

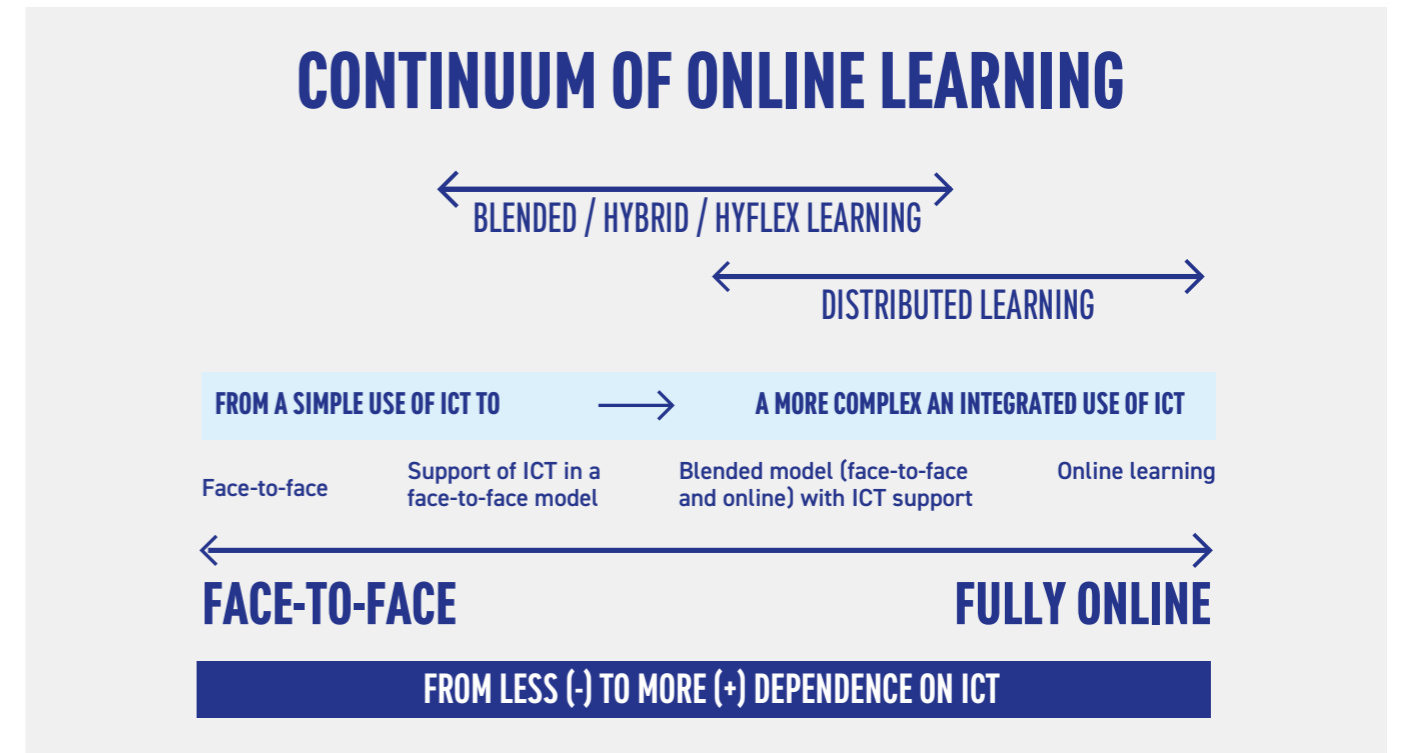
How does the adoption of various degrees of technology use, based on the educational institutional needs, capabilities, and readiness for digital transformation determine the educational model?

Regarding this question, it would be valuable to review the continuum of e-learning proposed by Bates and Poole (2003) and Bach et al. (2007), considering how the integration of technology influences and shapes the learning modality. The authors highlight that institutions and educators can adopt various degrees of technology use, based on their needs, capabilities, and readiness for digital transformation. Rather than prescribing a one-size-fits-all approach, this model emphasises the flexibility of e-learning and the idea that digital integration is a progressive journey.



Figure 1

Continuum of online learning. Adapted by Guàrdia, L. (2024) from Bates & Poole (2003), Bach et al. (2007).



Concerning this, it is relevant to understand the similarities and differences of the following concepts regarding the level of the use of ICT, synchronicity and asynchronicity in an online and hybrid environment, Raes, *et al.* (2020):

- **HyFlex Learning:** Combines face-to-face, online synchronous, and online asynchronous learning. Students choose how to participate, with full flexibility between modes.
- **Hybrid Learning:** Mixes face-to-face and online components, but requires students to participate in both formats as determined by the course schedule.
- **Online Learning:** All instruction and interactions occur fully online, either synchronously (real-time) or asynchronously (at any time).
- **Blended Learning:** Integrates face-to-face and online learning, with some in-person sessions complemented by online activities, but less flexible than HyFlex.

Experts like Luckin, *et al.* (2016) discusses **how artificial intelligence (AI) can enhance** all these learning models by personalising content, providing real-time analytics, and offering tailored feedback, thereby making education more flexible, adaptive, and responsive to individual learning needs.

However, institutions may begin at any point along the continuum and gradually evolve as they build capacity and expertise. The end goal, however, is not simply to adopt more technology for its own sake but to create a learning environment where technology enhances the educational experience, making it more accessible, flexible, and engaging for students.

The educational model can be understood from different perspectives, and one of the most relevant is the role technology plays in designing teaching and learning processes. In this context, we can reference several well-known models, although we will discuss the use of SAMR and TPACK models in more detail in section 5 and Digital Maturity Model in section 2 of this guide, we also find it relevant to mention them briefly here to illustrate how the intended role of technology influences the definition of the educational model:

- For example, one widely adopted model is the **SAMR (Substitution, Augmentation, Modification, Redefinition) framework**, Puenteadura (2012), which helps institutions understand the stages of ICT integration. This model encourages educators to move beyond simply substituting traditional tools with digital ones and towards more transformative uses of technology, where it redefines teaching and learning processes. At the higher levels of the model, institutions leverage ICT to enable new, previously inconceivable methods of instruction and student engagement, fostering deeper learning and more interactive experiences.
- Another influential model is **TPACK (Technological Pedagogical Content Knowledge)**, Mishra, P., & Koehler, M. J. (2006), which emphasises the intersection of technology, pedagogy, and content knowledge. TPACK provides a **guiding framework** for institutions and educators to develop digital strategies that align technological tools with sound pedagogical practices and subject-specific knowledge. How these three domains interact should be considered regarding how institutions can implement digitisation in a way that enriches learning outcomes while maintaining the integrity of their academic programs.

- Additionally, the **Digital Maturity Model** offers a holistic approach to assessing how prepared an institution is to embrace digital transformation. This model, as HEinnovate (2024), among others, that will be addressed in more detail in the next section of this guide, helps universities assess their readiness across key areas such as leadership, strategy, infrastructure, and faculty development. Institutions that achieve higher levels of digital maturity are better equipped to integrate digital tools into teaching, learning, and institutional processes, creating a more agile, responsive, and student-centred educational environment.

As institutions implement these digitalisation models, they aim to enhance learning experiences through innovations such as blended learning, virtual classrooms, and AI-powered learning analytics. These changes are not just about modernising classrooms or administrative workflows—they are about **creating ecosystems where students are empowered to take control of their learning**, where faculty are supported in developing dynamic and interactive teaching methods, and where institutional processes are optimised for efficiency and accessibility.

4. INTEGRATING TECHNOLOGY INTO TEACHING, LEARNING AND CURRICULUM DESIGN

4.1. Moving from lecturer to facilitator

In the context of higher education models based on ICT, the shift toward digital teaching has brought profound changes to the pedagogical landscape. One of the most significant transformations is the evolving **role of the teacher**. In this context, the role of the teacher can be distributed among **facilitators**, who guide the learning process, **advisors**, who provide personalised guidance and support regarding academic subjects or course selection, personal interest orientation, etc., and **lead lecturers**, who are responsible for the overall content and academic quality of the course. These lead professors are supported by **instructional designers**, who offer pedagogical insights and support throughout the learning design process. In a digital context, this division allows for a more tailored educational approach, meeting the diverse needs of students while leveraging the strengths of each teaching role.

How the teacher's role shifts in a digital classroom, from lecturer to facilitator, using ICT to foster student-centred learning and explore technology-enhanced teaching methods?

In a digitalised classroom, this role has shifted from that of a lecturer to a facilitator of learning. With the integration of ICT tools, educators are now focusing on creating more **student-centred learning experiences** that empower students to take an active role in their own learning journey.

In this new paradigm, **technology becomes an enabler** for active learning and collaboration. Teachers use a variety of digital tools to design interactive and engaging learning activities that foster critical thinking, problem-solving, and creativity. For instance, instead of merely delivering content, educators might use online simulations, collaborative platforms, or interactive quizzes to encourage students to explore, experiment, and apply their knowledge in real contexts. This shift from “sage on the stage” to “guide on the side” helps create a more dynamic student-driven learning environment where learners are at the centre of the educational process.

Moreover, **ICT has transformed teaching methodologies**, making them more adaptable and engaging. In a flipped classroom, for example, students access lecture content online outside of class time, freeing up in-class time for more hands-on activities like group work, discussions, or projects. In a blended learning model, the integration of face-to-face and online components provides a more flexible and personalised learning experience, allowing students to progress at their own pace and revisit materials as needed.

4.2. Student-centred learning

And how does the learner's role evolve in the digitised classroom to align with and support more student-centred learning experiences?

On the student side, the digital environment demands new **skills and competencies**. To succeed in this landscape, students must develop **digital literacy**, which involves the critical capacity to evaluate and use digital information effectively. Additionally, digital learning requires strong **autonomy** and **self-regulation** skills. In online or hybrid modalities, **student diversity** may be even greater than in traditional educational models. In environments where much of the learning occurs asynchronously or outside a structured classroom, students who are also working or managing family responsibilities must optimise their time, set goals, and monitor their own progress with greater independence. This **self-directed learning is a relevant skill** in a digitalised world where lifelong learning has become increasingly important.

Tools such as collaborative writing platforms, discussion boards, and video conferencing allow students to work together across distances, breaking down the traditional boundaries of the physical classroom. These tools not only foster teamwork but also prepare students for the collaborative nature of modern workplaces.

One of the most promising aspects of ICT in education is the potential for **personalising the learning experience**. Digital tools enable the creation of **adaptive learning environments** that tailor the learning path to the needs and abilities of individual students. For example, AI-powered systems can adjust the difficulty of tasks based on a student's performance, however, even though this can be automated, the proposal made by AI should be validated by the teacher.

Tailored feedback is another key feature of **personalised**

learning, with digital systems providing instant, specific feedback that helps students understand where they need to improve and what their strengths are. This kind of continuous feedback supports a more personalised and efficient learning process, however, as it was mentioned, it is essential to emphasise the human validation and supervision, and, if necessary, the further elaboration by an expert.

In addition, technology allows educators to offer **customised content** based on students' individual learning goals, interests, and progress. Whether through personalised learning dashboards, curated learning resources, or customised assignments, digital tools enable a more learner-centric approach that acknowledges the diversity of student needs regarding a more **inclusive learning design** of the training offer.

The integration of ICT into higher education is transforming both the role of the teacher and the experience of the learner. This shift represents a **move toward a more holistic, collaborative, and adaptive learning experience**, driven by the opportunities that digital tools bring to the classroom.

4.3. Impact on curriculum development and learning design

What changes would need to be made to curricula and teaching methods to meet the increasing demand of digital learning?

Digitalisation impacts curriculum development and emphasises the importance of collaborative efforts in creating integrated digital learning experiences that promote active methodologies and essential skills.

In the context of higher education, the integration of ICT into curriculum development represents a significant evolution in how learning is designed, delivered, and assessed. The **digitalisation**

of curricula impacts every aspect of the educational process, from how learning objectives are set to the methods used to achieve them. As institutions seek to prepare students for the challenges of the 21st century, technology is playing a critical role in shaping curricula that not only impart knowledge but also foster essential skills such as critical thinking, problem-solving, and collaboration.

The **integration of ICT into curriculum development** begins with rethinking the very foundations of education—its **learning objectives, competencies, and outcomes**. In traditional curriculum models, learning objectives often focus on content knowledge, with less emphasis on the processes of learning itself. However, in a digitalised environment, the focus shifts towards **competency-based learning**, where the acquisition of skills and the application of knowledge take centre stage. Digital tools can enhance these objectives by allowing for more **interactive and experiential learning opportunities**. For example, rather than merely reading about a historical event, students might explore it through a virtual reality simulation, engaging more deeply with the material and developing critical analytical skills in the process.

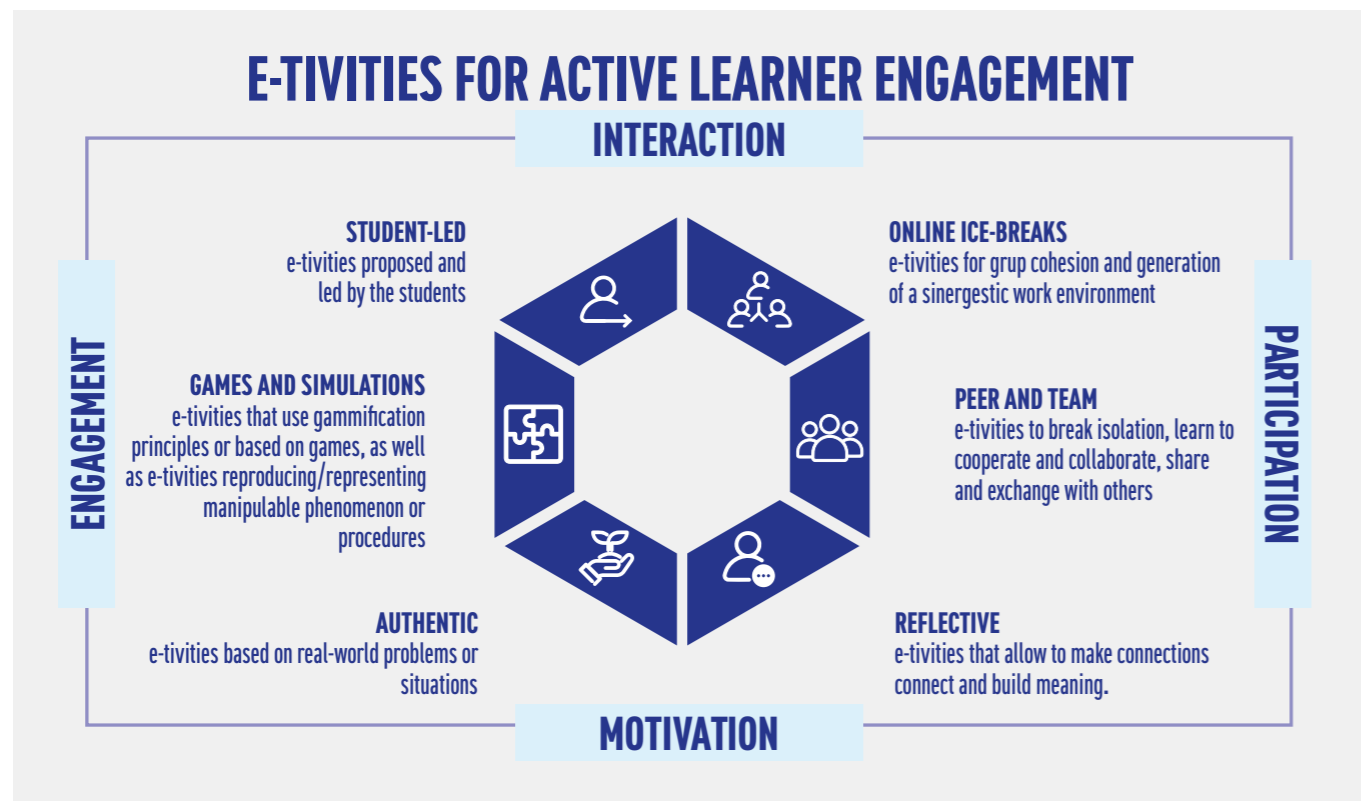
> ACTIVE LEARNING METHODOLOGIES

One of the major benefits of ICT in curriculum and learning design is the ability to support **active learning methodologies** (see section 6), where the learning activity becomes the centre of the educational model, and the entire teaching and learning process is designed around that activity rather than the content. Therefore, all the elements necessary to solve and support the activity, such as learning resources, assessment of learning outcomes, support tools, and teaching strategies, will be developed following this approach. In this regard, digital tools such as interactive simulations, collaborative platforms, and multimedia resources offer students the opportunity to engage with content in more dynamic ways. These tools encourage students to become **active participants** in their learning rather than passive recipients of information. In this way, technology helps students develop **critical thinking** and **problem-solving skills** allowing them to experiment, collaborate, and reflect on real problems within a controlled, digital environment.



Figure 2

E-Tivities for active learner engagement. Maina, M. & Guàrdia, L. (2020). Infographic based on Conrad, R. M., & Donaldson, J. A. (2011)



Experts in online learning have consistently highlighted that both learners and instructors take on new roles in the online learning environment. One of the key challenges for online educators is not just improving their ability to facilitate knowledge acquisition, but also guiding learners to become more self-directed and collaborative than they might be in traditional, lecture-based courses. In this sense, it is relevant to address how instructors can create an engaging learning environment that encourages learners to take ownership of their own education.

> DIGITAL CURRICULUM DESIGN FOR 21ST-CENTURY SKILLS

Digitalisation also enables institutions to design curricula that explicitly foster **21st-century skills**, which are increasingly essential in today's global and digital economy. Skills such as **critical thinking, problem-solving, and collaboration** are often difficult to teach in traditional, lecture-based classrooms but can be effectively cultivated through technology-enhanced learning environments, Redecker, C., & Punie, Y. (2017). For example, in a digitally integrated curriculum, students might engage in **project-based learning** using collaboration tools like Google Workspace, Trello, or virtual whiteboards to work on group projects with peers from different geographical locations. This not only enhances their collaboration and communication skills but also exposes them to **diverse perspectives** and challenges them to work in a more global, interconnected context.

Furthermore, technology allows for the development of **adaptive learning systems** that provide students with tailored learning

experiences based on their progress, strengths, and weaknesses. This personalised approach ensures that students not only meet the curriculum's objectives but also develop the **self-regulation** skills necessary to thrive in a rapidly changing, technology-driven world. In such environments, learners are encouraged to take ownership of their educational journey, which enhances their ability to apply these skills in meaningful contexts.

> EXAMPLES OF DIGITAL CURRICULUM INTEGRATION AND LEARNING DESIGN

To illustrate the practical application of digital curriculum design, consider the example of a **STEM program** where the curriculum is developed using **simulation tools** and **coding platforms** that allow students to experiment with scientific concepts or develop their own software applications. In these environments, students can actively engage in the iterative process of hypothesis testing, troubleshooting, and refining their work—mirroring real-world scientific inquiry and technological development. Similarly, in **humanities courses**, digital archives, multimedia storytelling tools, and social media platforms can be integrated into the curriculum to help students develop digital literacy and enhance their ability to analyse, create, and share content in a digital age. Another example could be the integration of **gamification** within the curriculum to foster motivation and engagement. Incorporating game elements such as challenges, badges, and leaderboards into coursework, educators can incentivise students to reach learning milestones while fostering a spirit of friendly competition and collaboration.

> COLLABORATION BETWEEN EDUCATORS, TECHNOLOGISTS, AND CURRICULUM DESIGNERS

Achieving a cohesive and integrated digital learning experience requires **close collaboration between educators, technologists, and curriculum designers**. This multidisciplinary partnership is essential for ensuring that the curriculum is pedagogically sound, technologically feasible, and aligned with institutional goals. Educators bring expertise in subject matter and pedagogy, while technologists contribute knowledge of the latest digital tools and platforms that can enhance learning experiences. Meanwhile, curriculum designers bridge these worlds, ensuring the quality of the course.

For example, in designing a digital curriculum, educators might work with technologists to integrate an AI-based adaptive learning system that provides real-time feedback to students. At the same time, **curriculum designers ensure that the system aligns with learning outcomes**, counselling the teacher about possible assessments that leverage the AI's ability to personalise the learning experience. The success of such a system relies on ongoing collaboration and feedback loops between all parties to refine and improve the integration of technology over time.

4.4. Technology as a catalyst for educational change

Technology is reshaping the educational landscape, positioning itself as an enabler not just for delivery but as a driver of educational transformation. Rather than simply delivering content, technology now enables new ways of teaching, learning, and assessing. This shift is particularly evident in higher education (HE), where institutions are now tasked with integrating technology strategically to respond to evolving educational needs, student expectations, and workforce demands.

How can educational institutions address the shift toward more student-centred, digitally enabled approaches?

> CHOOSING TECHNOLOGY WITH PURPOSE

The integration of technology in HE is not just about adopting new tools but about choosing the right ones to truly enhance and transform the educational experience. This choice involves understanding students' needs, aligning with educational goals, and selecting technologies that can create flexible, inclusive, and engaging learning environments. For example, Learning Management Systems (LMS) centralise course materials, assessments, and discussions, providing a structured and accessible digital environment. Synchronous platforms enable real-time interaction between students and instructors, **bridging the gap between digital and face-to-face learning**. Multimedia applications use video, audio, and visuals to make learning more engaging, while collaborative tools allow students to work together remotely, building a sense of community even in online

spaces. And cloud-based technologies enhance accessibility and adaptability, allowing institutions to seamlessly integrate new tools while reducing maintenance efforts.

> EMERGING TECHNOLOGIES: AI, XR, AND LEARNING ANALYTICS

Beyond these foundational tools, emerging technologies—such as AI, extended reality (XR), and learning analytics (LA)—are redefining what is possible in education. AI can be used to provide personalised learning experiences, from chatbots that support students in real-time to adaptive platforms that adjust to each student's pace and progress. XR technologies, including virtual and augmented reality, offer **immersive learning experiences** that let students engage with content experientially, creating memorable and impactful learning moments. Learning analytics, on the other hand, offer insights into student performance and engagement, empowering educators to make informed adjustments to their teaching strategies.

These technologies make it possible to move closer to the ideal of individualised learning, where each student's unique pace, needs, and preferences are supported. Importantly, they also contribute to greater accessibility, making it easier to reach and support a diverse range of students with different learning needs.

> THE ROLE OF PEDAGOGICAL AFFORDANCES

Central to successful technology integration is the concept of "pedagogical affordances," which refers to the potential that specific technologies hold for supporting and enhancing educational tasks. Instead of trying to fit technology into existing teaching methods, educators must consider what each tool offers in terms of facilitating meaningful learning experiences and outcomes.

For effective technology integration, educators should ask:

- How well does the technology support the intended learning activities?
- Does it provide an intuitive and accessible user experience for students and educators alike?
- Does it have the potential to encourage active engagement, critical thinking, and collaboration?
- Focusing on these questions, educators can leverage technologies that not only complement but also enhance traditional learning, creating richer and more interactive experiences.

> TECHNOLOGY AND INCLUSIVITY: UNIVERSAL DESIGN FOR LEARNING (UDL) AND DIVERSITY, EQUITY, AND INCLUSION (DEI)

One of the most transformative effects of technology in higher education is its ability to foster inclusivity and accessibility. Frameworks like Universal Design for Learning (UDL) provide a foundation for creating flexible, inclusive learning environments that cater to a diverse student population. UDL emphasises the importance of offering:

- **Multiple Means of Engagement.** Providing students with different ways to interact with material to keep them motivated and interested.
- **Multiple Means of Representation.** Presenting information in varied formats to address different learning styles and sensory needs.
- **Multiple Means of Action and Expression.** Allowing students to show their understanding in ways that play to their strengths, whether through writing, speaking, or other creative forms.

When used alongside Diversity, Equity, and Inclusion (DEI) principles, these technologies and frameworks ensure that learning environments are adaptable and equitable, allowing students of all abilities and backgrounds to participate meaningfully in their education.

> STRUCTURING TRANSFORMATION: THE SAMR MODEL

To assess and guide the impact of technology integration, the SAMR model—Substitution, Augmentation, Modification, and Redefinition—provides a valuable framework for understanding how deeply technology reshapes the learning experience:

- **Substitution.** Technology replaces a traditional tool without additional functional change.
- **Augmentation.** Technology substitutes with functional improvements.
- **Modification.** Technology significantly redesigns learning activities.
- **Redefinition.** Technology enables the creation of tasks that were previously unimaginable.

Enabling educators to create transformative learning experiences that meet the skills and expectations of the digital age requires a focus on modification and redefinition, moving beyond mere enhancements.

5. CONCLUSIONS

ICT-based educational models transform education by enhancing flexibility, accessibility, and personalisation. Institutions can adopt blended, hybrid, or online learning approaches based on their needs, with teachers evolving into facilitators who support active, student-centred learning. Students develop essential skills like digital literacy and self-regulation, while personalised learning paths and digital tools tailor experiences to individual needs. Curriculum design shifts to focus on 21st-century skills through interactive, collaborative learning environments. Successful digitalisation requires collaboration among educators, technologists, and curriculum designers to create engaging, effective learning experiences that leverage technology to promote autonomy, personalisation, and community. In this regard, a pedagogical innovation supported by technology as a catalyst, higher education can transcend adaptation and lead in educational innovation,

creating learning environments that meet the needs of a diverse, digital-native generation and it becomes crucial for next-generation.

6. TAKEAWAYS

- Adopt and customise digital learning modalities—such as blended, hybrid, hyflex or online formats—that align with their specific needs, enhancing flexibility, accessibility, and personalisation
- Reframe the teacher's role shifting from traditional lecturing to becoming dynamic facilitators who engage students through interactive digital environments, focusing on active learning, collaboration, and critical thinking.
- Prepare students with essential skills like digital literacy, self-regulation, and adaptability, ensuring they are well-equipped to navigate and succeed in a technology-driven world.
- Develop curricula that integrate interactive, collaborative, and adaptive tools, preparing students for the demands of the modern world by prioritising critical thinking, problem-solving, and teamwork.
- Establish a pedagogical structure or model that delineates the specific tasks involved in the student support process, whether facilitated by a single academic or a team of educators, to maximise the effectiveness of this process and ensure its quality.
- Leverage technology and AI-powered analytics to create student-centred learning environments, offering personalised learning experiences and promoting continuous improvement in teaching and institutional processes.

7. QUESTIONS FOR REFLECTION

1. How can institutions ensure that digitalisation not only modernises the classroom but also creates meaningful improvements in student engagement, learning outcomes, inclusion and accessibility?
2. What challenges might institutions face when transitioning along a continuum of online learning, and how can they overcome barriers related to digital readiness and capacity building?
3. How can educators balance the integration of advanced technology, such as AI, virtual simulations and other technologies, with the need to maintain strong pedagogical foundations rooted in student-centred learning?
4. How can educators strategically leverage emerging technologies and frameworks to create truly transformative, inclusive, and student-centred learning environments that go beyond traditional teaching methods?
5. What strategies should be employed to assess and enhance an institution's digital maturity, ensuring that digital transformation efforts align with broader educational goals and priorities?

8. VISUAL SYNTHESIS

Table 1
Technologies and learning modalities

TECHNOLOGY	FACE-TO-FACE	HYBRID/BLENDED	HYFLEX	FULLY ONLINE
Learning Management System (LMS)	Not typically required	Essential for managing online components (e.g., Moodle, Canvas).	Crucial for organising all modes of participation and content delivery.	Essential for all course management and delivery (e.g., Moodle, Canvas).
Video Conferencing Tools	Not typically required	Used for remote guest speakers or occasional online sessions (e.g., Zoom, MS Teams).	Essential for synchronous online participation (e.g., Zoom, MS Teams).	Essential for live classes and meetings (e.g., Zoom, MS Teams).
Classroom Technology	Basic classroom tech (e.g., projectors, whiteboards)	Enhanced classroom tech (e.g., smart boards, interactive displays).	Advanced AV setup (e.g., multiple cameras, microphones, interactive displays).	Not required; relies on personal devices and home setups.
Content Creation Tools	Physical materials (e.g., textbooks, handouts).	Digital content creation tools (e.g., Google Workspace, Microsoft Office).	Comprehensive digital tools for creating and sharing content across modes (e.g., Google Workspace, Microsoft Office).	Essential for creating and sharing digital content (e.g., Google Workspace, Microsoft Office).
Assessment Tools	Traditional methods (e.g., paper exams, quizzes).	Combination of online and in-person tools (e.g., online quizzes, digital submissions).	Flexible tools to accommodate all participation modes (e.g., online quizzes, proctored exams).	Essential for online assessments and proctoring (e.g., online quizzes, proctored exams).
Communication Tools	In-person communication.	Mix of in-person and online tools (e.g., email, discussion boards).	Integrated communication platforms (e.g., LMS messaging, discussion boards, video conferencing).	Essential for all communication (e.g., email, discussion boards, LMS messaging).
Accessibility	Physical accessibility features (e.g., ramps, seating).	Digital accessibility tools (e.g., screen readers, captioning).	Comprehensive accessibility features for all modes (e.g., screen readers, captioning, adaptive tech).	Essential for ensuring accessibility in digital formats (e.g., screen readers, captioning, adaptive tech).

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10. RESOURCES

1. IDEAS for Transforming Higher Education: An Overview of Ongoing Trends and Challenges

The study explores current technological, organisational, and pedagogical trends through a three-stage exploratory design. First, a literature review identified 14 key trends, discussed with higher education experts in workshops and interviews. In the second stage, 108 initiatives representing these trends were identified, with 30 selected for further exploration in the final stage. Thematic analysis of these cases revealed 12 main themes, which were used to create the IDEAS framework. This framework serves as a guide for implementing innovative, next-generation pedagogies to transform HE, with practical applications discussed.

USEFULNESS

The IDEAS framework aids institutional leaders in aligning their vision with emerging trends in technology, pedagogy, and organisational practices. By understanding these trends, decision-makers can anticipate future developments and enhance competitiveness.

Case studies and thematic analysis provide examples of successful educational innovations, inspiring institutions to adopt or adapt similar practices. This resource offers a structured **roadmap** for integrating new ideas, guiding faculty and administration through transformative changes in curriculum, teaching methods, and digital transformation.

Guàrdia, L., Clougher, D., Anderson, T., & Maina, M. (2021). **IDEAS for Transforming Higher Education: An Overview of Ongoing Trends and Challenges**. *The International Review of Research in Open and Distributed Learning*, 22(2), 166-184. <https://doi.org/10.19173/irrodl.v22i2.5206>

2. UOC's Educational Model. Pioneering Online University

The educational model of the **Universitat Oberta de Catalunya (UOC)** is designed to offer a fully online, flexible, and student-centred learning experience. At its core, the UOC model emphasises asynchronous learning, allowing students to manage their time and pace while accessing a wide range of digital resources through the virtual campus. This model supports students who may need to balance their studies with work or personal commitments. The UOC's focus on **competency-based learning** ensures that students develop practical skills that can be applied directly to their professional and personal lives. Through continuous assessment, students receive real-time feedback that helps them track their progress.

USEFULNESS

The UOC model could be useful as inspiration for other institutions regarding how to address the learning design, because it places a strong emphasis on **collaborative learning**. Students engage in discussions, group projects, and forums, fostering interaction and knowledge sharing with peers and instructors. This dynamic, online environment is complemented by constant support from **academic advisors** and **tutors who guide students** throughout their educational journey. The UOC also integrates **cutting-edge technologies** to enhance learning, providing an immersive experience with multimedia resources and digital tools. This approach is geared toward creating a personalised, flexible learning path that equips students with the skills and competencies needed in the rapidly changing global landscape.

UOC. *Educational Model*. <https://www.uoc.edu/portal/en/metodologia-online-qualitat/model-educatiu/index.html>

3. Digital Education 2021-2027. Action Plan. Resetting education and training for the digital age (European Commission)

The digital education action plan is a strategic framework aimed at improving and modernising education and training across Europe for the digital age. It focuses on two main priorities:

- **Enhancing digital skills and competences for the digital transformation**, equipping students, teachers, and institutions with the necessary digital skills, promoting digital literacy, and addressing the digital divide.
- **Fostering a high-performing digital education ecosystem**, focusing on improving infrastructure, connectivity, and digital tools to support quality digital education and training.

USEFULNESS

This resource can be useful regarding the digital maturity of the institution to assess its digital readiness. The plan also emphasises lifelong learning, inclusivity, and ensuring that digital transformation benefits all members of society. Key initiatives under the plan include: promoting teacher training in digital skills, encouraging the use of digital learning platforms, developing common guidelines on AI and data usage in education and implementing frameworks like SELFIE to help institutions assess their digital readiness.

European Commission. *Digital Education Action Plan*. <https://education.ec.europa.eu/focus-topics/digital-education/action-plan>

4. Teaching in a Digital Age

"Teaching in a Digital Age" by Tony Bates is a comprehensive guide that explores effective teaching strategies in the context of technological advancements and the evolving educational landscape. The book addresses key questions such as:

- How is the nature of knowledge changing, and how do different views on this influence **teaching approaches**?
- What research and science can best **inform teaching practices**?
- How should educators decide between **face-to-face, blended, or fully online courses**?
- Which strategies are most effective in **technology-rich environments**?
- How can educators **choose among various media**—text, audio, video, computer, or social media—to benefit students and subjects?
- How can **high-quality teaching** be maintained in a rapidly changing learning environment while managing workload?

USEFULNESS

This book is useful for academic leaders and teachers aiming to digitally transform their universities, this book offers valuable insights and practical guidelines. It provides a framework for making informed decisions about teaching methods and media selection, considering the unique aspects of each subject and the individual strengths of educators. Understanding the principles outlined, educators can effectively integrate technology into their teaching practices, enhance student engagement, and develop the necessary skills for success in a digital age.

Bates, A.W. (2022). *Teaching in a digital age* (3rd ed.) BCcampus PressBooks. <https://pressbooks.bccampus.ca/teachinginadigitalagev3m/>

5. A Process for Institutional Adoption and Diffusion of Blended Learning in Higher Education

This case study explores how universities can implement blended learning to enhance student engagement and outcomes. Using Rogers' diffusion of innovations theory, it finds that successful adoption requires a clear strategy, infrastructure investment, and faculty support. However, limited lecturer involvement in decision-making posed challenges. The study highlights the importance of involving faculty to align strategies with their needs, leading to smoother implementation and greater acceptance of blended learning.

USEFULNESS

This case study is useful as it outlines key factors for successful blended learning adoption in universities, including strategic planning, infrastructure investment, and faculty involvement. It highlights the importance of aligning initiatives with educators' needs to ensure smoother implementation and greater acceptance.

Ali, R., Georgiou, H. A Process for Institutional Adoption and Diffusion of Blended Learning in Higher Education. *High Educ Policy* (2024). <https://doi.org/10.1057/s41307-024-00359-y>



Watch the webinar here

SECTION 2

DIGITAL TRANSFORMATION

OF HIGHER EDUCATION

INSTITUTIONS:

FRAMEWORKS & MODELS

Authors: **Marcelo Maina, Lourdes Guàrdia & Nati Cabrera**

1. INTRODUCTION

Digital transformation involves a comprehensive overhaul of an institution's culture, processes, and workflows, extending beyond merely adopting new technologies. It focuses on enhancing teaching, learning, operational efficiency, student engagement, and global competitiveness. Key drivers include evolving student expectations, technological advancements, and the need for flexible, accessible education.

This section introduces university senior leaders and teachers to digital transformation frameworks and models specifically tailored for higher education. It explores the multifaceted nature of digital transformation (DT), highlighting how it can reshape educational institutions to better meet the demands of the 21st century. Various frameworks and models provide a structured approach to implementing digital strategies, ensuring that changes are sustainable and impactful. The critical role of leadership in driving these changes is emphasised (see section 3), highlighting the need for a clear vision and strategic planning, as well as fostering a culture that embraces innovation and continuous improvement.

2. OBJECTIVES

- Understand and analyse **digital transformation frameworks** tailored for higher education to enhance educational outcomes and operational efficiency.
- Familiarise with **essential methods and tools** that support assessing the current state of digitalisation, facilitate data-driven decision-making, and utilise benchmarks.
- Examine **how to build a strategic roadmap** for digital transformation tailored to the institution's vision and goals.

3. UNDERSTANDING DIGITAL TRANSFORMATION FRAMEWORKS IN HIGHER EDUCATION

Digital transformation in higher education is a **multifaceted process** that requires a strategic approach to overhaul an institution's culture, processes, and workflows (Rahmadi, 2024). We will explore well-established digital transformation frameworks that provide a structured pathway for institutions to navigate this complex journey

Why and how can HEIs embrace digital transformation?

Digital transformation (DT) is crucial for HEIs, as it enables them to respond effectively to both long-term challenges and

short-term disruptions. By adopting a strategic approach to digital transformation, institutions can enhance operational efficiency, support their strategic missions, and improve the overall experience for staff and students. Effective digital transformation fosters a **culture of innovation, resilience, and adaptability**, which are essential for navigating the rapidly changing landscape of higher education.

A few frameworks have been developed to guide HEIs through the digital transformation process. Among the most notable are the **JISC Framework for Digital Transformation in Higher Education** and the **EDUCAUSE Digital Transformation** approach. These frameworks offer comprehensive guidelines that encompass various aspects of digital transformation, ensuring a holistic approach.

3.1. JISC Framework for Digital Transformation

The JISC Digital Transformation Framework (JISC, 2023) is designed to guide HEIs through the digital transformation process. It provides a comprehensive approach to navigating the complexities of digital transformation, ensuring that institutions can effectively integrate digital technologies and practices to enhance their educational offerings and operational efficiency. The framework is structured around **six key elements**, each addressing a critical aspect of this transformation.

- **Leadership and governance** are essential for setting a strategic vision and establishing governance structures that support digital initiatives. Effective leadership ensures that digital transformation is aligned with the institution's overall goals and that there is a clear roadmap for implementation.
- **People and culture** focuses on the human aspect of digital transformation, emphasising the importance of developing digital skills among staff and students and fostering a culture that embraces change and innovation. It is crucial to create an environment where individuals feel supported and motivated to engage with new technologies.
- **Technology and infrastructure**, covers the deployment and management of digital technologies and infrastructure, ensuring that the necessary technological tools and systems are in place to support teaching, learning, and administrative functions. Robust and reliable infrastructure is the backbone of any digital transformation effort.
- **Teaching, learning, and assessment** involves integrating digital tools and practices into the curriculum. The goal is to enhance learning experiences and outcomes by leveraging technology to create more engaging and effective educational environments, including the use of digital assessment methods to provide timely and meaningful feedback to students.
- **Research and innovation** encourages the use of digital technologies to support research activities and drive innovation, using digital tools to enhance research processes, collaboration, and dissemination of findings. In this regard, by embracing digital innovation, institutions can stay at the forefront of academic research and contribute to the advancement of knowledge.
- **Data and information** focuses on the effective use of data

and information management. This last element involves implementing data governance and analytics practices to inform decision-making and improve institutional performance. It is relevant that harnessing the power of data, institutions can gain insights that drive strategic planning and operational efficiency.

In addition to these elements, **the framework outlines several key areas of activity**. **Strategic planning** is crucial for developing and implementing a digital strategy that aligns with institutional goals. **Professional development** is necessary to provide training and support to **build digital capabilities** among staff and students. **Investing in digital infrastructure** ensures that the technological foundation is robust and reliable. **Curriculum design** should embed digital practices to enhance teaching and learning. **Research** support leverages digital tools to improve research processes and outputs. Finally, **effective data management practices** are essential for informed decision-making and institutional improvement.

To support the implementation of this framework, **JISC has released a toolkit** that includes a set of instruments designed to help institutions assess their current **level of digital maturity**, develop detailed actionable plans, and create strategic roadmaps for DT. The maturity model uses the framework structure to illustrate different levels of digital maturity, helping organisations identify their baselines and set goals for improvement. The action plan provides a **practical template** for outlining specific actions, key performance indicators, and necessary investments. The **roadmap** serves as a strategic guide, ensuring that all efforts are aligned with the institution's long-term goals and vision.

3.2. EDUCAUSE Digital Transformation Journey

The EDUCAUSE approach to digital transformation DX (EDUCAUSE, n.d.) in HE emphasises the **strategic use of digital technologies** to drive significant improvements in **educational practices, enhance the experiences of learners and instructors, and develop new instructional models**. DT is defined as a series of deep and coordinated shifts in culture, workforce, and technology that enable new educational and operational models, transforming an institution's operations, strategic directions, and value proposition. This transformation is essential for institutions to remain competitive and prepare learners for the digital workplace.

While the EDUCAUSE approach provides the overarching strategy and rationale for digital transformation, the **Dx Journey instrument**, on the other hand, offers a **practical roadmap** for implementing this strategy, guiding institutions through the necessary steps to achieve successful digital transformation. The Dx Journey is structured into three main phases: **Learn, Plan, and Do**. Each phase is designed to help institutions understand, prepare for, and implement DT effectively.

In the **Learn phase**, institutions focus on understanding what DT entails and why it is crucial. This involves exploring definitions and concepts, assessing the institution's readiness for DT, and building awareness among stakeholders. The goal is to educate and engage faculty, staff, and students about the benefits and challenges of digital transformation, ensuring a shared understanding and commitment to the process.

The **Plan phase** is about preparing for DT by developing a

strategic approach. Institutions set clear, achievable goals that align with their overall mission and strategic priorities. They create a detailed roadmap outlining the steps needed to achieve these goals, including timelines, resource allocation, and key milestones. Engaging stakeholders in the planning process is essential to gather input and ensure broad support. Additionally, institutions assess potential risks and the resources required, such as technology, funding, and personnel, to ensure they are well-prepared for the transformation journey.

In the **Do phase**, institutions put their plans into action. This involves launching digital transformation initiatives, such as deploying new technologies, updating infrastructure, and enhancing digital skills among staff and students. Continuous monitoring and evaluation are crucial to track progress and measure outcomes. Institutions collect data, evaluate the impact of changes, and make necessary adjustments to their strategies and plans. This iterative process ensures that digital transformation efforts remain effective and aligned with institutional goals. Celebrating successes and recognising achievements help maintain momentum and motivate stakeholders throughout the journey.

4. COMMON COMPONENTS OF DIGITAL TRANSFORMATION APPROACHES

The JISC and EDUCAUSE digital transformation (DT) approaches both aim to guide HEI's through the integration of digital technologies to enhance their operations and educational offerings but they differ in their approaches and tools.

What are the key elements digital transformation models address?

JISC primarily focuses on the higher education sector, providing a comprehensive framework that includes leadership, people, technology, teaching, research, and data. It emphasises a holistic approach to digital transformation across all institutional functions. In contrast, EDUCAUSE puts a strong emphasis on the strategic use of digital technologies to drive significant improvements in educational practices.

Despite these differences, both frameworks share **common components** such as the **emphasis on strategic planning** to align digital efforts with institutional goals, **the importance of engaging stakeholders** to ensure broad support and successful implementation, and **the need for continuous professional development** to build digital capabilities among staff and students. Both frameworks also stress the deployment and management of digital technologies to support teaching, learning, and administrative functions, as well as the effective use of data and information management to inform decision-making and improve institutional performance. Consider your institution's strategic priorities. If your focus is on

comprehensive institutional functions, including leadership, governance, and detailed operational aspects, the JISC framework's structured elements might be more beneficial. On the other hand, if your institution aims to drive significant improvements in educational practices and develop new instructional models through cultural, workforce, and technological shifts, the EDUCAUSE framework's phased approach might be more aligned with your goals.

5. DIAGNOSIS METHODS AND TOOLS

Digital transformation in higher education is a complex and multifaceted process that requires a thorough understanding of an institution's current state of digitalisation. We will examine the various tools and methodologies that can be employed to assess digital readiness and establish a solid foundation for strategic planning.

How can HEIs ensure they are fully prepared for a successful digital transformation journey?

Using diagnostic tools allows institutions to identify strengths, weaknesses, opportunities, and threats, which in turn enables data-driven decision-making and effective strategy formulation.

5.1. Assessing the current state of digitalisation

Before embarking on a digital transformation journey, institutions must assess their current state of digitalisation. This involves evaluating existing digital capabilities, infrastructure, and processes to identify areas that require improvement. Several tools and methodologies can be employed for this purpose, including self-assessment surveys, SWOT analysis, and gap analysis.

- **Self-Assessment surveys** are a valuable tool for gauging an institution's digital readiness. These surveys typically include questions related to various aspects of digital transformation, such as technology infrastructure, digital skills, and organisational culture. By collecting responses from different stakeholders, institutions can gain a comprehensive understanding of their current digital capabilities and identify areas that need enhancement. See below in Resources, the HEInnovate self-assessment tool.
- **SWOT analysis** is another effective methodology for assessing digital readiness. This tool helps institutions identify their strengths, weaknesses, opportunities, and threats in relation to digital transformation. Strengths and weaknesses are internal factors, such as existing digital infrastructure and staff competencies, while opportunities and threats are external factors, such as technological

advancements and competitive pressures. By conducting a SWOT analysis, institutions can develop strategies that leverage their strengths and opportunities while addressing their weaknesses and threats.

- **Gap analysis** involves comparing an institution's current state of digitalisation with its desired future state. This methodology helps identify the gaps that need to be bridged to achieve digital transformation goals. By conducting a gap analysis, institutions can prioritise areas for improvement and allocate resources effectively. This process typically involves setting benchmarks, defining key performance indicators (KPIs), and measuring progress over time. See below in Resources, Mohamed Hashim et al. (2022).

5.2. Importance of data-informed decision-making

Data-driven decision-making is a critical component of digital transformation. **Leveraging institutional data and external benchmarks** allows institutions to make informed decisions that drive progress and ensure the success of their digital initiatives. This process involves collecting, analysing, and interpreting data to identify trends, measure performance, and inform strategic planning. Institutional data, such as student performance metrics, staff competencies, and technology usage patterns, plays a pivotal role in this process. Analysing this data provides insights into the current state of digitalisation and highlights areas for improvement. For instance, examining student performance data can reveal gaps in digital literacy, enabling the development of targeted interventions to enhance digital skills.

5.3. External benchmarks

External benchmarks provide a point of reference for comparing an institution's digital capabilities with those of other institutions. These benchmarks can be obtained from industry reports, academic studies, and best practice guidelines. By comparing their performance with external benchmarks, institutions can identify areas where they lag behind and develop strategies to close the gap. See, for example, the EDUCAUSE Core Data Service

5.4. Maturity model for Digital Transformation

The concept of a Maturity Model is a valuable tool for diagnosing digital maturity at the institutional level. A Maturity Model provides a structured framework for evaluating an institution's digital capabilities across different domains, such as leadership, infrastructure, and pedagogy. Assessing their digital maturity allows institutions to set realistic goals, monitor progress, and continuously improve their digital initiatives.

To use a maturity model, institutions typically conduct a **self-assessment to evaluate their current level of digital maturity** across the different components. This involves collecting data from various stakeholders, such as faculty, staff, and students,

and analysing the results to identify strengths and areas for improvement. Based on the assessment, institutions can develop action plans to enhance their digital capabilities and achieve higher levels of maturity over time.

Employing these diagnostic tools and methodologies, HEIs can effectively assess their current state of digitalisation, make data-driven decisions, and develop strategic plans for digital transformation. These tools provide a structured approach to understanding and improving digital capabilities, ensuring that institutions are well-equipped to navigate the complexities of digital transformation.

6. DEVELOPING A ROADMAP FOR DIGITAL TRANSFORMATION

Creating a strategic roadmap for digital transformation is essential for HEIs aiming to achieve long-term success. We will delve into the components of a digital transformation roadmap, providing a guide to develop and implement an actionable strategy. By following these steps, institutions can ensure a structured and effective approach to digital transformation.

6.1. Components of a Digital Transformation roadmap

A digital transformation roadmap outlines the strategic vision, goals, and steps to achieve digital transformation. It serves as a blueprint for guiding institutions through the complex process of integrating digital technologies and practices. The key components of a digital transformation roadmap include vision and goals, a phased approach, key milestones, resource allocation, risk management, and stakeholder engagement.

- Establishing a **clear vision and setting specific goals** is the first step in developing a digital transformation roadmap. The vision should articulate the institution's long-term aspirations for digital transformation, reflecting its commitment to enhancing teaching, learning, and operational efficiency. Goals should be specific, measurable, achievable, relevant, and time-bound (SMART) to ensure they provide clear direction and can be effectively monitored. For example, an institution might set a goal to increase the use of digital tools in classrooms by 50% within three years. This goal is specific (increase use of digital tools), measurable (by 50%), achievable (within three years), relevant (enhances teaching and learning), and time-bound (within three years).
- **Managing the complexity** of digital transformation requires a phased approach. This involves breaking down the transformation process into manageable phases, each with specific objectives and deliverables. A phased approach allows institutions to focus on one aspect of digital transformation at a time, ensuring that each phase is completed successfully before moving on to the next. For instance, the first phase might focus on upgrading the institution's technological infrastructure, while the second phase might involve training staff and students in digital skills.

Subsequent phases could include integrating digital tools into the curriculum and developing data analytics capabilities.

- **Tracking progress and maintaining momentum** throughout the digital transformation process needs identifying **key milestones**. Milestones are significant achievements or events that mark the completion of important stages in the roadmap. They provide a way to measure progress and ensure the transformation is on track. Examples of key milestones might include the completion of a technology infrastructure upgrade, the launch of a digital skills' training programme, or the successful integration of digital tools into a specific department's curriculum. Setting and celebrating these milestones helps institutions maintain motivation and demonstrate progress to stakeholders.
- **Allocating resources effectively** is critical for the success of digital transformation initiatives. This involves identifying the financial, human, and technological resources required for each phase of the roadmap and ensuring that they are available when needed. Institutions must prioritise their investments to ensure that resources are allocated to the most critical areas. For example, an institution might allocate funds for purchasing new hardware and software, hiring additional IT staff, or providing professional development opportunities for faculty. It is also important to consider the ongoing costs of maintaining and updating digital technologies.
- Developing a digital transformation roadmap **also involves risk management**. Institutions must identify potential risks and develop strategies to mitigate them. This involves conducting a risk assessment to identify threats to the success of the transformation and developing contingency plans to address these risks. Common risks in digital transformation include resistance to change, cybersecurity threats, and budget constraints. Proactively addressing these risks helps institutions minimise their impact and ensure the smooth implementation of the roadmap.
- **Engaging stakeholders** is vital for the success of digital transformation initiatives. Stakeholders include faculty, staff, students, and external partners who have an interest in the transformation process. Effective stakeholder engagement involves communicating the vision and goals of the transformation, soliciting feedback, and involving stakeholders in decision-making. For example, institutions can hold workshops and focus groups to gather input from faculty and students, create advisory committees to guide the transformation process, and regularly update stakeholders on progress. Involving stakeholders helps institutions build support for the transformation and ensure that it meets the needs of the entire community.

6.2. Case Studies

To illustrate the practical application of a digital transformation roadmap, we will present case studies and real-life examples of successful DT in HEIs. These examples will highlight best practices, challenges, and outcomes, providing valuable insights for institutions embarking on their digital transformation journeys.

CASE STUDY 1: UNIVERSITY OF TECHNOLOGY SYDNEY (UTS)

The University of Technology Sydney (UTS) embarked on a comprehensive digital transformation initiative **to enhance its teaching and learning environment**. The roadmap included upgrading the technological infrastructure, integrating digital tools into the curriculum, and developing data analytics capabilities. Key milestones included the launch of a new learning management system, the implementation of a digital skills' training programme for faculty, and the establishment of a data analytics centre.

One of the challenges UTS faced was resistance to change. To address this, the university implemented a robust stakeholder engagement strategy, including regular

communication, training sessions, and opportunities for feedback. As a result, UTS successfully transformed its teaching and learning environment, leading to improved student engagement and academic outcomes.

University of Technology Sydney (May 18, 2020). *Digital transformation to foster collaboration and creativity. Company report. Technology Magazine.*
<https://technologymagazine.com/brochure/uts-sydney-has-undergone-digital-transformation>

CASE STUDY 2: UNIVERSITY OF CENTRAL FLORIDA (UCF)

The University of Central Florida (UCF) embarked on a **mission to break the "iron triangle" of access, cost, and quality by transitioning from analogue to digital transformation**. This journey began in 1995 and involved gradual digital enablement, constantly optimising education delivery through digital means. UCF reached a state of true digital transformation by introducing fully digitally dependent adaptive learning, providing affordable quality higher education to students regardless of time, preference, or life considerations. The transformation was driven by the leadership of UCF's CIO, who emphasised creating a culture that integrates both analogue and digital approaches. The case study highlights **several best practices developed by UCF**, including the importance of building digital capabilities, fostering a leadership culture that embraces both analogue and digital methods, and maintaining flexibility to handle crises and disruptions.

These practices have positioned UCF as a leader in digital transformation in higher education, providing valuable insights for other institutions aiming to undertake similar journeys.

Lowendahl, J-M (April 9, 2020). Case Study: Digital Transformation Journey (University of Central Florida).
<https://www.gartner.com/en/documents/3983300>

Kurzweil, M. & Brown, J. (2015). Breaking the Iron Triangle at The University of Central Florida. Ithaka S+R.
<https://doi.org/10.18665/sr.241922>



CASE STUDY 3: NORWEGIAN MULTI-CAMPUS UNIVERSITY

This institution has been actively implementing digital transformation initiatives, particularly accelerated by the COVID-19 pandemic. The University approach **focuses on upgrading and introducing new digital systems, training academic and non-academic staff on these platforms, and providing online support to resolve connectivity issues**. The digital transformation involves several key components. Firstly, the university has invested in digital infrastructure to support online and hybrid learning environments. Secondly, there has been a significant emphasis on professional development, with extensive training programmes designed to enhance the digital competencies of both faculty and staff. Moreover, the University has focused on fostering a supportive organisational culture that embraces digital change. This involves encouraging collaboration and communication across different departments and levels of the institution. The university's efforts have also included the development of digital content and resources that are accessible to all students, thereby promoting inclusivity and reducing digital divides.

The case highlights the importance of readiness and adaptability in successfully implementing digital transformation in higher education. By addressing both technological and cultural aspects, the university has been able **to create a resilient and flexible educational environment** that can respond effectively to both immediate challenges and long-term strategic objectives.

Laterza, V., Asante, M.O., Tømte, C.E., Pinheiro, R. (2023). Implementing digital transformations in Higher Education following COVID-19: A Norwegian case study. In R. Pinheiro, C. Edelhard Tømte, L. Barman, L. Degn, L. & L. Geschwind (Eds), *Digital Transformations in Nordic Higher Education* (pp. 243-265). Palgrave Macmillan, Cham.
https://doi.org/10.1007/978-3-031-27758-0_11

CASE STUDY 4: GEORGIA STATE UNIVERSITY

Georgia State University embarked on a transformative journey **to improve its graduation rates and reduce student dropout rates by leveraging artificial intelligence (AI)**. The university faced a significant challenge: ensuring that students from diverse racial, ethnic, and socioeconomic backgrounds could succeed and graduate. To address this, the University implemented an AI-based system designed to analyse vast amounts of academic data collected over several years. The AI system meticulously examined the academic records of thousands of students, identifying patterns and factors that contributed to both student success and dropout rates. By understanding these patterns, the university could develop targeted interventions tailored to the specific needs of at-risk students. These personalised interventions were crucial in providing the necessary support to help students overcome their challenges and stay on track for graduation.

Additionally, the university saw a 3.3% increase in enrolment rates, translating to an additional \$3 million in tuition revenue. **Most importantly, the personalised interventions facilitated by the AI system significantly improved graduation rates, demonstrating the effectiveness of using AI to support student success and inclusivity.**

De Bem Machado, A., dos Santos, J. R., Sacavém, A., & Sousa, M. J. (2024). Digital Transformations: Artificial Intelligence in Higher Education. In A. de Bem Machado, M. J. Sousa, F. Dal Mas, S Secinaro, & D.Calandra, *Digital Transformation in Higher Education Institutions* (pp. 1-23). Springer.
https://doi.org/10.1007/978-3-031-52296-3_1

Kenny, B. (Host). (2021). How Georgia State University Increased Graduation Rates (No. 148) [Audio podcast episode]. In *Cold Call*, Harvard Business review.
<https://hbr.org/podcast/2021/05/how-georgia-state-university-increased-graduation-rates>

The results of this AI-driven approach were remarkable. Georgia State University reported a 21.4% reduction in summer melt, which refers to students who are accepted to college but do not enrol.

7. TAKEAWAYS

- Understand that the digital transformation of HEIs is a holistic process that includes several key elements that need to be addressed.
- Familiarise yourself with established frameworks like JISC and EDUCAUSE to guide your institution through a structured digital transformation process.
- Regularly use self-assessment surveys, SWOT analysis, and gap analysis to evaluate your institution's digital readiness and identify areas for improvement.
- Establish a data analytics strategy to collect, analyse, and interpret data, ensuring that strategic decisions are based on solid evidence.
- Organise regular training sessions, workshops and communication strategies to enhance digital skills and foster a culture of innovation among faculty, staff, and students.

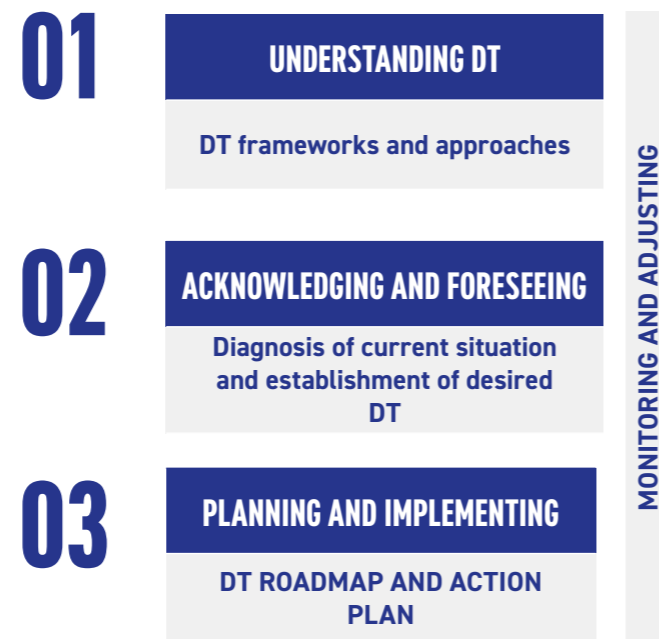
8. QUESTIONS FOR REFLECTION

1. What strategies can we implement to foster a culture of continuous innovation and adaptability in the face of rapid technological changes?
2. How can we ensure that our digital transformation initiatives are inclusive and address the diverse needs of all stakeholders within our institution?
3. How can we effectively balance the investment in new digital technologies with the need to support quality inclusive learning?
4. How can we leverage partnerships and collaborations to enhance our digital transformation efforts and share best practices with other institutions?



9. VISUAL SYNTHESIS

Figure 3
Digital transformation in action



10. REFERENCES

EDUCAUSE *The Dx journey*. <https://dx.educause.edu/>

JISC (March 7, 2023). *Framework for digital transformation in higher education*. <https://www.jisc.ac.uk/guides/framework-for-digital-transformation-in-higher-education>

Rahmadi, I.F. (2024). Research on Digital Transformation in Higher Education: Present Concerns and Future Endeavours. *TechTrends* 68, 647–660. <https://doi.org/10.1007/s11528-024-00971-0>

11. RESOURCES

1. JISC Digital Transformation Framework and Toolkit

JISC has released a set of documents supporting framing and implementing Digital Transformation in HE. The framework provides the overarching structure and strategic vision, while the maturity model offers a way to measure progress and identify specific areas for development within that structure. The maturity model's assessments inform the creation of detailed action plans and roadmaps, ensuring that institutions have clear, actionable steps to advance their digital transformation efforts.

Table 2
Synthesis of JISC Digital Transformation Framework and Toolkit

DOCUMENT	PURPOSE	COMPONENTS	GOAL
Framework for Digital Transformation in Higher Education	Provides a comprehensive structure to guide strategic visions and plans for digital transformation	Digital leadership, investment, secure infrastructure, stakeholder engagement, digital capabilities	Support shared understanding, encourage holistic approaches, help articulate and achieve strategic digital visions
Maturity Model for Digital Transformation in Higher Education	Helps assess current level of digital maturity and identify areas for improvement	Different levels of digital maturity, assessed against framework activities	Enable benchmarking, support tailored digital transformation strategies
Maturity Model for Digital Transformation: Action Plan and Roadmap	Practical tool for creating actionable plans and roadmaps based on maturity model assessments	Templates and guidelines for action plans	Translate insights into concrete steps and timelines for achieving digital transformation goals

JISC (March 7, 2023). *Framework for digital transformation in higher education*. <https://www.jisc.ac.uk/guides/framework-for-digital-transformation-in-higher-education>

JISC (September 27, 2023). *Digital transformation toolkit*. <https://www.jisc.ac.uk/guides/digital-transformation-in-higher-education>

2. HEInnovate self-assessment tool

HEInnovate is a free self-assessment tool designed for HEIs to explore and enhance their innovative potential. It guides institutions through a structured process of identifying strengths and weaknesses across eight key areas, including leadership, organisational capacity, and digital transformation. The tool is accessible in all EU languages and is intended for fostering discussions about innovation and entrepreneurship.

USEFULNESS

HEInnovate serves as a vital resource for HEIs aiming to cultivate an entrepreneurial culture and improve their innovative practices. It enables institutions to pinpoint areas for development and prioritise actions that align with their strategic goals. The tool's emphasis on collaboration through group assessments fosters dialogue among stakeholders, promoting a shared vision for innovation. Additionally, the extensive training materials empower institutions to implement effective changes, and makes HEInnovate not just a diagnostic tool, but a catalyst for transformative growth in higher education.

European Commission's DG Education and Culture - OECD (n.d). *Self-assessment tool*. HEInnovate <https://www.heinnovate.eu/en>

3. ARTICLE: Higher education strategy in digital transformation

The article explores how DT serves as a crucial driver for building competitive advantages in HEIs. It presents a qualitative model that highlights the evolving nature of competitive advantage in the context of rapid technological advancements and globalisation. It also emphasises the need for universities to adapt their strategies to leverage digital tools effectively, thereby enhancing educational quality and student experiences. The research provides empirical insights into the impactful changes affecting HEIs and advocates for a strategic approach that integrates digital transformation into institutional management and performance.

USEFULNESS

The study is particularly valuable for higher education leaders and policymakers, as it offers a framework for understanding the implications of digital transformation on institutional strategy. By identifying key drivers of change and outlining a model for competitive advantage, the article equips HEIs with the knowledge to navigate the complexities of the digital landscape. It encourages institutions to rethink their educational delivery methods and embrace innovative practices that meet the demands of a globalised economy.

Mohamed Hashim, M. A., Tlemsani, I., & Matthews, R. (2022). Higher education strategy in digital transformation. *Education and Information Technologies*, 27(3), 3171-3195. <https://doi.org/10.1007/s10639-021-10739-1>

4. Digital Transformation Map

The EUA Digital Transformation Map (DTM) serves as a valuable resource for universities navigating the complexities of digital transformation. It provides a comprehensive framework that addresses key themes under three core pillars: Institutional Culture, Digital Architecture, and Framework Conditions. This initiative gathers insights and experiences from the European university community, helping institutions identify opportunities and tackle challenges in their digital journeys.

USEFULNESS

The DTM proves useful as a dynamic knowledge base for university leaders in Europe and around the world. It offers a rich collection of practical examples and guidance tailored to various stages of digital transformation. This resource fosters innovation and knowledge transfer while encouraging a holistic approach to change. Institutions can enhance their strategic priorities and contribute meaningfully to a broader digital ecosystem through the insights gained from other institutions.

EUA. Digital Transformation Map. <https://eua-dtm.eu/>





Watch the webinar here

SECTION 3 LEADERSHIP AND MANAGEMENT

Authors: **Deborah Arnold & Pastora Martínez Samper**

1. INTRODUCTION

Strategic leadership, institutional change management, and implementation processes are key elements when addressing the Digital Transformation (DT) in Higher Education Institutions (HEIs).

This section explores the strategic significance of senior leadership in higher education, highlighting its crucial role in successfully navigating digital transitions within institutions. Senior leaders are responsible for steering DT, articulating a compelling institutional vision, and cultivating a culture that embraces innovation. Their responsibilities are particularly important as they directly influence the adoption of emerging trends in education, which are vital for the future competitiveness of their institutions. Effectively guiding these changes enables leaders to improve operational efficiency, boosting global competitiveness, and better prepare students for the digital economy.

The following pages also present the primary challenges and opportunities associated with DT in HEIs (see section 2). On one hand, common barriers – such as resistance to change, insufficient digital skills, budget constraints, and regulatory hurdles – are frequently reported across various countries and institutions. On the other hand, several key factors can effectively address DT in HEIs, including the engagement of people, the integration of technology, the management of academic processes, and the implementation of a robust communication strategy.

The following pages also outline the primary challenges and opportunities of DT in HEIs that leaders must address. Common barriers – such as resistance to change, insufficient digital skills, budget constraints, and regulatory hurdles – are often

encountered across various contexts and require collaborative and distributed leadership to overcome. Key factors for effective leadership include engaging people through a robust communication strategy to facilitate technology integration and manage academic processes, all of which drive initiatives and foster an environment conducive to transformation.

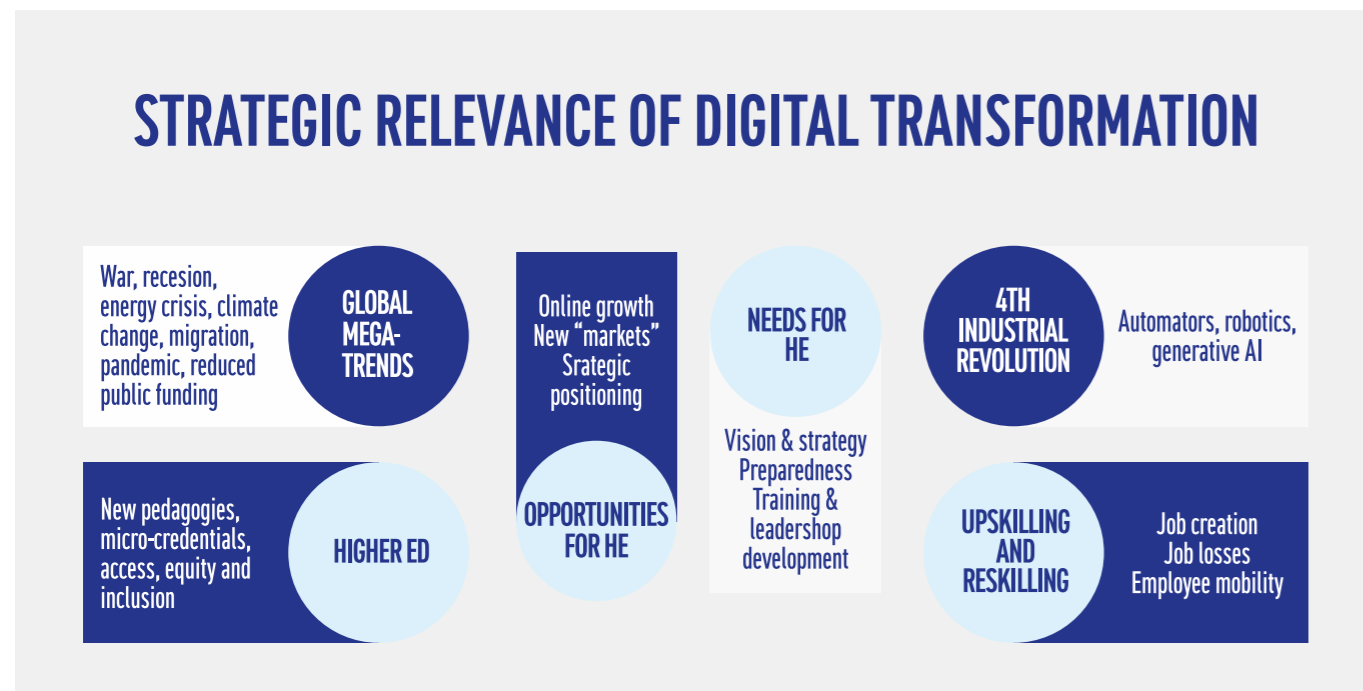
2. OBJECTIVES

- Understand the issues at stake with respect to the digital transformation of higher education and the current trends worldwide.
- Identify key factors to consider when developing your own digital transformation strategy.
- Examine the role of senior leadership from the angles of vision-making and strategy, resources and sustainability, human factors, and organisational dynamics.
- Reflect on challenges and barriers to digital transformation, and on ways to overcome them.

3. STRATEGIC RELEVANCE

In order to examine the strategic relevance of digital transformation, we first need to look at the wider context in which HEIs operate. Olcott et al. (2023) frame this in terms of global mega-trends, evolutions specific to the higher education landscape and characteristics of the 4th Industrial Revolution.

Figure 4
Strategic relevance of digital transformation



4. LEADERSHIP IN DIGITAL TRANSFORMATION: GLOBAL INSIGHTS AND LESSONS FROM THE PANDEMIC

Global megatrends encompass a range of critical issues, including war, recession, energy crises, climate change, migration, pandemics, and reduced public funding. In this context, higher education must evolve by introducing innovative pedagogies that prioritise access, equity, and inclusion. And in many countries, where the traditional three or five-year degree represents a significant financial burden for students, it is essential to strategically evaluate the role of **short courses** and **micro-credentials** as viable alternatives. This consideration is closely linked to the advancements of the Fourth Industrial Revolution, which demands continuous reskilling and upskilling. As a result, the emphasis on lifelong learning becomes increasingly vital.

In this dynamic landscape, HEIs have a significant opportunity to engage with new categories of learners and strategically position themselves for the future. To do this effectively, they must articulate their vision and purpose more clearly, striving to become "future-ready" in a world characterised by volatility, uncertainty, complexity, and ambiguity (VUCA). Moreover, the professional development of both academic and administrative staff is crucial, as is fostering leadership capacity throughout the institution.

Higher Education Institutions must embrace the potential of digital technologies while remaining mindful of the associated risks. From the student perspective, digital education significantly enhances engagement by providing greater flexibility. This is particularly beneficial for individuals who may face barriers to attending campus, such as disabilities, caregiving responsibilities, or work commitments. The traditional image of a student in their early twenties attending full-time, on-campus classes is increasingly outdated. As the student population diversifies, HEIs must adapt to meet the varied needs of learners, ensuring that educational opportunities are accessible to all.

Moreover, universities have a critical responsibility to prepare students for the digital economy. This preparation extends beyond digital skills and specialised fields such as computer programming, data science, and artificial intelligence. It also includes fostering **digital and information literacy**, as well as what is increasingly referred to as **AI literacy**. In today's world, it is essential for all citizens to understand the implications of generative AI as it becomes more embedded in various aspects of human activity.

From the institutional perspective, it is important to approach leadership in digital transformation thoughtfully. Leaders should avoid rushing into widespread adoption of digital technologies without a clear understanding of their purpose, identity, and values as HEIs. Additionally, a solid grasp of digital technologies is necessary to identify both their potential benefits and associated risks. When integrated wisely, these technologies can enhance operational efficiencies and create new opportunities. However, for this integration to be successful, university leadership must establish a clear vision, develop a strategic plan, and adopt a whole-institution approach.

Between 2018 and 2019, the International Association of Universities (IAU) conducted a global survey to assess the **state of digital transformation (DT) in HEIs** worldwide (Jensen, 2019). With responses from 1,039 institutions across 127 countries, the survey highlighted significant leadership-driven trends and challenges in integrating DT into institutional strategies. A notable 75% of institutions reported incorporating DT into their strategic plans, 68% ranked DT as their top priority, and over 70% had implemented learning management systems (LMS). Yet, only 16% found national regulatory policies supportive of DT in higher education, revealing a critical need for aligned, supportive policies. While institutions in Asia reported the most positive perspectives, European institutions expressed more negative assessments, and in Africa, only 19% of institutions reported supportive national regulatory frameworks for DT.

The COVID-19 pandemic in 2020 further underscored the urgency of DT, as educational institutions worldwide were forced to close physical campuses, impacting roughly 90% of the global student population, including over 220 million tertiary students (UNESCO, 2021). Academic leaders faced the complex task of pivoting to virtual teaching environments to maintain continuity in education. This shift to digital platforms demonstrated the **pivotal role technology plays in sustaining academic operations** during crises but also exposed significant gaps in preparedness and strategic foresight.

How can higher education leaders create a strategic digital transformation that addresses both immediate needs and long-term goals?

For university leaders, this period revealed that while technology could enable emergency remote teaching, sustainable digital transformation demands more than just tech adoption. The hasty reliance on digital tools highlighted the limitations of existing solutions, which often constrained teaching methods and limited opportunities for a truly innovative educational model (see section 1). As reported by the Association of Commonwealth Universities (ACU, 2020), a "double digital divide" became apparent, particularly at leadership and operational levels. Senior leaders often had reliable access to broadband and remote working tools, while academics and students frequently encountered gaps in digital resources, support, and infrastructure, further complicating equitable digital engagement.

This period underscored the **importance of comprehensive DT leadership, focusing on proactive planning, inclusive policies, and bridging digital divides**. Effective digital transformation for higher education requires visionary leadership to align technology use with pedagogical objectives, institutional culture, and supportive national policies. Leaders in higher education now face a mandate not only to integrate digital strategies but to actively shape environments

where technology enhances both teaching quality and institutional resilience, ensuring that all members of the academic community are equipped for a digital future.

5. THE ROLE OF SENIOR LEADERSHIP

Foremost, it is worth taking a moment to think on what we mean by leadership. Much of what has been written about leadership since the early 20th century has focused on the individual leader. However, contemporary leadership scholars view leadership as something much more complex, framing leadership **as a social influence process to guide a group of people towards achieving a common goal**. If we break this down, we see that leadership is social, and that it involves interactions between people. We see that it entails influencing others through these interactions, and that it presumes that the group has a shared vision of the goal they are working towards. This last point is of particular importance when it comes to digital transformation, as there may be as many interpretations of what that means as there are people working within the institution. As we shall see in a moment, creating such a shared vision is one of the key roles of senior leadership.

We propose to address the **role of senior leadership** from four different angles: vision-making and strategy, resources and sustainability, human factors and organisational dynamics.

5.1. Vision-making and strategy

In simple terms, a strategy is a tool for getting from A to B, in other words from the current (AS-IS) situation, to the desired (TO-BE) position. In order to define the vision of where we want to go, we need to think carefully about where we are now, and why. There are important historical, geographical, political and cultural factors that define our **identity as a university**, and which will influence future directions. If we look at this in terms of the vision for digital education, we need to establish clearly what kind of university we are, in terms of **our role and purpose in the digital age**: are we a research intensive university, upholding traditional views of higher education as a site of knowledge creation and transfer, with a strong culture of on-campus teaching, or are we a “widening participation” institution, with a remit for supporting the development of learners and for addressing wider societal challenges. What is the socio-economic background of the learners we want to reach, and what form of digital education would best meet their needs?

The question of strategy is also related to **external drivers and barriers**, for example the level of **autonomy** that the institution enjoys, in addition to the global mega-trends, evolutions specific to the higher education landscape and characteristics of the 4th Industrial Revolution described earlier. In highly centralised countries such as France, there is little room for manoeuvre in terms of individual strategies. This is also the case in countries where there is much greater autonomy, but where accreditation and quality assurance bodies (see section 4) largely dictate what is expected of universities. A useful resource here is the European University Association (EUA) autonomy scorecard, which you can learn more about in the Resources section below.

Autonomy can be seen as something desirable, if it means being able to decide on your own strategy, but if it comes at the cost of decreased public funding, then we need to question what the additional constraints are in a context of the marketisation of higher education. This brings us nicely to the next area for attention when it comes to digital transformation, that of resources.

5.2. Resources and sustainability

When we speak of resources for digital transformation, the first thing that comes to mind is funding. Not just for the **technology and infrastructure** but also in terms of **staffing requirements and training**. Senior leadership should also look closely at the structure of this funding. Project-based funding can be very useful in supporting innovation, but what happens when the project is over? Are we in a position to scale-up these innovations and embed them into everyday operations if necessary?

An often-neglected aspect of digitalisation is the **environmental impact**. We now know that technologies such as Generative Artificial Intelligence (GenAI) use much more energy and water for cooling the massive computer clusters required to run it, and that many universities are now tracking and reporting on the carbon footprint of their operations. But how many of them factor in the impact of their use of such technology? Introducing hybrid learning can bring environmental benefits in terms of reduced travel to campus for both staff and students, but this needs to be set against the impact of technology on the planet itself, with far reaching consequences such as forced migration due to climate change, which in turn raise the issue of how to provide access to education to displaced populations (Selwyn et al., 2020).

As we can see, this is a highly difficult conundrum to resolve. What we are trying to say here is that senior leadership needs to be aware of these interrelated factors even if the solutions are not immediately apparent. Finally, as universities operate in an increasingly VUCA world, the question of **organisational agility** will be key. This entails being able to react quickly and effectively to changes in the external environment, something for which universities have the reputation of finding very difficult.

5.3. Human factors

We introduced human factors in terms of human resources in the previous subsection. Now it is time to explore this aspect of digital education leadership more deeply. A first level to analyse is the **formal governance structure** in terms of remit(s) for digital education and DT. Is there a dedicated vice-rector for digitalisation, or does this come under a wider remit for learning and teaching? The place in which the responsibility for DT sits within the governance structure sends out important messages to the community, in terms of the political priorities.

Over and above this, **how is leadership perceived** within the university? Is it seen as a very top-down process, with decisions made at the top and implemented by others? Or is it very collegial? If we return to our definition of leadership as a social influence process aimed at accompanying a group to achieve a common goal, then we see that leadership is about much more than decision-making.

How can senior leaders balance a shared vision for digital transformation with challenges in resources, human factors, and organisational structure?

Senior leaders need to know about **different forms and models of leadership** in order to select those most appropriate to the context and the goals they want to achieve. This is not the place to present an exhaustive account of leadership theories and approaches: if you want to explore this further, we refer you to two literature reviews specific to digital education leadership: Arnold and Sangrà, (2018), and Jameson et al. (2022). In some cases a **top-down** approach will be necessary, for example where the change is widespread and rapid, but even here attention needs to be paid to getting all staff on board. In other cases, a more **distributed** approach will be more relevant, yet for this to be effective, it needs to be recognised and supported by senior governance.

In any digital transformation initiative, senior leadership also needs to ensure that the right people are in the right place, something we call **talent alignment**. In public universities where the staffing structure is dictated by nationally defined role descriptions, promotion paths and lower salaries than in the private sector, it can be a challenge to recruit specialists (particularly in IT). Looking beyond the question of recruitment and pay, senior leaders also need to identify and implement **incentives for change**, recognising and celebrating efforts and initiatives on the part of academic and professional staff alike, and providing sufficient training and support.

We close this section on human factors by turning to the vital questions of **ethics** and **trust**. When making the decision to implement any digital solution, it is the responsibility of senior leadership to identify the human impact of such choices. For example, if we decide to introduce proctored online exams, what are the implications for students in terms of privacy and equity? What happens to the students' work that they input into plagiarism detection software? What are the wider implications of both students and academics using GenAI, in terms of Intellectual Property and again privacy? For DT to be successful, staff and students need to be able to trust the technology, to trust each other and to trust the leadership.

5.4. Organisational dynamics

Our final focus relating to the role of senior leadership concerns organisational dynamics. We have talked about the need to have the right people in the right place, and this also entails ensuring that these people work together in the most effective way. Digital education concerns many different professional profiles, including academic teaching staff, both permanent and adjunct, educational developers, learning technologists and IT specialists. However, university structures are often organised in silos, with not only a split between the academic and professional “sides of house”, but also between different disciplines through faculties and departments. DT requires working across traditional boundaries, and it is the responsibility of senior leadership to put in place and support the mechanisms for this to happen.

A useful concept here is that of **third space** (Whitchurch, 2009), at the nexus of academic and professional work. Third space can

be physical, for example represented by the library, a learning centre or a centre for learning and teaching, in which academic and professional staff (and sometimes students) come together to collaborate in improving the way in which technology is used for pedagogical purposes. Third space can also be conceptual, in the case of a university-wide network of academics and learning designers who work both within their respective faculties and together for peer learning and support. What characterises these third space roles is a blurring of the boundaries between the two categories of staff. Contemporary thinking around third space (e.g., McIntosh & Nutt, 2022) focuses less on the organisational aspects and more on the identities of these third space or ‘blended’ professionals, who may be academics working in non-academic roles, or highly specialised professional staff struggling for recognition of their expertise and leadership. Having said this, the informed mobilisation of the concept of third space, and the recognition of those working in it, is a powerful way to foster **shared understanding** and create a **shared vision** for digital education and DT more broadly.

It is often said that the role of a leader is to create more leaders. This brings us to the question of **leadership development**. Again this needs to be understood from both an individual and a collective perspective. Leadership development is commonly understood to refer to individual leader development, in other words activities such as training, coaching, mentoring and networking that people engage in to develop their leadership skills. However, seen from the collective angle, leadership development is also about **increasing the leadership capacity of an organisation** (Day, 2024), hence its inclusion in this section on organisational dynamics. From the senior leadership perspective, we need to ask ourselves what we are doing to foster the development of other digital education leaders, through training and mentoring opportunities, or the possibility for professional staff to attend conferences and contribute to scientific publications, and also how the way in which our university functions supports or not organic learning and development.

6. CHALLENGERS AND OPPORTUNITIES TO DIGITAL TRANSFORMATION

Barriers and enablers for DT in HE have common elements all around the Mediterranean but it is essential to address DT with a **holistic and context-sensitive approach** that considers socio-cultural, economic, and educational contexts.

For instance, the DT landscape in HE across African nations can be described following the dimensions below (Ajani, 2024):

- **Adoption rates.** Different adoption rates of digital technology across countries, where adoption factors include institutional leadership, funding availability, and faculty readiness to integrate technology into their pedagogical practices.
- **Implementation challenges.** Inadequate infrastructure, limited internet connectivity, and insufficient technical support, digital literacy gaps among faculty and students, resistance to change, and concerns about the quality of online education.
- **Pedagogical Innovations.** The adoption of flipped classroom models, active learning strategies, competency-based

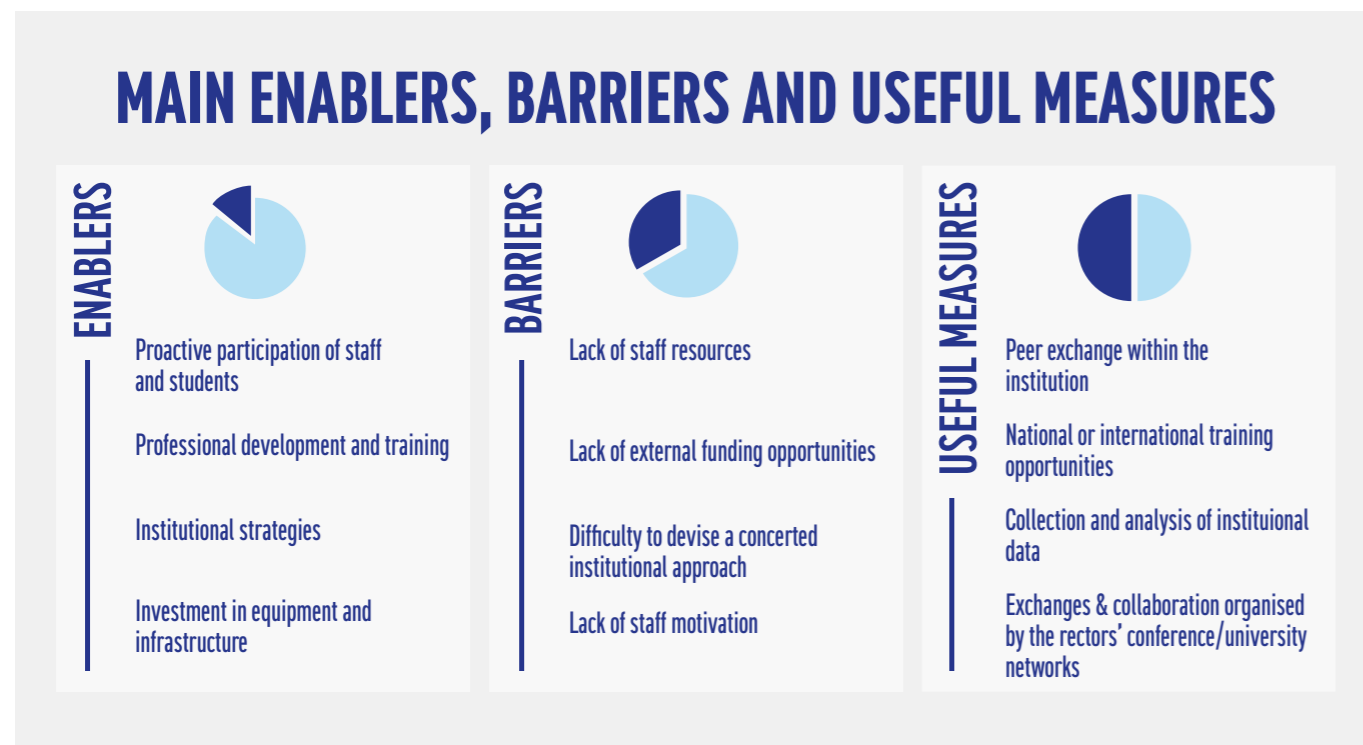
approaches to instruction, and other pedagogical innovations have emerged as a critical focus area in the discourse on DT within African HEIs.

- **Technological Infrastructure.** Robust technological infrastructure, including broadband connectivity, digital devices, and software applications, is needed besides disparities in infrastructure development across African nations.
- **Faculty Development.** There is a need for professional development initiatives to enhance digital literacy, instructional design skills, and online pedagogy, as well as for institutional support and resources to facilitate faculty development efforts effectively.

- **Student Engagement.** Promotion of student engagement includes multimedia content, collaborative learning platforms, and gamification techniques to enhance motivation and participation.
- **Institutional Strategies.** Strategies as a pivotal factor influencing the successful implementation of DT in HE across African nations.

The situation at European universities right after the COVID-19 outbreak has been studied within the Erasmus+ project DIGI-HE, which aims to help universities develop strategic approaches to Digitally Enhanced Learning and Teaching (DELT). The project developed a survey responded by more than 350 HEIs across Europe where the main enablers, barriers and useful measures for DELT at HEIs are summarised in the figure below (Gaebel, 2023).

Figure 5
Enablers, barriers and useful measures for DELT at HEIs upon the survey on digitally enhanced learning and teaching in European HEIs (N=368) (Gaebel, 2023, p.15)



As in Europe, a lack of resources and institutional approaches to DT can also be found as challenges across African nations. Moreover, other threats when addressing DT in HE are listed below:

- The need for policymakers, funding agencies, and institutional leaders to **prioritise investments** in digital infrastructure, human capital development, and regulatory frameworks to support the effective implementation of DT initiatives;
- The necessity of addressing **digital inequality**, including disparities in access to technology and digital skills;
- Tackling **ethical implications of technology use**, including data privacy and cybersecurity.

Finally, it is worth remembering some **key factors** for tackling DT in HEIs: **People**, as the main figures involved, must be committed and trained in digital skills; **Technology**, as a means to facilitate educational and management processes, collecting, analysing, and using the data provided by students' actions, and incorporating emerging technologies applicable to education; **Management and academic processes**, with students as the primary consideration, and with decisions being made by and for them, while always thinking about how to optimise operations to improve internal and external services; **Comprehensive communication management**, as a cornerstone for responding to resistance to change, maintaining flexible, clear, and fluid communication internally and externally, and having a presence in the various channels for that purpose.

7. TAKEAWAYS

- Balance individual and collective perspectives by recognising the influence of both formal leaders and the broader organisational leadership process, including contributions from those leading behind the scenes.
- Prioritise strategic investment by securing funding for sustainable digital infrastructure, staffing, and support, while ensuring leadership addresses environmental impacts like energy use and carbon footprint in long-term planning.
- Foster an inclusive culture of innovation by leading collaborative and inclusive professional development efforts, engaging faculty, staff, and students in shaping the digital future through shared decision-making.
- Lead with ethical principles by prioritising privacy, equity, and data security in digital decisions, fostering transparency to build trust among students, faculty, and staff in using technology as a trusted ally.
- Promote cross-functional collaboration and leadership growth by breaking down silos, creating "third spaces" for interdisciplinary teamwork, and investing in leadership development through training, mentorship, and digital education initiatives across all levels.

8. QUESTIONS FOR REFLECTION

1. How can senior leaders develop a compelling vision for DT that aligns with their institution's identity, mission, and socio-economic context?
2. What are the main challenges your institution is facing right now? What strategies do you have (or need to develop) regarding how to address them?
3. What is the leadership culture in your institution? Top-down, bottom-up, middle-out, collective? Is this culture and the way the institution organised appropriate for the transformations you want to make? If not, how might it need to change and how could you bring about this change?
4. What are the human, financial, and environmental implications of a new digital solution your institution is planning to implement, and how does it align with your institution's sustainability goals?
5. How can senior leadership effectively communicate the goals and benefits of DT to address potential resistance from faculty and staff?
6. In what ways can institutional leaders ensure that DT initiatives enhance academic quality and student engagement rather than simply digitising existing practices?

9. VISUAL SYNTHESIS

Table 3
Strategic leadership, institutional change management, and implementation processes: key points when addressing DT in HEIs.

ELEMENTS	KEY POINTS	
1. Strategic leadership and vision	<ul style="list-style-type: none"> • Leaders need a vision aligned with institutional identity and socio-economic context. • DT ensures competitiveness in the digital economy. • Senior leadership drives change and innovation. 	
2. Challenges and barriers	<ul style="list-style-type: none"> • Common barriers include resistance to change, lack of digital skills, budget constraints, and regulatory issues. • Collaborative, distributed leadership helps address these challenges. 	
3. Resource allocation and sustainability	<ul style="list-style-type: none"> • Sustainable funding for tech infrastructure, staffing, and long-term needs. • Environmental considerations like energy and water usage. • Importance of planning beyond short-term funding. 	
4. Human and organisational dynamics	<ul style="list-style-type: none"> • Foster an inclusive culture that engages everyone in shaping the digital future. • Emphasise ethics, privacy, and building trust in digital initiatives. • Support cross-functional collaboration and talent alignment. 	

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11. RESOURCES

1. Close encounters in third space - Leadership and organisational dynamics for advancing Digital Education

The resource explores the concept of “third space” in higher education, where academic and professional staff collaborate to enhance digital education, emphasising the importance of relationships and collaborative practices over traditional hierarchical structures. The article discusses how effective leadership can facilitate this collaborative environment, enabling institutions to better integrate technology and pedagogy in support of teaching and learning.

USEFULNESS

This resource is particularly useful for understanding how these “third space” roles can bridge traditional silos, fostering collaboration that supports a unified digital education strategy. Leaders, educational developers, and administrators can benefit from this perspective, as it provides strategies for leveraging cross-functional teams to enhance digital transformation efforts and create a more cohesive institutional culture.

Arnold, D. (2022). *Close encounters in third space - Leadership and organisational dynamics for advancing Digital Education* [Keynote presentation]. Media & Learning 2022. <https://media-and-learning.eu/type/featured-articles/close-encounters-in-third-space-leadership-and-organisational-dynamics-for-advancing-digital-education/>

2. University Autonomy in Europe IV: The Scorecard 2023

Produced and regularly updated by the European Universities Association, the Scorecard offers a detailed analysis of university autonomy across Europe, assessing the regulatory frameworks that shape HEIs. Covering 35 higher education systems, the Scorecard evaluates four dimensions: organisational, financial, staffing, and academic autonomy.

USEFULNESS

The Scorecard presents data-driven insights that helps policymakers make informed decisions that enhance university autonomy, fostering innovation and responsiveness. For university leadership and management, it provides valuable background information for vision-making and strategy-building as it enables leaders to see what room for manoeuvre they have in each of these dimensions with respect to the constraints of national context in which they operate.

Bennetot Pruvot, E., Estermann, T. & Popkhadze, N. (2023). *University Autonomy in Europe IV: The Scorecard 2023*. EUA. <https://www.eua.eu/publications/reports/university-autonomy-in-europe-iv-the-scorecard-2023.html>

3. Higher Education for Good: Teaching and Learning Futures

This free access book is a thought-provoking collection that addresses the pressing challenges facing higher education today. It brings together diverse voices from across 17 countries, offering a range of perspectives on how to reimagine universities in a world increasingly dominated by financial incentives and performance metrics. Through essays, poetry, and speculative fiction, the contributors explore “wicked” problems in higher education and propose innovative solutions that emphasise values such as care, collaboration, and social justice. The interdisciplinary nature of the book makes it a rich resource for understanding the complexities of teaching and learning in contemporary contexts.

USEFULNESS

For leaders in HEIs, this book serves as a vital resource for fostering a transformative vision of education. It encourages leaders to critically reflect on existing practices and to embrace new values that prioritise the common good over mere profitability. The chapters provide leaders with essential insights to develop strategies that enhance resilience and adaptability within their institutions. The book also highlights the importance of collective action and community engagement, equipping leaders with the tools to navigate the complexities of modern educational landscapes.

Czerniewicz, L., & Cronin, C. (2023). *Higher Education for Good: Teaching and Learning Futures*. Open Book Publishers. <https://www.openbookpublishers.com/books/10.11647/obp.0363>





Watch the webinar here

SECTION 4

QUALITY IN DIGITAL

HIGHER EDUCATION:

MEANINGS FRAMEWORKS

AND ACTORS

Authors: Nati Cabrera, Marcelo Maina & Maite Fernández-Ferrer

1. INTRODUCTION

Despite the significant progress in technology and its widespread application across various fields, the acceptance of online education in higher education (HE) has been a slow process. However, over the past two decades, substantial strides have been made in developing **quality frameworks for digital or online learning**. Initially, most of these models operated separately from traditional higher education quality assessments. Still, nowadays, various organisations and expert networks are working to integrate digital quality evaluation into broader quality assurance models.

2. OBJECTIVES

- Understand the concept of quality of education and its complexity.
- Identify the main models for evaluating and ensuring university quality and visualise the scope of the three perspectives with which they can be approached: macro (HE system/country), meso (university) and micro (course).
- Explore the main international frameworks for online learning/digital learning quality assurance and the role of the main international organisations and networks in establishing frameworks for quality assurance.
- Recognise the challenges and opportunities that arise through the Digital Transformation process in HE.

3. THE QUALITY OF EDUCATION

To begin with, we will define the concept of quality in education and subsequently examine its application in higher education, with a particular focus on the specificities of quality in digital higher education contexts.

Defining “quality” is challenging due to its multidimensional, relative, subjective, and ambiguous aspects. This variability means that interpretations of quality can differ based on individual beliefs, contextual factors, and the interests of involved parties. Consequently, these aspects shape the criteria used to evaluate quality, influencing our judgements about what constitutes and does not. (Rodríguez- Espinar, 2005).

There are various beliefs and conceptions regarding the quality of education, which in turn influence the systems developed to evaluate or ensure it. Therefore, let’s briefly examine the most significant concepts, based on Harvey & Knight (1996):

- **Quality as excellence.** This conception views quality as synonymous with exceptional standards and outstanding performance. Institutions striving for excellence aim to be the best in their field, often setting benchmarks for others to follow. This perspective is frequently associated with prestigious universities known for their rigorous academic programmes and distinguished faculty.

- **Quality as consistency.** From this viewpoint, quality is about reliability and uniformity. It emphasises the importance of maintaining high standards across all processes and outcomes. Institutions that prioritise consistency ensure that their services and educational offerings are dependable and meet established criteria without significant variation.
- **Quality as fitness for purpose.** This approach defines quality based on how well an institution meets its stated goals and objectives. It focuses on the alignment between the institution’s mission and the outcomes it achieves. For example, a university might be considered high quality if it successfully prepares students for specific careers or fields of study, as per its mission.
- **Quality as value for money.** This perspective evaluates quality in terms of cost-effectiveness and efficiency. It considers whether the resources invested in education (such as tuition fees, government funding, etc.) are being used optimally to achieve desired outcomes. Institutions that provide good value for money offer high-quality education at a reasonable cost, ensuring that students and stakeholders get the most out of their investment.
- **Quality as transformation.** This transformative view focuses on the impact of education on students. It emphasises personal and intellectual growth, aiming to transform students’ lives by developing their knowledge, skills, and critical thinking abilities. Institutions that adopt this perspective prioritise the holistic development of students, preparing them to contribute meaningfully to society.

“The true quality of a university institution lies in its ability to achieve the greatest possible development of its members, students and professors, that is, to achieve the greatest added value. Said added value is understood as the differentials of the degree of intellectual development, affective, personal and social of students [...] and teachers (both in its pedagogical and academic and scientific productivity dimensions)” (Rodríguez Espinar, 2005, p. 50).

In the field of Higher Education, **quality is evaluated** or assured **for different reasons**:

- As a form of **accountability** (to society; to the government; etc.)
- As a **strategy that encourages competition** (rankings). Transparency can be an element of accountability, but also a strategy for universities to show their strengths and compete in an increasingly globalised and competitive education space.
- As a **strategy for continuous improvement**. It’s not just about showing that things are done well (processes, results, added value, etc.), but about doing them better each time.

4. HIGHER EDUCATION QUALITY FRAMEWORK

We will begin by examining the higher education system from a **macro-level perspective**, focusing on the territorial reach and the stakeholders involved. Next, we will explore the repercussions at the **meso-level**, concentrating on institutions and their managers, and at the **micro-level**, considering programmes, courses, teachers, and students. In section 8, we will delve deeper into the quality of online learning courses, specifically at the meso and micro levels. This discussion will highlight the importance of fostering a quality culture within educational institutions to ensure the effectiveness of quality assurance frameworks and processes.

4.1. Macro-level perspective: International frameworks & countries regulation

International frameworks for quality assurance in higher education aim to standardise and ensure the quality of academic programmes and institutions across different countries. These frameworks provide guidelines and benchmarks to assess whether HEIs meet the expected standards of teaching, research, and student services. The idea is that quality assurance in higher education ensures that institutions provide high-quality education and meet commonly referenced standards. Some key international frameworks include:

- **European Standards and Guidelines (ESG).** Developed by the European Higher Education Area (EHEA), the ESG provides a common framework for internal and external quality assurance systems across European universities. It focuses on student-centred learning, accountability, and the enhancement of educational practices. <https://www.enqa.eu/esg-standards-and-guidelines-for-quality-assurance-in-the-european-higher-education-area/>
- **ISO 21001:2018.** This is a quality management system standard specifically for educational organisations. It focuses on improving the management processes within institutions, ensuring they meet the needs of learners and stakeholders. <https://www.iso.org/standard/66266.html>
- **CHEA/CIQG Quality Assurance Principles.** The Council for Higher Education Accreditation (CHEA) and the International Quality Group (CIQG) promote a set of principles to guide quality assurance globally. Their focus is on transparency, accountability, and maintaining academic freedom while ensuring that institutions provide quality education. <https://www.chea.org/international-quality-principles-0>
- **INQAAHE Guidelines.** The International Network for Quality Assurance Agencies in Higher Education (INQAAHE) offers a framework that supports quality assurance agencies worldwide, providing them with tools to develop robust evaluation and accreditation processes. <https://2023.inqaahe.org/guidelines-good-practice>

These **international frameworks** ensure that institutions not only comply with local regulations but also maintain global standards of excellence in higher education. The principles that guide these standards are fundamental as they determine not only their content but the role they play in the process of ensuring quality. For instance, the CHEA International Quality Group (CHEA-CIGT, 2015) developed a set of “international quality principles” aimed at promoting a shared understanding of quality in higher education, focusing on quality and providers, students, society, government, accountability issues, accreditation bodies, and its role in changing education.

Countries’ regulations on quality assurance typically use international quality frameworks as a primary reference. This approach offers numerous advantages, such as facilitating the mobility of students and teachers, which are essential elements for a quality educational and academic process. However, with the rapid growth of cross-border education, the main reason should be to view the quality of higher education as a shared responsibility that transcends national borders and even the higher education areas of groups of countries.

For example, within the European Higher Education Area, member countries have agreed to follow the European Standards and Guidelines proposed by the European Network for Quality Assurance (ENQA). Since the ESGs were collaboratively developed by ENQA members, there is a high level of agreement. However, each country has adapted the ESG to fit its specific context, considering factors such as politics, economy, and priorities. Consequently, each country has its own regulations, detailed in guidelines and monitoring and control systems.

In **Latin America**, national agencies typically manage quality assurance. For instance, Brazil’s National Institute for Educational Studies and Research (INEP) oversees the quality of HEIs. Similarly, in **Asia**, countries like Japan and India have established their own quality assurance agencies. Japan’s National Institution for Academic Degrees and Quality Enhancement of Higher Education (NIAD-QE) and India’s National Board of Accreditation (NBA) play crucial roles in maintaining educational standards. In **other higher education areas**, countries are not required to adhere to common guidelines. However, following these guidelines often benefits institutions and serves as a compelling reason to adopt them.

There are also **global efforts** to harmonise quality assurance practices. The United Nations Educational, Scientific and Cultural Organisation (UNESCO 2019) and the Organisation for Economic Co-operation and Development (OECD 2004, 2015) are developing guidelines to help countries align their quality assurance processes, facilitating the international recognition of student qualifications. One of the main goals of the Global Convention on the Recognition of Qualifications concerning Higher Education and related to quality is:

“Promote a culture of quality assurance in higher-education institutions and systems, and develop the capacities necessary for ensuring reliability, consistency and complementarity in quality assurance, in qualifications frameworks and in the recognition of qualifications in order to support international mobility” (UNESCO, 2019: art.II-7).

These frameworks ensure that students receive a high-quality education regardless of where they study, and they help institutions continuously enhance their educational offerings.

4.2. Meso-level perspective: Higher Education Institutions

When **universities** establish their criteria and procedures to ensure the quality of their education services, they must comply with their **country's regulations**. As discussed earlier, some countries have developed mandatory quality systems, while others have not. Additionally, the obligation may only apply to certain types of programmes (e.g., university degrees) and not to others (e.g., master's programmes).

When there is no national regulation to accredit the quality of programmes, or when institutions seek to enhance their reputation, they often turn to accreditation agencies from other countries with recognised prestige in the academic or labour market. This approach serves two purposes: compensating for the lack of a state accreditation process for their programmes (or some of them) and projecting their qualifications to be recognised through prestigious accreditations, such as those offered by private or public accreditation agencies that provide this service to universities internationally.

The basic objectives of the accreditation processes established in universities are:

- Ensure the quality of programmes by adhering to the skill levels and criteria established in their countries' regulations.
- Provide valid and reliable information to assist university system users in making informed decisions.
- Facilitate internal processes to enhance the quality of programmes and services developed by universities.

In the current context of constant transformation, including DT (see section 1), competitiveness, and globalisation, other important objectives emerge:

- Integrate continuous improvement into the development of programmes and degrees, embedding the "digital" into the institution's overall strategy.
- Enhance the external perception of teaching quality, strengthen the university's position within the academic system, and support its international expansion.
- Highlight the institution's strengths and unique aspects to the broader academic community and the world.

4.3. Micro-level perspective

In terms of covering all aspects of quality in higher education, we should also address the micro-level, which involves evaluating quality within the context of a specific course or subject (see section 2.4).

5. INTERNATIONAL FRAMEWORKS FOR DIGITAL LEARNING QUALITY ASSURANCE

In addition to educational globalisation, the proliferation of HEIs, both non-profit (public) and for-profit (private), offering online or blended learning has further diversified the landscape of quality assurance. The intensive use of technology in education impacts not only the educational process but also organisational structures and resource utilisation. Moreover, decisions made to transform education through technology can have ethical implications, affecting data protection, health, and overall well-being during the educational process.

5.1. Quality systems and models for digital learning

While some quality assurance models provide specific guidelines for digital education, others integrate online learning within their broader quality assurance standards, focusing on areas such as learning outcomes, student support, teaching quality, and continuous improvement. Institutions can **adapt and tailor these frameworks to their specific contexts**, ensuring their programmes maintain high standards and deliver effective, accessible education. Let's explore these two types of frameworks.

> SPECIFIC MODELS OR FRAMEWORKS FOR DIGITAL LEARNING QUALITY ASSURANCE

Although we present the micro-level in section 8, a brief presentation better identifies the micro-level. The **e-Learning Quality Framework (eLQF)** is a comprehensive assessment framework for e-learning programmes. The Five Pillars of Quality Online Education, developed by the Online Learning Consortium, breaks down quality into five pillars: learning effectiveness, scale, access, student satisfaction, and faculty satisfaction. The **ISO/IEC 19796-1** is an international standard that outlines a general framework for quality management in e-learning. **E-xcellence**, developed by the European Association of Distance Teaching Universities (EADTU), focuses on benchmarking the quality of online education. **Benchmarking for E-learning in Universities (BENVIC)** is based on a benchmarking approach, where universities compare their performance with best practices or peer institutions. While they differ in their specific approach, the goal is the same: to ensure that students receive a high-quality education, whether it's delivered online or in a traditional classroom.

> GENERAL MODELS FOR HIGHER EDUCATION QUALITY ASSURANCE THAT CAN ALSO BE ADAPTED TO ONLINE LEARNING

Several international networks and institutions have also developed guidelines or frameworks specifically focused on ensuring the quality of e-learning in higher education or frameworks that can be adapted to both traditional and online learning. Some of these organisations, such as **ENQA** and **INQAAHE**, have contributed to shaping standards and best practices. Here's a closer look at what some of these organisations offer in terms of quality assurance for e-learning:

1. ENQA (European Association for Quality Assurance in Higher Education)

As we mentioned in section 2, ENQA has been influential in establishing quality standards across Europe, including in the context of e-learning. Though ENQA does not have a specific e-learning standard, its broader European Standards and Guidelines for quality assurance in higher education apply to e-learning programmes.

Key aspects include:

- **Student-Centred Learning:** Ensuring that e-learning is designed to meet the needs and expectations of students, allowing flexibility and personal growth.
 - **Learning Outcomes:** Defining clear and measurable outcomes for e-learning programmes.
- **Assessment and Feedback:** Establishing transparent and fair methods for evaluating student performance in an online setting.
- **Quality of Teaching and Resources:** Monitoring the effectiveness of online teaching methods and ensuring that sufficient resources are provided for students and staff.

ENQA encourages institutions to apply these principles to both traditional and online learning to ensure consistent quality.

2. INQAAHE (International Network for Quality Assurance Agencies in Higher Education)

INQAAHE is another global organisation that promotes quality assurance practices in higher education. While it doesn't provide specific guidelines exclusively for e-learning, its Guidelines of Good Practice (GGP) offers a flexible framework that can be adapted to e-learning contexts. The GGP emphasises:

- **Institutional Autonomy and Accountability:** Encouraging institutions to take responsibility for their e-learning quality while maintaining alignment with external quality standards.
- **Student Support:** Highlighting the importance of providing adequate support services for students engaged in online learning.

- **Continuous Improvement:** Emphasising the need for regular evaluations and updates to e-learning courses to keep them relevant and effective.

INQAAHE provides a foundation that can be adapted by quality assurance agencies to evaluate the unique aspects of e-learning programmes.

3. CHEA (Council for Higher Education Accreditation)

The Council for Higher Education Accreditation (CHEA) in the United States promotes quality assurance standards for higher education, including distance and online education. Through its Quality Platform Standards, CHEA supports innovation while ensuring that quality remains a priority. The guidelines emphasise:

- **Academic Integrity and Accountability:** Ensuring that online education programmes adhere to rigorous academic standards.
- **Learner Support:** Providing sufficient support for online students, including advising, tutoring, and technical help.
- **Outcome-Based Assessments:** Focusing on measuring the actual learning outcomes achieved through e-learning programmes.

CHEA works with accreditation bodies to ensure that online programmes meet the same high-quality standards as traditional face-to-face programmes.

4. OECD (Organisation for Economic Co-operation and Development)

The OECD has also addressed e-learning through its reports and guidelines. The OECD emphasises the importance of:

- **Inclusive and equitable access:** ensuring that online education is accessible to diverse groups of students, including those from disadvantaged backgrounds.
- **Quality teaching:** supporting educators in adapting their teaching methods for online environments through ongoing professional development.
- **Data-driven decision-making:** using data to continuously improve the quality of online education, including tracking student engagement, performance, and satisfaction.

Although the OECD does not offer a specific framework for digital learning, its broader guidelines on quality in higher education have influenced how universities design and evaluate their online offerings

Table 4
Macro, meso, and micro levels of quality assurance in higher education

LEVEL	FOCUS	STAKEHOLDERS	KEY ACTIVITIES	OUTCOMES	CHALLENGES
Macro Level 1	Higher education system	International networks, Government bodies, accreditation agencies, policymakers	Policy formulation, accreditation standards, national assessments, funding allocation	National and international reputation, compliance with regulations, overall system improvement	Balancing diverse interests, ensuring equitable resource distribution, maintaining standards across institutions
Meso Level 2	Institutions and their management	University administration, institutional managers, faculty committees	Institutional self-assessment, internal audits, strategic planning, resource management	Institutional ranking, resource allocation, institutional reputation, strategic growth	Aligning institutional goals with national policies, managing internal resistance, ensuring consistent quality
Micro Level 3	Programmes, courses, teachers, students	Programme coordinators, faculty, students	Course evaluations, peer reviews, student feedback, curriculum development	Course improvement, teaching effectiveness, student satisfaction, programme accreditation	Addressing diverse student needs, maintaining academic standards, integrating feedback effectively

5.2. International organisations and networks

As previously mentioned, countries and territories have diverse higher education systems, regulatory and quality assurance frameworks, and specific organisations or agencies for their management. The landscape is varied and complex. However, UNESCO offers a valuable tool for understanding and comparing the higher education policies and system characteristics of up to three countries: the Higher Education Policy Observatory Country Comparison (see: <https://hepo.iesalc.unesco.org/pc/policy/countrymap/cp/>).

Additionally, numerous international networks strive to establish common criteria for quality assurance. These supranational networks or organisations are regional or thematic groupings of agencies that collaborate to share best practices and develop common approaches, though they do not have regulatory authority. All of these networks have emerged since 1990, with a focus on public service. The following table highlights some of these networks.



Table 5
International networks for HE quality assurance. Herruzo, C. (2017)

AfriQAN	Quality Assurance Network for African Higher Education
ANQAHE	Arab Network for Quality Assurance in Higher Education
APQN	Asia-Pacific Quality Network
AQAN	ASEAN Quality Assurance Network
ASPA	Association for Specialised and Professional Accreditors
CAMES	African and Malagasy Council for Higher Education
CANQATE	Caribbean Area Network for QA in Tertiary Education
CEENQA	Central and Eastern European Network of Quality Assurance in Higher Education
EAQAN	East African Higher Education Quality Assurance Network
EASPA	European Alliance for Subject-Specific & Professional Accreditation & Quality Assurance
ECA	European Consortium for Accreditation in Higher Education
ENAE	European Network for Accreditation of Engineering Education
ENQA	European Association for Quality Assurance in Higher Education
EQANIE	European Quality Assurance Network for Informatics Education
IQA/AQAAIW	Association of QA Agencies of the Islamic World
INQAAHE	International Network for Quality Assurance Agencies in Higher Education
RIACES	Xarxa Iberoamericana per a l'Assegurament de la Qualitat a l'Educació Superior

6. IDENTIFYING CHALLENGES AND OPPORTUNITIES

We will focus now on the **challenges and opportunities** that arise when digitally transforming a higher education institution.

Digital technologies impact traditional notions of quality in teaching, research, and administration. These changes bring new **opportunities** like accessibility and personalised learning, but also new **challenges** such as digital equity and technological literacy. The main goal would be maintaining and improving quality in online or blended learning environments, including student engagement and academic integrity.

6.1. Quality assurance and the datafication of higher education

In the context of data-informed institutions, it is crucial to emphasise the importance of managing and utilising institutional information to maintain and enhance quality. Learning analytics involves collecting and analysing data related to student interactions with online courses and digital learning environments.

This data can include metrics such as login frequency, participation in discussions, assignment submissions, and quiz performance. Through the examination of these interactions, institutions can identify patterns and trends that highlight areas where students may need additional support or resources.

Academic analytics, on the other hand, focuses on broader **institutional data**, such as enrolment trends, retention rates, and academic performance metrics. This data provides a comprehensive view of the institution's overall health and effectiveness. For example, analysing enrolment trends can help institutions understand demographic shifts and plan for future student needs. **Retention rates** can indicate how well the institution supports its students, while academic performance metrics can reveal the effectiveness of teaching methods and curriculum design.

The effectiveness of both learning and academic analytics depends on how well institutions can interpret and act on the data to **improve the quality of education**. This requires not only sophisticated data analysis tools but also a culture of data literacy among faculty and staff. Institutions must be able to translate data insights into actionable strategies that enhance teaching and learning outcomes.

These **data-driven insights are integral to quality assurance processes** supporting the systematic review and evaluation of educational programmes, teaching methods, and institutional policies to ensure they meet established standards of excellence.

6.2. Strengthening the social dimension of higher education through quality assurance and digital transformation strategies

Strengthening the social dimension of higher education involves making educational systems more inclusive, accessible, and relevant to the diversity of society. Quality Assurance (QA) plays a pivotal role in achieving this by setting and monitoring standards that **promote equity, engagement, and accountability.**

Through QA, institutions can ensure that programmes and services are responsive to social needs, providing support for underrepresented groups and fostering an inclusive learning environment. Incorporating a **Diversity, Equity, and Inclusion (DEI)** approach further enhances these efforts. DEI initiatives aim to create a learning environment where all students, regardless of their background, have equal opportunities to succeed. This involves actively addressing barriers to inclusion and ensuring that institutional policies and practices reflect the diverse needs of the student body. DT strategies complement these efforts by broadening access to higher education and improving the learning experience of students by taking into account their differences. Digital tools and platforms can reduce barriers for remote or underserved populations, offering flexible learning opportunities and personalised resources. Additionally, digital solutions can enhance transparency and feedback mechanisms, allowing institutions to adapt more readily to social shifts.

Together, QA, DEI, and DT can make higher education more socially responsive, fostering an educational environment that not only meets academic and professional standards but also reflects and serves the diverse needs of society. By integrating these approaches, institutions can ensure that they are not only maintaining high standards of education, but also promoting a more inclusive and equitable learning experience for all students.

7. TAKEAWAYS

- Understand the complex and multidimensional nature of quality in higher education, recognising that it encompasses excellence, consistency, fitness for purpose, value for money, and transformation.
- Align with international quality assurance frameworks to enhance global recognition, ensure consistent educational quality, and facilitate student and faculty mobility.
- Adopt continuous improvement strategies within HEIs to enhance quality, integrate DT, and strengthen institutional reputation.
- Use data analytics to monitor and improve educational outcomes, ensuring that both learning and academic analytics inform quality assurance processes.
- Promote inclusivity and equity in higher education by integrating DEI initiatives and leveraging digital tools to broaden access and support diverse student needs.

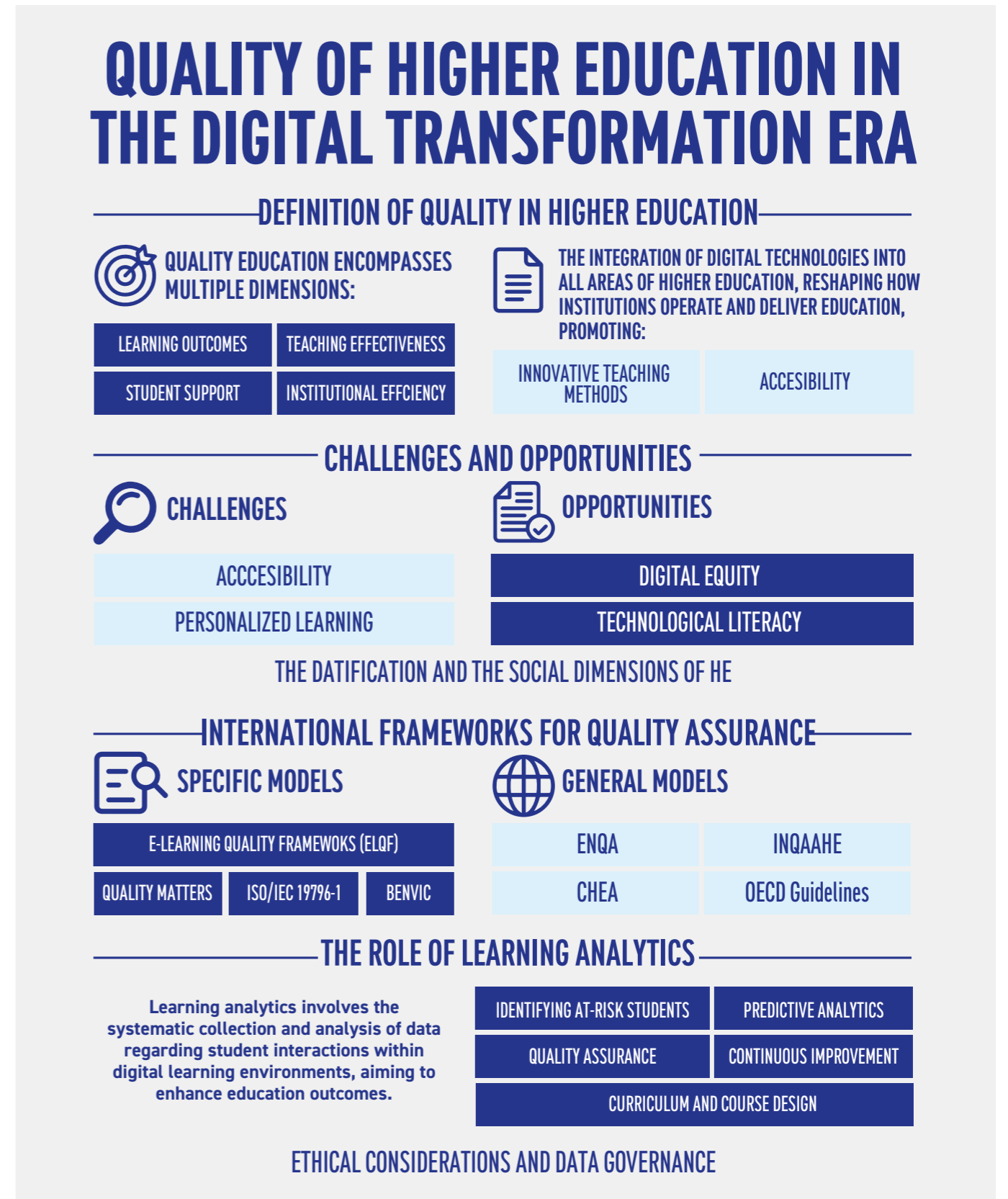
8. QUESTIONS FOR REFLECTION

1. How can we ensure that our quality assurance processes are adaptable to the rapid changes brought by DT in higher education?
2. What specific steps can we take to integrate international quality assurance standards into our institution's unique context and needs?
3. How can we address the ethical implications of data usage in quality assurance, particularly concerning student privacy and data protection?
4. In what ways can we enhance collaboration between different stakeholders (faculty, students, administration) to foster a culture of quality and continuous improvement?
5. How can we measure and improve the impact of our quality assurance initiatives on student engagement and learning outcomes in both traditional and digital learning environments?



9. VISUAL SYNTHESIS

Figure 6
Quality of Higher Education in the Digital Transformation Era



10. REFERENCES

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11. RESOURCES

1. Higher Education Policy Observatory

The Higher Education Policy Observatory provides a comprehensive platform for accessing and comparing higher education systems and policies worldwide. This platform features 45 indicators that cover a wide range of topics, including governance structures, quality assurance, and social justice programmes. Users can explore detailed country profiles, conduct comparisons between multiple nations, and view global and regional overviews through interactive graphs and maps. This comprehensive approach allows stakeholders to gain insights into the diverse educational landscapes across different countries, facilitating informed decision-making and policy development.

USEFULNESS

The tool is particularly useful for policymakers, researchers, and educators who seek to inform their decisions with comparative data. Understanding how different countries approach higher education enables stakeholders to identify best practices and potential areas for improvement within their own systems. The ability to visualise and compare data fosters a deeper understanding of global educational trends, ultimately contributing to the development of more effective and inclusive higher education policies.

UNESCO - IESALC. *Higher Education Policy Observatory*. <https://hepo.iesalc.unesco.org/pc/page/home/>

2. Benchmarking Higher Education System Performance

This work provides a comprehensive analysis of higher education systems across member countries. It evaluates how effectively these systems meet their educational, research, and societal engagement responsibilities. Based on a range of performance indicators, the report highlights strengths and weaknesses within various national contexts, offering valuable insights into the factors that contribute to successful higher education outcomes. This benchmarking approach not only facilitates comparisons among countries but also encourages the sharing of best practices and strategies for improvement.

USEFULNESS

In terms of quality assurance in higher education, this report serves as a crucial resource for policymakers and institutional leaders. Identifying key performance metrics and trends allows stakeholders to assess their own systems against international standards. This comparative analysis fosters a culture of continuous improvement, encouraging institutions to adopt effective quality assurance practices that enhance educational outcomes.

OECD (2019). *Benchmarking Higher Education System Performance*, OECD. <https://doi.org/10.1787/be5514d7-en>.

3. Global convention on the recognition of qualifications concerning higher education.

This is a significant treaty adopted by UNESCO on November 25, 2019, aimed at enhancing international cooperation in higher education. This convention establishes universal principles for the fair, transparent, and non-discriminatory recognition of higher education qualifications. It seeks to facilitate academic mobility and ensure that individuals can have their qualifications evaluated through equitable mechanisms, thereby promoting inclusive access to higher education across different countries.

USEFULNESS

It is particularly useful for quality assurance in higher education as it provides a framework for countries to align their recognition practices with international standards. Fostering dialogue and cooperation among nations encourages a collaborative approach that helps ensure that qualifications are recognised and valued across different educational systems. This not only benefits students seeking to study abroad but also strengthens the overall quality and integrity of higher education systems globally.

UNESCO. (2019). *Global convention on the recognition of qualifications concerning higher education*. <https://shorturl.at/bG6AT>



Watch the webinar here

SECTION 5

LEARNING DESIGN MODELS

Authors: Lourdes Guàrdia & Marcelo Maina

1. INTRODUCTION

Effective educational experiences rely on well-structured learning design models that provide clear frameworks for developing educational programmes and courses. These models ensure that all components—such as instructional goals, content delivery, and student assessment—are thoroughly considered. Following these frameworks, educators can maximise student engagement, achievement, and satisfaction. As Higher Education (HE) evolves, these models support the creation of personalised, inclusive, and flexible learning environments, aligning teaching strategies with the diverse needs of today's learners.

This section is crafted to provide teachers, instructional designers, and decision-makers with strategic knowledge and tools to create engaging, inclusive, and effective educational experiences in HE. To address the complexities of modern education, we will explore the most known learning design models, frameworks, and best practices that foster student-centred environments, enhance Digital transformation (DT) (see section 2), and promote innovation in teaching.

2. OBJECTIVES

- **Understand learning design models** and their role in creating student-centred, inclusive educational experiences.
- **Identify and apply structured approaches** from models like **ADDIE**, **TPACK**, and **SAMR** to develop effective educational programmes and courses.
- **Explore the integration of digital technologies** using technology-focused models to support flexible and personalised learning pathways.
- **Analyse the relationship between learning design models and student outcomes**, focusing on engagement and achievement.
- **Implement Universal Design for Learning (UDL)** principles to ensure equitable access and inclusion in HE.

3. LEARNING DESIGN MODELS: FOUNDATIONS AND APPLICATIONS

At the heart of designing effective educational experiences are learning design models that offer structured approaches to developing educational programmes and courses. These models ensure that all main elements are considered, from instructional goals to the assessment of student outcomes (Guàrdia (2020), allowing educators to maximise learner engagement and achievement. Understanding and applying these models, teachers and designers can create environments that promote personalised learning, where students are at the centre of the learning experience.

One of the foundational models is the ADDIE model (Analysis, Design, Development, Implementation, Evaluation), which serves as a systematic guide for learning design. ADDIE helps ensure that learning activities are aligned with learning objectives, allowing instructional designers to monitor and evaluate each step in the process. Similarly, models such as TPACK (Technological Pedagogical Content Knowledge), (Herring, et al., 2016), integrate technology into teaching in a way that complements pedagogy and content. TPACK helps educators choose digital tools that enhance learning rather than complicating it. On the other hand, the SAMR model is valuable for guiding decisions about the role of technology in the learning process. It categorises levels of technology integration in teaching, encouraging educators to go beyond simple substitutions of traditional tools and to explore the transformative potential that digital tools can bring to learning experiences.

What implications might these models have for curriculum development, especially within digital transformation initiatives?

The growing shift toward online and hybrid education demands flexible learning pathways that adapt to the needs of diverse learners. Employing frameworks such as ADDIE, TPACK, and SAMR, among others, educators can develop **personalised and flexible learning environments** that foster engagement, promote autonomy, and support academic success. Furthermore, these models help guide the integration of digital tools, ensuring that technology enhances rather than detracts from the learning experience.

4. INTEGRATING TECHNOLOGY IN TEACHING AND LEARNING

The adoption and integration of digital technologies require both **conceptual and procedural tools** that provide clarity, guidance, and significance to decision-making. Learning design models such as ADDIE and TPACK, which are focused on pedagogical design, **support systematic processes** that help educators translate learning theories into practical solutions. These models guide educators in making informed decisions about which digital tools to incorporate and how to structure the learning experience.

4.1. ADDIE model

Models such as ADDIE (Analysis, Design, Development, Implementation, and Evaluation) offer a structured, systematic process to help educators make informed decisions about incorporating technology into their courses. The ADDIE model is particularly useful because it provides clarity and a step-by-step approach, ensuring that each phase of learning design is meticulously planned and executed.

> PHASES OF THE ADDIE MODEL:

- **Analysis.** In this phase, educators assess the learning environment, determine the learning needs of their students, and identify the technological tools that can best address those needs. Key questions might include: What are the learning objectives? Who are the learners? What resources are available? This stage sets the foundation for everything that follows by establishing the goals and identifying gaps.
- **Design.** Based on the findings from the analysis phase, the design phase focuses on creating the course structure. Educators define the learning objectives, select content, and choose appropriate digital tools to deliver that content. The design also involves planning assessments that align with the objectives. During this phase, decisions about the integration of technology (e.g., learning management systems, and multimedia resources) are made with the intention to enhance the student learning experience.
- **Development.** In this phase, all materials and resources are created or gathered. This could include designing online modules, developing multimedia presentations, and integrating various digital tools. The content and activities are built with the learning objectives in mind, ensuring that they provide an engaging and interactive learning experience for students.
- **Implementation.** This is the phase where the designed course is delivered to the learners. Teachers and instructional designers monitor the use of digital tools and ensure that the technology functions as intended. Students interact with the content, tools, and assessments, while educators provide guidance and support throughout the process.
- **Evaluation.** The final phase involves assessing the effectiveness of the course. Educators gather feedback from students and analyse the outcomes to see if the learning objectives were met. Both formative (ongoing) and summative (final) evaluations help refine the use of digital technologies and instructional methods, ensuring continuous improvement.

The systematic approach provided by ADDIE allows educators to **translate learning theories into practical, technology-enhanced solutions** that are aligned with their pedagogical goals. Guiding the selection and integration of digital tools, models like ADDIE help ensure that technology is used effectively to support learning, rather than just for its own sake. Through this structured process, educators can make more informed decisions about how to structure learning experiences that truly engage students and enhance their academic success and it also aims to **ensure the quality of the design**.

Consider mentioning a few more learning design models to raise awareness, even if we don't go into detail about them, there are more specialised models, such as the **4C/ID** model, that focus on developing **complex cognitive skills** and are particularly useful for instructional scenarios that demand deeper learning. The **R2D2** model emphasises **constructivist approaches**, encouraging students to engage in learning by doing, and reflecting on their experiences

But whereas ADDIE has a process-oriented approach to design, the TPACK and SAMR models focus on a smooth integration of new technologies into design practices.

A comprehensive understanding of technology integration models ensures that educators can effectively implement digital tools and integrate new technologies into their design practices. TPACK and SAMR models guide instructional designers in making informed choices about technology, enabling them to design learning experiences that align with pedagogical goals. Comparing these models through six criteria (Kimmons & Hall, 2016), educators can gain insight into their specificity, characteristics, and the value they bring to the teaching-learning process.

4.2. TPACK model

The TPACK model (Technological Pedagogical Content Knowledge) is a framework that helps educators integrate technology into their teaching in a meaningful and effective way. Unlike models that focus solely on the mechanics of instructional design, TPACK addresses the interplay between three core components: **content knowledge (CK)**, **pedagogical knowledge (PK)**, and **technological knowledge (TK)**. This model emphasises that teaching with technology isn't just about adding tools to the classroom—it's about how these tools interact with the content and pedagogical strategies to create a cohesive and engaging learning experience.

> COMPONENTS OF THE TPACK MODEL

- **Content Knowledge (CK).** This refers to the teacher's understanding of the subject matter being taught. Whether it's mathematics, history, or biology, content knowledge is the foundation upon which everything else is built. In the TPACK framework, this knowledge must be connected to how technology can enhance or alter the way this content is conveyed to students.
- **Pedagogical Knowledge (PK).** Pedagogical knowledge involves understanding how to teach effectively. It includes knowledge of instructional methods, classroom management, and the ways in which students learn. When technology is integrated, educators must adapt their teaching strategies to ensure that digital tools complement and enhance their pedagogical approaches.
- **Technological Knowledge (TK).** This refers to an educator's knowledge of how to use digital tools and technologies in the classroom. However, in the TPACK model, it's not just about using technology—it's about using the right tools in the right ways to support specific content and pedagogical strategies.
- **Technological Pedagogical Content Knowledge (TPACK).** The intersection of these three components is where true integration occurs. TPACK represents the knowledge teachers need to combine content, pedagogy, and technology to create an effective and engaging learning environment. The challenge is finding the balance between these elements, ensuring that technology is used not as a substitute, but as a tool that enhances teaching and learning.

> APPLYING THE TPACK MODEL

The TPACK model guides educators in making informed decisions about technology integration. For example, if an educator is teaching a science lesson, they might consider how **simulation software** can offer students hands-on learning opportunities that wouldn't be possible with traditional tools. In this case, the technology (simulation software) supports the content (science concepts) and the pedagogy (experiential learning).

The TPACK model also encourages educators to think critically about which technologies will best serve their teaching objectives. Rather than adopting technology for the sake of it, educators are asked to consider how specific tools will help convey content and engage students. For instance, an educator using TPACK might decide to use a combination of **interactive quizzes, collaborative platforms, and multimedia content** to ensure that students not only understand the material but also remain actively engaged throughout the learning process.

> SIGNIFICANCE OF THE TPACK MODEL

The power of the TPACK model lies in its ability to blend **technology with pedagogy and content** in ways that maximise the potential of each. By recognising that teaching is a complex activity requiring the integration of various forms of knowledge, TPACK empowers educators to create dynamic, technology-enhanced learning environments. This framework helps guide the **selection, adoption, and integration of technology** into lessons, ensuring that the tools chosen serve to enhance both teaching strategies and learning outcomes.

In the context of DT and the shift toward online and hybrid education, the TPACK model offers a valuable framework for creating **personalised, flexible learning experiences**. It helps educators remain focused on the goal of meaningful learning, using technology as a means to **engage students** and promote deeper understanding, rather than just as an added layer of complexity.

The TPACK model ensures that digital tool usage is intentional, thoughtful, and aligned with instructional goals by integrating content, pedagogy, and technology. This creates a more holistic and effective approach to teaching.

4.3. SAMR model

The SAMR model, developed by Puentedura (2006), is a framework that helps educators integrate technology into their teaching practices in a meaningful way. SAMR stands for **Substitution, Augmentation, Modification, and Redefinition**, and each level represents a different way technology can be incorporated into the learning process. The SAMR model encourages teachers to move beyond simply using technology as a replacement for traditional tools and toward using technology in transformative ways that redefine and enhance the learning experience.

> LEVELS OF THE SAMR MODEL:

- **Substitution.** At the substitution level, technology acts as a direct replacement for a traditional tool, without any functional improvement. For example, using a word processor to type an essay instead of writing it by hand. The task remains the same, but the tool used to complete it is digital.
- **Augmentation.** At this level, technology still replaces a traditional tool, but with added functionality that enhances the task. For instance, using a word processor with built-in spell check or grammar check features. The core task remains the same (writing an essay), but the technology offers improvements that make the process more efficient or effective.
- **Modification.** The modification level moves beyond enhancement to a stage where technology fundamentally changes the way the task is designed. For example, instead of a traditional written essay, students might collaborate on a shared document or create multimedia presentations. Here, the task is altered to take advantage of the collaborative and interactive capabilities of digital tools.
- **Redefinition.** At the highest level, redefinition, technology allows for the creation of entirely new tasks that were previously inconceivable. For example, students might create a podcast or a video documentary to express their understanding of a topic. These new tasks, enabled by technology, allow students to demonstrate learning in innovative ways that extend beyond the traditional classroom methods.

> APPLYING THE SAMR MODEL

The SAMR model provides a clear path for educators to integrate technology thoughtfully, encouraging them to progress from using technology as a mere substitute (Substitution) to transforming and redefining their instructional practices (Redefinition). At the redefinition level, technology is used not just to enhance the task but to **transform learning outcomes** by allowing students to engage with content in ways that were not possible without digital tools.

For example, in a history class, a traditional approach might involve students writing essays based on textbook readings (Substitution). Moving up the SAMR model, the teacher could incorporate Augmentation by having students use digital tools for real-time collaboration, peer editing, or the addition of multimedia resources. With Modification, the teacher could assign students to create interactive timelines or digital portfolios, altering the original task to leverage the capabilities of digital platforms. At the Redefinition level, students could create their own digital exhibits or virtual reality experiences to explore historical events, presenting their learning in entirely new ways.

> SIGNIFICANCE OF THE SAMR MODEL

The SAMR model is significant because it encourages educators to think critically about how they integrate technology into their teaching. By progressing through the levels of SAMR, teachers can ensure that technology is used not just to digitise traditional tasks but to **enhance and transform the learning experience**. The model promotes deeper learning, creativity, and engagement, aligning with modern educational goals such as personalised learning and student-centred environments.

SAMR also aligns well with **digital transformation initiatives** in education. As institutions shift toward online and hybrid models, the SAMR framework provides a practical guide for teachers to rethink how they design learning experiences. It helps them take full advantage of the digital tools at their disposal, moving from simple enhancements to creating new, technology-enabled learning opportunities that foster creativity, collaboration, and critical thinking.

By integrating technology in more meaningful ways, educators can create learning experiences that are more engaging, interactive, and aligned with the needs of today's learners, pushing the boundaries of what's possible in education.

5. UNIVERSAL DESIGN FOR LEARNING (UDL)

In the pursuit of **inclusive education**, the **Universal Design for Learning** framework, Cumming & Rose, (2021), offers a valuable approach to ensuring that all students, regardless of background or ability, have equal opportunities to succeed. UDL is based on the idea that learning is not a one-size-fits-all process. Instead, it promotes **flexibility** in how instructional goals, methods, materials, and assessments are designed and delivered. This flexibility allows educators to cater to the diverse needs of their students, ensuring that everyone can engage with the material in ways that work best for them.

UDL focuses on three primary principles: providing multiple means of representation, **multiple means of engagement**, and **multiple means of expression**. Offering various ways to access content, engage with it, and demonstrate understanding allows educators to create a more **inclusive learning environment** that addresses different learning styles and needs. For instance, digital tools can be used to provide alternative formats for content, such as audio or visual representations, while assessments can be tailored to allow students to express their understanding in different ways, such as through writing, video, or oral presentations.

6. FUTURE LEARNING DESIGN: USING AI TO ENHANCE ENGAGEMENT AND PERSONALISE EDUCATION

Understanding how to harness AI to enhance learning design and delivery—while preserving the human elements of teaching and learning—is crucial for fostering meaningful educational experiences. Recognising both the opportunities and challenges presented by AI is essential, as these factors profoundly impact design processes and hold **transformative potential for learning design (LD) in HE**. In this context, institutions are increasingly adopting innovative strategies to improve student outcomes. AI in LD leverages tools like machine learning, natural language processing, and other advanced technologies to support the creation of educational strategies, providing a significant evolution in traditional course design, making it more adaptive and responsive to student needs.

What is the AI's role in LD, showing how it helps learning designers and educators create more personalised, engaging experiences?

AI can enhance efficiency in content creation, generating quizzes, interactive exercises, and writing prompts, enabling educators to focus on complex activities that promote advanced skills and personalised support. AI also inspires creative ideas for learning activities and fresh approaches, enriching the learning experience.

AI-assisted LD best practices should be implemented across two phases: course design and delivery can be checked. In the design phase, AI aids pre-planning with content curation and activity suggestions. In the delivery phase, AI supports real-time adjustments, focused feedback, assessment, and course monitoring, using learning analytics to guide interventions.

For this purpose, there are already some tools developed to support educators in creating effective and engaging educational experiences.

- **AI Teaching Assistant Pro by Contact North | Contact Nord** It is a free AI-powered application designed to assist educators in various aspects of course development. It enables users to generate multiple-choice quizzes, essay questions with scoring rubrics, and create comprehensive course syllabi, including descriptions, learning outcomes, and weekly topics. The tool aims to reduce educators' workload and enhance teaching quality by streamlining the content creation process.
- **ELM (Edinburgh (access to) Language Models) by the University of Edinburgh** The University of Edinburgh offers ELM, an AI innovation platform providing access to Generative Artificial Intelligence (GAI) via Large Language Models (LLMs). ELM serves as a central gateway for staff and students to experiment with AI technologies, facilitating the integration of AI into research, teaching, and administrative processes.

It offers a secure environment for users to explore AI applications, ensuring data privacy and compliance with ethical standards.

These tools exemplify the growing trend of integrating AI into educational design, offering educators resources to enhance learning experiences and adapt to the evolving educational landscape.

7. BEST PRACTICES FOR ONLINE AND HYBRID MODELS

As higher education continues to embrace **online and hybrid learning models**, educators must be equipped with best practices that ensure quality, engagement, and inclusivity. Designing effective online or hybrid courses requires a thoughtful approach that takes into account the unique challenges and opportunities presented by these modalities.

Some best practices include the use of **active learning strategies** that will be addressed in more detail in section 6, where students are encouraged to engage directly with the material through discussion, collaboration, and problem-solving activities. **Collaborative tools**, such as discussion forums, group projects, and peer assessments, can be leveraged to foster interaction and build a sense of community, even in a virtual environment. Additionally, **timely feedback** and **adaptive learning technologies** can help keep students on track and ensure that they are receiving the support they need to succeed.

Instructional designers and teachers should also consider how to incorporate **accessibility** into their course designs. This includes ensuring that all course materials are accessible to students with disabilities, providing closed captions for videos, and designing assessments that are flexible and adaptable to different needs. Adopting a **student-centred approach** and using technology to enhance learning enables educators to design online and hybrid courses that are both engaging and effective.

8. CONCLUSIONS

Exploring learning design models, technology integration frameworks, and inclusive design principles such as UDL empowers educators and learning designers to design effective, engaging, and personalised educational experiences. These models provide the foundation for designing student-centred learning environments that support academic success while fostering motivation, engagement, and innovation in teaching. Furthermore, the use of AI as an assistant in the learning design process is evolving, offering educators a valuable opportunity to save time and to be more systematic and organised in their decision-making. In the context of DT, these frameworks are useful tools for creating flexible and inclusive learning pathways that address the diverse needs of today's learners while also ensuring high-quality design.

9. TAKEAWAYS

- Apply **structured models like ADDIE, TPACK, and SAMR** to develop and evaluate educational programmes systematically, ensuring that main elements like learning outcomes, content, and assessments are aligned for maximum student engagement and achievement.
- Integrate digital technologies focused models (e.g., TPACK and SAMR) to seamlessly **integrate digital tools into your teaching practices**, enhancing the learning experience by moving beyond basic substitution to transformative uses of technology.
- Promote **inclusive education implementing Universal Design for Learning (UDL)** principles to provide flexible and accessible learning pathways for all students, ensuring that content, engagement, and assessment cater to diverse needs and learning preferences.
- **Adopt active learning strategies** encouraging students to engage directly with the material through discussions, collaborations, and problem-solving activities in both online and hybrid learning environments.
- **Incorporate accessibility**, ensuring that course materials and assessments are designed with accessibility in mind, including options like closed captions and flexible assessments, to support a diverse range of learners and learning styles.
- **Use AI as an assistant** in learning design to save teachers time on more systematic tasks, allowing them to focus on the creative and pedagogical aspects that a design process requires in this digital context.

10. QUESTIONS FOR REFLECTION

1. How can learning design models like ADDIE and TPACK help you create more personalised and flexible learning environments for your students?
2. In what ways can UDL principles be applied in your current teaching practices to ensure equitable access and support for all students?
3. How does the integration of digital tools through models like SAMR transform the learning experience from traditional methods to more engaging, student-centred approaches?
4. What challenges might you face when adopting technology-focused models in your teaching, and how can frameworks like DOI or UTAUT help you navigate these obstacles?
5. How can you incorporate accessibility into your online or hybrid courses to ensure that all students, regardless of their abilities, can fully engage with the content and assessments?
6. How can AI tools like AI Teaching Assistant Pro and ELM be effectively leveraged to enhance educational design and delivery while preserving the human touch that is vital to impactful teaching and learning?

11. VISUAL SYNTHESIS

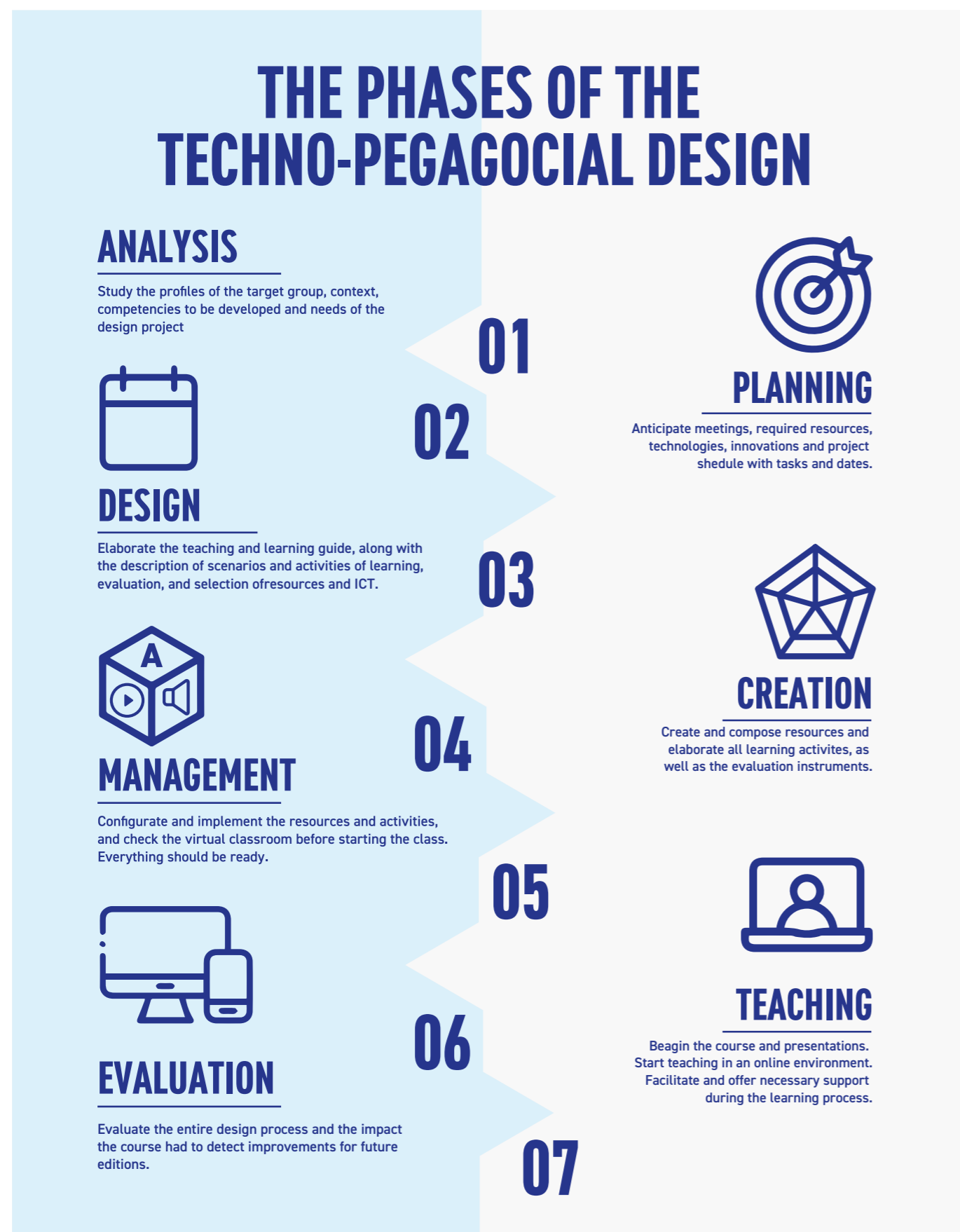
Table 6
Summary of the Learning Design Models

MODEL	FOCUS	KEY COMPONENTS	MAIN APPLICATION	LEVEL OF TECHNOLOGY USE	OUTCOME
Addie	Systematic instructional design	Analysis, Design, Development, Implementation, Evaluation	Structured course and curriculum development	Can be used with or without technology	Well-organised, goal-oriented learning experiences
Tpack	Technology integration in teaching	Content, Pedagogy, Technology	Effective integration of technology with pedagogy	Focus on integrating technology	Technologically-enhanced pedagogy
Samr	Technology integration and transformation	Substitution, Augmentation, Modification, Redefinition	Transforming learning tasks with technology	Direct focus on using technology to enhance learning	Enhanced and redefined learning experiences through technology



Figure 7.

Outline of a learning design model inspired by the ADDIE model. Guàrdia, L. (2022)



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13. RESOURCES

1. Beyond blended: rethinking curriculum and learning design

This resource is a guide aimed at helping curriculum teams reassess and redesign their approaches to learning. It emphasises understanding the unique pedagogical requirements of both in-person and online learning environments. The guide highlights the importance of balancing flexibility with the specific needs of students, ensuring that learning design is responsive and adaptable.

USEFULNESS

It is valuable for curriculum teams and educators as it provides a structured approach to thoughtfully integrating digital and face-to-face elements. Addressing the pedagogical differences between learning modes, it supports the development of more effective, student-centred designs that can enhance engagement and learning outcomes in diverse educational settings. And finally it is also helping curriculum teams consider the pedagogic differences between in-place and online learning, and the need to balance flexibility with the specific needs of students.

JISC (2024). *Beyond blended: rethinking curriculum and learning design*. <https://shorturl.at/H0X20>

2. UDL Guidelines

The UDL Guidelines (<https://udlguidelines.cast.org/>) serves as a comprehensive resource for implementing Universal Design for Learning (UDL), a framework aimed at optimising teaching and learning for all individuals. Developed by CAST, the guidelines are grounded in scientific research about how people learn, emphasising the importance of providing multiple means of engagement, representation, and action and expression. This approach fosters an inclusive educational environment where diverse learners can thrive.

USEFULNESS

For higher education teachers, the Guidelines offer invaluable strategies to enhance course design and delivery, thus developing learning experiences that accommodate various learning preferences and needs, ensuring that all students have equitable access to educational opportunities. The guidelines encourage the incorporation of diverse teaching methods and materials, which can lead to increased student engagement and motivation. Furthermore, the emphasis on flexibility allows teachers to adapt their teaching practices to better support individual learners, ultimately promoting a more inclusive and effective learning environment.

CAST. *UDL Guidelines*. <https://udlguidelines.cast.org/>

3. Technological pedagogical content knowledge (TPACK)

The Handbook of Technological Pedagogical Content Knowledge (TPACK) for Educators is a vital resource that explores the integration of technology in education. It provides a comprehensive overview of the TPACK framework, emphasising the interconnectedness of technological, pedagogical, and content knowledge. It features contributions from experts across various disciplines, offering insights into how technology can enhance teaching practices and improve student learning outcomes.

USEFULNESS

This handbook presents theoretical foundations but also practical strategies for implementing TPACK in diverse educational contexts. Educators can find specific examples and case studies that illustrate successful technology integration in different subject areas, making the content highly applicable to their teaching. Furthermore, the handbook addresses common challenges teachers face when incorporating technology, providing solutions and best practices that can be readily adopted in the classroom. Fostering a deeper understanding of how to blend technology with pedagogy and content empowers educators aiming to enhance their teaching through thoughtful and informed technology use to create more engaging and effective learning experiences for their students.

Herring, M. C., Koehler, M. J., & Mishra, P. (Eds.). (2016). *Handbook of technological pedagogical content knowledge (TPACK) for educators* (2nd ed.). Routledge. <https://doi.org/10.4324/9781315771328>



Watch the webinar here

SECTION 6 DIGITAL TEACHING AND LEARNING TRANSFORMATION

Authors: **Cristina Girona & Maite Fernández-Ferrer**

1. INTRODUCTION

Digitalisation in Higher Education (HE) goes beyond technology use; it involves how people engage with that technology. Institutions adopting more technology-driven models must not only choose the right platform or learning management system (LMS), but also define their educational approach, outlining how teaching and learning will occur.

This section introduces a digital learning framework centred on knowledge development and competency-based education, effectively integrating cognitive and psychomotor processes to equip students for real-world challenges. It introduces various learning activities, methodologies, and formative feedback strategies that foster ongoing learning, alongside diverse assessment types to ensure comprehensive growth.

Furthermore, the section highlights the critical role of self-regulation in digital learning, promoting different forms of assessment of student achievements and challenges to facilitate continuous progress. It also offers practical strategies for institutions transitioning to hybrid or fully online models, ensuring a smooth and effective implementation of these approaches

2. OBJECTIVES

- Acknowledge the importance of competency-based learning design in HE and its implications in students engagement and performance.
- Get insights about the key elements involved in learning design.
- Understand constructive alignment as a relevant issue to ensure coherence in course design, encompassing teaching activities, learning outcomes, assessment methods, and student feedback.
- Explore examples of e-tivities and active teaching and learning methodologies.

3. LEARNING DESIGN IN HE: FROM THE EDUCATIONAL PURPOSE TO ITS IMPLEMENTATION IN THE CLASSROOMS

Regardless of the context or the teaching model a university adopts—whether in-person, blended, or fully online—the classroom experience should never be left to improvisation. While this may seem obvious, it is often overlooked.

Educators must carefully design their courses around the content they aim to teach and the specific learning needs of their students, clearly defining the learning outcomes, resources,

activities, and assessment methods. However, these elements represent only the visible part of the design process; many critical factors lie beneath the surface, influencing the overall effectiveness of the course. Without proper planning, various issues can arise: aspects may fail without clear reasons, students might learn unintended content, assessments could evaluate unexpected material, and learners may be unclear about whether they have achieved the expected outcomes.

Design should be first person-centred, rooted in our beliefs as educators, as these beliefs shape every aspect of our teaching.

What principles should an educator consider when beginning a design for learning?

- Valuing people's innate ability to learn.
- Recognising that everyone has a talent, even a genius, something that makes them special and that is worth bringing out.
- Recognising that everyone has things that are worth improving in order to be better people in every aspect of their lives (personal, professional).
- Acknowledging that I (the teacher) know, but so do they (the students).

Having reflected on these principles, we propose using the **4+1 formula** that can help to "get started". It's about asking and answering ourselves 4 questions and then responding to a fifth one:

1. What do we want to happen, or what do we **imagine will happen in our course**? Or better still: what makes us want to begin?
2. What do I think **students expect to find there**? What are they looking for?
3. How will the **learning scenario** be structured, and what elements will be included to ensure that the basic aspects of previous questions align or converge effectively? Additionally, reflect on your role as a teacher in this context—what kind of atmosphere of trust do you want to foster in the classroom, and what level of teaching and emotional presence do you aim to establish?
4. How will I **help students to learn**: what feedback will I give, at what times and by what means?
5. What will **the students do**? We propose to adopt an active learning perspective and ask ourselves not 'what will I explain to them' but 'what will I ask them to do, what evidence or product will we share'.

4. COMPETENCY-BASED CURRICULUM DESIGN: WHY, WHEN AND HOW

The **demands of the labour market** have increasingly influenced universities, placing a premium on graduates who possess comprehensive training and can navigate the complexities of 21st-century society. This shift underscores the necessity of equipping students with competencies that allow them to apply their **knowledge, skills, personal resources**, and cognitive processes to real-world challenges. It is no longer sufficient to simply have extensive knowledge; graduates must also demonstrate their ability to utilise that knowledge effectively.

From a design perspective, we need to transition from activities that merely assess what students know to those that showcase what they can do. This integration of theory and practice is recommendable for tackling the challenges of today's world (Brauer, 2021), leading us to the concept of **competency-based education**.

What do we mean by competencies, a concept that has gained significant attention recently? Why has competency-based educational design become so crucial?

First, because **knowledge becomes outdated rapidly**. For instance, it is more beneficial for students to develop the skills to search for and critically evaluate information rather than simply memorise it, as these competencies will support lifelong learning.

Second, there is an increasing demand for a **holistic education** that goes beyond fragmented subject knowledge to include general and transversal competencies.

Third, the **labour market's evolving needs** have created a demand for education that is closely aligned with professionalisation, where competencies play a highlighted role in facilitating this transition.

Finally, we seem to have reached a consensus that **effective educational practices require a new understanding of learning**—one in which students are actively engaged and drive their learning. This shift should serve as the foundation for a successful university system.

Competency-oriented design involves:

1. **Planning:** we must begin with a clear vision of the professional and civic **profile** we aim to cultivate, along with the overarching goals that guide our educational programme. This approach requires us to consider the needs identified in the current context, ensuring that each subject within the degree programme contributes to the development of specific competencies. Our focus should be on the competencies we wish to foster, followed by determining how each subject can support that development.

2. **Methodology:** this shift necessitates the incorporation of situated and meaningful learning activities, such as role-playing, simulations, case studies, internships, and projects. These experiential activities enable students to apply their knowledge to real-world problems, providing them with practical and relevant learning experiences.

3. **Assessment:** this approach calls for a transformation in assessment practices, moving towards authentic assessment methods. Rather than merely assessing what students remember or know, we should prioritise how they apply this knowledge in specific contexts. The aim is to evaluate their ability to implement solutions and demonstrate their understanding in real-world scenarios.

5. KEY ELEMENTS IN LEARNING DESIGN FOR DIFFERENT SCENARIOS

Designing competency-based learning necessitates a focus on progressive competence development through a structured curriculum that gradually increases the complexity and variety of activities, ensuring effective skill-building for students. Special attention must be also given to aligning assessment methods with learning outcomes, while considering the required student effort; this combination, along with the incorporation of diverse and engaging resources, significantly enhances the educational experience and fosters active participation.

5.1. The relationship between programme competencies and course or subject learning outcomes

The distribution of programme competencies into courses (or subjects) are fundamental for ensuring a cohesive educational experience. This relationship ensures that the competencies outlined at the programme level effectively translate into specific, measurable learning outcomes, guiding both learning activities and assessment methods. Aligning these elements creates a more integrated curriculum that supports students in developing the skills and knowledge necessary for success in their studies.

5.2. The assessment criteria aligned to the learning outcomes

Clear connections between assessment criteria and specific learning outcomes enable effective measurement of student performance while fostering meaningful competence development. This alignment enhances understanding of the material and promotes active engagement in the learning process.

5.3. The distribution of the student's workload and effort throughout the course

When designing a course, the total number of credits assigned to a subject significantly influences the time educators are expected to dedicate to teaching. The credit system, particularly the **European Credit Transfer and Accumulation System (ECTS)**, provides a framework for understanding the time commitment required from students. Typically, one ECTS credit corresponds to approximately 25 to 30 hours of total student workload, which includes lectures, assignments, and self-directed study. This structured approach helps educators gauge how much content can be realistically covered within a given timeframe, ensuring that the course remains manageable and effective.

Equally important is the careful balancing of class time and independent work. Distributing tasks appropriately is recommended to prevent students from feeling overwhelmed. Educators should estimate the time required for each assignment and ensure that the overall workload aligns with the credits assigned. A well-balanced workload not only enhances academic performance but also boosts student satisfaction and reduces dropout rates.

5.4. Guidelines for effective learning resources

Sharing course materials such as presentations, videos, and academic texts is only the first step in ensuring students engage with these resources effectively. To enhance their learning experience, it is appropriate to clarify the purpose of each resource and illustrate how they relate to specific activities. This approach not only fosters understanding but also encourages students to actively incorporate these materials into their assignments, making their study time more productive.

In addition to providing clear guidance on resource utilisation, considering students' prior knowledge and available study time is essential. This awareness allows educators to tailor their recommendations, helping students make informed decisions about their study habits.

5.5. The alignment of all elements

Constructive alignment (Biggs et al., 2022) refers to connecting intended learning outcomes, learning activities, and assessment tasks to enhance student learning. It begins with clearly defined LO that outline what students should achieve, followed by the design of learning activities that actively engage students and facilitate their progress toward these outcomes. Assessment tasks must coherently and accurately measure student achievements, ensuring that both formative and summative assessments are effective. This alignment creates a cohesive educational experience, reduces student anxiety by clarifying expectations, and enhances motivation.

5.6. e-tivities and active teaching and learning methodologies

The development of competencies requires a concerted effort from educators during the design process. Recognising that students also share this responsibility is important. Designing courses under this approach encourages the adoption of more active teaching methodologies and emphasises productive activities over rote learning. This shift transforms the learning experience and necessitates greater engagement and participation from students.

Technology plays a vital role in facilitating effective learning activities. E-tivities, as described by Salmon (2013), promote active and participatory learning through a student-centred approach. In this framework, learners construct knowledge through meaningful interactions with their peers, enhancing understanding and retention. Leveraging these innovative strategies creates a dynamic learning environment that empowers students to take charge of their educational journeys.

Not all e-tivities are equally effective; their success hinges on adherence to specific design principles (Maina, 2020). The table below illustrates **various types of activities aligned with three design principles**, highlighting how thoughtful design can enhance the learning experience.

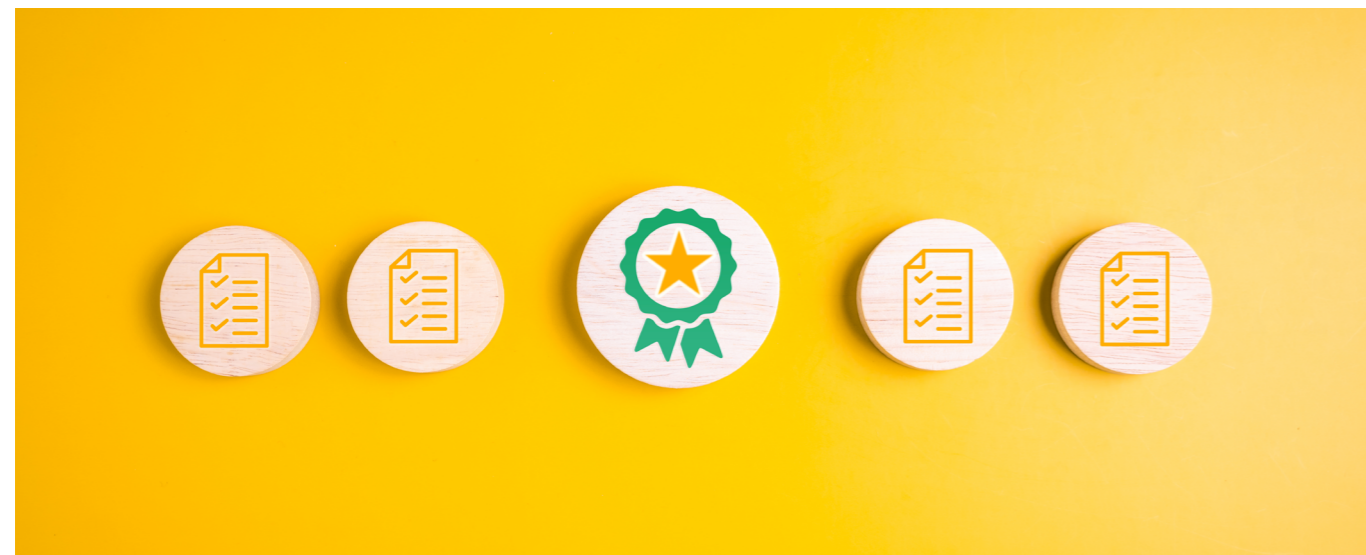


Table 7
E-tivities principles with example. Adapted from Maina, M. (2020)

DESIGN PRINCIPLE	DESCRIPTION	EXAMPLES OF ACTIVITIES
Relevance	Activities should be meaningful, authentic, and engaging, connecting to social or professional contexts to enhance their relevance for students' personal and professional development.	<ul style="list-style-type: none"> Interactive case studies and decision-making exercises grounded in real-world facts. Learning derived from actual data and current news. Conferences and multicultural interactions, both academic and extracurricular. Interviews with real-world experts and practitioners. Assignments connected to students' social environments.
Interactivity	Activities should foster collaboration and interaction among students, enabling them to work in teams, engage in discussions, and collectively develop ideas and solutions, which strengthens relationships and promotes a sense of belonging.	<ul style="list-style-type: none"> Role-playing Jigsaw or puzzle-based exploration of online content Flipped classroom approaches Brainstorming sessions and collaborative digital co-creation Collaborative mind maps or visual representations of ideas through infographics or interactive maps Interactive videos featuring notes or embedded questions Cloud-based interactions or digital networking
Tension	Activities should present a sufficient challenge or incorporate elements of discrepancy or controversy, creating a constructive tension that keeps participation and attention engaged.	<ul style="list-style-type: none"> Engaging in online debates about news or topics. Visual summaries that capture the arguments and ideas from debates, highlighting main contributors and their persuasive impact. Synchronous videoconferences where participants propose and tackle challenges. Digital competitions that encourage collaboration and friendly rivalry.

This type of activities can be implemented using active learning methodologies, such as **Problem-Based Learning, Challenge-Based Learning, role-playing, simulations, or research-based methodologies**, as illustrated in the following image:

Figure 8

Active teaching and learning methodologies. Adapted from Guàrdia & Maina (2020). <https://shorturl.at/iMHtp>

 <p>1 PROBLEM-BASED LEARNING</p> <p>Problem-based learning presents complex real-world and meaningful situations or problems, in which students must seek possible solutions. It is triggered by the need to discover, experiment and reason and reflect. It may rely on resources and content provided by the teacher or sought by the students.</p>	 <p>2 CASE-BASED LEARNING</p> <p>Case-based learning is an approach in which students apply their knowledge to real-world scenarios presented as stories or cases, promoting higher levels of cognition. Cases can be fact-driven and deductive where there is a correct answer, or they can be context-driven where multiple solutions are possible.</p>	 <p>3 GAMIFICATION</p> <p>Gamification applies game dynamics to learning processes. It incorporates principles that maintain attention, motivation, and satisfaction through challenges, overcoming levels, and reward. It involves individual or group participation and emphasizes competition or cooperation.</p>	 <p>4 PROJECT-BASED LEARNING</p> <p>Project-based learning involves the use of authentic projects, based on a motivating task or problem, directly related to the social or professional context, through which students develop skills with a collaborative approach, following a structure of work based on phases that lead to the final solution.</p>
 <p>5 SIMULATIONS</p> <p>Simulation-based learning is a technique used to stimulate the student participation through hypothetical situations that seek to enhance real-life knowledge and apply it in everyday situations. It consists on the representation or simulation of a phenomenon that helps experiencing and reaching deeper understanding.</p>	 <p>6 INQUIRY-BASED LEARNING</p> <p>Inquiry-based learning focuses on an active subject who instead of receiving the contents passively, investigates and discovers patterns, ideas, and principles. It puts the development of research skills at the forefront and is based on the inductive reasoning and the solution of problems.</p>	 <p>7 ASSESSMENT EPORTFOLIO</p> <p>ePortfolio-based learning is used as a strategy to showcase a selection of evidence relevant to the competencies developed throughout a period of time. The evidence can be presented in different formats and be accompanied by explanations, justifications and or reflections. The ePortfolio should support formative feedback and summative assessment.</p>	 <p>8 AUTHENTIC PRACTICES</p> <p>Learning based on authentic practices puts students in front of real problems or challenges within a social or professional environment/setting. Those experiential scenarios require the application of knowledge and creativity which allow exploring alternative solutions in a bounded period of time.</p>
 <p>9 FLIPPED-CLASSROOM</p> <p>Flipped-Classroom consists of students having first a contact with the content in an autonomous way, through recorded video sessions, teaching materials or other resources, and second, a face-to-face or online synchronic session with the teacher where they discuss, put into practice, solve or present their work.</p>	 <p>10 COLLABORATIVE LEARNING</p> <p>Collaborative learning enforces the social organization of the group, where students collaborate as a team to achieve the common goal of learning; this type of learning is planned and structured. It encourages the development of social and individual skills, such as autonomy, and personal and group responsibility. The teacher accompanies and guides the students.</p>	 <p>11 DESIGN THINKING</p> <p>Design Thinking focuses on the end user of a solution. It is a design process that begins by defining the problem and ends with the delivery of the solution as a final product. The end users' opinion forms part of an iterative process that is used to improve the product or service.</p>	 <p>12 CHALLENGE-BASED LEARNING</p> <p>Challenge-based learning is a practical approach, where students work as a team with other peers, teachers, and experts starting with a challenge. Conflict situations relevant to students are generated to increase their motivation and urge them to come up with new ideas and use different tools to find solutions.</p>

These methodologies can be applied in both online and traditional classrooms that use technology. Most activities can be effectively implemented in face-to-face, hybrid, or online settings. Instead of merely adapting in-person methods for online use, we should explore the unique potential of each methodology across different contexts.

5.7. e-assessment strategies

Digital assessment involves using technology to evaluate student learning through methods like online quizzes, projects, and presentations, enhancing accessibility and flexibility in the learning experience.

Effective assessment begins with clear planning to determine the evidence we expect to gather, which should reliably reflect what students have learned and their level of competency. The choice of assessment strategies should align with our learning outcomes, as no single method is inherently superior. The true value lies in how well the chosen strategy captures relevant information about learning. While we often focus on the types of assessments, it is convenient first to identify what we actually want to assess, ensuring that our approach effectively measures student progress. Let's explore some assessment strategies:

- **Self-assessment:** self-assessment rubrics allows students to reflect on their learning progress and identify areas for improvement.
- **Multi-agent assessment:** peer assessment and co-evaluation foster constructive criticism and enhance learning outcomes.
- **Digital portfolio:** provides students with a platform to demonstrate progress, showcase their learning gains, and share samples of their competency profiles with a wider audience.

> FORMATIVE ASSESSMENT AND FEEDBACK

When we think about assessment, we can approach it from two distinct angles. On one hand, it can be viewed as a "full stop" in the teaching process—an isolated moment focused solely on measuring the knowledge students have gained. Conversely, we can see assessment as a vital component of the learning journey, acting as a tool that enhances students' understanding of their own learning.

> ENGAGING STUDENTS IN ASSESSMENT

Involving students in the assessment process allows them to reflect on what they have learned and identify areas for improvement. This approach not only enriches their learning experience but also fosters a more meaningful assessment process.

> KEY CONSIDERATIONS IN ASSESSMENT:

1. **Variety of assessment activities:** use diverse assessment methods, including practical tasks, to enhance student engagement.

2. **Coherence between methodologies and assessment:** ensure that teaching methods align with assessment strategies for effective learning.
3. **Workload appropriateness:** balance the workload to avoid overwhelming students.
4. **Teacher coordination:** collaborate with colleagues to create a cohesive assessment framework.
5. **Visibility of assessment criteria:** clearly communicate assessment criteria to students.
6. **Real-world relevance:** incorporate activities that simulate real-life situations to prepare students for their professional futures.
7. **Multi-agent assessment:** encourage peer assessment to foster constructive feedback and critical thinking.
8. **Providing formative feedback:** implement strategies for timely and effective feedback to support student learning.

> THE ASSESSMENT PROCESS

Assessing student learning involves three fundamental processes:

- a. **Gathering evidence:** collect information on students' learning processes.
- a. **Applying quality criteria:** evaluate the quality of the gathered evidence.
- a. **Judging learning value:** determine the merit of students' learning outcomes.

Generally defined, feedback is a reflective, situated, and dialogic process where students make sense of the information they receive from teachers to enhance their learning.

Once assessment is designed, we must consider how to support students through this process and the feedback they will receive to help them stay engaged, understand their learning journey, and identify areas for improvement. Thus, it is required to plan not only the assessment activity but also the **ongoing support and continuous improvement**.

> UNDERSTANDING FEEDBACK

Feedback is a reflective, contextual, and dialogic process through which students interpret the information they receive from teachers to enhance their learning.

Once an assessment is designed, we must consider how to support students throughout this process. The feedback they receive plays a crucial role in keeping them engaged, helping them understand their learning journey, and identifying areas for improvement.

Therefore, it is important to plan not only the assessment activities but also the ongoing support and pathways for continuous improvement.

Feedback goes beyond merely informing or correcting errors; it represents a continuous exchange between the evaluator and

the evaluated. Both teachers and students play active roles in identifying:

- **What is the student learning?** Encourage students to reflect on their experiences by recalling what has surprised them, what they were previously unaware of, any misunderstandings they've had, what they can now confirm, and what they've had to unlearn to acquire new knowledge.
- **How is the student learning?** Consider the strategies students are employing to manage their time and tasks effectively. This reflection can help them recognise their strengths and areas for improvement.
- **What can the student do to enhance their learning and upcoming tasks?** Prompt students to think about whether they need to develop new study habits, reorganise their work, or delve deeper into specific topics to feel more confident in their progress.

> EMPOWERING STUDENTS THROUGH FEEDBACK

It is relevant to understand that even when students perform well, they still need feedback to recognise their strengths and learn how to build on them. To support this process, assessments should be designed to emphasise metacognitive skills, which help students reflect on their learning and develop self-regulation. Engaging in critical reflection about what they learn and how they learn it, helps students significantly enhance their motivation and better academic performance.

> MANAGING FEEDBACK IN LARGE CLASSES

In large classes, providing formative feedback can be a significant challenge. However, there are numerous effective strategies to address this, such as conducting group feedback sessions or facilitating individual dialogues between teachers and students. Additionally, technology can serve as a powerful ally, enabling personalised feedback in various formats—whether synchronous or asynchronous, written, oral, or video.

6. CONCLUSIONS

As institutions increasingly adopt technology-driven models, aligning educational practices with the evolving demands of the labour market and the diverse needs of students becomes imperative. We explored the transformative potential of digital teaching and learning in higher education, emphasising the shift toward competency-based education. This focus on competencies equips students with the skills to navigate real-world challenges, enhancing employability while fostering lifelong learning, critical thinking, and adaptability. Through competency-based curriculum design, universities can effectively prepare graduates for the complexities of the 21st century.

Creating effective learning experiences requires coherence among learning outcomes, teaching activities, and assessment methods. Integrating e-tivities and innovative teaching strategies

promotes collaboration and deeper understanding among students. Using technology enables educators to craft dynamic learning environments that empower students to take charge of their education. Prioritising formative assessment and timely feedback significantly guides student progress. Engaging students in the assessment process enriches their learning experience and cultivates self-regulation and metacognitive skills.

As we move forward, educational institutions must embrace these principles, ensuring that DT in teaching and learning emphasises not only technology but also the enhancement of the overall educational experience.

7. TAKEAWAYS

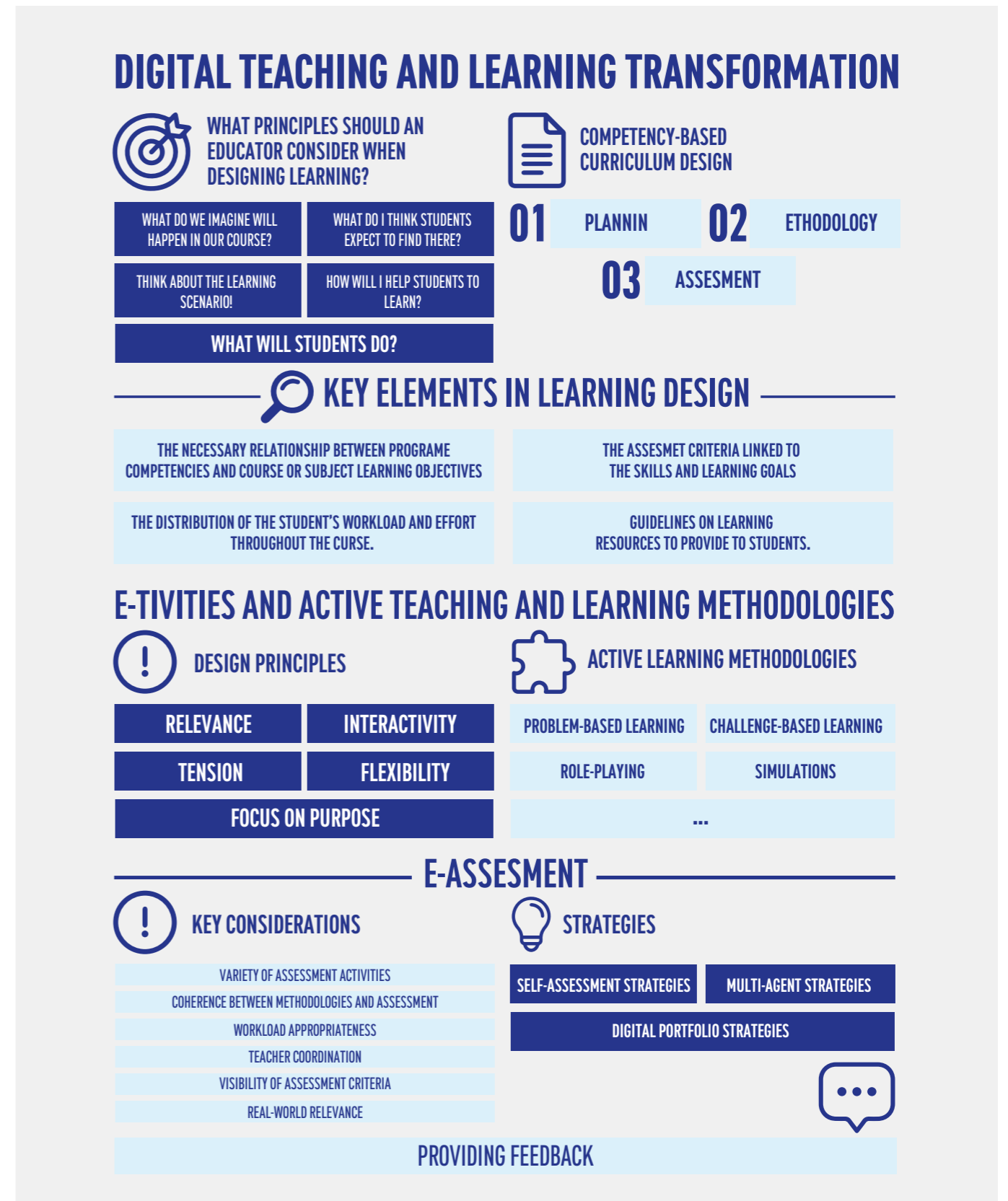
- **Prioritise** formative assessment and feedback in your course design to enhance student learning, ensuring that feedback is timely, actionable, and aligned with learning objectives.
- **Stay informed** about active teaching and learning methods that foster an engaging and effective learning experience, and explore tools that encourage student participation, critical thinking, and collaboration.
- **Evaluate various e-assessment strategies** and select those that best align with your learning objectives, adapting your methods to address both formative and summative needs for meaningful continuous learning.
- **Ensure constructive alignment** between your course goals, teaching activities, and assessments from the outset of your course design, effectively guiding students through their learning journey.
- **Use technology in facilitating personalised learning** by employing digital tools that create adaptive pathways catering to diverse student needs and promoting self-regulation.

8. QUESTIONS FOR REFLECTION

1. What are the key benefits of competency-based education in higher education?
2. Designing a course goes beyond just teaching content. How can universities adopt models that foster the development of competencies and skills?
3. Feedback is fundamental for learning. What role do feedback from teachers and peers play, and how can we make sure it's timely and effective?
4. Before choosing e-assessment methods, why is it crucial for teachers to first clarify what they want to assess?
5. After reading this chapter, why do you think learning design is critical in face-to-face, hybrid, and online education? Are institutions prioritising it enough?

9. VISUAL SYNTHESIS

Figure 9
Digital teaching and learning transformation



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11. RESOURCES

1. Design for learning: Principles, processes and praxis.

This book serves as a foundational resource for educators interested in integrating educational technology into their teaching practices. It covers concepts related to digital tools and their application in the classroom, providing a comprehensive overview that helps teachers understand how to enhance learning experiences. The content is designed to be accessible and practical, making it suitable for educators at various levels of experience with technology.

USEFULNESS

This book is of interest for teachers and learning designers as it explores how to understand and address educational needs, analyse contexts, develop solutions, and evaluate effectiveness. It also discusses sources of design knowledge, design processes, and strategies for creating learning activities based on learning theories, and making effective use of technology.

McDonald, J. K., & West, R. E. (2021). *Design for learning: Principles, processes, and praxis*. <https://edtechbooks.org/id>

2. A system for the assessment, accreditation and representation of competency learning in online Higher Education

The Competence Design and Assessment System at the Universitat Oberta de Catalunya (UOC) enables students to visually track their competency learning throughout their degree or master's programme. For educators, it offers a model and tools for designing competency-based programmes

and assessing student learning evidence. From the student perspective, it enhances traditional assessments by providing grades alongside constructive feedback on competency levels, along with a graphical representation of progress.

USEFULNESS

GRAF provides a structured framework for designing competency-based programmes, facilitates ongoing assessment and monitoring of student progress, and offers visual insights into class performance, enabling more personalised and effective instructional strategies.

Girona C., Pastor L., Mas X., Martínez-Aceituno JA. (2022) GRAF: A system for the assessment, accreditation and representation of competency learning in online Higher Education. In: Guralnick D., Auer M.E., Poce A. (eds), *Innovations in Learning and Technology for the Workplace and Higher Education*. TLIC 2021. Lecture Notes in Networks and Systems, 349 (pp. 111-121). Springer. https://doi.org/10.1007/978-3-030-90677-1_11 Preprint: <http://hdl.handle.net/10609/135886>

3. Applying the ICAP framework to improve classroom learning

The objective of this publication is to provide educators with a model of learning design that will facilitate the implementation of more effective strategies to engage their students cognitively and, ultimately, to enhance their learning outcomes.

To help teachers design and implement active learning strategies in the classroom, ICAP (Interactive, Constructive, Active, and Passive), a science of learning and evidence-based theory, provides heuristics that can help differentiate and distinguish between different types of active learning activities in terms of their effectiveness for improving learning.

USEFULNESS

This publication may guide educators to implement better approaches in learning design, considering four modes of student engagement: Interactive, Constructive, Active, and Passive. This is a practical and inspirational framework. It has been elaborated to facilitate the design of more effective educational activities and to provide a means of evaluating teachers' own classrooms and modes of delivery, thereby enabling them to enhance their teaching practice.

Chi, M. T. H., & Boucher, N. S. (2023). Applying the ICAP framework to improve classroom learning. In C. E. Overson, C. M. Hakala, L. L. Kordonowy, & V. A. Benassi (Eds.), *In their own words: What scholars and teachers want you to know about why and how to apply the science of learning in your academic setting* (pp. 94-110). Society for the Teaching of Psychology. <https://teachpsych.org/ebooks/itow>



Watch the webinar here

SECTION 7

TRENDS IN TECHNOLOGY ENHANCED LEARNING

Authors: **Marcelo Maina & Lourdes Guàrdia**

1. INTRODUCTION

In recent years, the pace of digital transformation in education has significantly accelerated, largely driven by rapid technological advancements and an increasing demand for flexible, accessible, and personalised learning experiences. This shift aligns with the United Nations' Sustainable Development Goal 4 (SDG 4), which aims to ensure inclusive and equitable quality education for all.

The OECD (Organisation for Economic Co-operation and Development) Digital Education Outlook reports from 2021 and 2023 illustrate the dynamic landscape of digital education, highlighting both the opportunities and challenges arising from these technological advancements. Smart technologies, including artificial intelligence (AI) and learning analytics, hold great potential to personalise learning experiences and enhance educational management.

To fully harness the benefits of these technologies, it is recommendable to develop coherent digital education ecosystems that effectively integrate them into existing educational frameworks. Higher Education Institutions (HEIs) must leverage the potential of digital trends for change and innovation. Understanding these trends is advantageous for educators, administrators, and policymakers to stay ahead and effectively utilise technology to improve educational outcomes.

This chapter explores the latest trends in technology-enhanced learning, delving into the integration of pedagogy and technology. It emphasises the importance of teacher training and the need for educators to remain informed about emerging technologies. Most relevant trends such as artificial intelligence, micro-credentials, learning analytics, and extended reality are examined in detail, providing insights into how these innovations are transforming higher education.

2. OBJECTIVES

- Understand how **technology** contributes to promote **inclusive, equitable, and quality** education for all.
- Acknowledge the importance of **integrating pedagogical strategies with technological tools** to enhance the teaching and learning process, supported by continuous professional development for educators.
- Gain insights into the **latest trends in technology-enhanced learning** and their impact on higher education.
- Review the **ethical considerations and practical challenges** associated with implementing emerging technologies in educational settings, such as data privacy and bias.
- Understand the necessity of **collaboration among HEI stakeholders** to create a supportive environment for DT in HE.

3. PEDAGOGICAL AND TECHNOLOGICAL INTEGRATION

How can integrating technology and pedagogy transform the educational experience for both teachers and students?

Integrating pedagogy and technology fosters a synergy that enhances the teaching and learning process. This integration involves a **collaborative effort among various stakeholders**, including educators, IT departments, centres for teaching and learning, and institutional leadership (*see section 3*). By working together, these groups can create a cohesive **strategy that leverages technology to improve educational outcomes**.

Effective integration requires comprehensive **teacher training plans and strategies**. Continuous professional development ensures that educators are equipped with the necessary skills and knowledge to use technology effectively. Professional development workshops on emerging technologies and their applications in education, along with hands-on training sessions, can familiarise teachers with new tools and platforms. Establishing **collaborative learning communities** where educators can share experiences, resources, and best practices, and encouraging peer mentoring and support networks, are also relevant. Providing access to online courses and certifications on educational technology and digital pedagogy, and embedding technology training in pre-service teacher education programmes, ensures that new teachers have a strong foundation in **digital pedagogy**.

Integrating technology into pedagogy can significantly enhance the learning experience by making it more interactive, personalised, and engaging. **The flipped classroom model**, where students access instructional content online before class, allows in-class time to be used for interactive activities and discussions. **Blended learning** combines traditional face-to-face instruction with online learning activities, facilitated by platforms like Learning Management Systems (LMS) that provide a centralised space for course materials, assignments, and communication. **Gamification** incorporates game elements into the learning process to increase motivation and engagement, using tools like Kahoot!, Quizizz, and Classcraft to create interactive quizzes and challenges. **Adaptive learning technologies** use AI-powered tools to provide personalised learning experiences based on individual student needs and progress, with examples including intelligent tutoring systems and adaptive learning platforms like DreamBox and Knewton. **Collaborative tools**, such as Google Workspace, Microsoft Teams, and Padlet, facilitate real-time collaboration on projects and assignments.

A successful DT in higher education (*see section 2*) requires the collaboration of multiple departments and leadership to create a supportive environment for technology integration. The **Information Technology department** plays a crucial role in ensuring the infrastructure supports the integration of new technologies, providing technical support and maintenance for digital tools, and collaborating with educators to identify

and implement effective technological solutions. The **Centre for Teaching and Learning** leads professional development initiatives focused on digital pedagogy, offers resources and support for educators to integrate technology into their teaching, and conducts **research on the effectiveness of technology-enhanced learning strategies**. Institutional leadership sets a vision and strategic direction for digital transformation, allocates resources and funding for technology initiatives, and fosters a **culture of innovation and continuous improvement**. In this holistic view, the IDEAS framework (Guàrdia et al., 2021)—which emphasises **Intelligent, Distributed, Engaging, Agile, and Situated next-generation pedagogy**—serves as a guiding principle for the pedagogical drive in technology integration. Ensuring that all stakeholders are included in the transformation process, fostering ongoing professional development, engaging students actively in their learning, assessing the impact of technology on educational outcomes, and promoting sustainable practices allows institutions to create a robust environment that not only embraces technology but also enhances the overall educational experience.

The rapid pace of technological advancement means that educators must stay informed about **emerging technologies and their potential to improve teaching, learning, and assessment**. Continuous professional development and a commitment to lifelong learning are integral to educators' effectiveness in a technology-enhanced learning environment. Engaging with professional networks, participating in conferences, webinars, and workshops, subscribing to educational technology journals and blogs, collaborating with colleagues, and experimenting with new tools are all important **strategies for staying informed and adequately trained**.

By **integrating pedagogy and technology**, and involving all relevant stakeholders, educators can create dynamic and effective learning environments that cater to the diverse needs of students. This integration not only enhances the teaching and learning process but also **prepares students for success in a digital world**.

4. MAIN TRENDS IN TECHNOLOGY-ENHANCED LEARNING

What are the key technological trends transforming higher education, and how are they reshaping the way we teach and learn?

The landscape of higher education is undergoing a profound **transformation**, driven by rapid advancements in technology. These changes are not just about adopting new tools but about fundamentally **rethinking how education is delivered, accessed, and experienced**. As institutions strive to meet the evolving needs of students and society, understanding and leveraging the latest trends in technology-enhanced learning becomes a mandatory ongoing activity.

This section delves into the **main trends that are shaping the future of higher education**. By examining these trends, we can gain valuable insights into how technology is driving change and innovation in teaching and learning. The trends discussed here have been selected based on their **current impact and potential to transform educational practices**.

Each trend is explored in detail, providing practical applications, benefits, and challenges. We will look at how artificial intelligence is enhancing personalised learning and student support, the growing importance of micro-credentials in providing flexible and relevant learning pathways, the role of learning analytics in enhancing educational outcomes, and the potential of extended reality (XR) to create immersive and engaging learning experiences.

4.1. Artificial Intelligence (AI) in Higher Education

Artificial Intelligence is rapidly transforming higher education by introducing innovative solutions that enhance teaching, learning, and administrative processes (EDUCAUSE, 2023). AI technologies, such as machine learning, natural language processing, and data analytics, are being integrated into various aspects of education, offering new opportunities for personalisation, efficiency, and engagement.

One of the most significant applications of AI in higher education is **personalised learning**. AI-powered systems can analyse vast amounts of data to understand individual student needs, preferences, and learning styles. This enables the creation of **customised learning paths** that adapt to each student's pace and progress. For example, intelligent tutoring systems can provide **tailored feedback and support**, helping students to master complex concepts at their own pace. These systems can identify areas where students struggle and offer additional resources or alternative explanations, thereby enhancing the overall learning experience.

AI is also remodelling the way courses are designed and delivered. **Enhanced course design through AI** involves the use of data analytics to optimise curriculum development and instructional strategies. By analysing student performance data, educators can identify which **teaching methods** are most effective and make data-driven decisions to improve course content and delivery. AI can also assist in creating **more engaging and interactive learning materials**, such as adaptive textbooks and multimedia resources that respond to student interactions.

In addition to personalised learning and course design, AI is making significant strides in the area of **automatic assessments**. Traditional assessment methods can be time-consuming and may not always provide **timely feedback**. AI-driven assessment tools can automate the grading process, providing instant feedback to students and freeing up valuable time for educators. These tools can evaluate a wide range of assignments, from multiple-choice quizzes to complex essays, with a high degree of accuracy. Moreover, AI can help in **identifying patterns in student performance**, enabling early intervention for those who may be at risk of falling behind.

Student support is another critical area where AI is making a substantial impact. AI-powered chatbots and virtual assistants are being deployed to provide **round-the-clock support to**

students. These tools can handle a variety of tasks, from answering frequently asked questions to provide guidance on academic and administrative matters. By offering **immediate assistance**, AI-driven support systems can enhance the student experience and **reduce the workload** on administrative staff.

However, the integration of AI in higher education also demands attention to **ethical considerations and raises many challenges.** One of the primary concerns is the potential for bias in AI systems. AI algorithms are trained on large datasets, and if these datasets contain biases, the AI systems can perpetuate and even amplify these biases. This can lead to unfair treatment of certain groups of students. **Ensuring fairness and transparency** in AI systems is central to prevent discrimination and promote equity in education.

Data privacy is another significant concern. The use of AI in education involves the collection and analysis of vast amounts of student data. Protecting this data from unauthorised access and ensuring that it is used responsibly is paramount. Institutions must implement robust data **security measures** and establish **clear policies** on data usage to safeguard student privacy.

Finally, the **role of teachers** in an AI-assisted educational environment is also evolving. While AI can automate many tasks and provide valuable insights, it cannot substitute the human connection that is fundamental in education. Teachers play a leading role in **interpreting AI-generated data**, providing emotional support, and fostering a positive learning environment. It is important for educators to view AI as a tool that complements their work rather than a replacement.

This article explores the integration of artificial intelligence (AI) in higher education, focusing on how leading universities are adapting their pedagogical strategies and policies. It examines the experiences of 25 top institutions, highlighting both the **benefits and challenges associated with AI implementation.** One of the principal findings is that AI tools significantly **enhance teaching efficiency** by streamlining administrative tasks, which allows educators to dedicate more time to engaging with students. The study emphasises the importance of ongoing **faculty training** to ensure that educators can utilise AI technologies effectively in their teaching practices. A central lesson from the research is the need for a balanced approach that **fosters innovation while preserving academic values.** Engaging faculty, students, and administrators in the development of AI policies creates a more inclusive and effective integration process.

Alqahtani, N., Wafula, Z. (2024). Artificial Intelligence Integration: Pedagogical Strategies and Policies at Leading Universities. *Innovative Higher Education*. <https://doi.org/10.1007/s10755-024-09749-x>

4.2. Micro-credentials in Higher Education

Micro-credentials are emerging as a significant trend in higher education, offering **flexible and targeted learning opportunities** that complement traditional degree programmes. These credentials represent a shift towards more modular and competency-based education, allowing learners to **acquire specific skills and knowledge in a shorter time frame.** This approach aligns with the evolving needs of the workforce and the increasing demand for lifelong learning.

Micro-credentials provide flexible learning pathways that cater to diverse learner needs (Varadarajan et al., 2023). Unlike traditional degree programmes, which can take several years to complete, micro-credentials can be earned in a matter of weeks or months. This flexibility is particularly beneficial for working professionals who seek to **upskill or reskill** without committing to a full-time degree programme. By offering bite-sized learning opportunities, micro-credentials enable learners to quickly gain expertise in specific areas, making them more adaptable and **competitive in the job market.**

The role of micro-credentials in supporting lifelong learning cannot be overstated. In today's rapidly changing world, **continuous learning** is fundamental for career advancement and personal growth. Micro-credentials facilitate this by providing accessible and affordable learning options that can be pursued at any stage of life. They empower individuals to take control of their learning journeys, allowing them to acquire new skills and knowledge as needed to stay relevant in their fields.

Integration of micro-credentials into traditional degree programmes is another important aspect of this trend. Many HEIs are now offering micro-credential programmes that can be stacked towards a full degree. This approach provides learners with the flexibility to build their qualifications incrementally, **earning recognition** for each completed module. It also allows institutions to respond more quickly to industry needs by developing targeted programmes that address specific skill gaps.

Designing effective micro-credential programmes requires careful consideration of several factors. Programmes must be aligned with industry standards and demands to ensure their relevance and value. Collaboration with industry partners is decisive in this regard, as it helps to identify the skills and competencies that are most in demand. Additionally, micro-credential programmes should include **robust assessment methods to validate learners' achievements and ensure the quality of the credentials awarded.** Educators can use micro-credentials to create more personalised and relevant learning experiences for their students. For example, they can design **micro-credentials that address specific learning outcomes** or competencies, allowing students to focus on areas where they need improvement. This targeted approach can lead to more effective learning and better student outcomes.

Micro-credentials may significantly **enhance students' employability** by offering focused training in specific areas, helping learners develop the skills that employers seek. They serve as a bridge between education and employment, **facilitating smoother transitions for those entering the job market or changing careers.** From an institutional perspective, micro-credentials should be **integrated into counselling and career guidance services.** However, micro-credentials are not only for professional development but **also for personal growth**

and active citizenship. They may help individuals acquire and improve skills that are core for personal development and civic engagement. Institutions have the opportunity to **empower individuals to manage their personal and professional lives** more effectively, ultimately leveraging micro-credentials as a lifelong learning strategy.

Despite the many benefits of micro-credentials, there are also challenges to consider. Ensuring the **quality and recognition of micro-credentials** is a key concern. Institutions must establish clear standards and criteria for awarding them to maintain their credibility and value. Additionally, there is a need for greater awareness and understanding of micro-credentials among employers and learners. Promoting the benefits and potential of micro-credentials can help to increase their acceptance and adoption.

This case study on **micro-credentials** details the implementation of the **Employability Skills Micro-credentialing (ESMC) methodology.** This project was part of the EPICA Horizon 2020 initiative and was tested at three East African universities. The methodology aimed to **enhance the recognition of employability skills through a competency-based ePortfolio and a digital micro-credentialing system.** The study involved 13 lecturers, 169 students, and 24 employers, and it demonstrated promising results in supporting students' transition from academia to the workplace.

Maina, M. F., Guàrdia Ortiz, L., Mancini, F., & Martinez Melo, M. (2022). A micro-credentialing methodology for improved recognition of HE employability skills. *International Journal of Educational Technology in Higher Education*, 19(1), 10. <https://doi.org/10.1186/s41239-021-00315-5>

EPICA toolkit: Handbook, Teacher-Student-Employer Guides, Skills rubrics, Appraisal tool. <http://openaccess.uoc.edu/webapps/o2/handle/10609/128629>

4.3. Learning Analytics

Learning analytics is a field of incremental adoption in higher education that leverages data to improve teaching and learning outcomes. By collecting, analysing, and interpreting educational data, institutions can gain valuable insights into student performance, engagement, and progression (Lang et al., 2022). This **data-driven approach** enables educators to **make informed decisions** that enhance the learning experience and support student success.

At its core, learning analytics involves the systematic use of data to understand and optimise learning processes. This can include data from various sources, such as learning management systems, student information systems, and digital learning tools. By analysing this data, educators can identify patterns and trends that provide a deeper understanding of how students learn and what factors contribute to their success or challenges.

One of the primary applications of learning analytics is to **improve student retention and success.** By monitoring student engagement and performance in real-time, institutions can identify at-risk students early and intervene with targeted support. For example, if a student is consistently missing deadlines or performing poorly on assessments, learning analytics can flag this behaviour, prompting educators to reach out and offer assistance. This **proactive approach** can help prevent students from falling behind and increase their chances of completing their courses successfully.

Learning analytics also plays a crucial role in **personalised learning.** By analysing data on individual student behaviours and preferences, educators can **tailor instruction to meet the unique needs of each learner.** This can involve adjusting the pace of instruction, providing additional resources, or offering alternative learning activities that align with the student's strengths and interests. Personalised learning not only enhances student engagement but also improves learning outcomes by ensuring that instruction is relevant and effective.

In addition to supporting individual students, learning analytics can **inform broader instructional strategies and curriculum design.** By examining data on student performance across different courses and programmes, institutions can identify areas where students are struggling and adjust the curriculum accordingly. This might involve revising course content, introducing new teaching methods, or providing additional training for educators. Learning analytics can also help institutions **evaluate the effectiveness of different instructional approaches** and make data-driven decisions to improve teaching practices.

Though it brings many advantages, the use of learning analytics raises **ethical considerations.** One of the primary concerns is the ethical use of data. Institutions must ensure that student data is collected, stored, and used in a manner that respects privacy and confidentiality. This involves implementing **robust data security measures** and establishing **clear policies on data usage.** Transparency is also a must; students should be informed about how their data is being used and have the opportunity to provide consent.

Another ethical consideration is the potential for **bias in learning analytics.** Data-driven decisions are only as good as the data they are based on, and if the data contains biases, these can be perpetuated in the analysis and subsequent actions. For example, if certain groups of students are underrepresented in the data, the insights generated may not accurately reflect their experiences and needs. Institutions must be vigilant in identifying and addressing biases in their data and analytics processes to **ensure that learning analytics promotes equity and inclusion.**

The implementation of learning analytics also requires a cultural shift within institutions. Educators and administrators must be willing to embrace data-driven decision-making and invest in the necessary tools and training. This involves **fostering a culture of continuous improvement**, where data is used not just for accountability but as a **tool for enhancing teaching and learning.** Collaboration between different departments, such as IT, academic affairs, and student services, ensures that learning analytics is effectively integrated into institutional practices.

This article explores the implementation and **impact of learning analytics across various HEIs**. It examines multiple **case studies** that illustrate **how data-driven insights can enhance teaching and learning processes**. The authors analyse the methodologies used in these case studies, highlighting the diverse approaches institutions take to leverage learning analytics for **improving student engagement and academic performance**. The findings underscore the potential of learning analytics to inform educational practices and foster a more personalised learning environment.

Wong, B. T. M. (2017). Learning analytics in higher education: an analysis of case studies. *Asian Association of Open Universities Journal*, 12(1), 21–40. <https://doi.org/10.1108/aaouj-01-2017-0009>

> MIXED REALITY (MR)

Combines elements of both VR and AR, allowing digital and physical objects to interact in real-time. MR can create highly interactive and collaborative learning experiences, where students can manipulate digital objects within their physical environment. This can be particularly useful in disciplines that require spatial awareness and hands-on practice, such as architecture, design, and engineering. For example, students can use MR to design and test prototypes, visualise architectural plans, and collaborate on complex projects in a shared virtual space.

The implementation of XR in higher education offers numerous benefits, including **enhanced engagement, improved retention of information**, and the ability to provide **practical training** in a safe and controlled environment. XR can make learning more interactive and enjoyable, capturing students' attention and motivating them to explore and experiment. By providing immersive and hands-on experiences, XR can help students better understand and retain complex concepts, leading to improved learning outcomes.

However, integrating XR into higher education also presents several challenges. One of the primary challenges is the **cost of XR equipment and infrastructure**. High-quality VR headsets, AR devices, and MR systems can be expensive, and institutions need to invest in the hardware and software to support these technologies. Additionally, there is a need for technical expertise to develop and maintain XR content and applications. Educators and IT staff must be trained to use and troubleshoot XR technologies, and institutions may need to collaborate with external partners to create high-quality XR content.

Another challenge is **ensuring accessibility and inclusivity** in XR experiences. Not all students may have access to the devices or may have physical or cognitive limitations that make it difficult to use XR technologies. Institutions must consider these factors when designing and implementing XR-based learning experiences, ensuring that they are accessible to all students and providing alternative options when necessary.

Despite these challenges, the potential of XR to transform higher education is vast. As technology continues to advance and become more affordable, the adoption of XR in education is likely to increase. Future developments in XR could lead to even more immersive and interactive learning experiences, further enhancing the educational landscape.

4.4. Extended Reality (XR)

Extended Reality is an umbrella term that encompasses Virtual Reality (VR), Augmented Reality (AR), and Mixed Reality (MR). These technologies merge the physical and digital worlds, creating **immersive experiences** that can significantly enhance teaching and learning in higher education (JISC, 2024). XR offers innovative ways to engage students, provide practical training, and explore complex concepts in a more interactive and intuitive manner.

> VIRTUAL REALITY (VR)

Creates a fully immersive digital environment that can simulate real-world or imaginary scenarios. In higher education, VR can be used to create virtual laboratories, field trips, and simulations that allow students to explore and interact with content in ways that are not possible in a traditional classroom. For example, medical students can practise surgical procedures in a virtual operating room, gaining hands-on experience without the risks associated with real-life practice. Similarly, engineering students can explore complex machinery and systems in a virtual environment, enhancing their understanding through interactive 3D models.

> AUGMENTED REALITY (AR)

Overlays digital information onto the physical world, **enhancing the real-world environment with additional layers of information**. AR can be used in higher education to provide contextual information and interactive content that enriches the learning experience. For instance, AR can bring textbooks to life by overlaying 3D models, videos, and interactive elements onto printed pages. This can help students visualise complex concepts and engage with the material in a more meaningful way. AR can also be used in field-based learning, such as archaeology or biology, where students can access additional information and resources through their mobile devices while exploring real-world sites.

A case study from The University of Newcastle, Australia, details their systematic approach to **integrating Extended Reality (XR) technologies** into their teaching applications. The university developed and implemented virtual reality (VR) teaching applications. This project involved careful selection of suitable teaching content, software development, hardware solutions, and implementation strategies. The study highlights the critical elements that shaped these decisions, the challenges encountered, and the lessons learned, providing valuable **insights for other institutions** looking to **integrate XR technology into their educational frameworks**.

Kluge, M. G., Maltby, S., Kuhne, C., Evans, D. J., & Walker, F. R. (2023). Comparing approaches for selection, development, and deployment of extended reality (XR) teaching applications: A case study at The University of Newcastle Australia. *Education and Information Technologies*, 28(4), 4531–4562. <https://doi.org/10.1007/s10639-022-11364-2>

5. CONCLUSIONS

The **integration of technology** in higher education is **not merely an option, but a fundamental shift that is reshaping the educational landscape**. As we have explored throughout this chapter, various technological advancements are driving significant changes and innovations in teaching and learning. From the personalised learning experiences enabled by artificial intelligence to the flexible and targeted learning pathways offered by micro-credentials, technology is enhancing the quality and accessibility of education in profound ways.

The trends in technology-enhanced learning discussed in this chapter highlight the **transformative potential of digital tools in higher education**. Embracing these technologies thoughtfully and responsibly ensures that institutions can create more inclusive, equitable, and effective learning environments. The ongoing need for innovation and adaptation underscores the importance of staying informed and engaged with the latest developments in educational technology. As we move forward, the **collaborative efforts of all stakeholders** will be imperative in harnessing the power of technology to achieve the goals of quality education for all.

6. TAKEAWAYS

- Stay informed about **emerging trends in educational technology** to continuously **innovate and adapt teaching practices** for improved student outcomes.
- Implement **AI tools to personalise student learning** experiences while ensuring ethical data use and addressing potential biases.

- Design and integrate **micro-credential programmes to offer flexible, career-relevant** learning opportunities that align with industry needs.
- Utilise **learning analytics** to identify **at-risk students** early and **tailor support strategies** to enhance student retention and success.
- Adopt **XR technologies** to create **engaging, hands-on learning experiences**, while addressing accessibility and inclusivity challenges.

7. QUESTIONS FOR REFLECTION

1. How can your institution balance the integration of new technologies with maintaining traditional educational values and practices?
2. What strategies can be employed to ensure that all students, regardless of their background, have equal access to technology-enhanced learning opportunities?
3. In what ways can collaboration between stakeholders (e.g., IT, academic affairs, student services) may boost the implementation of technology in the institution?
4. How can educators stay updated with the rapid advancements in educational technology and continuously improve their teaching practices?
5. What are the potential long-term impacts of technology-enhanced learning on the overall student experience and educational outcomes?



8. VISUAL SYNTHESIS

Table 8

Key factors influencing the adoption of trends in digital learning in HEIs.

FACTOR	DESCRIPTION	AI	MC	LA	XR
Institutional Culture	The values, beliefs, and practices that shape how technology is perceived and used.	Promoting a culture of innovation and openness to AI-driven personalised learning.	Encouraging a mindset that values flexible, modular learning pathways through micro-credentials.	Fostering a data-driven culture where decisions are based on insights from learning analytics.	Cultivating an environment that embraces immersive and interactive learning experiences with XR.
Leadership Support	Commitment from top management to drive and support digital initiatives.	University leaders championing AI initiatives and providing resources for implementation.	Leadership endorsing micro-credential programmes and integrating them into strategic educational goals.	Administrators advocating for the use of learning analytics to improve student outcomes.	Executive support for investing in XR technologies and integrating them into the curriculum.
Infrastructure	The technological and physical resources required to support digital learning.	Robust IT infrastructure to support AI tools and platforms for personalised learning.	Developing online platforms and systems to deliver and manage micro-credential programmes.	Implementing advanced data storage and processing systems to handle learning analytics.	Investing in VR/AR hardware and software to create immersive learning environments.
Professional Development	Training and development opportunities for educators to effectively use technology.	Offering workshops and courses on AI tools and ethical considerations for educators.	Providing training on designing and delivering micro-credential programmes.	Educating staff on how to collect, analyse, and interpret data from learning analytics.	Training faculty on the use of XR technologies and integrating them into their teaching practices.
Collaboration and Partnerships	Working with external partners to enhance technology adoption and relevance.	Collaborating with AI technology providers and industry experts to enhance learning tools.	Partnering with industry to ensure micro-credential programmes meet current job market needs.	Working with data analytics firms to develop effective learning analytics strategies.	Collaborating with tech companies to develop and implement XR applications in education.
Student Engagement	Strategies to involve and motivate students in using new technologies.	Using AI to create personalised learning experiences that increase student engagement.	Promoting the benefits of micro-credentials for career advancement and lifelong learning.	Engaging students with dashboards and feedback systems powered by learning analytics.	Creating engaging and interactive XR experiences that captivate students' interest and participation.
Ethical Considerations	Addressing ethical issues related to technology use, such as privacy and bias.	Ensuring AI systems are transparent, unbiased, and respect student privacy.	Establishing clear standards and criteria for awarding micro-credentials to maintain their credibility.	Implementing policies to protect student data and ensure ethical use of learning analytics.	Designing XR experiences that are accessible and inclusive for all students.

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10. RESOURCES

1. The Horizon Report (New Media Consortium & EDUCAUSE)

The Horizon Report series is an annual publication that identifies and describes key trends, challenges, and emerging technologies that will impact higher education in the coming years. These reports are based on global research and collaboration among education and technology experts.

USEFULNESS

This resource is valuable for professionals and policymakers who want to stay informed about the latest trends and technologies that could transform higher education. It provides a forward-looking perspective on how technology may affect educational institutions and how they can prepare for these changes.

EDUCAUSE, and New Media Consortium. *Horizon Report Series*. <https://library.educause.edu/resources/2021/2/horizon-reports>

2. The Innovating Pedagogy Report series

The Innovating Pedagogy report is an annual publication that explores new and emerging teaching and learning practices. Launched in 2012 by the Open University (UK), the series aims to identify innovative pedagogical approaches that can enhance education in a rapidly evolving technological landscape. Each report is collaboratively authored by experts from the OU and other HEIs, providing a diverse range of insights into effective teaching strategies.

USEFULNESS

The reports not only highlight innovative methods but also offer practical guidance for educators, policymakers, and instructional designers, making them a valuable resource for anyone involved in education. They are particularly useful for educators seeking to incorporate fresh ideas into their practice, helping them stay abreast of current trends in pedagogy and technology, and innovate in their approaches.

The Open University. *Innovating Pedagogy*. <https://www.open.ac.uk/blogs/innovating/>



Watch the webinar here

SECTION 8 QUALITY IN ONLINE LEARNING COURSES

Authors: **Maite Fernández-Ferrer & Marcelo Maina**

1. INTRODUCTION

Despite significant advances in technology and its integration into various aspects of human activity, the acceptance of online education in higher education has taken time to mature fully. However, over the past two decades, there has been notable progress in recognising the value of digital learning and developing comprehensive quality frameworks to support its growth. Today, digital learning is regarded as an integral part of educational systems, with increasing efforts to align its quality evaluation with broader institutional models.

Quality systems and models for digital learning have evolved to provide not only definitions and approaches to quality, but also methods and tools that align with these perspectives. Ensuring and enhancing the quality of online education within Higher Education Institutions (HEIs) now requires familiarity with these models, as well as a deep understanding of the criteria, indicators, and evaluation tools that support continuous improvement.

In this section, we explore the strategic role that evaluation plays in maintaining and enhancing the quality of higher education, particularly in digital learning. This chapter will delve into the key elements of quality in online and hybrid learning, addressing the micro-level of course design and curriculum alignment (*see section 6*), teaching and learning process, and influencing institutional factors. We will examine critical aspects such as learning effectiveness, student experience, instructor satisfaction and accessibility. These elements form the basis for creating a dynamic and engaging online learning environment that caters to a diverse student population. They also help HEIs meet benchmarks and standards, thereby enhancing their position in the higher education landscape. We will also discuss how these elements can be measured to provide institutions with valuable insights that drive institutional improvements.

2. OBJECTIVES

- Clarify the **concept of online learning quality** as a multifaceted educational approach while underscoring its critical role in contemporary education.
- Examine **quality assurance challenges**, focusing on creating effective **quality assurance systems** for online learning in the context of rapid technological advancements.
- Highlight the importance of **quality models** that provide a foundational understanding of the **criteria used for evaluating** quality in online learning.
- Acknowledge the significance of **fostering a culture of quality** that emphasises continuous improvement through **stakeholder engagement and innovative strategies**.
- Recognise the importance of **establishing a foundation that paves the way for a deeper exploration of quality assessment frameworks and strategies** in online learning.

3. INTRODUCTION TO QUALITY IN ONLINE LEARNING COURSES

A widely accepted assertion over the past 20 years is that the rapid advancement of information and communication technologies (ICT) has transformed education. This shift has opened up **new possibilities for teaching and learning, while also presenting challenges in defining and applying quality assurance systems**. Establishing these systems can often be slow and laborious, as it requires negotiating values associated with a culture of quality and defining appropriate instruments and metrics for various levels of analysis.

The rapid adoption of online and hybrid learning models in higher education has underscored the critical importance of quality in educational delivery. As institutions transitioned to online formats during the COVID-19 pandemic, many recognised that simply moving content online was insufficient. This shift has prompted a **reevaluation of quality assurance practices**, ensuring that both online and hybrid courses meet rigorous educational standards and provide meaningful learning experiences. The **ICDE's 2023 report** (Chand et al., 2023) provides a **detailed examination of the current landscape of quality in open, flexible, and distance learning (OFDL) globally**. It highlights significant trends, challenges, and opportunities that educational institutions face in ensuring quality in their offerings. One of the main findings is the substantial increase in the adoption of OFDL methods across the globe. As more institutions embrace these methods, the need for robust quality assurance frameworks becomes increasingly critical. The report underscores that while many regions are making strides in this area, there remains considerable **variability in the maturity of quality assurance practices** and stresses the need for localised quality standards that cater to the specific educational contexts.

The report also identifies several **good practices** that can serve as models for enhancing quality in OFDL. Collaborative learning environments that leverage peer support and community involvement are encouraged, as they foster a sense of belonging and engagement among learners. The effective integration of technology, such as learning management systems and interactive platforms, is crucial for maintaining learner interest and participation. Furthermore, institutions are adopting continuous improvement models that involve regular feedback from students and stakeholders, allowing them to refine their educational offerings continually.

Looking to the future, Chand et al. outline several **directions for enhancing quality in OFDL**. **Strengthening partnerships** between educational institutions, governments, and industry stakeholders is strategic for developing relevant and high-quality educational programmes. There is also a call for **innovative approaches to quality assurance that incorporate emerging technologies and pedagogical practices**. Ensuring inclusiveness in OFDL is a priority, with a focus on making education accessible to all learners, including marginalised groups. Finally, the report advocates for increased global collaboration to share best practices and resources, fostering a more interconnected educational landscape.

As higher education continues to evolve, the commitment to quality in hybrid and online learning will be paramount in shaping a resilient and inclusive educational landscape.

How is your institution addressing the increasing digitalisation of education?

Enhancing the effectiveness of digital learning initiatives requires the **development of contextualised quality standards and procedures** that address issues such as infrastructure limitations, cultural relevance, outdated regulatory frameworks, disparities in equity and access, stakeholder engagement, mechanisms for continuous improvement, and adequate training and support for educators.

4. QUALITY ASSURANCE AND QUALITY ENHANCEMENT

What does “quality” mean in the context of digital learning? What are the critical elements that define quality in online learning? How is quality evaluated in online education?

Quality assurance (QA) and quality enhancement (QE) are two fundamental concepts in higher education that serve distinct yet complementary roles. According to Raban (2007), QA focuses on maintaining accountability and compliance with established standards, often involving systematic evaluations and external audits to ensure that educational institutions meet specific criteria. This process is relevant for **providing stakeholders with confidence in the quality of education** offered. Elassy (2015), on the other hand, emphasises that QE is oriented towards **continuous improvement, fostering a culture of innovation** and development within educational practices. While QA is about verifying that standards are met, QE encourages institutions to proactively enhance their offerings, focusing on the overall learning experience and outcomes for students.

Both QA and QE are basic for supporting the design of quality courses and programmes. **QA ensures that the foundational standards are upheld**, providing a framework within which educational offerings can be developed. Meanwhile, **QE drives the ongoing refinement** of these programmes, encouraging educators to adapt and innovate based on feedback and emerging best practices. Together, these concepts create a robust environment for teaching and learning, where quality is not only maintained but continuously improved. This synergy ultimately leads to enhanced educational experiences, better student outcomes, and a commitment to excellence in higher education.

This approach to **QE aligns** with the primary goal of enhancing the **quality of design, teaching, and learning**, situated at the **micro level of quality processes**. In contrast, the macro and meso levels of quality (*see section 4*) are more focused on assurance and accreditation of programmes and institutions, ensuring that broader standards are met while allowing for localised improvements in educational practices.

5. QUALITY MODELS IN HIGHER EDUCATION ONLINE LEARNING

As we engage in the rapid evolution of online learning and the increasing integration of technology in education, focusing on the **quality of the fundamental changes affecting the teaching and learning practices** is key. With a growing reliance on online platforms, educational institutions encounter the challenge of maintaining high standards in their educational provision. This scenario emphasises the **need for effective quality systems** that can **navigate the complexities** introduced by **technological advancements**.

What are the critical elements that define quality in online learning? How is quality evaluated in online education?

Let's begin by **exploring models and tools supporting quality in programmes and courses** such as the Kirkpatrick Model (Kirkpatrick & Kirkpatrick, 2016) and the OLC Quality Framework (Moore, 2005).

The relationship between the Kirkpatrick Model and various quality assurance frameworks in education underscores a shared commitment to enhancing the effectiveness of learning experiences, especially in online and distance learning contexts. The **Kirkpatrick Model**, which evaluates educational programmes through four levels -reaction, learning, behaviour, and results - **provides a foundational approach to assessing the impact of programmes or courses**. This model emphasises not only learner satisfaction but also the long-term outcomes of educational interventions, making it a valuable reference for other frameworks focused on quality assurance.

The **OLC Quality Framework**, developed by Moore in 2005, complements the Kirkpatrick Model by concentrating on the **specific elements that contribute to high-quality online learning**. It addresses critical factors such as course design, learner engagement, and assessment strategies. Applying the OLC framework and the Kirkpatrick Model allows educators to effectively evaluate how well their online courses meet **established quality standards and achieve meaningful learning outcomes**. This integration allows for a more comprehensive understanding of both the design and effectiveness of online education.

Similarly, the Quality Matters (QM), the Commonwealth of Learning (COL) Quality Assurance Toolkit, and the EADTU E-xcellence Kit all aim to promote quality in educational offerings. Each of these frameworks provides specific criteria and guidelines that can be enhanced through the application of the Kirkpatrick Model. By applying this model, institutions can ensure that their online and distance learning initiatives not only adhere to quality standards but also lead to impactful learning experiences. This interconnected approach fosters a culture of continuous improvement in education, ultimately benefiting both learners and educators.

Table 9

Key criteria for assessing online learning quality.

Student and teacher satisfaction	Students and instructors find the online learning content engaging, beneficial, and relevant to the learning objectives.
Learning effectiveness	Participants acquire the desired knowledge, skills, and dedication through the course.
Applicability of learning	Learners can apply the acquired knowledge in practical, real-life contexts.
Return on investment	The overall goals are achieved considering the investment made, including training, support, and resources.
Accessibility	Refers to a system's capability to offer universal access, ensuring that all users can comprehend the content and engage with the system's features, irrespective of their cultural background, language, available technology, or mental and physical abilities.

One of the main parameters for evaluating online learning is **student satisfaction**, which is often assessed through feedback on how much students valued the content and its effectiveness, along with other insightful feedback. This concept is known in academic literature as SET—Student Evaluation of Teaching—and a substantial body of research has been developed on this topic since the 1980s. (Ghislandi et al., 2020).

Teacher satisfaction is another relevant criterion, yet it is rarely assessed at universities, although their self-evaluations are not always considered.

The **effectiveness of learning** is arguably the most challenging yet highly significant parameter to assess in academia. It pertains to the extent to which the online learning experience enhances the quality of learning, essentially measuring the effectiveness of the learning process. Evaluating learning effectiveness is a complex issue that has been extensively explored in educational literature, particularly in relation to technology. Despite this discussion, no unifying theory has emerged, largely due to the intricate nature of learning processes and the challenges of conducting rigorous scientific experiments in real-world classroom settings. A notable publication addressing teaching quality from the perspective of learning effectiveness is Gibbs (2010), which remains a recommended resource for understanding the quality of online learning in relation to learning outcomes.

Applicability of learning is a singular aspect of lifelong learning environments. It evaluates how effectively what has been learned can be applied to real-world problems, specifically complex tasks related to the curriculum and everyday situations. These tasks showcase the student's ability to use cognitive, emotional, and knowledge-based resources. In academia, methods such as case-based, problem-based, or project-based learning are often less prevalent than traditional lecture-based approaches. In contrast, corporate settings place a high value on the ability to solve real-world problems, where knowledge is tested in immediate, practical contexts.

Regarding **return on investment**, while this guide does not provide a detailed economic analysis, a comprehensive discussion can be found in Horton (2001).

Accessibility, for instance, adheres to established standards, yet it is often overlooked during initial development phases when other priorities may take precedence. Key accessibility standards developed by the World Wide Web Consortium (W3C) include Web Content Accessibility Guidelines (WCAG), Authoring Tool Accessibility Guidelines (ATAG), and User Agent Accessibility Guidelines (UAAG).

How can we balance our pursuit of innovation with the need to maintain high-quality education?

After discussing various quality standards, we should turn our attention to a significant question: How can we balance innovation with quality in today's educational landscape? As educators, it's important to reflect on how **innovative practices** can align with our **ongoing commitment to quality in online learning**. This balance is particularly relevant as we consider the processes of **techno-pedagogical innovation** and their relationship to the continuous pursuit of **excellence in education**.

Table 10

Key considerations to balance innovation and quality in online learning.

Integration of innovation	Integrating innovative processes within a strategic framework that aligns with both international and national agendas. This involves assessing how new methods can be seamlessly incorporated into existing quality assurance practices while maintaining educational standards.
Quality assurance measures	Evaluating the effectiveness of the institution's current quality assurance measures, considering whether they adequately address the complexities of emerging educational technologies and practices.
Stakeholder engagement	Collaborating with colleagues, students, and other stakeholders to gather feedback on innovative practices. This input can offer valuable insights into how to maintain quality while embracing new methods.
Adaptation and innovation	Reviewing quality assurance processes to integrate innovative practices, such as establishing new criteria that align with the unique features of current online learning platforms and tools.
Professional development	Engaging in professional development opportunities that focus on quality assurance and innovative educational strategies.
Continuous reflection	Assessing the impact of innovations on educational quality regularly, ensuring that changes remain relevant and effective in addressing the learners' needs.

Prioritising quality assurance alongside innovative practices allows establishing an educational environment that addresses the needs of today's learners while equipping them for future challenges. Reflecting on these strategies can help educators uphold high standards of quality as they integrate innovation into their teaching methods.

The application of these frameworks equips HEIs to navigate the complexities of online education and ensures that their programmes meet global quality standards. Evaluating the quality of online learning involves using well-established models and instruments developed across various regions, including the OLC (2005), ENQA's (2018) initiatives in Europe, and recent discussions in Latin America (2015). These models arise from collaborative research among experts, providing valuable insights for assessing online learning quality. Below (Table 3), we outline the most prominent frameworks, each with its unique focus and approach to quality assurance.

6. WORLDWIDE FRAMEWORKS AND STANDARDS FOR ONLINE LEARNING QUALITY ASSESSMENT

Ensuring the quality of online learning requires attention to **internationally recognised frameworks and standards** that assist institutions, instructors, and administrators in delivering high-quality online and hybrid learning experiences. They provide guidelines for maintaining quality and tools for evaluating and enhancing teaching and learning outcomes.

Table 11
Global Frameworks and Standards for Quality Assurance in online learning

European Association for Quality Assurance in Higher Education (ENQA) and its Standards and Guidelines for Quality Assurance in the European Higher Education Area (ESG).	Provides a comprehensive framework for maintaining and enhancing quality in higher education across Europe. URL: https://www.enqa.eu/esg-standards-and-guidelines-for-quality-assurance-in-the-european-higher-education-area/
EADTU E-xcellence Kit	Offers benchmarks and quality criteria specifically for online and blended education programmes and courses. It covers strategic management, curriculum design, course design, course delivery, staff support, and student support, ensuring a holistic approach to quality assurance. URL: https://e-xcellencelabel.eadtu.eu/
Quality Matters (QM)	Its QM Rubric evaluates the design of online and blended courses. It focuses on course design, learning objectives, assessment, and learner engagement, providing a structured approach to course quality. URL: https://www.qualitymatters.org/qa-resources/rubric-standards
The Online Learning Consortium (OLC) Quality Framework	Includes five pillars: learning effectiveness, scale, access, instructor satisfaction, and learner satisfaction. Additionally, the OLC Quality Scorecard offers benchmarks and standards to help institutions evaluate and improve their blended and hybrid learning programmes. URL: https://onlinelearningconsortium.org/about/quality-framework-five-pillars/
Commonwealth of Learning (COL) and its Quality Assurance Toolkit for Open and Distance Learning Institutions	Promotes the development and sharing of open learning and distance education knowledge, resources, and technologies. URL: https://oasis.col.org/items/d1c7a1e6-8557-4e96-9894-585b64e8aa75/full

Institutions aiming to enhance their online learning programmes should understand and utilise globally recognised frameworks. Each model targets specific areas—such as strategic management, course design, or learner satisfaction—yet together they create a comprehensive approach to quality assurance. For newcomers, starting with a single framework that aligns with the institution's goals can lay a solid foundation.

Meanwhile, more experienced practitioners might find value in adopting a multi-framework approach to promote continuous improvement across all aspects of online education. **Tailoring the standards to fit the local context and institutional needs** fosters a **culture of quality**, ensuring that the online learning initiatives are effective, scalable, and accessible.

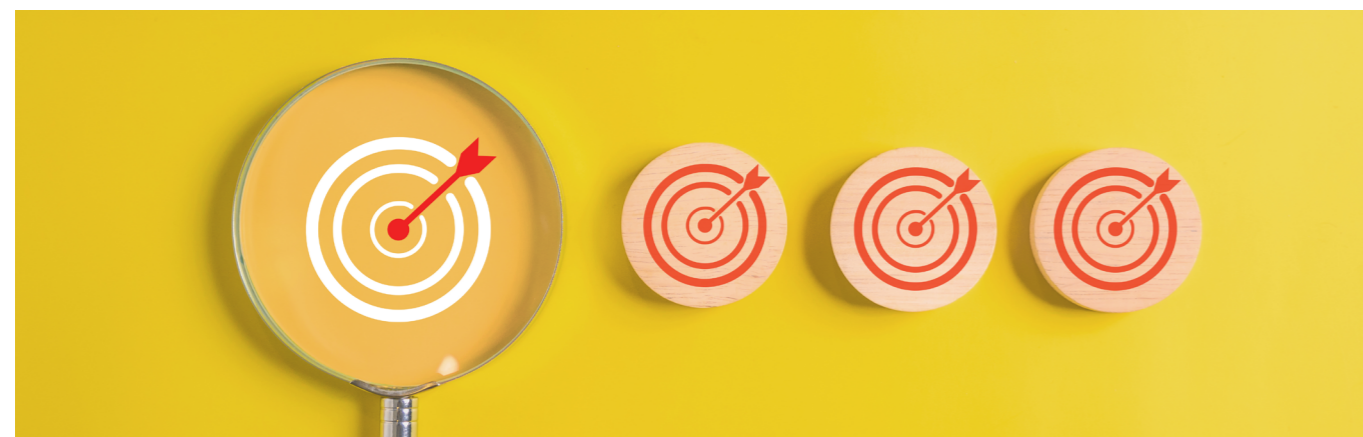


Table 12
Considerations for adapting quality instruments in online learning

Adapted instruments to local context	The instruments and metrics should align with the maturity of the country's quality culture and the standards set by local and national assurance agencies. Rigid metrics may not be appropriate for institutions or educators who are just starting to engage with online learning.
Balanced flexibility	Embrace a flexible and nuanced approach to integrating quality measures tailored to each specific modality, such as online or hybrid learning. Rather than applying standards rigidly, use them as a basis for discussion aimed at enhancing the quality of courses and programmes.
Enhanced quality awareness	The selected instruments should not only evaluate current online learning practices but also foster a deeper understanding and ongoing engagement with quality standards. This approach will enable participants to internalise what it means to deliver and evaluate quality in online learning effectively.

Selecting tools that take into account the local context and varying levels of online learning adoption fosters the development of a sustainable and inclusive approach to quality in online education.

7. LOOKING INTO UNIVERSITY RANKINGS

University rankings are a **valuable reference of educational quality** by evaluating factors such as academic reputation, faculty qualifications, and student satisfaction. These rankings guide prospective students in their choices and help universities identify areas for improvement, promoting a culture of accountability and continuous enhancement in their programmes. Some of the most recognised rankings are listed in Table 13.

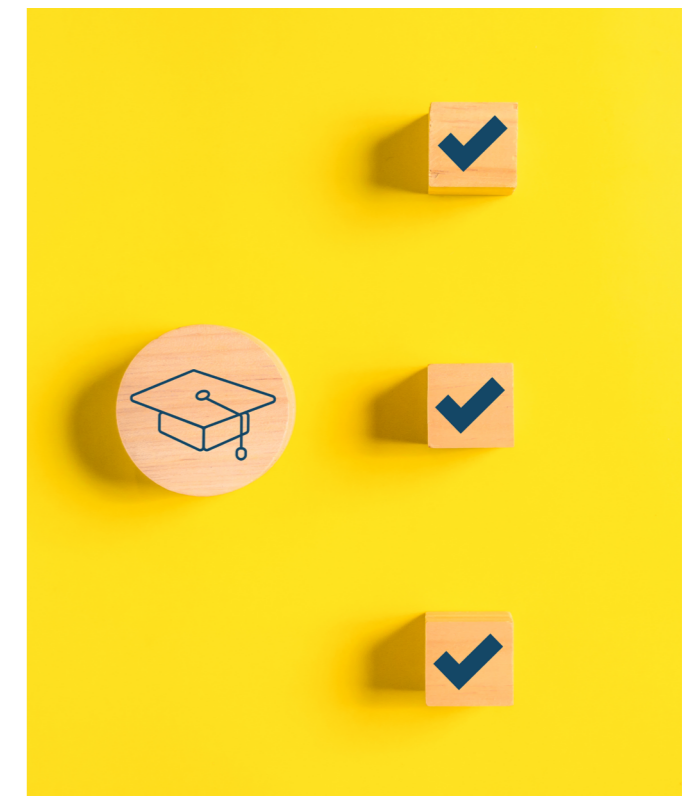


Table 13
The Most Well-Known International University

NAME	ACRONYM	ORGANISATION	WEBSITE
QS World Universities Ranking	QS	Quacquarelli Symonds	topuniversities.com
Academic Ranking of World Universities	ARWU	ShanghaiRanking Consultancy	shanghairanking.com
Times Higher Education World University Rankings	THE	Times Higher Education	www.timeshighereducation.com/world-university-rankings
U-Multirank	U-Multirank	European Commission	umultirank.org
U.S. News & World Report Best Global Universities	USN	U.S. News & World Report	www.usnews.com/rankings

Quality rankings can significantly **inform the micro level of quality enhancement**, serving as a critical tool that offers actionable insights to drive **improvements in course design, teaching methodologies, and student engagement**. When institutions analyse their rankings, they can pinpoint specific strengths and weaknesses in their educational offerings. For example, if a ranking reveals low student satisfaction in a particular programme, faculty can delve into the underlying causes, such as curriculum relevance or teaching methods. This feedback often leads to targeted enhancements, including revising course materials, incorporating more interactive teaching strategies, or providing additional support resources for students. Furthermore, quality rankings frequently highlight best practices in pedagogy and curriculum design. Institutions can leverage these benchmarks to adopt innovative teaching approaches that have proven successful elsewhere, fostering a culture of continuous improvement. Aligning practices with those recognised in high-ranking institutions allows educators to enhance the overall learning experience, ensuring it meets the evolving needs of students.



What strategies can be implemented to increase the visibility of the university within international rankings?

Table 14
Strategies for Online Universities to Improve Ranking Visibility

Highlight institutional strengths	Focus on areas where online universities excel, such as flexibility, accessibility, and student satisfaction.
Develop online learning-specific metrics	Advocate for the inclusion of online learning performance metrics within existing ranking frameworks. Metrics could include learner engagement, digital infrastructure, and student outcomes in online environments.
Build a strong quality culture	Emphasise the development of a robust institutional culture of quality that integrates online learning, promoting transparency and accountability in digital education practices.
Collaborate in ranking system evolution	Engage in discussions with ranking organisations to adapt the metrics to better reflect the unique contributions of online learning models.

By adopting these strategies, online universities can better participate in international ranking systems, improving their visibility and credibility in the global higher education landscape.

8. COURSE LEARNING ASSESSMENT MOMENTS FROM A QUALITY PERSPECTIVE

When planning and delivering an online course or programme, **evaluating its quality should occur at three key stages**. Each stage ensures that the programme meets educational goals, promotes engagement, and provides meaningful learning experiences. Using quality frameworks like Quality Matters, the OLC Five Pillars, and E-xcellence can significantly enhance the design, delivery, and evaluation of online courses.

Here's a breakdown of these critical moments:

8.1. During the design process

During the design phase, quality frameworks serve as tools that **inform design decisions and ensure alignment** with established standards, addressing key aspects of course quality. For instance, implementing Quality Matters involves using the QM rubrics to verify that learning outcomes, assessment strategies, and course materials meet specific quality benchmarks. Additionally, engaging colleagues in a peer review process can yield valuable feedback prior to implementation. Other frameworks, such as **Universal Design for Learning (UDL)**, also contribute by providing guidelines for creating inclusive learning environments and effective use technology (see section 5). This multifaceted approach helps create a robust foundation for successful course delivery.

8.2. Throughout the course delivery

Ongoing monitoring during course delivery ensures that the **intended design principles are effectively implemented**. This phase enables adaptations to address unforeseen challenges or emerging needs. By establishing a robust feedback system, teachers can **identify both immediate and long-term improvement actions**, fostering continuous enhancement of the learning experience. For instance, the OLC framework emphasises the significance of student satisfaction, advocating for regular assessments through surveys to evaluate the learning experience. This proactive approach not only supports student engagement but also helps refine course delivery over time.

8.3. After implementation

The evaluation phase following the conclusion of a course is relevant for assessing the extent to which the **expected outcomes were achieved**. Conducting a formal review using both **qualitative and quantitative data** aligned with established standards ensures that relevant and well-structured information is captured for effective course evaluation. This process helps identify areas needing attention and contributes to a **cycle of continuous improvement**. For example, the E-xcellence framework facilitates benchmarking against established standards, which aids in documenting findings and sharing best practices with stakeholders. This process not only enhances transparency but also encourages collaboration and continuous improvement across the institution.

9. CONCLUSIONS

The transformation of online learning, fuelled by technological advancements and diverse educational methodologies, presents both opportunities and challenges. As we have seen, the integration of **information and communication technologies (ICT)** has deeply challenged teaching and learning, necessitating a **redefinition of the quality of courses and programmes**. It is clear that ensuring quality in online education **transcends mere compliance with standards; it requires cultivating a culture that aligns with the dynamic needs of learners**.

The focus on **balancing innovation with quality highlights** the importance of **reflective practices among educators**. Embedding innovative strategies within a framework that prioritises educational effectiveness allows institutions to adeptly navigate the complexities of online learning while maintaining high standards. Furthermore, adapting established frameworks to local contexts is crucial for developing effective quality assurance mechanisms that resonate with specific educational environments.

As we move forward in the realm of online education, adopting a multifaceted approach to quality assurance will be indispensable. Regular assessments of educational practices, active stakeholder engagement, and a commitment to continuous improvement will ensure that online learning not only meets current demands but also equips learners for future challenges.

10. TAKEAWAYS

- Consider **global frameworks and standards for quality** in online learning and adapt quality instruments to the local context
- Establish a clear understanding of **what quality means in the context of online learning**, focusing on elements like learning effectiveness and student satisfaction.
- Leverage recognised **quality assurance models and frameworks to guide the design and evaluation** of online courses, ensuring they meet international standards.
- Actively **involve students, faculty, and administrative staff** in the quality assurance process to gather diverse perspectives and enhance course relevance.
- Implement a **cycle of ongoing evaluation and feedback to refine courses** continually, adapting to emerging needs and technological advancements.

11. QUESTIONS FOR REFLECTION

1. What does quality in online learning mean to you, and how does it shape your educational practice?
2. Which quality assurance frameworks do you find most relevant for enhancing your courses?
3. In what ways can you actively involve students and colleagues in the quality assurance process to gather valuable feedback?
4. What strategies can you implement to create a cycle of continuous improvement for your online courses, and what specific steps will you take to put these strategies into action?
5. What innovative practices have you incorporated into your teaching, and how do you ensure they align with maintaining high quality in your courses?



12. VISUAL SYNTHESIS

Figure 10
Quality in online learning courses



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12. RESOURCES

1. EADTU E-xcellence Kit

The EADTU E-xcellence Kit is a comprehensive **quality assurance and benchmarking toolkit** developed by the European Association of Distance Teaching Universities (EADTU) to support HEIs in enhancing the quality of their **online and blended learning offerings**. The kit includes a set of **guidelines, best practices, and self-assessment tools** that allow institutions to evaluate and improve their digital education practices.

USEFULNESS

The Kit focuses on **several critical areas of online education quality**, including course design, student support, institutional strategy, and technological infrastructure. It helps institutions ensure that their digital learning environments meet high standards and are aligned with best practices in digital learning.

EADTU. *E-xcellence Kit*. <https://e-xcellencelabel.eadtu.eu/>

2. QM - Quality Matters initiative

The Quality Matters (QM) initiative is a globally recognised quality assurance framework focused on improving the design and delivery of online and blended courses. Developed by educators, QM evaluates courses using a series of rubrics (Quality Matters, 2014) based on eight general standards. **Quality Matters (QM)** is known for its **QM Rubrics**, which evaluate the learning design of online and blended courses. The rubrics focus on areas like course design, learning objectives, assessment, and learner engagement, offering a structured method for ensuring course quality.

USEFULNESS

QM is a **structured approach to evaluating course quality**, which helps institutions and instructors enhance the clarity, consistency, and accessibility of their digital offerings. Following QM standards, educators can ensure their courses meet high-quality benchmarks, support student engagement, and create a positive learning experience. QM also fosters a culture of continuous improvement, helping institutions and instructors refine their online education practices to meet evolving educational needs.

Quality Matters. <https://www.qualitymatters.org/>

3. Online Learning Consortium (OLC) Quality Framework

The OLC Quality Framework is a **comprehensive model** designed to guide institutions in **developing, implementing, and assessing** high-quality **online and blended learning programs**. This framework includes five pillars: learning effectiveness, scale (cost-effectiveness and commitment), access, faculty satisfaction, and student satisfaction. Each pillar provides specific benchmarks and standards to help institutions enhance the quality and sustainability of their online learning offerings.

USEFULNESS

The OLC QF provides a coherent approach for institutions to ensure that their **digital learning environments are effective, inclusive, and sustainable**. Following these guidelines, institutions can improve course quality, support faculty and student satisfaction, and achieve scalability and accessibility in their online education programs.

OLC Quality Framework. <https://onlinelearningconsortium.org/about/quality-framework-five-pillars/>

CONCLUSIONS

This Guide-Book provides a strategic framework to drive Digital Transformation (DT) in Higher Education Institutions (HEIs) across the Mediterranean region. Drawing on internationally recognised initiatives, proven frameworks, best practices, and successful case studies, we have explored four key concepts that drive institutional capacity building for digital readiness: educational models, DT, leadership, and quality.

With a focus on accessibility, inclusivity, and alignment with evolving trends in technology and social demands, the guide outlines how digital education can enhance both learning experiences and institutional competitiveness. DT in education is then presented as a pathway to create adaptable, student-centred learning environments.

The guide also stresses the importance of education models that are flexible and accessible, aiming to reduce digital divides and foster equity among diverse student populations. It underscores the need for institutions to develop comprehensive digital strategies, highlighting themes like internationalisation, governance, and employability, while also addressing challenges such as unequal access to technology and limited digital literacy. This resource promotes collaboration across educational roles—including administrators, faculty, and curriculum designers—to ensure that digital tools and resources are integrated thoughtfully. It highlights the benefits of personalised learning

approaches, interactive technologies, and cross-institutional networks that support information exchange and best practices.

Moreover, the guide reinforces the important role of quality assurance in DT, highlighting its impact on maintaining academic standards, inclusivity, and continuous improvement in digital learning. We point out that quality assurance frameworks should address unique challenges in digital education, including data privacy, accessibility, and digital equity, ensuring that all students benefit from high-quality educational experiences.

Additionally, the promotion of the quality at every level—from institutional strategies to course design—should be adopted to support student engagement, personalise learning, and enhance overall effectiveness. Embracing a culture of quality fosters accountability and innovation, challenging Mediterranean institutions to provide future-ready digital education.

Overall, the guide serves as a foundational resource for Mediterranean Higher Education Institutions, strengthened by the expertise of the Universitat Oberta de Catalunya, to support effective Digital Transformation. Embracing digital education strategically enables HEIs to build resilient and adaptable learning ecosystems, equipping students to succeed in a rapidly changing world.



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ENHANCING DIGITAL EDUCATION IN THE MEDITERRANEAN



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