InnovaT
Innovative Teaching Across Continents

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CHAPTER 1

KEYS TO THE UNIVERSITY OF THE FUTURE

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CHAPTER 1

Introduction

Digital technology is changing all aspects of life. It also affects universities. In this chapter, we will concentrate on the direct and indirect impact of digital technologies on universities, and in particular on their educational mission. The research and transfer missions are also impacted by digital technologies, but we will not cover them here. We will define 8 aspects of the impact on universities, which we will convert into 8 keys universities should take care of to design their future. There are 4 more direct keys and 4 indirect, structural ones.

Oe of the immediate keys is to understand that if there are new tools that support teaching, new teaching methods will come up. Tools have always been used to support teaching. In the past, it has been the chalk and the chalkboard, later on PowerPoint and projectors. Today, and in the future, it will be cloud-based applications and computers and mobile devices. Mastering this transition will be our first key.

A direct consequence of the availability of new tools and methods for teaching and learning is the need for the instructors to master them. For instance, how to best use one particular cloud-based tool in class and when? Identifying these new educational methods and training instructors accordingly will be key 2.

Form follows function, and therefore learning spaces should be adapted to the educational tools and methods. The learning space is called the third teacher, the first one being the teacher him/herself, and the second one being a peer (Sketchplanations 2022). It is clear that often the traditional lecture halls could be used, but spaces that optimize the new methods and tools make the transition much simpler. This will be our key 3.

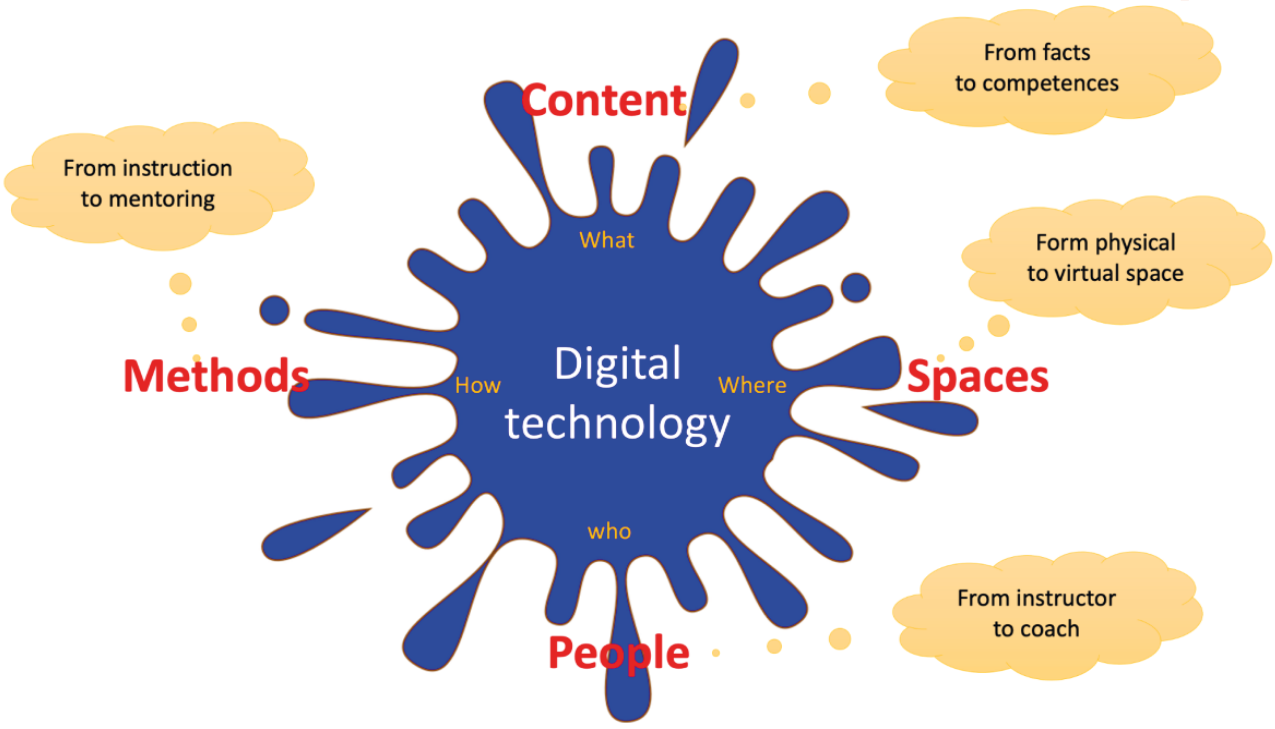
Digital technology tools do not only transform teaching methods and spaces, but they also transform the future workplace. This has implications on what to teach and what to stress. Maybe there should be less stress on content and more on skills and competences. Maybe different materials should be taught. Adapting to the future jobs that maybe don't yet exist might be challenging but are nevertheless a must. This will be key 4.

So, the first 4 keys are:

- Key 1: Harnessing digital tools in teaching and learning methods

- Key 2: Training instructors on new educational methods
- Key 3: Adapting spaces to new methods of teaching
- Key 4: Reformulating programs and syllabi to the needs of the future society

Figure 1
First four direct keys that universities should take care of to design their future: Methods (Key 1), People (Key 2), Spaces (Key 3) and Content (Key 4).



Then, there are 4 more implications that are indirect and structural.

Faculty can learn the new teaching methods by themselves, but sooner or later it will become clear that a specific support unit is necessary. Teaching and Learning Centers are not new, but there are still many universities that don't have them. Their importance will grow in the future to convert universities into learning institutions, institutions that learn themselves. This will be key 5.

The traditional university products are undergraduate and graduate programs, which typically take from one to four years to complete. This arrangement was useful in the industrial age when knowledge did not change at the fast pace it is changing today. Life-long learning and upskilling and reskilling programs of shorter duration play an increasingly important role (Goglio and Bertolini, 2021). Universities should decide whether they prefer to have other actors take over this space or whether they want to play a relevant role as well. The digitalization of the credential helps in defining short learning experiences and certify them with digital

microcredentials. This is key 6.

The two previous keys implied internal reorganization or reinforcement/ restructuring of existing units at the institution. However, the university of today is too structured like a factory, where students are pushed through a conveyor belt of subjects in the daily routine. It is time to rethink whether this approach is still adequate in the information age. We analyze this in key 7

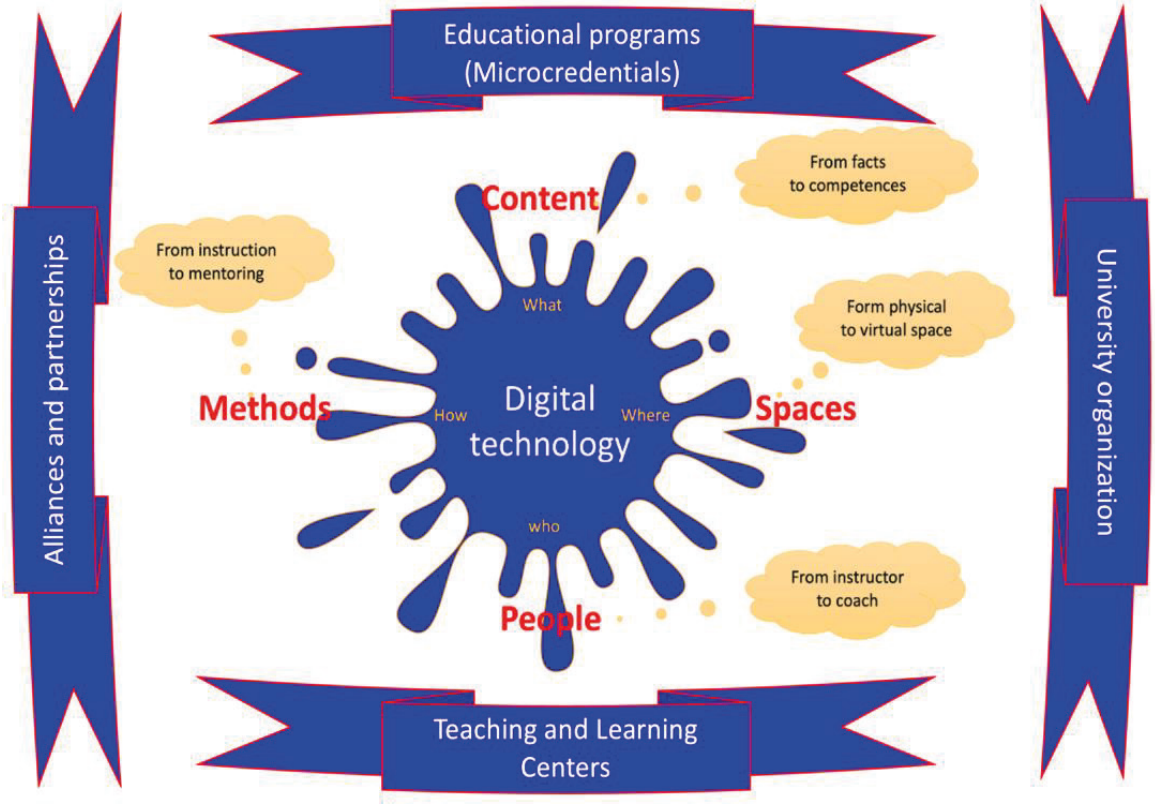
Universities should not only restructure internally, but they should also redefine the relationship with other stakeholders. Open innovation is a term that describes how innovation should work in the information age, in contrast to the silo mentality of the industrial age. In an analogous way, universities should define strategies to work closely with other universities and also with other stakeholders, like companies and institutions. This will be our last key, key 8.

Again, the 4 keys, which have just been described, are:

- Key 5: Establishing teaching and learning centers
- Key 6: Microcredentials and repackaging of educational programs
- Key 7: Internal university organization
- Key 8: Alliances and partnerships

When covering these 8 keys we will give prominent examples, including those from universities that are part of the InnovaT project (InnovaT, 2022), such as Universidad Carlos III de Madrid.

Figure 2
Eight keys that universities should take care of to design their future. The first four are in the inner part of th e figure and correspond to those already mentioned in figure 1. The last four are indirect keys: Teaching and Learning Centers (Key 5), Educational Programs (Key 6), University Organization (Key 7), Alliances and Partnerships (Key 8)



KEY 1:
Harnessing digital tools in teaching and learning methods

Today universities are using several educational models. Traditionally, classes were mainly face-to-face in most higher education institutions, with a few exceptions in the case of distance and online universities. The COVID-19 pandemic triggered a shift to emergency online teaching, which accelerated the subsequent interest for online and hybrid education (Pelletier et al., 2021). Anant Agarwal claims that the future of learning is blended (Agarwal 2021) with a final convergence between in-person and online education in the coming years.

Nevertheless, these changes in educational models and the necessary adoption of digital tools that support these educational models must also be accompanied by a profound change in teaching and learning methods. It is the necessary shift from instruction to mentoring. The transformation of the teacher into a facilitator of learning (Reeve, 2006). The key to this lies in the shift from passive, teacher-centered instruction to active, student-centered learning (Hartikainen et al., 2019). This is not new at all; for many years, research in education has shown the benefits of student-centered, active learning (Michael, 2006; Misseyanni et al., 2019). Nevertheless, the best practices developed over the years in face-to-face education must also be put into practice in online and hybrid environments. Student assessment must go hand in hand with this shift in teaching and learning methods, with a focus on continuous assessment and the collection of data-supported evidence throughout the entire course (Holmes, 2018).

In this context, it is important to consider different scenarios when applying teaching and learning methods with the support of the corresponding digital tools and the particularities of each of these scenarios. For example, there may be courses at lower levels of a program vs. courses at higher levels; courses that traditionally have a strong theoretical foundation vs. courses with a strong practical nature, undergraduate vs. graduate level courses, courses in which students must learn to use a physical tool vs. a software tool, courses that are conducted in collaboration with other institutions or companies with students in online, face-to-face or hybrid modes, to name a few examples. In each of these cases, it is necessary to reflect on the methods to be applied and their implications.

In short, educational institutions should promote the adaptation of teaching and learning methods based on active learning and student-centered learning, regardless of the delivery mode, but taking into account the particularities of each course, program, and context. Digital tools are there to help the instructor, but they are worthless without their use with appropriate methods.

Key 2:
Training instructors on new educational methods

The rapid changes in technologies to support teaching and the new teaching models, especially hybrid and online models, must be accompanied by appropriate training for teachers to be able to deliver quality classes that are student-centered and encourage active learning. This has been clearly evidenced by the lockdowns

due to the COVID-19 pandemic and the need to move to emergency remote teaching overnight (Hodges et al., 2020). In this challenging context those teachers with better digital competences were able to deal more easily with the enforced transition to emergency remote teaching (Antonopoulou et al., 2021).

Universities should review their teacher training plans to include specific training activities on methodologies and technologies to support teaching (Cabero and Barroso, 2016). These training activities should be delivered by other teachers, presenting success stories within the area of knowledge of the trained teacher. These success stories should be shared within the university community for wider dissemination. Additionally, universities should evaluate the impact of the training activities on the digital competences of educators. This can be done by using tools that support the individual self-diagnosis of the teacher and the overall diagnosis of an institution.

Popular frameworks and tools can be used to make this diagnosis and plan de teacher training activities (Schröter and Grafe, 2020). For example, UNESCO published the ICT Competency Framework for Teachers (Version 3) in 2018, revising previous versions of this framework (UNESCO, 2018). This framework consists of 18 competences classified in six aspects of teachers' professional practice, namely 1) Understanding ICT in Education Policy, 2) Curriculum and Assessment, 3) Pedagogy, 4) Application of Digital Skills, 5) Organization and Administration, and 6) Teacher Professional Learning. Three levels of attainment are defined for each of these competences: a) knowledge acquisition, b) knowledge deepening, and c) knowledge creation. Similarly, the DigCompEdu framework (Redecker, 2017) identifies 22 digital competences of educators classified in six areas, namely 1) Professional Engagement, 2) Digital Resources, 3) Teaching and Learning, 4) Assessment, 5) Empowering Learners, and 6) Facilitating Learners' Digital Competence. Six levels of attainment are defined in the DigCompEdu for each competence from A1 (Newcomer) to C2 (Pioneer).

These frameworks serve to identify gaps in an institution and weaknesses in educators, facilitating the organization of training activities to scale up in attainment levels. The personnel in charge of designing teacher training plans may take a competence, for example "creating and modifying digital resources" (2.2 in DigCompEdu framework) and prepare a training activity with a focus on the principles of creating engaging educational videos in different formats. In this way, educators can quickly scale up the levels in this competence after taking this training activity. The next step would be to consolidate the achieved level for this competence with single-themed training actions that are specific for tools that support teachers do self-production of videos, for instance, training actions for the use of Kaltura, Camtasia, or PowToon, among others (Hancock et al., 2021). This ensures that educators develop a digital competence both vertically and horizontally.

Overall, this is a critical moment in which universities need to invest in the training of their educators so that they can take advantage of technology to improve the way in which they teach their courses. This includes the development of multiple skills ranging from the creation of digital resources to the use of tools that enhance active and collaborative learning in the classroom, to the support that students receive in the form of mentoring, feedback, and assessment both inside and outside the classroom. Digital faculty for an ever more digital future is urgently needed (Grajek, 2021).

Key 3: Adapting physical and virtual learning spaces

Technological changes also entail rethinking the use and equipment of learning spaces at the university. In fact, learning spaces do not only refer to physical learning spaces, as universities nowadays have a virtual extension of the learning space consisting of platforms and tools that are used daily for teaching and learning and that can be framed within the virtual campus. The experience gained because of the changes brought about by the pandemic in the way professors teach and work shows that the purely face-to-face and purely online activities work well but that much work still needs to be done to improve the hybrid format with people in the same room and others following the activity remotely and synchronously (Grajek, 2021).

Physical spaces for teaching and learning had already been adapted by many universities in recent years, for example through the creation of spaces for the generation of digital educational resources, the creation of classrooms designed to promote active learning and teamwork, the creation of makerspaces, or the creation of spaces for collaboration between students outside class hours (Alexander et al., 2020). However, new hybrid models of teaching and learning must now also be considered when discussing the physical spaces. Hybrid models require the ability to capture what is happening in the classroom both in image (cameras required) and audio (microphones required), as well as to enable remote students to be heard when they participate (loudspeakers required) (Triyason, 2020). In addition, the images and text used as support by the teacher should be clearly visible by both onsite and online students. The traditional blackboard may be complemented (and even replaced) by interactive monitors or tablets which make it possible to better illustrate what the teacher wants to explain directly writing or drawing on them (Huang et al., 2021). In addition, it may be interesting to have special classrooms

that allow connecting groups of students in different locations, as is the case for example with the telepresence (sometimes also called multi-location) classrooms (Nenonen et al., 2019).

Virtual spaces for teaching and learning in universities have been evolving for years but have dramatically grown due to the need to move to remote emergency teaching because of lockdowns. IT services must reinforce connectivity on campus and cybersecurity, and move forward with the digitization of processes, among others. IT services are also responsible for the administration and operation of Learning Management Systems (LMSs), as the core of the virtual campus and entry points to educational content and the communication between teacher and students. Moreover, many educational tools need to be integrated in the ecosystem around the LMSs including synchronous videoconference tools for lecturing and office hours, tools for the production and management of educational videos, engagement tools for synchronous and asynchronous teaching, document sharing and collaboration tools, or assessment tools, among others (Ruiz-Martínez and Ruiz-Martínez, 2021).

The new teaching models also mean that teaching and learning activities extend beyond the classroom. Teachers and students must have adequate personal equipment, especially in the case of courses and programs that are offered online. Teachers should count on laptops, webcams and interactive monitors replacing the blackboard and acting as a second screen to be able to receive more information about what is happening with the students. In addition, teachers should use tools specifically designed to promote interaction in online teaching; tools that allow for seamless teamwork and gathering learners' feedback for the redesigning of the class on the fly based on the data collected (Pelletier et al., 2021; Zhao, 2021). Connectivity is also an issue to pay special attention to in the case of both the teacher and the students.

All in all, physical and virtual learning spaces change and universities must adapt to these changes, investing part of their budget to this adaptation. Sometimes the investment will be occasional for the purchase of hardware and sometimes will be recurrent for the maintenance of software licenses. In any case, it is important to build spaces, either physical or virtual, for collaboration and active learning and to use tools that allow students to enjoy an immersive experience regardless of their location.

CHAPTER 1

Key 4:
Reformulating programs and syllabi to the needs of future society

Technological evolution brings with it the need to adapt the programs (curricula) and syllabi (contents) taught at universities to better meet the needs of the industry and to promote the employability of graduate students. This adaptation of programs and syllabi affects both undergraduate and postgraduate programs, as well as continuing education, in the latter case due to the need for upskilling and reskilling of professionals throughout their career (Illanes et al., 2018). For example, the Future of Jobs Report 2020 (World Economic Forum, 2020) points out that the current constrained labor market shortens the window of opportunity to upskill and reskill workers and estimates that, by 2025, 85 million jobs may be displaced while 97 million new roles may be created due to the new division of labor between humans, machines, and algorithms.

Changes in the labor market impact all areas but are most noticeable in those jobs that fall within the technology and business areas. For example, the most demanded hard skills nowadays, according to employment-oriented online service LinkedIn include blockchain, cloud computing, artificial intelligence, business analysis, affiliate marketing, or video production, among others (LinkedIn, 2020). Moreover, soft skills like creativity, persuasion, collaboration, adaptability, and emotional intelligence are also in high demand by companies (LinkedIn, 2020). Universities cannot ignore these realities and should even try to anticipate future trends.

It is also important to highlight among these trends the transformation of traditional degrees to the new professional context. For example, a Bachelor of Mathematics, which for many years had graduate students working mainly on teaching and academia, becomes now essential in the design of algorithms and data processing for decision making in private companies. A Bachelor of Philosophy can be very useful to address the ethical implications on the use of artificial intelligence in business practices of a global company (Etzioni and Etzioni, 2017). Therefore, it is important for universities to consider the multidisciplinarity in the redesign of the programs offered, including training on the use of technologies and programming even in programs that historically avoided the use of technology, such as those that belong to the areas of social sciences and humanities. The redesign of degrees with this multidisciplinarity in mind should also include training on business in those technical careers in which this has not traditionally been a priority.

Nevertheless, universities sometimes struggle to redesign their programs due to the rigidity of the quality assurance systems in charge of the accreditation of

degrees. This makes major content changes difficult to implement quickly in practice. As a result, many private companies that focus on offering content that is highly customized to the demands of the labor market at a specific time, generally through short courses or bootcamps, have emerged. Some examples are 42 (the private school with a focus on programming training that is hosted in Spain by Fundación Telefónica) or Ironhack, Le Wagon and The Bridge with onsite (and in some cases also) online bootcamps on data science and web technologies, just to new a few (Hojas Hojas and García del Toro, 2021). Even a topic as fresh in the media as the metaverse is already finding its way through with Virtual Voyagers Academy although in this case through a joint venture between industry and academia (Virtual Voyagers Academy, 2022).

All in all, universities must be able to adapt the content they offer to their students. On the one hand, universities must redesign traditional programs to make them more attractive and incorporate multidisciplinarity through the development of competences related to the use of technology and business. On the other hand, universities must be able to offer new programs that are adapted to market needs, especially in their postgraduate offerings. Both traditional and new programs must consider students' development of the soft skills that are most sought after.

Key 5:
Establishing teaching and learning centers

To foster the learning and exploring of new teaching methods, tools and technologies and support the redesign of traditional programs, a dedicated unit is necessary to be in place for faculty. The importance of having established and well-equipped Teaching and Learning Centers has grown in the last years and will become a must for universities to foster the inner culture of continuous learning and respond to the challenges that higher education will face in the future.

Teaching and Learning Centers (TLCs) are not a new concept. Some universities have such centers or offices in place for years, sometimes decades, offering a variety of services and support programs, applying best practices in learning theory from multiple pedagogical perspectives aiming to improve academic success and retention of students. However, there are still many higher education institutions that have not established such spaces yet.

Some demographics related to the presence of Teaching and Learning Centers at universities worldwide indicate that the United States universities are far beyond the universities in Europe, Asia, and Latin America (PROF-XXI, 2022) in terms of their TLCs offer. This shows the immense room of improvement for universities in

different continents. More than ever, higher education institutions must consider having TLCs among their top priorities to keep them relevant and assure academic success for teachers and students.

It is relevant to point, that the mission of TLCs needs to evolve for the future scenario. There is a need to shift away from merely introducing faculty to technology and methodologies to make a more holistic approach, with the focus to help teachers improve their courses and delivery, adapting the style for new generations and including new ways of accessing and performing teaching and learning. TLCs should be seen as drivers for development and permanent innovation of the teaching-learning processes, bringing up trends to improve the quality of higher education. Empowering the role of the teachers not as a mere delivery of content and subjects, but as a key player on the development of personality, critical thinking, ethics, and capacity to learn and self-learn.

To successfully establish TLCs, it is paramount the commitment of all stakeholders, starting with the top management, continuing with academic faculty, administrative staff, and students. It should be also considered that the definition of services portfolio and types of operation of the TLCs will depend on the characteristics and needs of each higher education institution and its surrounding environment. Nonetheless, some aspects of the implementation should be always in place:

1. ***Mission and objectives.*** Every stakeholder should have clarity of the TLCs main mission and objectives, and they should properly align with institutional mission, vision, and values.

2. ***Service offer.*** The portfolio of services the TLC will provide should be designed and planned carefully, including the different stakeholders in the discussion of the needs and gaps, to put a plan forward. Services should include traditional and innovative offers, on and offline, such as workshops, webinars, talks, online sessions, courses, conferences, tutorials, certifications, training, career advice, career development, tutoring, among many others.

3. ***Target audience.*** When considering the range of offers, it should also be well tailored to the specific audience. Also, the different audiences should be clearly informed about the main benefits for them, and the support they could get.

4. ***Technology.*** The important role of technology in higher education is clear, so TLCs should decide on the technologies and how these will be used to offer advanced programs and services to faculty, to enhance individual student learning, improve the teaching delivery and management of courses, and

meet institutional and unit objectives.

5. ***Personnel.*** TLCs need to have adequate professional and administrative personnel to support its mission and carry out the activities. It includes, for example, instructional designers, educational developers, librarians, technology specialists, teachers, researchers, project managers, graphic designers.

6. ***Infrastructure.*** A TLC is meant to be a central office accessible to all faculty and students, at convenient times with adequate space, equipment and furniture that allows them to implement their programs and services and accommodate the needs of the stakeholders.

7. ***Visibility.*** As much as all the points above, the visibility of the TLC should be fostered in order to promote its services and get the best use of the unit from all faculties, departments, and institutes. It should be included as institutional support service and be present in institutional communications in general. TLCs must have a virtual presence (website, social media) and promotional materials for the dissemination of its services and achievements to the administration, faculties, and students.

In summary, TLCs are a very important unit in today's educational institutions. Therefore, TLCs should be created with the aim to support teaching staff and improve the quality of the teaching and learning processes. TLCs help to connect the previous four keys: 1) teaching and learning methods (key 1), training of instructors (key 2), adaptation of spaces (key 3), and reformulation of programs (key 4). To this end, it is important for educational institutions to dedicate the appropriate resources to install and maintain a TLC and learn from the operation of other TLCs around the world.

Key 6:
Microcredentials and repackaging of educational programs

The packaging of academic programs has traditionally been rather rigid, with 3-4-year undergraduate programs and 1-2-year postgraduate programs. The main advantages of this widespread approach include the compatibility of programs between universities located in different countries, especially in the European context, and the possibility of establishing common quality assurance criteria for both undergraduate and postgraduate programs. In some cases, universities could also offer some slightly shorter extension programs, typically for graduate learners who already hold a bachelor's degree. Precisely continuing education and the need

for rapid upskilling and reskilling for professionals who already have university degrees has opened the possibility of rethinking the way in which academic programs are packaged, especially in areas where the contents are highly dynamic (McCowan, 2017).

MOOCs were a first step towards the unbundling of academic programs (O'Connor, 2014). MOOCs received widespread attention already a decade ago with initiatives such as Coursera, edX, FutureLearn or MiríadaX, among many others (Sharma, et al., 2017). From them on, these initiatives have focused on promoting courses on popular topics and on "rebundling" them under different brands: Specializations, Micro-masters, Micro-bachelors, ExpertTrack, Nanodegrees, etc. (Shah, 2021a; Shah, 2021b). All these "rebundling" of courses, in the form of short learning experiences (also known as short learning programs), can be referred to as microcredentials (Clements et al, 2020).

Nevertheless, the concept of microcredentials is still in its early stages and there is a great deal of ambiguity about their meaning and scope (Brown et al., 2021). There have been different initiatives that try to make sense of and reach agreement on what microcredentials and the learning experiences that lead to them should consist of. This is the case of the Common Microcredentials Framework by the European MOOC Consortium, released in 2019 (Antonaci et al., 2019), or the European approach to microcredentials by the European Commission, released in late 2020 (European Commission, 2020), as well as the Erasmus+ funded projects microbol and MicroHe (Microcredentials, 2022). Some challenges related to microcredentials beyond their own definition include standardizing the data contained in microcredentials and the formats in which they are offered, measuring the quality of the short learning experiences leading to microcredentials, or raising awareness among learners and employers of their use of microcredentials to demonstrate the knowledge and skills gained through lifelong learning (European Commission, 2020).

There are a multitude of initiatives that have recently emerged in relation to digital credentials (Certidigital, 2022) and microcredentials, some of which are more local in scope, use a centralized approach to storing and validating credentials, and most of which are private initiatives. Some of the most popular initiatives include Digitary (Digitary, 2022), Parchment (Parchment, 2022), edubadges (Edubadges, 2022), and Diplomasafe (Diplomasafe, 2022), among others. The European Commission is supporting its own centralized initiative, EDC (European Digital Credentials) (Strack et al., 2021), which aims to become the de facto standard for the issuance, storage, and validation of digital credentials by European universities, these credentials being linked to the CVs and job applications of workers. In addition, the EBSI (European Blockchain Service Infrastructure) network is expected to be used for the implementation of a distributed blockchain-based approach that facilitates learners gaining control over their digital credentials, reducing verification costs, and improving trust in the authenticity of digital credentials (Grech, et al., 2021).

In conclusion, private initiatives today have been able to exploit lifelong learning

through the creation of programs that "rebundle" educational content in an attractive way, with a strong focus on professionals who already have a diploma. This "rebundling" results in the emergence of microcredentials, which are often stackable, which should be portable and verifiable by a potential employer in a quick and easy way, and which should be subject to quality standards like those of other study programs.

Key 7:
Internal University Organization

Universities have evolved to become efficient "factories" to graduate students. As a matter of fact, national accreditation institutions evaluate universities according to their efficiency in channeling students through the "assembly line", like in a factory (Ríos, 2015). The modern university is in fact modeled like an industrial age factory: Freshmen come in on one side, and graduates are produced on the other. Knowledge is divided into subjects and assigned to academic years. The daily routine is divided into hour-long periods of different subjects. Students are organized into groups and pushed through this daily routine. This is very much like conveyor belts in manufacturing factories: from mass production to mass instruction (Ennew and Fernandez-Young, 2016). Like in an efficient factory, it is important to follow the rules to achieve maximum efficiency.

The problem is that we are in a different era. And this type of approach does not correctly capture the need for personalized learning and development of transversal skills that are so necessary in professionals today. The "factory" model for producing graduates can end up killing creativity and is far from the reality of society. The Humboldtian model of higher education promoted the combination of research and teaching within the university (Daraio et al., 2015). The idea was that research would make teaching more meaningful. However, the internal organization and quality systems emphasize the role of research far above teaching in the career of the university professor and in the classification of universities in rankings. In addition, a great vocation for teaching is needed, something that some excellent researchers may not have. Moreover, it is also important that teachers have professional experience, and that they can bring it to the university, together with the entrepreneurial spirit that is so necessary today, to reflect what is needed outside (Canhoto et al., 2016).

In this sense, some universities have evolved in their internal organization and the roles played by their staff. For example, open universities have faculty specialized in content production, which is different from instructors teaching the content. This aligns with the increasingly evident separation between content generation (in more and more audiovisual and interactive formats), and instructor mentoring

(more and more tailored and personalized to student's needs. While content can be consumed asynchronously and at the student's own pace, mentoring has a strong focus in synchronous interactions and personal relationships. In this transition, third-party content can be used as support, for example, through applications that have done a great job in this area, such as Brilliant (Brilliant, 2022) or Matific (Matific, 2022), among many others.

All in all, the university structure needs to be reviewed. This includes the organization of faculties and departments, the structuring of schedules, the arrangement of subjects, and the balance between research and teaching, with the possibility of perhaps offering differentiated careers depending on the profile of each professor. The objective must be to move from an efficient factory of graduates to a personalized learning and development environment adapted to the characteristics demanded by today's society.

Key 8:
Alliances and Partnerships

Universities are facing an increasingly complex and global world with multiple players and where rankings play an important role in students' decisions on which university to study at (Fauzi et al., 2020). This context means that universities must seek alliances with other academic institutions or with industry partners to become more competitive. In some cases, national governments even decided to merge smaller universities by decree to create larger universities, as has been the case, for example, in France in recent years (Sulkowski et al., 2019). However, it is possible to identify other increasingly widespread examples of strategic alliances involving universities, such as 1) European Universities; 2) Alliances with OPMs (Online Program Managers); and 3) Alliances with industry leaders.

The European Universities Initiative was created by the European Commission in late 2017 with the aim of strengthening strategic alliances between higher education institutions. These alliances are shaped as networks that contain multiple universities from different European Union countries, with each country contributing a maximum of one university to each network. These networks of universities are called European Universities and may also include some non-academic partners. European Universities shall allow students to obtain a degree by combining studies from different countries (Gunn, 2020). Two calls for European Universities have been already opened with a first call in 2019 leading to 17 European Universities with 114 higher education institutions from 24 Member States (e.g., YUFE – Young Universities for the Future of Europe with UC3M), and a second call in 2020 leading to 24 additional European Universities alliances with 165 higher education institutions from 26 Member States (European Commission,

2021). European universities face numerous challenges that they must overcome, such as the definition and development of joint academic programs, the identity management of students taking courses from different universities in a seamless way, the issuance of joint diplomas, the mobility of students and faculty within the European University, or the relationship of the European university with citizens and society, among others.

Online Program Managers (OPM) provide products and services to universities to help them offer online courses (Hill, 2021). Universities rely on OPMs to outsource some relevant issues, such as student recruitment and enrollment; student and graduate retention; design of programs and courses based on labor market needs; technological support with platforms and tools; and student placement for training and employment purposes. There are OPMs that work together with universities on redesigning traditional degrees (undergraduate and postgraduate), while others also focus on certificates related to continuing education and lifelong learning (e.g., microcredentials). MOOC initiatives can also be included as OPMs, as these initiatives evolved to help universities outsource some of their programs, e.g., online master's degrees for professionals (Reich and Ruipérez-Valiente, 2019). In fact, some OPMs take advantage of MOOCs to create large databases of millions of potential students globally, and then recruit some of them to upsell on a spectrum of paid offerings (e.g., some advanced MOOCs, short courses, bootcamps, sub-degree stackable courses that lead to certificates, and even full degrees). The obtained revenue is split between the OPM and the higher education institution and can be used to incentivize the creation of more content that can be offered for free (e.g., other MOOCs) with the aim to reach more learners worldwide and increase the database of potentials students to whom to sell the paid offerings; Educational Technology Consultant Phil Hill uses the metaphor of "flywheel effect" to describe the cycle that comprises the generation of content/programs, to be able to offer each learning a tailored training offer (whether free or paid), and the financial gain in the OPM-University relationship (Hill, 2021).

The relationship between industry leaders and universities must be strong and close. Traditionally, this relationship has taken various forms, for example, with students doing internships in companies in the final years of their academic degree, with industry professionals lecturing in upper undergraduate courses or in postgraduate courses, with companies endorsing postgraduate programs, or even with industrial doctorate in which the entire research project leading to a PhD is carried out in a company. Industry-university alliance is key to try to reduce the skills gap between academia and industry. In some cases, industry leaders are precisely those who are most knowledgeable about a particular technology they developed so the alliance between industry and university becomes essential. For example, to learn about Amazon Web Services (AWS) there is no better option than to refer to Amazon itself, which already provides learning paths with courses, hands-on labs, and assessments (Fain, 2019); in fact, Amazon lists the AWS Academy member institutions, which are those that have taught AWS Academy courses, including many universities across the globe (AWS, 2022). LinkedIn also offers learning paths

in topics in highly employable knowledge and skills, with the possibility of receiving academic credit at universities with which they established alliances (Cortes Mendez, et al., 2021; LinkedIn, 2021).

All in all, in a rapidly changing educational and work environment, mainly due to rapid technological evolution, universities must be able to increase their visibility and relevance in an international context, adapt their educational offering to the changes in the labor market, and offer greater flexibility to their students. This adaptation shall be achieved through strategic alliances, mainly with other educational institutions and industry leaders.

Conclusions

This article has presented 8 keys to the university of the future. Four of these keys are direct implications of digital technology and stem from the transformation of teaching and learning methods (from instruction to mentoring), teaching personnel (from instructors to coaches), teaching and learning spaces (from physical to virtual spaces), and content (from facts to competences). The remaining four keys are indirect implications of digital technology and arise from the need of dedicated units to support the transformation of methods, people, spaces, and content (teaching and learning centers), the need of repackaging educational programs (including microcredentials), the need for an internal reorganization (to evolve from the "factory" of graduates with mass instruction to personalized student coaching), and the need to build alliances and partnerships (for a stronger university connected to the professional field). All in all, digital technology is like water: it finds its way to wet everything.

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