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COMPARATIVE ANALYSIS OF NATIONAL REPORTS: THE CASE OF THE ERASMUS+ ECOLHE PROJECT

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ABSTRACT

European projects lend themselves to facing a comparative analysis through qualitative, quantitative, or mixed methods. Among the various elements that organise the comparison, an important component is the cultural dimension since it organises social actors' practices, often carried out with qualitative methods. However, in line with the literature, this dimension is detectable through text mining methods since it determines the choice and association of the words used to organise communication. This work proposes a text-mining procedure for comparing the documents' symbolic-cultural categories, in line with the theory of translation.

In particular, Emotional Text Mining was used to study the cultural differences in digital development in Higher Education among countries through the analysis of the country partners' report of the Erasmus+ Project ECOLHE (Empower Competences for on life Learning in Higher Education[1]) to identify the symbolic-cultural categories and the representations of digital development. Results have important implications for identifying digital culture development indicators starting from texts, an aspect that could be considered relevant for policymakers in the context of Erasmus+ projects.

Keywords: Digital transformation, Higher Education, Emotional Text Mining, comparative analysis.

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[1] E-learning in the European Higher Education Area: http://ecolhe.eu/

UNIVERSITY GOVERNANCE FACING CHALLENGES OF DIGITAL TRANSFORMATION.

SOME RESULTS OF THE FIELD RESEARCH

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ABSTRACT

Some studies show that most European HE institutions haven't made much progress in changing the courses they offer to a student centred learning model that can take into account developments and opportunities in technology-enhanced education. Challenges posed by digital transformation to universities do not regard only teaching and learning processes. There are different levels of institutional and organizational action which produce effects on these processes.

The paper presents some results of a part of the field research of the Erasmus+ Project ECOLHE. Six case studies have been carried out. They have aimed to investigate how the universities involved develop their strategic approaches to digitalisation. The results presented refer to the focus groups conducted in 2021.

INTRODUCTION

The world of universities is rapidly transforming, in continuity with what is happening in the global and national scenarios, but not without a bright internal debate on the contradictions of unplanned and few managed development, especially regarding the technological and digital issues.

Some major trends are changing the educational landscape and posing challenges for universities that wish to remain competitive: the nature of jobs is changing and students need to be able to update their skills throughout their careers; demand for continuous education and corporate training is growing; higher education (HE) faces serious capacity issues to deal with the global increase in student numbers; competition to attract the best students is increasing; public funding is decreasing as a share of revenue; research funding is increasingly skewed towards the top universities; Universities are collaborating more but increasingly selective; digitalized learning environments are becoming the norm and blended learning is becoming the main way of learning (Raetzsch et al., 2016).

Concerning this last challenge, ECOLHE (*Empower Competences for Online Learning in Higher Education*)[2] – an Erasmus+ Project, carried out from September 2020 to August 2023 – examines how the vision of digital learning in the European Higher Education Area (EHEA) is "translated into practice" (Latour, 1988; 2005) at national level by academic bodies. It aims to identify how digital challenges to promote lifelong learning through information and communications technologies (ICTs) in HE is shaped in specific contexts. ECOLHE aims to find out how universities involved adopt the European steering documents about how to use ICTs for HE; how digitalization contributes to transform teaching

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[2] https://ecolhe.eu/

and learning processes or can help to do it, but also how it influences the action of Universities in their territorial context and in relations with the several stakeholders, in the perspective of a planning more participatory and bottom up; basically, how European recommendations and digital innovation processes are transposed into organizational practices.

Main ECOLHE's objectives and phases are: to analyse six case studies in HE, to examine how the universities involved develop their strategic approaches to digitalization; to implement online training to empower lectures and researchers to perform online and blended learning, more responsive to the qualitative dimensions of relationships; to develop innovative online environments for HE, enhancing the gamification tools; to develop a tool for the self-assessment of HE professionals based on the Symbiotic Learning Paradigm (SLP), a framework which, placing the learner at the centre, guides to a hyper-collaborative relationship between all stakeholders in HE; to provide guidelines, in order to propose Academic Bodies recommendations and tools to run digital transformation in HE; to favour social innovation in EHEA, also sharing good practices developed by partners[3].

The paper presents some results of the focus groups conducted during the first phase of the international research: the six case studies. They are the following: in Italy, eCampus University (presented by Fondazione Link Campus University, applicant of ECOLHE) and University Roma Tre (presented by CRES IELPO, a Research Center of the Department of Education[4]); in Spain, the Universitat Oberta de Catalunya; in Ireland, the Adult Continuing Education of the University College Cork; in Greece, the University of Patras and in Finland, the Laurea University of Applied Sciences.

THEORETICAL FRAMEWORK

The progress of the division of labour generates more knowledge-based work, new jobs and the rise of new social groups in search of recognition, as well as instability, precariousness and new forms of inequality (Butera & Di Guardo, 2010). In the knowledge economy, a worker is required to be increasingly educated and trained, creative, resourceful, flexible, autonomous and responsible; a significant dimension of the "know-how" aspect of work tends to expand. Greater responsibility attached to the role also means more complexity of the performances (Negrelli, 2013). Work environments are expected in the near future to be characterized by greater autonomy, less routine activities, greater use of ICTs, less physical exertion and greater social and intellectual tasks (Cedefop, 2018).

Organisations are increasingly characterized as learning organisations, subject to solicitations that transform their distinctive features in relation to structures, processes, but also to their culture, towards new logics, which are less hierarchical, more open, flat, networked and adhocratic (Cocozza, 2014).

Workers have to face a growing number of challenges, which have continually evolving implications: to adapt the ability to learn to new situations and problems, develop an ability to learn quickly. Coming times are those of research and discovery, information overload, compliance to legislation and making sense of data (Al-Kofahi, 2018).

The lifelong learning key competences (Council of the European Union, 2018) - as strategic resources for living and working - redefine the educational, political and social dimension which qualifies the relationship between state and citizen, in a new, more inclusive and democratic form.

In this framework, lifelong learning becomes a requirement, but also an entitlement.

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[3] Further information on intellectual outputs and research reports of ECOLHE is available at: https://ecolhe.eu/outputs/.

[4] https://cresielpo.uniroma3.it/.

Universities are tested about their capability to offer a fundamental contribution in the construction of this universal entitlement and giving it effective responses. The entitlement to learn lifelong and to see recognized own non-formal and informal competences is highlighted and today required by different European Union recommendations and national decrees and laws (Proietti, 2020).

A universal entitlement to lifelong learning "enables people to acquire skills and to reskill and upskill. Lifelong learning encompasses formal and informal learning from early childhood and basic education through to adult learning. Governments, workers and employers, as well as educational institutions, have complementary responsibilities in building an effective and appropriately financed lifelong learning ecosystem." […]

"Establishing an effective lifelong learning ecosystem is a joint responsibility, requiring the active engagement and support of governments, employers and workers, as well as educational institutions. For lifelong learning to be an entitlement, governments must broaden and reconfigure institutions such as skills development policies, employment services and training systems to provide workers with the time and financial support they need to learn. Workers are more likely to engage in adult learning where they are assured of continuity of income and labour market security. Employers' and workers' organizations also have a leading role to play in this ecosystem, including through anticipation of future skills requirements as well as participation in their delivery" (International Labour Organisation, 2019, pp. 11; pp. 30-31).

Universities are called to contribute to prepare students - and to accompany adult learners who return to study - for the challenges of today's world of work; to become "self-navigators" (Wyn, 2014); through innovative, multidisciplinary, open, pioneering learning processes.

Digital transformation can offer strategic opportunities in this direction. It is characterized by a fusion of advanced technologies and the integration of physical and digital systems, the predominance of innovative business models and new processes, and the creation of smart products and services"[5]. It is the use of technology to radically improve the performance or reach of an organization. In a digitally transformed business, digital technologies enable improved processes, engaged talent, and new business models[6]. In this scenario, the digitalisation is the series of phenomena that turn around the adoption of the outcomes of the process through which physical entities of different nature (three-dimensional objects, documents, sounds, images) are represented through a sequence of numbers (digits), usually in order to manipulate them by means of information technology (process known as digitization). The novelty of recent years, therefore, is above all in the process of creating digital data, which has reached ever more extensive processing capacities and which grow at an exponential rate combined with a progressive reduction in costs (Ambra, Pirro, 2017).

The transformation of organisational, professional and educational models that radically alter the rules, boundaries and autonomy of those who work daily in educational contexts, should suggest a global rethink of the education model and the idea of digital innovation to be pursued. Organisational processes and systems in their internal configurations (processes, procedures, internal and external communication systems, learning paths and environments, educational interventions, etc.) must be rationalised in order to integrate and exploit DTs, with the aim of making them more flexible and effective (Capogna, 2014; Capogna, Cianfriglia, Cocozza, 2020).

An organization has no other existence than that of the people who make it live (Morgan, 2014). Weick (1997) proposes to read organizations through the concept of *sensemaking*: a process based on the construction of identity; retrospective; establishment of sensitive environments; social; continuous;

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[5] European Commission about digital transition available at https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/europe-fit-digital-age/shaping-europes-digital-future_en.

[6] https://www2.deloitte.com/ie/en/pages/technology/articles/digital-enablement.html.

centred on (and from) selected information; driven by plausibility rather than accuracy. The meaning that digital transformation assumes for University is therefore given first by people who work in it and have constant relationships; while the impacts it produces are not always the desired ones, because, beyond the unexpected factors, the planning of the adoption of ICTs is not always systematic and built in a shared and bottom-up way.

DTs in educational institutions have the potential to be one of the main means of delivering quality education in line with their mission and vision. Their adoption and integration into educational systems implies changes in three basic dimensions: cultural, organizational and educational. The qualitative field research on ECOLHE focuses on them; they consider seven sub-dimensions of analysis based on the proposal of a *Digital Maturity Framework for Higher Education Institution* (Đurek, Begičević Ređep, Kadoić, 2019), a synthesis of the main existing frameworks related to the integration of DTs in HE: leadership, planning and management; quality assurance; scientific-research work; technology transfer and service to society; learning and teaching; ICT culture and ICT resources and infrastructure.

At European level, the European Digital Competence Framework for Educational Organizations (DigCompOrg) (Kampylis, Punie and Devine, 2015) is another interesting framework, useful to encourage self-reflection and self-evaluation within educational organizations as they progressively develop learning pathways and teaching methodologies for the digital era; to create the conditions for decision makers can design, implement and evaluate programmatic interventions aimed at integrating and using educational technologies effectively. The role of management in integrating and effectively using educational technologies to achieve educational goals is crucial. The strategic plan of an educational organization should take into account technologies as a key element of a long-term educational vision, well-articulated and clearly expressed. Visible actions related to the leadership and management of the organization can provide important support for the realization of this vision, which should be an integral part of medium to long-term planning. The concept of learning in the digital age is an integral part of the mission, vision and strategy of the educational organization. The strategic planning of the educational organization, together with its documentation, reflects a vision and a mission in which the potential contribution of technologies to favouring the modernization of educational practices, particularly in the generation of broader educational outcomes (Earp and Bocconi, 2017).

METHODS

ECOLHE is an action-research (Barbier, 2007). To investigate the complexity of the phenomena, the field research adopts a mixed method, in which the team combines elements of qualitative and quantitative approaches.

The first phase of ECOLHE is organised in two main activities (Fig. 1).

The first one has the objective to elaborate a Guidebook *Pattern for enhancing digital technologies in HE* for the development of the case studies. It offers a theoretical background, a European framework about DTs in HE and a template and tools for the national case studies. The second activity has the objective to develop the field research: the research teams have realised the case study of its University; then, a comparative report on *Digital technologies in HE: from the European vision to the university governance* has been realised.

The six case studies, using an organisational empowerment approach (Capogna, 2018), aim to investigate some specific aspects of the evolution in the adoption of DTs in HE, from the European vision to the university governance and to examine how each university (unit of analysis) involved develops its strategic approaches to digitalisation.

Fig. 1 – Ecolhe. Research activities of Intellectual Output 1. Digital technologies in HE
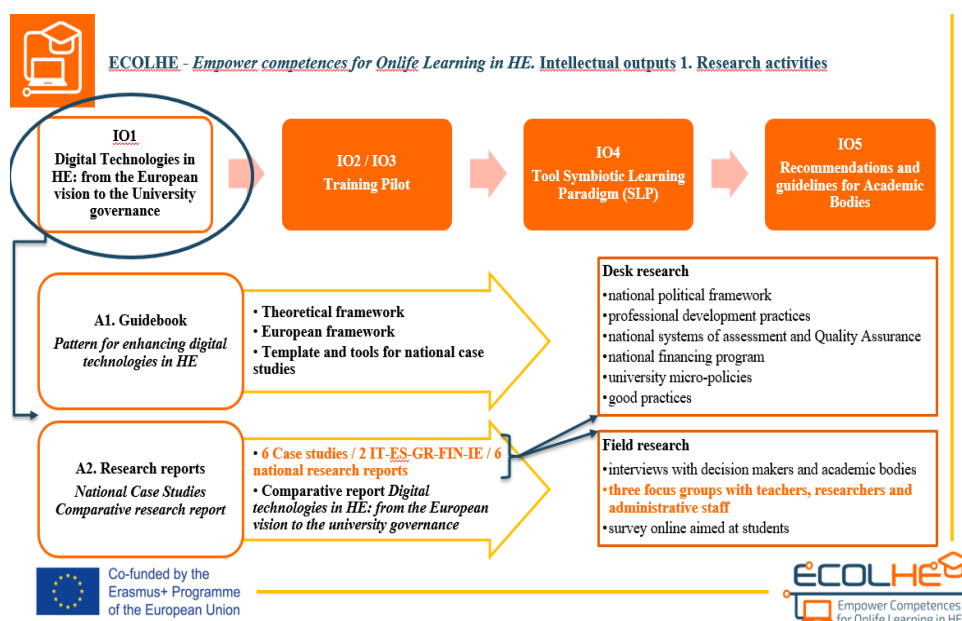
The national research reports of the case studies have the objective of illustrating: needs and perspective of improvement of the use of DTs in HE; emerging teaching, researching and administrative staff competences for the digital era; the most important problems detected and possible solutions (suggested in according to a bottom-up approach).

They present the same structure, organised in two main parts, which describe the results of a desk research and the field research. The first one shows a reconstruction of the national political framework related to digital innovation in the national HE system; the professional development practices; the national systems of assessment and Quality Assurance in HE; the national financing program and a focus on university micro-policies by documentary analysis; university good practices of digital learning and smart-working.

The main phases of the field research are: in-depth interviews with decision makers and representatives of academic bodies; three focus groups with teachers, researchers and tutors and administrative staff (according to a qualitative approach); a survey online aimed at students to investigate their perception of the ability to integrate DTs into organizational and training processes supporting teaching and learning activities (according to a quantitative approach).

A total of 45 teachers, 35 researchers and tutors and 41 office workers have participated. In some cases, the focus groups had not the minimum number of participants suggested in literature (at least 6), but we have decided to use the results anyway because they have been still considered useful and interesting by the researchers, in line with the other evidences emerged.

The focus group is a data collection method: a detection technique for social research, based on discussion between a small group of people, in the presence of one or more moderators, focused on a topic that you want to investigate in-depth (Corrao, 2000). Data are collected through a semi-structured group interview process. The exchange of views of the various participants can promote a greater wealth of ideas and information on the topic.

The focus groups have been conducted using the questioning route method, which is often used in academic research. There has been a structured path in which the moderator has developed specific questions to which participants have responded verbally. The type of questions has been divided

according to the degree of exploration to be achieved, using open questions. Main issues discussed are: their digital innovation idea; organizational dimension of digital innovation; teaching practices and digital innovation; professional development with a focus on digital skills; good practices related to their own university; strength and weakness, opportunity and threat (SWOT analysis) in implementation of digital innovation in HE[7].

The next paragraph presents the main results emerging from the focus groups.

RESULTS

All we remember probably the key dates of the COVID-19 Pandemic. In December 2019, the Wuhan Municipal Health Commission (China) reported to the World Health Organization (WHO) a cluster of cases of pneumonia of unknown aetiology in Wuhan, in the Chinese province of Hubei. In January 2020, first, the new virus identified, then the new coronavirus transmitted from person to person and finally the first lockdown in the world begins, in Wuhan.

It means that during the development of our field research, and especially during the course of the focus groups (between March and June 2021), we have listened the reflections of colleagues on experiences made during the health emergency phase, and they are strongly affected by the impacts that a rapid, and sometimes disorganised, digital tools adoption have had on learning and organizational processes, during the 2020.

The results are presented in aggregate form and they concern three main investigation dimensions: organizational, teaching practices and professional dimension[8].

Regarding the organizational dimension, main results are the following. During the Pandemic, the need to resort quickly - even if not always effectively and efficiently - to ICTs to guarantee the continuity of teaching open up a wide debate on how to improve the integration of DTs at all levels in the HE. In all Universities, there is a good availability of digital tools, platforms and devices (e.g. TEAMS, ZOOM, CANVAS); in some cases, they were already present but not so used. All participants agree on the huge possibilities offered by the automation and the development of the dematerialization process, especially in the public administration. The use of DTs favours the development of relationships with stakeholders: for example, thanks to the increase of online meeting. All categories of participants highlight a greater work and learning flexibility, which, however, often coincide with an unclear difference between working time and free time. Some needs have been highlighted: to develop co-creative processes which integrate all staff, students, workplaces and digital tools; a greater technical support dedicated to teachers and administrative staff; a strong quality assurance system to guide and to evaluate the practices; a strong sharing culture for learning by best practices (also among universities); a shared vision and good competences (in digital, but above all in communication and relationship fields); a greater need for leadership (guidance, support and collaboration). A lack of a long-term digital vision in academic governance has been registered, which is considered crucial to accompany the skills and organizational development models, thanks to a bottom up approach. But all institutions should be prepared to receive innovative proposals and to share them, to develop a more learner centred approach. The key is to transform organizational dynamics into a learning organization model.

Regarding the teaching practices and DTs, main results are the following. The first and more important lesson learned is that online learning is not the transfer of the face-to-face method into the virtual world. It needs of solid methodological and pedagogical approaches. Especially in teaching, the technological

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[7] Further information on methodological approaches and research results is available at: https://ecolhe.eu/outputs/. With particular reference to IO1 Report "Digital Technologies in HE: from the European vision to the university governance".

[8] Further information on the results of the six case studies is available on: http://ecolhe.eu/outputs/.

and digital infrastructure and tools were there, but they weren't used. There has been a great diffusion of DTs in learning processes, which has promoted a larger integration of research projects and teaching (easier thanks to the possibilities of online meetings). The outstanding use of distance learning has attracted more students and encouraged the inclusion of others. But a lack of didactic skills in a digital environment has been registered: by all staff involved, sometime by teachers, researches and administrative staff, but also by students (although most of them are considered digital natives). They have sometimes demonstrated a poor set of self-management skills. For university staff, the bigger lack has been that of time resources: too much work to do during all the day. So, the main lesson learned is that there are some weaknesses in using DTs in teaching practices governed largely by emergency measures, without a long-term vision.

Finally, regarding the professional development, main results indicate that digital competences of teachers and researches are still diverse and heterogeneous (and also of administrative staff). New ones are necessary: including mastery of the subject to be taught, of the language of instruction, of digital tools, pedagogical and communication skills, innovative mind-set, correct attitude, systems thinking and learning skills. Participants underline that there has been a good availability of internal training, including participating in organized courses, but above all reading, observing, peer discussions and experimenting with new tools on their own and trying to do our best have been the main opportunities. Essentially self-training. There has been a lack of time for personal development and no possibility of specialization. A significant weakness is the recognition of creative and hard work done, also due to the considerable adoption of old and new digital tools: participants say generally it is not appreciated and not valorised. The motivation to train or to adopt new methodologies are not connected with career progression. This situation could be one of the factors of a resistance to change, which all participants recognize as one of the greatest risks also for the academic community.

DISCUSSION

The main lessons learned by the research team on the basis of the results of the focus groups are the following. Traditional universities are expected to undergo a profound evolution to achieve the integration of online learning into their structured learning processes. Digital innovation is a vehicle for improvement, not a goal in itself. Universities should use technology to improve teaching, research and knowledge sharing, but the technology transfer is an application of knowledge transfer. So, develop knowledge remains the most important challenge for universities. The digital transformation proceeds step by step: some parts of the organisation proceed faster than other; this can be a trouble in the adoption of new DTs and innovative technological processes, for this reason training opportunities are recognised as a strategic choice. The intensive use of digital "forces" to deal with a new way of working: more digital, open, collaborative, agile, data-based and, above all, more transdisciplinary. A great convergence emerges regarding the idea that *digital* must remain a technology "at the service" of well-being of people and of knowledge.

CONCLUSION

The three dimensions briefly analysed are closely related. In the first one the vision, ideas, concrete projects of organizational development are born; they find application in professional practice: in teaching and learning processes, as well as in research and third mission –; but the administrative apparatus of the university is deeply involved too, because it works in essential support of these processes and actions. Not only that, it represents a wealth which is sometimes little used and valued in universities. From critical issues arises a new training need for all types of staff and from fully exploited training opportunities emerge the need for change and new ideas, new projects, innovation in essence, which must return to the organizational dimension. Otherwise the circle is not virtuous and the organization risks wrapping itself up. At an organizational level, several dimensions come into play: the structural one, the cultural dimension; organizational roles and coordination mechanisms (Cocozza, 2014).

In a scenario characterized by strategic vagueness and continuous change (Cocozza, 2023) – in a metamorphosis as Beck (2016) remembers us – in work and organizational processes, in life – as Pandemic pointed out –, in the economy of flexibility and indeterminacy, life cycle analysis of organisations should be recurring, carried out in an in-depth and participatory manner by all stakeholder representatives. Analysis and decision times are shortened and condition not only the set-up and functioning of the structures, as well as the articulation of processes, but they require a new organizational culture paradigm oriented marked by change and the enhancement of people and diversity present in organisations, assumed as a strategic asset to effectively carry out a real innovation project. An innovation that improves the results of the overall performance of the organisation, not in an ephemeral and transitory way, but in a lasting way, because it is based on a complete conscious and participated renewal of personal, professional, productive, administrative and organizational behaviours (Cocozza, 2014).

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UNIVERSITY TEACHERS' DIGITAL EMPOWERMENT FOR BLENDED TEACHING: AN EXPERIENCE OF TEACHERS' TRAINING IN EUROPEAN HIGHER EDUCATION

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ABSTRACT

Due to the global pandemic, online training became a response for educational institutions to develop their training activities. HE teachers adopted remote solutions based on replicating face-to-face dynamics and activities online, while any online education activity needs a proper design to be developed and to assure students' meaningful learning. The results were not coherent with online teaching principles, causing a negative vision on online teaching and learning. To promote HE teachers' Digital Competence, an online course was designed, implemented and evaluated in six European universities. The process of design and implementation will be critically discussed to highlight the limit and opportunities of this training as a model to help teachers to transform their practices to blended teaching.

ONLINE TEACHING IN HIGHER EDUCATION AFTER THE PANDEMIC EXPERIENCE: GUIDELINES AND RECOMMENDATIONS

Conclusions from the pandemic era experience

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ABSTRACT

In the years during the pandemic, there was a dramatic conversion in the traditional operation of universities. Until then, distant teaching was used rarely, or not at all. To fulfill their role and continue their operation in quarantine times, traditional Higher Education Institutes (HEIs) transformed their teaching services from in situ into fully distant, keeping it this way for at least two years. A critical question is whether they should return to their usual teaching methods or transform their operation, based on their experience from distant teaching. The present work uses the collective work of ECOLHE Project to outline the effect of new teaching methods in Higher Education (HE) during and after the pandemic. During a three-year research, ECOLHE project investigates the way that Universities have forwarded the enhancing of ICT resources in HE, through the realization of six case studies in partner countries HEIs. Furthermore, the Project developed a pilot implementation of an online environment as an online teaching tool to increase HE teachers' ability in the usage of digital technologies. Next step was the creation of a Serious Game aiming to study users' development of new skills and new ways of solving problems. Also, a self-assessment tool was implemented aiming to define and evaluate the level of innovation in HE institutes. Summarizing the extensive work of the previous steps conclusions were drawn that lead to the formation of Recommendations and Guidelines regarding the Academic Bodies, with the target of addressing the challenges for modern educational systems.

ADOPTING GAMIFICATION AS A STRATEGY TO SUPPORT STUDENTS' MOTIVATION IN HIGHER EDUCATION:

THE TEACHERS' ROLE

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ABSTRACT

Students' academic performance and learning outcomes are significantly influenced by their level of engagement in learning activities and their motivation to learn. Several studies referred to gamification as a possible strategy to foster students' engagement and motivation at the Higher Education (HE) level. However, a crucial factor affecting the adoption and the success of this new pedagogical practice is the fact that teachers possess the needed skills' set to implement it. To equip teachers with the competences needed to effectively design, implement, and evaluate a gamified learning activity, an online course was prepared and piloted in the framework of the European project ECOLHE. This work will offer an analysis of the course design process and a synthesis of the course implementation results.

Keywords: Gamification, Higher Education, students' engagement, teachers' training, teachers' attitude

A STUDENT-CENTRIC WORKING-LIFE COMPETENCE DEVELOPMENT A JOURNEY FROM CLASSROOM TEACHING TOWARDS 'ONLIFE' LEARNING: PEDAGOGICAL BEST PRACTICES

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ABSTRACT

In recent years the digital transformation and pandemic emergency demanded the digitalisation of contemporary higher education (HEIs) in Europe. The situation needs transformational vision, legislative and operational support from the HEI stakeholders, government, and relevant bodies. However, the most critical element is a working-life, and the industry demands a new set of skills and competencies from HEIs graduates. The ECOLHE European innovation project presented the Onlife Manifesto for being human in the hyperconnected world. More broadly, it helps start a reflection on how a hyperconnected world calls for rethinking the many existing practices in HEIs. On the one hand, the hyperconnected world demands a new way of future competencies. And on the other hand, many research studies confirm that a clear gap between HEIs competence development and market demands resulted in a significant shortfall of the workforce and working-life-ready graduates. The most interesting thing in these studies shows the lack of suitable working-life candidates causing this shortfall rather than the organisation's willingness to hire. In Finland, the education ministry has manifested future-proofing of the education system to meet the demand of modern businesses and a hyperconnected world under the Vision 2030 development. In Vision 2030, one of the key development areas identified was a modern curriculum design and development that meets the rapidly changing demands of working life and society. Laurea University of Applied Sciences has positioned its education offering to fill the gap demand gap and towards Vision 2030. Laurea adopted online education and an innovative pedagogical model that strengthens students' futureproof competence development and workforce capacity building. A student-centric working-life competence development, a journey from classroom teaching towards 'Onlife' learning presents the pedagogical best practices. The paper focuses on the adaptation of continued curricula development, adopting modern online pedagogical and education approaches, and increasing industry cooperation and work-life practices. The paper addresses two-fold challenges, including meeting the demands of working-life professionals and future-proofing education offerings.

Keywords: Digital transformation, Working-life ready graduates, Futureproof higher education, Working-life competence development, Digital pedagogy best practices

THE EUROPEAN STUDENTS' PERSPECITVE OF DIGITAL TEACHING AND LEARNING IN HIGHER EDUCATION

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ABSTRACT

The increase in the use of online training connected to the pandemic emergency has highlighted, as never before, that Higher Education Institutions have to deal with the digital revolution, promoted by the European Community since 1998 from the so-called Bologna Process. This work illustrates the results of the students' survey of the "Empower Competences for Onlife Learning in Higher Education" (ECOLHE) project. the project aimed to investigate the transformation processes and of developing practices of higher education's digital teaching and learning in several European countries. The research project was based on the hypothesis that the availability of technological infrastructures does not grant an efficient and effective use of ICTs by professors, students, and researchers.

THE SYMBIOTIC LEARNING PARADIGM (SLP): A LEARNER-CENTRED CURRICULUM DESIGN APPROACH

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ABSTRACT

The Symbiotic Learning Paradigm (SLP) has developed from practice in the Centre for Adult Continuing Education at University College Cork (UCC). Central to this practice are the core concepts of 'Learner at the Centre' and 'Lifelong and Life-wide Learning.' SLP offers a curriculum design approach that is dynamic and adaptive for the rapidly changing and perpetually challenging world of twenty-first teaching and learning in higher education. It offers a new curriculum design lens that places the learner at the centre and focuses on the importance of collaborative co-designing relationships within and beyond the university as a means to achieve this. Life-wide learning recognises that people occupy different learning spaces (personal, professional, public, community) and the lifelong learning journey provides the learner with a variety of learning experiences (Jackson, 2012). SLP offers a flexible and reflexive approach to co-designing these varied learning experiences. As part of the Erasmus+ ECOLHE Project: Empowering Competencies in 'Onlife' Learning, SLP was piloted in six higher education contexts across Europe. Through this process SLP has been developed and refined as a model of best practice and as evidence-based critical reflection on practice to improve practice in higher education. Its process of inquiry into teaching and curriculum design as a 'practically oriented activity, conducted collegially' through the ECOLHE project has grounded it in the scholarship of teaching and learning (Prosser, 2008). Through the piloting process of the ECOLHE project we came to understand that the central tenet of the SLP approach to curriculum design is 'Learner at the Centre' and so this is the concept that we will discuss here in the ECOLHE final conference paper.

THE DIGITAL INVESTING IN EDUCATION

A CHANGE THAT STARTS FROM THE FUTURE TO RETURN TO THE PAST.

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ABSTRACT

Digital today is present in every context and has increased its opportunities for use and at the same time the risks of speculation and unethical uses.

This research work will deal with educational actions in the digital age with the aim of analyzing three virtuous cases that have worked in the educational field, highlighting the potential and possible critical issues in order to transfer know-how for future projects.

The analysis methodology used is of a qualitative nature through a mix of data collection tools, first of all a participating observation made in the first case study. Then you will apply a content analysis for the second observed case and finally you will conduct an interview with the organizer of the last examined educational project. Therefore, based on the Grounded Theory we will start from an empirical analysis of the data to arrive at conclusions and theories in view of the implementation of these particular models in other areas.

Starting from the reflections of sociologists Franco Ferrarotti and Vanni Codeluppi, who frame the problem related to education above all by observing the digital context and the changes it brings, we will analyze empirically some virtuous models that use digital not only as a technological support, but as an ontological concept on which to base their innovative educational offerings.

Specifically, we will observe the hybrid teaching methods used at the Talent Garden Innovation School, which offers digital professional teachers experts in the labor market.

The second case analyses the innovative Treccani Scuola platform: a perfect example of a combination of innovation and tradition.

Finally, the project Ma.L.L. Mo at the Heracle UniCusano Lab, a project that studies predictive models of learning motivation through algorithms of machine learning (AI), will be analyzed.

Lastly a particular focus on the Ma.L.L. Mo at the Heracle UniCusano Lab a project that studies predictive models of learning motivation through machine learning algorithms (AI) and finally in the international context it will observe the Mit open courses and the TED platform that that distribute knowledge at high levels for free.

The hope of this analysis is to be able to take interesting ideas to strengthen research in the field of digital education and put the ethical question of technological instrumentation at the center.

Keywords: digital work, social media, education, media education, ethics, infosphere.

1. INTRODUCTION AND THEORETICAL FRAMEWORK

Today's world seems to deny traditional values and reduce them to a mere technical factor, it is a question of living in a hyperproductivistic and chronophatic way. The speech is emptied and made insignificant because of the large amount of information, no longer logically mastered, but deforming and phagocytic. The fact that ethical questions are put on the same level as aesthetic appearances and

consistency is exchanged with stubbornness no wonder and makes the research must find tools to stop this rapid rise of the irrational to the benefit of judgment critical and modulated. Among the various paths to be taken certainly that related to digital education must be pursued with force and probed in all its most relevant parts.

Si dice che i bambini e gli adolescenti di oggi, perdutamente innamorati dello schermo e abilissimi nel ciccare Internet, siano più intelligenti, più informati di quelli di ieri. Può essere vero. Ma di quale intelligenza, di quali informazioni si tratta? Se non già oggi, quasi certamente domani, saremo probabilmente messi di fronte ad un popolo di informatissimi idioti, se è vera la definizione dell'idiota come di colui qui sait tout et ne comprend rien. (Franco Ferrarotti 2019: 109).

It is said that today's children and adolescents, who are madly in love with the screen and are very skilled at taking advantage of the Internet, are smarter, more informed than yesterday's ones. That may be true. But what intelligence, what information is that? If not already today, almost certainly tomorrow, we will probably be faced with a people of highly informed idiots, if it is true the definition of the idiot as the one who sait tout et comprend ne rien. (Franco Ferrarotti 2019: 109, Tran. Eng).

Many have found an atrophy of the imagination that therefore reduces the habit of reading, while increases correspondingly the satisfaction induced by the contemplation of images. Experts say that we are faced with a new form of illiteracy that leads us to prefer the acquisition of knowledge through images.

Knowledge should not be confused with a sum of information, any knowledge of reality necessarily refers to a theoretical-conceptual apparatus that is the pivot to the reality of the world at the very moment when it is explored. Today, according to Innis, the human being is in the fourth phase of transformation and social organization, dominated by the two imperial systems, American and Soviet, linked to the use of electricity, electronics and oil. Yet new users have an escape from the power of the mass media and is called according to Lazarsfeld "small informal group" within which develops the concrete daily life of the individual and which plays a decisive function with regard to acceptance, refusal or indifference to media messages (Franco Ferrarotti: 2019: 187).

Certainly nowadays the immediate usefulness and the massification of profit are hindering all those activities not directly utilitarian as the tradition, the custom, the conviviality, the pure taste of being together. We must therefore remember that the spectator being disposes to passive participation, becomes the antechamber of mental passivity and political inertia. It almost seems that one is impersonally experienced by other systems and other superstructures.

The educational system that schools offer is based on the assumption that children should learn by providing them with basic skills such as writing, reading, accounting and other such as geography, history and literature. A current of pedagogical thinking states that strengthening the child's thinking ability should be the main task of the school, in order to promote the ability to reason and judgment.

Initially being educated was compared to acquiring information, today it is not only about this but there is a phase that sees critical reflection at the center of thought and a development of the creative component of it that pushes students to employ an imaginative thought; there is also a value and ethical component that must not be neglected.

The school represents the means through which past and present generations try to give an imprint to the future. If today goods have progressively enriched their meaning with a symbolic and communicative value as well as material, the school must be the instrument that makes us reflect on the true meaning of things and reality in order not to lose sight of the true meaning of life. Students must be treated reasonably so that they become more reasonable human beings.

The child in the early years is faced with a problematic world, everything invites to be investigated and examined thoughtfully, it is a world that stimulates thought, incites action and causes amazement, a world that marvels. In the school environment, however, we are faced with structures and superstructures, and the natural mystery of the domestic and family environment is replaced by stability and conformity in which everything is regular and explicit.

The child comes to miss the pleasure of discovery and it is therefore necessary to encourage both organization and creativity, to create the conditions capable of leading curiosity, establishing connections and promoting the course of suggestion.

The new educational objective to be pursued must be the acquisition of the ability to understand and to "judge well" and the fundamental part of the educational process must be the understanding of the internal and reciprocal relations between the subjects.

It is the analysis of problems that generates interest and motivation in order to create independent, imaginative and ingenious thinking as stated by John Dewey (Lipman, 2003: 30).

The purpose of this educational revolution is to be able to speak of a class as a research community in which students listen with respect to the ideas of others, can integrate them, ask them to give reasons in support of their opinions and help each other to draw conclusions, so this is a mature and responsible system.

Today it has added a time made possible by the Internet, instant that requires individuals to be always active and connected, in the same way that the world of consumption requires to be always ready and available to commercial novelties. The human mind, however, has not evolved as fast as the economic and cultural system; in an age in which hyper-communication and technologies capable of simple life dominate, the brain takes on a determining role and is continuously stressed and often used even beyond its capabilities.

Human beings are experiencing, according to James Lull, a culture that wants to overcome the communicative limitation of the written word and oral speech, adopting languages symbolically richer, less analytical and based on the emotions given by images and music (James Lull, 2000: 120). To count only the novelties of the stimulus produced, the one that I categorize as the "slavish difference" and eccentricity. There is therefore a continuous search for the new, variety and excess. What is fed by the media is continually combined with what is directly experienced by individuals, without the latter having the time to elaborate the necessary distinctions and their semantic contributions. It is here that media education and the new digital edu-platform must enter and find its investigative and decisive dimension to guide man in the right experiential direction. Let us always remember that, despite the fact that the world today stands on financial markets and the economy, the economic sphere necessarily needs the cultural sphere, which is capable of creating a reliable environment where trade can take place.

2. METHODS AND METHODOLOGY

For this analysis work, it was decided to use a qualitative methodology in order to investigate in depth some salient aspects of digital education present in the main study platforms. The qualitative methodology used is based on the Grounded Theory that sets out to discover or construct theory from data, systematically obtained and analyzed using comparative analysis. Some of the most significant examples of digital education will be analyzed using the method of content analysis, participatory observation and a final interview in depth.

The whole analysis will be carried out from a sociological point of view with the main purpose of investigating and providing insight into how human into how human society functions in relation to digital education.

The choice of conducting empirical research on three case studies is based on the objective of revealing the existence of virtuous models to be emulated or improved.

In the first instance, consideration was given to the need to get to the heart of the online educational mechanism that, thanks to the participant observation technique, was analysed in detail and discussed concretely with the participants. A continuous exchange of opinions and points of view allowed the visualization of the phenomenon in many aspects that would not have emerged by performing a simple questionnaire. Often the quantitative methodology is not the best option to pursue as it leaves uncovered the emotional and character peculiarities of the more human reality that, in this precise context, had to be investigated in depth in order to understand what were the best aspects for the their training on the web.

The analysis of the first case study will therefore focus on the observation from within a Digital Marketing course held between April and July 2020 at the Talent Garden Innovation School, a digital training institute that provided courses both in presence and at a distance, but that for the problems caused by the epidemic was entirely provided online.

For the entire analysis process, a precise analysis of the content has been carried out, which has made it possible to find the most relevant details of each case study under consideration.   In particular, for the Treccani Scuola platform, we went to see which themes and which service techniques are used to show the various educational contents. Therefore, based on the Grounded Theory we will start from an empirical analysis of the data to arrive at conclusions and theories in view of the implementation of these particular models in other areas.

Starting from the reflections of sociologists Franco Ferrarotti and Vanni Codeluppi, who frame the problem related to education above all by observing the digital context and the changes it brings, it will be emphasized some virtuous models that use digital not only as a technological support, but as an ontological concept on which to base their innovative educational offerings.
Therefore to summarize the observation of the hybrid teaching methods used at the Talent Garden Innovation School, which offers digital professional teachers experts in the labor market; The Treccani Scuola platform: a perfect example of a combination of innovation and tradition; ultimately the present research will end with a particular focus on Ma.L.L. Mo at the Heracle UniCusano Lab, a project that studies predictive models of learning motivation through algorithms of machine learning (AI). An in-depth interview will be conducted with one of the project's collaborators to highlight the innovations from the educational and organizational point of view. A last focus to open the horizons towards an international panorama it will on the work of Massachusetts Institute of Technology (MIT) and the TED Talks that for years has been providing free courses on digital   platform proposing innovative themes that students can spend on the job market.

The comparative analysis of these various models of digital teaching at high levels allows to understand strengths and gaps and lays the foundations for developing new models of pedagogical growth.

The research objective is to describe and to provide, through a qualitative empirical analysis, a detailed account and reporting of the characteristics of this digital education systems, including establishing regularities in this models in order to assess social impacts and identify the likely social and cultural consequences of a planned technological project.

3. CASE STUDIES.

Talent Garden Innovation Schools - Treccani Scuola - Ma.L.L. Mo - MIT.
The way we learn, communicate, work and interact, socialize, have fun, play and care has been completely revolutionized by the arrival of digital technologies; these have offered us the opportunity to do more at the same time, become so multitasking and to be present in several places simultaneously,

what is called telepresence, thus transforming the nature and the conception we had in the past of temporality and spatiality.

These initial considerations are useful to understand that we live in a new environment, which Luciano Floridi defined *infosphere*, a space that is increasingly made in function of the ICT and IOT to allow them to interact and meet our needs. Think for example of the fact that we are rebuilding cities and the road fabric for autonomous cars and not vice versa; our habitat is becoming more and more robot-friendly and less and less human-friendly (Floridi, 2020: 15).

It is necessary to dwell still to investigate in depth the current context and keep in mind that technological changes have lived three periods sanctioned by three types of philosophies: the philosophy of programming, the philosophy of automation and the philosophy of simulation. During a lecture organized by Treccani Futura, Cosimo Accoto talks about software code and how this marks the change of civilization; initially man was part of an oral civilization, of a civilization of writing and printing and then finally arrive at the so-called civilization of programming. All technological devices today live and work because inside there is a software code that presents an executable language, that is, it does what it says. Today the language of machines is not interpreted, it is executed because it is a formal structure made of instructions and commands; moreover the software code that you are writing is able to perceive the world and living beings: it is sentient.

The challenge for the future of man is to increase our distinctive ability to reason critically and apply more consciousness, more judgment and more creativity, what robots are not yet able to do.

In the new age of technology and digital, men become more and more officers of apparatuses and the identity of the individual is assigned by the apparatus in which the same is inserted, thus shifting the identity more and more towards the role.

Digital technology therefore becomes a structure that is an integral part of public and private life; today it is in fact used in every sector, from the financial sector to the health sector, up to the clerical and school life. Every human being has called for the use of technology to speed up processes and simplify procedures, but the question remains what the disadvantages of this progress may be. Does technology really simplify people's lives? It happens sometimes that instead complicates it and creates potential dangers or unsurpassed difficulties; just think of the news of Stefan Thomas, a German programmer living in San Francisco who risked losing $220 million in bitcoin because he couldn't remember the password to access his cryptocurrency wallet.

Personal information plays a fundamental role in who I am and who I can become. It is necessary to call into play a philosophical understanding of human nature that is adequate in the digital age and in our information societies.

It is in fact with the arrival of social networks that have developed "boxes" information built in the image and likeness of customers and only by promoting a more open comparison and a higher quality of information that can improve the social context starting from investing in education.

How is it possible to decline the digital in the various educational contexts in the best way?
A reading was given by the journalist and writer Gianluigi Nuzzi during his speech on the platform Treccani Futura who insisted on promoting a school course of media interpretation. Every young person must be able to relativize and listen to what he is hearing or seeing.

Today there is a cultural decline determined by the inability to give value to knowledge as a matrix of problem solving, so Giovanni Floris observed. The characteristics of immediacy and simplification typical of digital are declined in any context and also for what concerns the choice of politicians is more a representation of empathy and not the ability to solve problems. «We are fascinated by those who complain about the same things we complain about, just in line with the logic of likes of social networks, we follow and like only those who confirm our thinking».

The only structure that can restore a coherent and objective vision of the world, which can increase a critical consciousness, is the school that is, even today, the only effective network of the country. We guarantee the whole country's contact with culture, but we don't give it the importance it has. With what rules and principles should we conceive the use of digital?   Prometheus said, quoted in many speeches by Umberto Galimberti «technique is far weaker than the laws that govern nature». Nature, for the philosopher, is the background to refer to in order to live with new digital technologies. Today we inhabit the technique and look at the universe only from the point of view of utility, but we must stop verifying the truth only on the basis of effectiveness.

So how can the school educate the soul in the digital age? The answer is: going to incentivize what resides within man, emotions and morality. The ethical question must therefore be the pivot on which all the adoption of technology revolves.

Any activity today is rationally ordered in terms of efficiency and productivity. According to Galimberti, adults no longer have an alternative to technical thinking, people have become accustomed to thinking binary "yes" and "no", everything passing in the middle is excluded and children are increasingly affected by this mentality. It was thanks to the use of divergent thinking that solutions were found by reversing the problem and this was stimulated first of all by the schools where at the base there was the difference between education, that is, the passage of cognitive contents, and education, care of the emotional and sentimental path of students. The   technological context is almost irreversibly reducing this difference, making schools increasingly incapable of educating; because it is thanks to emotion, the emotional resonance, that every child feels the weight of their words and behaviors (Umberto Galimberti, 2021, p.98).

In today's world, in many situations, there is no emotional resonance of the gravity of one's gesture. This is because, still according to the psychologist, it is necessary to leave in the first three years of life to manage the formation of emotional maps.

Man has no feelings but emotions, as feelings are cultural phenomena; feelings are learned, all primitive tribes have myths and stories to teach what is pure and what is impure, what is good and what is bad, right or unjust. Literature is the unique and indispensable repertoire from which to draw and learn feelings. The school first understands the importance of literature, the sooner it will be able to train the young of the technological future who can dispose of emotions and feelings to face life in a *phygital* environment.

So how does digital fit into the various educational contexts? I bring here an example that I had the opportunity to analyze and live concretely: Talent Garden Innovation School a model of education that sees Davide Dattoli creator of a real digital school that counts thousands of students around the world. He has made digital materials the leverage to create new skills and inject them directly into the world of work, the study plan includes lectures in presence or an entire online teaching that uses tools and platforms such as Miro, Google Drive, Canva, Facebook Business Manager to work together in the creation of projects and the analysis of results. The experience of this new teaching puts the practice first and grants maximum freedom of expression to students who can measure their creative and cognitive abilities.

The difference that emerges from Talent Garden is the choice to bring into the classroom teachers who are first of all digital professionals, work for corporates and have field experience of what the market and society requires. An attentive, participatory, almost "ethnographic" gaze that gives   students an effective concreteness.

School data shows that almost everyone at the end of the course has the opportunity to join a digital team where they can spend the new knowledge acquired. It is not just a matter of understanding the importance of the direction the world is taking, but it is primarily a matter of teaching new students/users the advantages that digital can offer them both in economic and experiential terms; Moreover, by touching the ICT, students have the opportunity to understand how these can become potentially

dangerous and harmful for their interlocutors. Talent Garden is primarily a place of relationship and meetings between people who want to work with the future, but who can not forget that they are working especially for the future.

The period in which the online educational mechanisms of Talent Garden have been observed is from April to July 2020; from the beginning there is an atmosphere of confidence and serenity, every student has the opportunity to present himself and everyone is asked what his super power is, that is, his greatest ability. There is a first obvious enhancement of individual abilities that can be put at the service of others. Taking into account the aptitudes of the individual allows to modulate the subsequent requests for the tasks to be performed.

The educational strategy adopted involves the creation of small classes, a maximum of 25 participants are invited to collaborate in groups of up to 5 people. The communication platforms on the web allow in this case to strengthen ties and create perhaps a stronger union because to bridge the physical distance increase the chances and opportunities of contact thanks to the phenomenon of telepresence that electronic devices and digital allow. It creates a continuous exchange of ideas, reflexive ideas almost 24 hours on 24 because this possibility of being continuously connected increases the opportunities for comparison.

Another significant benefit of this type of online teaching mechanism is the learning of the use of new digital platforms, useful for cooperation and telework, were in fact used graphics and brainstorming platforms such as Canva and Miro, file sharing platforms such as Google Drive, video calling platforms such as Google Meet or Zoom and finally also platforms for work planning and deadlines such as Trello. It is therefore a whole series of instruments which would have been almost superfluous in the present situation but which at a distance have proved to be very useful and effective from the point of view of group work management.

A new method of work that can be spent in the company in the future has been learned, a method that involves working for goals, obtaining rewards and returns thanks to a mechanism of personal satisfaction that becomes an incentive to do more and better. A didactic therefore that incites the individual to become autonomous and to follow his own style.

The distance learning experience ends with the opportunity to conduct a day of interviews and get to know the managers and human resources managers of large multinational companies, which thanks to technology has been easier to achieve. The opportunity has therefore been created for each student to establish links and expand their network of contacts.

The sentiment of the class has always been very positive and the knowledge acquired has also proved useful in the workplace, being online has stimulated offline meetings for the curiosity to get to know each other and to organize face-to-face meetings.

Another type of educational experience that treats digital as its support and not just as an activity to be countered is the case of the Treccani Scuola platform, which provides two types of products: on the one hand interactive teaching, and on the other of the Treccani lessons with guests of great cultural and political importance. The offer is aimed at students, but also teachers, who have the opportunity to enter a club where interventions and practical advice are spread to better experience the world of school. The topics addressed are of various types and range from literature, science, economics, philosophy, but do not forget the new digital context in which they are inserted. In fact, there is no lack of a reference to technologies and the way to use them in a conscious way; Treccani, thanks to its interest in exploiting the potential of new media, becomes an example of value that combines culture and culture of digital novelties.

The frequency of the courses also provides for the issuance of a certificate that certifies the   presence and participation, it is a pdf to be printed and have physically with you to give a physical trace of a virtual experience.

The mechanism implemented by the digital platform adopts a user retention process that receives email reminders of future events and lessons, therefore feeds a type of education that uses marketing ploys to increase views and clicks. In addition, online participation allows you to use the chat during educational meetings and be able to ask questions to guests, characters of a certain caliber with which it is usually rare to be able to get in touch. This increases the curiosity and reputation of the platform, encouraging the creation of virtuous communities linked to the desire to learn and know.

From this, therefore, we deduce that many educational contexts are taking into account the impact that digital has on education and try to exploit it in a positive perspective that takes into account the simplicity but also the effectiveness and immediacy with which the various contents can be vehicled. However, it remains to be understood how these are received by the students, since the almost maternal physical contact that is established in a space with the teacher in three dimensions is certainly more meaningful and more incisive. In Massimo Recalcati's book *L'ora di lezione. For an erotic teaching*, this is precisely what we are talking about and it is shown how important it is to «achieve maximum closeness with the body of the teacher to absorb all knowledge» (Massimo Recalcati 2014, p. 39).

We must be cautious and thoroughly analyze the prevailing contemporary model of a satisfying drive that seems to burn every difference between absence and presence. This is what Recalcati defines as the «cult of the immediate enjoyment of the Thing» that excludes the possibility of the encounter with the Other and carries out a certain independence in the the formation that becomes a continuum of the individualistic mentality born with capitalist society.

In the investigation carried out by Milena Gabanelli and Francesco Tortora on *Il Corriere* emerges the guidelines that provide for the prohibition for children from zero to two years of standing in front of a screen, from two to four years must never spend more than an hour a day passively watching tv or mobile phones, tablets. From 6 to 10 years the critical threshold stops at two hours. The time spent in front of the screen can harm children and indicates correlations with overweight, obesity, problems of motor and cognitive development and psycho-social health. In addition, excessive exposure to devices risks damaging the ability to express emotions and communicate effectively.

There is one datum that seems to discourage the idea of progress towards digitalization and it is precisely the one about schools. In America, public institutions that house children from the middle and lower classes are becoming more and more digitized, but in Silicon Valley and other areas inhabited by technology managers are increasingly popular Waldorf Schools that promote the educational approach developed since 1919 by Rudolf Steiner: learning through recreational and practical activities.

Con la premessa che ci viene da questi dati si prendano ora in considerazione due esempi internazionali di didattica online, la prima è quella utilizzata dal Massachusetts Institute of Technology (MIT): a technology institute considered one of the best in the field of education to be ranked as the second best school in the world in 2021; la seconda è una forma educativa che vede nel talk uno strumento necessario a fornire conoscenza, i TED Talks che, oltre a essere momenti di scambio motivazionale, appaiono come eventi che si servono di tecniche televisive e di show entertainment per trasmettere informazioni circa determinate tematiche.
With the premise that comes from these data it now considers two international examples of online teaching, the first is that used by the Massachusetts Institute of Technology (MIT): a technology institute considered one of the best in the field of education to be ranked as the second best school in the world in 2021; the second is an educational form that sees in the talk a necessary tool to provide knowledge, The Ted Talks that, in addition to being moments of motivational exchange, appear as events that use television techniques and show entertainment to convey information about certain topics.

A few years ago, the American university announced the MITx program to attend free courses through an open-source platform, accessible via the Web to all students in the world. Anyone can audit an interactive course through the OpenCourseWare e-learning platform that includes lectures, online workshops, self-evaluation tests and discussions between students. This type of project is embodied as one of the most human projects of MIT as it has been realized that there is much untapped potential that

is lost for the development of human society because of the impossible financial support to obtain the required training. One would feel with the location of the institution, along with the price of admission and study, plus an acceptance rate that is only 7.3%, MIT would be one of the least accessible institutions in the world. But on the contrary, MIT has been aware of facilitating accessibility for students and prospective students by staying true to its slogan "the soul of MIT is research" by digging into ways through which a wider range of people can be educated.

The university co-founded Edx with Harvard University in the year 2012. Edx is a non-profit educational platform that currently offers students more than 200+ courses that are free for audit. In addition to this, MIT has made a habit of publishing free of charge on the Internet all the teaching materials of its undergraduate and postgraduate courses since 2001. The more than 2,000 of these free MIT online courses are easily accessible to anyone with an Internet connection and Internet-enabled devices through the MIT OpenCourseWare platform. Edx is a tool to study any of MIT's free online courses within which you can live a more traditional classroom experience that includes video lessons, community involvement in discussion forums and assessed assignments (for those who opt for the paid version) and a certificate of completion that can be shared on social platforms such as LinkedIn or more traditionally on their Curriculum Vitae. Among the various courses proposed are, for example, machine Learning with Python: from linear models to Deep Learning that offers an in-depth introduction to the field of machine learning.

There is no lack of anthropological and sociological insights for example the course of Global Africa: Creative Cultures that shows students the opportunity to learn more about the material and visual culture of Africa. Additionally, students have the opportunity to learn more and examine how the continent's literary, musical, and artistic productions intersect with global politics.

Arts, crafts, science is another among MIT's free online courses where, through historical, theoretical and anthropological visions, they study the development, consumption, marketing and the value of craftsmanship in the past and present with the ultimate purpose of building and explaining personal critical thoughts on craftsmanship using the techniques investigated.

Research the link between new technology, work and society to establish action plans to improve the workforce are the topics covered by the course entitled "Shaping the work of the future". Students will explore how civic institutions can leverage the benefits of new technologies to enhance equal opportunities, Social inclusion and shared prosperity by addressing class issues from a historical perspective of labor and employment policy in the United States and around the world. Another interesting element addressed in this teaching portrays the tools for academic engagement in public policies and takes into account that the latter are becoming more complicated and technological and scientists and engineers must collaborate with the policy makers to provide scientifically sound answers to public issues. In short, a large number of courses and insights that the new technology makes possible the use. In a plurinformational context it is necessary to know how to find the right channels on which to inquire and certainly many of the courses provided by MIT reach a very high scientific level and quality.

The second example that was mentioned earlier concerns the TED Talks phenomenon. According to an educational neuroscience scholar there is no learning without emotion, there is need emotion to acquire new knowledge, to retain that new knowledge and focus attention. It now knows that positive emotions are related to association memory.

Recent research in neuroscience tells that the emotions are contagious, mirror neurons are in fact responsible for the empathy and happiness that the human beings feel when they see another individual experiencing those same feelings. This is the concept behind the TED philosophy with the mission to discover and spread ideas that spark imagination, embrace possibility and catalyze impact. The organization is devoted to curiosity, reason, wonder and the pursuit of knowledge, they welcome people from every discipline and culture who seek a deeper understanding of the world and connection with others, and they invite everyone to engage with ideas and activate them in your community. TED began

in 1984 as a conference where Technology, Entertainment and Design converged, but today it spans a multitude of worldwide communities and initiatives exploring everything from science and business to education, arts and global issues. In addition to the hundreds of TED Talks published on TED.com, they produce original podcasts, short video series, animated TED-Ed lessons and TV programs that are translated into more than 100 languages and distributed via partnerships around the world.

The education platform is based on watch-video lessons organized by subject and age, lessons collection organized by theme, interactive experience created with other organizations. Moreover you can create and build your own video-based lesson and partecipate to students and educators talk. Each year, more than 3,000 independently run TEDx events bring people together to share ideas and bridge divides in communities on every continent. Through the Audacious Project, TED has helped catalyze more than $3 billion in funding for projects that seek to make the world more beautiful, sustainable and just. In 2020, TED launched Countdown, an initiative to accelerate solutions to the climate crisis and mobilize a movement for a net-zero future.

It is worth recalling that TED is owned by a nonprofit, nonpartisan foundation. To close the analysis framework, it was decided to do a further study on a type of education that uses new artificial intelligence technologies to improve the quality of teaching and investigate the best techniques to convey the teachings. The principle is to evaluate the student's learning methods and the internal dynamics of individual students in order to propose the best educational solutions. Technology is here at the service of the human being, first by discovering it and then by helping it. This is the research project M.L.L.Mo that is carried out at H.E.R.A.C.L.E. laboratory of Niccolò Cusano University has as common focus the analysis of learning processes through scientifically validated methodologies. In particular, as regards the educational reality, of great importance is the strand of studies related to Educational Data Mining, that deals with designing models and algorithms useful for the development of new educational strategies through the formulation of accurate predictions on the behavior and performance of students and teachers. Within the conceptual framework exposed, the study group coordinated by Prof. Luigi Piceci, and composed by Dott. Emanuele Marsico and by Dott. Umberto Barbieri deals with studying the applications of Machine Learning in the educational field, mainly analyzing the different variables that influence the learning processes at an intersubjective and environmental level. Specifically, this field of investigation aims to structure a new model of learning motivation that enhances the differential weight of a series of cognitive factors, affective, sociodemographic and intraindividual through the use of a machine learning algorithm. The data in question are obtained through the application of an experimental evaluation protocol consisting in the administration of a series of tests validated in digital format that investigate the various components of the motivational processes and determine their effective manifestation both on a conscious and unconscious level. In this sense, the algorithm used will allow the creation of a predictive model of learning motivation that, based on the data collected through the administration of the presented protocol, allows the identification of motivational profiles structured on the basis of a computational process of systematization of indicative values in reference clusters calibrated on subjective characteristics. This model will provide useful information to university teachers for the setting of personalized training courses to enhance individual motivational events.

4. CONCLUSIONS

Many examples have been treated on the benevolent use of digital, the road ahead is still long and uphill, but if you do not start from improving education and work by making digital a support and not an enemy, it cannot build a future that is adequate to the many problems that lie ahead, first and foremost climate change.

It will rediscover the privilege of giving ourselves, of giving our person not to obtain something in return that is useful pragmatically, but to nourish emotions and feelings that must be the engine of the world to create solidarity, cooperation and mental openness.

Since Copernicus the human being has discovered that he is no longer at the center of the world and every current signal I am continuing to tell him that he must reinvent himself, rediscover himself, measure himself against his limits and perhaps, what he must do, is simply to take a step back and return to being human, a human with the peculiarities that have distinguished him for millennia and that technology can not supplant.

Simplicity is the answer to complexity, banality is the answer to novelty, nature is the answer to technique. Let us go back to see with more disenchanted eyes a world that immerses, encompasses, sometimes almost suffocates, only in this way we can judge and change it more critically, more concretely.

The comparative analysis of all these results shows the innovation of these methodologies and clarifies the satisfaction of users who can take advantage of these new educational content, but above all of a method of teaching that makes it comes closer and closer to the needs but above all to the peculiarities of individual students, going to intercept them in the moments most suited to them.
It is the birth of a new era that brings into vogue the possibility of creating a smart, dynamic and innovative environment, leaving behind what slowed down schematic and repetitive learning to be more modular on the expectations and interests of learners.

The satisfaction of students, the effectiveness of the tools used that eliminate geographical and temporal barriers, the rapid connection and the intersection of various topics almost simultaneously, These are just some of the highlighted parameters that are among the positive aspects on which research still has to do a lot of work.

The digital revolution has started some years ago and the school must be one of the institutions capable of understanding and managing it in order to consolidate useful learning for students.
If you want to breathe in a sea of information you need to provide the right boats and the right equipment to conduct a safe and profitable trip.

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EUROPEAN HIGHER EDUCATION IN 2050: THE VISION, THE EVOLUTION

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ABSTRACT

The European Higher Education and Research Area is going through a transformation process that will push Europe to a leading position on the way to a green digitalization of societies. The environment of learning, including methods and spaces is expected to change drastically. With knowledge of today's technologies we can only imagine the future but the way forward is almost clear. In this paper we will attempt to describe the learning in the future in both school and higher education as their evolution needs to develop in parallel. The paper will utilize results from several EU funded projects, including, STEAME, STEAME-Hybrid, ONLIFE, STEAME-Students, BYOD, FACILIATET-AI, STEAME Teacher Facilitators Academy, and more.

1. THE VISION BASE

The project "STEAME: Guidelines for Developing and Implementing STEAME Schools" that endinged on 31 December 2021 provides the ground for building the learning of the future as a kick-off of a paradigm shift to Education 4.0. It provides what steps Education Systems all around the world could follow in order to escape from Education 2.0 and change to Education 3.0 and eventually to Education 4.0 with learning based on inquiry and project based learning. Literature and research has been showing for years now that this should be the way forward in order to help school students develop the needed competences and skills that appear to lack when they enter HE studies or enter the world of work. With today's development of digital learning most of the learning needed by school students can be easily accessible or retrieved at any time and place.

STEAME (Science - Technology – Engineering - Arts - Mathematics - Entrepreneurship) has been developed to support European teachers' knowledge and understanding of creating successful STEAME learning and creativity project activities. It offers approaches to teaching, teaching materials, entrepreneurship aspects, organizational suggestions for STEAME-oriented teaching, propositions and

analysis of STEAME-oriented curriculum. All the OERs of the project are available through the STEAME Observatory at www.steame.eu . As an observatory, it is designed to be adaptive and dynamic, able to support a dynamic and adaptive STEAME Curriculum in any school that needs to implement STEAME activities in the learning process.

The process of adding and updating the content is a continuous one, providing the opportunity to all teachers across the EU and beyond to be up to date and to share and publish their own work if they wish to.
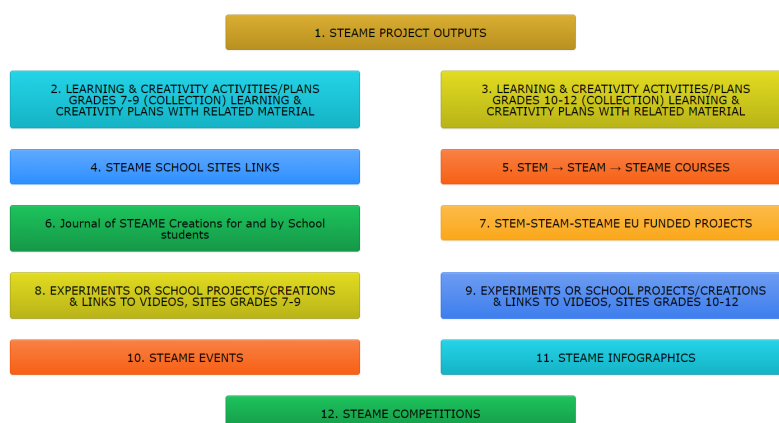

Fig 1: The structure of the STEAME Observatory

1.1 The STEAME Framework consists of the following elements:

1. Learning and Creative Methodologies (PBL-IBL-PSL)
2. Guide to Science Communication as a skill for students
3. Guide to Learning and Creative(L&C) Plan Development, including a a L&C Plan Template in different languages
4. Evaluation Rubric for implementing a project
5. Observatory (Guide to dynamic and adaptive STEAME material)

1.2 Methodologies adopted by the STEAME framework (PBL, IBL, PSL)

The following four methodologies are adopted by the STEAME framework:

A. Project-Based Learning Methodology (PBL)
B. Inquiry-Based Learning Methodology (IBL)
C. Problem Solving Learning Methodology (PSL)
D. A guided method to L&C Plans development with an 18 steps prototype procedure in supporting project based work of student groups, moderated and supported by at least two teachers of different disciplines.

The STEAME project, based on an International investigation, a European wide survey and based on focus groups with teachers and experts, associate partners and through its consortium creative work, has developed guidelines for STEAME school organization structures covering actions for existing schools and actions for future schools. Below we present indicative photos of the design of the STEAME School of the future. In the project website www.steame.eu , one can find a full detailed content and designs of the STEAME School of the future.
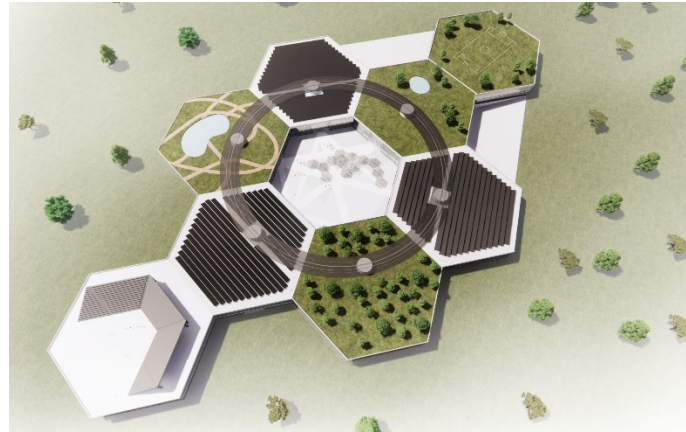
**Fig. 2: A top view of the design of the school fully energy
self-sustainable with photovoltaics**

**Fig. 3: A side view of the school one basement,
ground floor, first floor and roof**

The basement main content is a full set of STEAME Laboratories, VR rooms and entrances to the main amphitheatre and sports centre.

The ground floor contains mainly satellite laboratories, open work space, learning stations and base entries into the small amphitheatres, reception entrance and main dual reception of the sports centre, one entrance for the school students during the day and another entrance for the community during the night, the access to the internal yard and cafeteria and more.

The first floor contains open work space, learning stations, learning centres, learning rooms, a slow moving train with space for group student work, entry into amphitheatres and more.

The roof contains, photovoltaics providing green sustainable energy to the school, pool recreation area, circular sport field, sports courts, roof cafeteria and restaurant and more.

The school provides the option to change colours every day with an app so students decide what will be the colour of their school every day.

Fig. 4 The logo of the project STEAME

2. THE EVOLUTION

2.1 The evolution of Lesson Plans from what is happening today in most education systems located as EDUCATION 2.0 is evolving into Learning Plans and eventually into Learning & Creativity Plans. The STEAME project has adapted and developed the Learning & Creativity Plans as a new name of Lesson Plans.
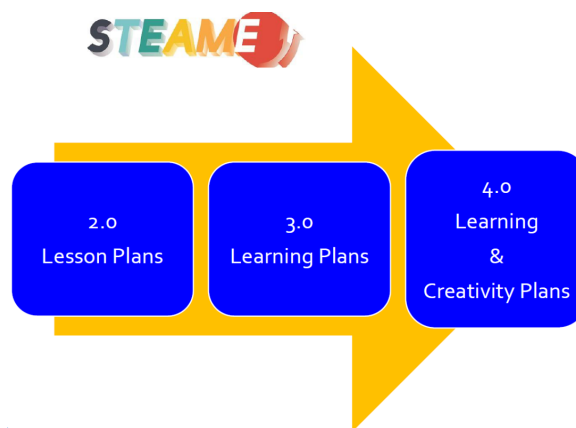

Fig. 5. The Evolution of Lesson Plans

2.2 The evolution of Pedagogy and Andragogy into Peeragogy & Heautagogy, the latter adapted by the STEAME projects.
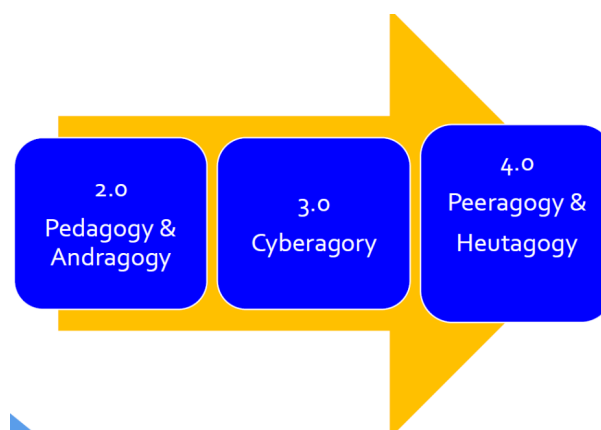

Fig. 6. The Evolution of Pedagogy and Andragogy

2.3 A second step development was the project STEAME-Goes-Hybrid where the PBL activity could be done remotely and online so students and teachers at distance (flip classroom or need due to lock-downs or need due to illness) can work on project work collaboratively and co-creatively. The platform access and guidelines of this solution can be found in www.steame-hybrid.eu

Fig. 7 The logo of the project STEAME-Goes-Hybrid

2.4 A third step development was the BYOD-Learning (www.BYOD-Learning.eu) where it is believed that all classroom learning can be transformed into video learning where each teacher can produce his/her teaching or facilitation of learning in to learning videos. These learning videos were originally planned to be of 45 min duration (usual classroom lesson duration) but also made available into more accelerated learning, that is 30 min and 15 min duration, supporting talented students in learning who could learn faster. Eventually and after reactions of students, the project adapted to the needs of students by supporting shorter videos, like 5 min each as smaller parts of a complete lesson plan duration. This will facilitate the learning at any place and anytime through an approach of Bring-Your-Own-Device (BYOD). The videos can also support the retrieving of knowledge and can save a lot of time from classroom learning so students can spend more time on applying knowledge through project work, thus developing competences and skills.

BYOD-Learning

Fig. 8 The logo of the project BYOD_learning

2.5 The fourth step was to the need to support teachers in becoming adaptable to change and the project ONLIFE (https://onlife.up.krakow.pl/) has developed a special programme and module supporting teachers to develop competence in self-improvement and adapting to change without having to go through special trainings.

Fig. 9 The logo of the project ONLIFE

2.6 The fifth step was the need for teachers and students to understand the new tech environments governed by Artificial Intelligence (AI) . The project Facilitate-AI (www.facilitate-ai.eu) that started in February 2022 and will be completed in January 2023 aims to accomplish this in two main steps. In the first year the AI experts have trained teachers about AI and in the second year trained teachers are designing Learning & Creativity plans in support of facilitating the learning of AI by school students. During 2023 a training by teachers to teachers is planned for preparing teachers for a pilot learning activity.

Fig 10. The logo of the project Facilitate-AI

3. THE STUDENTS

Following collaboration work with experts, teachers, academics and students, a critical need became evident to generate on one hand a bottom-up approach in bringing changes in Education Systems in the future as policy recommendations do not seem to generate movements for change and on the other hand to support the wider preparation of teachers for such a change.

Changing from traditional classroom learning into an open space PBL environment is not something that could happen from one day to another or even from one year to another. This change has high cost and requires big efforts by service teachers, by student teachers, by HE institutions and by authorities.

3.1 The sixth step came in to play with the need to organize the European School students and to give them a voice. By supporting school students to get a voice it is an opportunity to put force into change as nowadays young students adapt to technology changes and grow much differently than the way their parents and teachers grew. The project STEAME-Students developed a platform of communication for school students and supported the kick-off of the first European STEAME School Students Network, with acronym E3SN. The first committee developed its first working statute and a Manifesto , which was presented publically on 14 March 2023 in Krakow, Poland, during the EUROMATH & EUROSCIENCE conference for school students. The project ended on 31 May 2023 and the results can be found in https://thalescyprus.com/?page_id=3386 . A new project proposal named STEAME-Students 2.0 has been submitted in 2023 proposing the further and wider expansion of the E3SN with more student participation.

Fig. 11 The logo of the project STEAME-Students

3.2 The seventh step and may be the most important is the project STEAME Teacher Facilitators Academy, which started on 1st June 2023 , coordinated by the Pedagogical University of Krakow, Poland with 14 partners and 19 associate partners.

The main innovations to be delivered by this project are during 2023-2026 are:

1. STEAME Teacher Facilitators Competence Framework for student and serving teachers

2. STEAME Teacher Facilitators Learning Modules/Workshops

3. International Sharing Observatory for STEAME Learning Facilitators

4. Development of the STEAME Facilitators Community of Practice/Mentoring and Certification Programme

5. Policy Recommendations – European Federation of STEAME Teacher Facilitators Academies

The website of the project is already published at www.steame-academy.eu and has created its logo shown here

Fig. 12 The logo of the project STEAME Teacher Academy

Schools, Universities, Researchers can become associate partners through the website. In addition, regions in Europe and beyond may express interest in becoming regional STEAME-Teacher Academies supported by the special observatory to be created by this project.

Several parallel proposed projects building on the learning of the future are in the pipeline to complement the missing dynamic puzzle for the evolution of education that is expected to be created by Higher Education support through research and innovations. Some examples of these new proposals either running or submitted in 2023 include the REVEALING (VR Classrooms), STEAME-Hybrid Labs, STEAME-Parents and more.

All projects mentioned in this paper are co-funded by the European Union.

Fig. 13 The logo of the funding authority

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*The Partners of all mentioned projects can be found in the corresponding websites of the projects as mentioned.

DESI INDEX IN HIGHER EDUCATION. A SOCIOLOGICAL REFLECTION FOR DIGITAL MEDIA INCLUSION

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ABSTRACT

In recent years, the Italian public University has experienced an acceleration of the digitalization process, also thanks to its response to the health emergency generated by COVID Sars 19 in 2020. Specifically, in recent years it has invested above all in technological-infrastructural equipment in order to guarantee educational and administrative continuity at a distance. This has contributed to strengthening the connectivity of universities, which is one of the indicators underlying the European DESI INDEX.

The use of technological devices as educational and communicative mediators has inevitably led to a technical and technological literacy of the teaching and administrative staff, enabling an implementation of the human capital of the DESI INDEX itself, albeit from an experiential perspective. This digitalization process, however, has not always ensured a consequent process of didactic integration of technology, i.e. a process of normalization of the same that would induce an updating of teaching and knowledge transmission methodologies, helping to implement the soft digital skills of educators and students themselves. This gap has left open a challenge of reflection and research precisely on didactic design and experimentation through the use of technologies in the perspective of digital education, as well as on the critical and safety component underlying the sharing of data and online information.

The abstract intends to propose a reflection on the implications of the application of digital education in universities as an innovative didactic methodology for enhancing the soft skills of teachers and students in the perspective of onlife-education.

INTRODUCTION

The impact of digital in the university is a complex, interdisciplinary topic, still little explored and deepened from a political-governmental and scientific point of view, but gradually becoming of great academic and public interest in recent years, especially in the post-pandemic period. The lack of empirical research in this field, both of a national and international nature, does not make it possible to concretely reconstruct a clear picture of the process of dissemination and integration of digital capital in the daily practices of lecturers, students, administrative staff, and the perceptions of the actors within universities, leaving open an unexplored field of investigation rich in stimuli for scholars in the academy and beyond. By virtue of what has just been stated, the essay intends to promote a scientific reflection, exclusively theoretical, deepening the meaning of initiating a process of digital transformation in the academic world according to a sociological perspective, considering some international theoretical contributions that have offered in recent years interesting hints to build new keys to interpret the phenomenon investigated and to acquire greater awareness on the role of digital in the educational

system of the University. The absence of a theoretical framework shared at an international level and promoted by the European Commission on the subject, has not facilitated the task of reconstructing the significance related to the use of digital in the university system, for this reason, within this essay we have decided to use the DESI INDEX (Digital Economy and Society Index) of the European Commission, as the main guiding tool to critically reason about the impact of digital within the Universities, focusing on 4 main areas human capital, connectivity, the integration of digital into everyday practices within organizations and e-government. Starting from this first reading framework, we proceeded to read and semantically analyze about 40 international scientific articles related to the topic of digital transformation in universities, written in the sociological field in the post covid period (2021-2023), from which we extrapolated the main reflections that emerged in the literature on the digital topic, reorganized in 4 semantic categories: human capital, connectivity, integration of digital in learning/teaching practices, integration of digital in administrative practices. The essay therefore begins with an initial sociological reflection on what it means to speak of digital transformation in universities from a macro-social and micro-social perspective to focus, in a second moment, on the DESI INDEX as the key to interpreting and analyzing the impact of digital technology according to the four main areas of which it is composed (human capital, connectivity, integration of digital in practices and e-government). For each of these areas, some relevant theoretical conceptual definitions were subsequently reported and summarized from the analysis of the scientific literature produced in the post-Covid period on the subject.

1. THEORICAL BACKGROUND

According to Jakoet-Salie and Ramalobe (2023), Higher education digitalization is a transformative process (Seres et al., 2018) that has a significant impact on all the activities of higher education (Crittenden et al., 2019; Rampelt et al., 2018). It includes technological and organizational changes brought about primarily by the advancement of digital technologies (Menendez et al., 2016). The term "digital transformation (DT)" refers to the changes that digital technology causes or influences in all aspects of human life (Stolterman and Fors, 2004). It has implications for the Sustainable Development Goals set out in The United States 2030 Agenda: governments, institutions and organizations should commit with the goal of reducing the digital divide and improving social and cultural inclusion.

Digital transformation has often defined as a journey (TechCentral.ie, 2018), in which technologies will require a constant evolution of working approaches, systems and processes throughout the system, to add value to users (Higher Education Authority (HEA), 2019). Hence, digitalization pervades all processes, locations, formats and goals of higher education teaching, learning, researchs and work. Finally, Westerman et al. (2014) define the DT of an organization as the use of digital technologies to improve its performance and scope.

In the sociological perspective, the DT of HEIs could be considered as the process of technological, cultural and organizational change induced in these institutions by the development of digital technologies (Almaraz et al.,2017). It is not a matter of technology, but how people use technologies, how institutions intend to invest in technological progress to improve the management of different activities, how these technologies are integrated into practices by changing methodologies of use and the previous ideas and assumptions (Diaz-Garcia et alii, 2022).

The incorporation of the possibilities of ICTs in Higher Education (HEI) is leading to the development of new strategic options using policies and plans according also to the new demands of the labor market.

Hence, in the macro social perspective, digitization process in the HEs system must take into account, at least, the following aspects:
(a) strategically enabling DT development through an integrated and ecological perspective,

(b) moving away from basic forms of inquiry and incorporating multidisciplinary perspectives outside of educational sciences in order to advance theory and practice (Peters et alii, 2022).

In the first case (a), in Social Sciences the ecological approach assumes that technologies are not tools but environments within which relationships are built, interactions are established, symbols are shared and meanings are exchanged (Granata, 2015). According to this approach, digital media are part of wider relational systems, which are cultural, social, natural (De Biasi, 2007, p.13). Within such systems, the media take on roles and functions of support and management of educational, commercial, political, economic and cultural or entertainment activities. Media build relationships of mutual influence that contribute to the construction and sharing of symbols, perceptions of reality, ideologies, beliefs that modify people's way of thinking, acting and relating, as well as of constantly looking at and interpreting the surrounding reality. In order to summarise this ecological view of media, it is particularly effective to use the representation of this socio-cultural view of media proposed by some scholars, such as Tongeurs et al.(2008).

These scholars proposed a model of ICT integration in the form of concentric circles; it represents the complexity of the topic involving of integration of digital media in a sociocultural context, where it is possible to consider many characteristics that can influence the spread of digital technologies. Specifically, these scholars had to consider contextual features, cultural characteristics, teachers' structural characteristics, cultural characteristics, and ICT used in classrooms.

Fig.1 Conceptual model of ICT integration
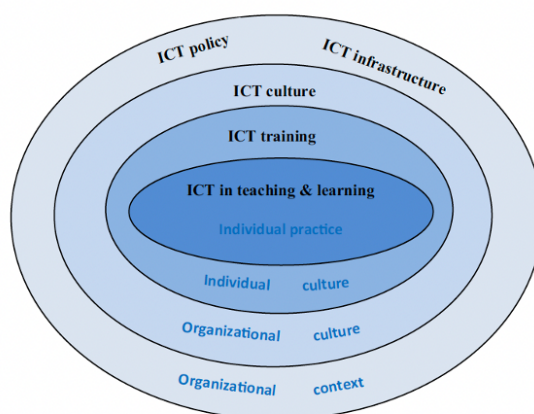
Source: Yuting Zhang Donnie Adams, Kenny Cheah Soon Lee, 2022

In the figure 1, the ICT infrastructure dimension (Kundu et al., 2020; Mutisya, 2020) involves the construction of hardware, software, digital resources, and related services, as well as the arrangement of ICT funding within the institution by assessing physical, service and financial aspects. The technological investment is the basis for enabling access to digital equipment and resources and administrators play a critical role in providing guidance and services for ICT applications. Hence this dimension is connected to the ICT policy adopted in the higher education that may favor the investment in this field.

The institutional ICT culture is a critical component that predicts the level of ICT integration. It refers to values, knowledge, beliefs in digital culture that may orientate the digital perception of actors (researchers, professors, administrative staff and so on) and the socio-material relationships between institutional factors that dynamically interact with each other and that could be improved, fostered and changed during the process (Connell, 2019). They can influence the ICT integration in HE.The ICT

culture also influences the pedagogy and the digital course design, the idea of teaching and learning, the level of autonomy or innovation and collaboration principles at the basis of teaching, the teaching efficiency and the ICT-integrated curriculum (Blau & Shamir-Inbal, 2017).

ICT training is indispensable in ICT integration mentioned in the model (Tondeur et al., 2008) to improve technical digital skills and soft digital competences (Cortoni, Lo Presti, 2018) in the professional field. University teachers expected institution-based ICT training programs to facilitate the autonomy of teachers and their reflection on educational technology usage, to facilitate the implementation of technology in their educational activities. Finally, the ICT in the teaching dimension concerns the teaching practices of confidence, convenience, courses preparation and usage in curriculums, while ICT in the learning dimension refers to the learning practices of creation, exploration, communication and professional learning in the digital field.

In the second case (b), according to Kravchuk et alii (2022), the use of digital technologies in education is a complex system including interconnected structural-functional elements, namely: structure and subsystems, purpose, goals, challenges, principles, main tasks, functions, stakeholders (interest parties) or subjects, content and methods of educational activities, system dynamics, essence and features, factors and conditions, etc. For instance, technologies can optimize the organization of the educational process, speed up communication processes, increase the level of learning efficiency. They intervene to modify more aspects in the HE system, such as the streamlining of orientation, student and teacher recruitment, placement, tutoring, administrative support services from an e-government perspective. Finally, their practical use ensures the update of the competences of HEIs' participants: teachers, administrative staff and students. Hence, ICT integration in higher education must be explained by a framework to allow integration of individual and institutional characteristics from micro- to macro factors.

According to Esteve-Mon (2022), there are some models in the literature that connected to the responsibility for the success of technological implementations in HEIs. For example, UTAUT model is composed of four main constructs including: performance expectancy, effort expectancy, social influence and facilitating conditions. In this model, facilitation conditions refer to the facilitations provided by the institution for the faculty members to teach in online environment such as professional development and technical support etc. Also, effort expectancy refers to the expected efforts that faculty members need for using online teaching tools compared to the benefits received by that effort. Social influence is related to the peers or other faculty members' influence to use online teaching. Finally, performance expectancy refers to how using the new technology may enhance the performance of users (Aljanazrah A, Yerousis G, Hamed G and Khlaif ZN (2022). Some basic variables gender, experience, voluntary use, and age can influence ad orientate the functioning of the model.

Fig.2. Unified theory of acceptance and use of technology
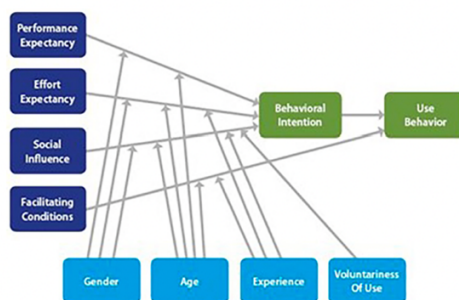
Source: UTAUT; Venkatesh et al., 2003

2. DESI INDEX AND HES IN POST COVID PERIOD

The Digitization Index of Economy and Society (DESI INDEX) is the tool through which the European Commission since 2015 has started to monitor the digitization process of the 28 EU member states from 4 main areas: connectivity, human capital, the integration of digital technologies in the organizational context, the use of digital in public services (e-government).

Starting from this model, we use the same theorical structure to analyze the digitalization process in Higher Education. It is structured in four main dimensions:

1. **The investment in the technological infrastructure equipment** that is the basis to integrate the digital culture in the social context, such as the Higher Education (it could be connected whit connectivity area of DESI INDEX);
2. **The human capital** in higher education, that means the improvement of digital competences of teachers, students and administrative staff;
3. **The integration of digital tools in the daily activities** in these following fields: teaching and learning, research, support services, administration, and communication, as well as the need for students and faculty to acquire new (digital) skills for their future workplaces (Rampelt et al., 2018);
4. **Integration of technological means in the administrative procedures** to improve the quality of services in the higher education. The use of ICT is essential to many business processes of universities, including institutional communication, library management, HR management, teaching and student support, research and technology transfer support, project management and fundraising, financial support, IT support, legal support, logistics, strategic planning, and many others (Maltese, 2019).

In the following paragraphs we analyze each of these dimensions in HE, starting from studies and researches described into the recent scientific and intenrational literature in the post COVID period. These dimensions are at the basis of digital capital in the Higher Education (Ragnedda et al., 2018; Paino and Renzulli, 2012; Pitzalis, 2016; Cortoni, 2020). With this expression, we define the material and immaterial resources used in the specific social space, such as the HE system, to achieve specific educational goals. In the macro perspective, digital capital refers both to the endowment infrastructure and technology (DESI INDEX connectivity), as well as to the number of training and school digital experimentation, to implement the cultural capital of teachers and students on technology (digital literacy) and through technology (digital education). From a cultural point of view, the investment in projects of experimentation and training on digital literacy, or digital education, can contribute to increasing the digital skills of all school actors (teachers, researcher, students, staff and so on), hypothetically improve the efficient functioning of the school system, perceived externally as a factor of educational quality (DESI INDEX human capital). Still in the macro perspective, digital capital is doubly connected to financial capital, insofar as opportunities for economic investment, both institutional and public and private, can stimulate the purchase of technological equipment and educational experimentation.

Moving from a macro to a meso-social perspective, digital capital seems connected to the concept of educational innovation, from design to classroom experimentation to the teaching, learning and assessment of student learning, changing their relational dynamics (social capital) and cultural capital, as well as the sharing of digital skills in teaching activities, management and organizational activities (DESI INDEX Digital Technologies integration). Finally, from a micro-social point of view, digital capital is identified with a specific dimension of the cultural capital of each individual (digital competence), and with attitudes embedded in individual use (Ragnedda et al., 2018; Paino and Renzulli, 2012; Pitzalis, 2016; Magaudda in De Feo and Pitzalis, 2014).

2.1 TECHNOLOGICAL EQUIPMENT OF HES

Technologies are the initial and basic component of a first step, the "digitalization" of "HEIs," when they tiptoe into the "digital economy" using "innovations" in the "management" of the "information" of the organization, which requires the acquisition of "digital competences" by their members (Díaz-García et alii, 2022).

The Digital Transformation of Education: Connecting Schools, Empowering Learners in 2020, the International Telecommunication Union (ITU), the United Nations Educational, Scientific and Cultural Organization (UNESCO), and the United Nations Children's Fund (UNICEF) called for strengthening national infrastructure to ensure that Internet connectivity is more reliably and widely available (Unesco, 2022). In 2021, UNESCO published the Strategy on Technological Innovation in Education (2022–2025) to study emerging and future technological changes and their impacts on education and support member countries to develop remote learning platforms, learning tools, open educational resources, and effective learning methods, to enable equitable and inclusive quality education and promote lifelong learning opportunities for all.

According to the 2021 EDUCAUSE Horizon Report® | Teaching and Learning Edition, published by EDUCAUSE, the key technologies and practices that will have a significant impact on the future of teaching and learning in higher education are AI, Blended and Hybrid Course Models, Learning Analytics, Micro-credentialing, Open Educational Resources (OER), and Quality Online Learning.

The main digital resources and formats implemented in educational teaching in HE institutions during the COVID-19 pandemic have been LMS platforms of the institutions themselves: the videoconference—Zoom or Microsoft Teams; the creation and use of educational videos; the exchange of messages by the usual means (email) or through instant messaging applications—as WhatsApp Messenger—combined with the use of social networks, mainly used for communication or, alternatively, as an LMS platform (see fig.3).

In this sense, it can be noted that most of the applications or technological solutions used for the continuity of teaching are open educational resources (OER), that are available free of charge, or reusable educational resources (RER) that have been integrated into LMS platforms. (cfr. Rodríguez et alii, 2022).

Fig. 3 List of potential technologies implemented in HE during COVID period

FORMAT	TYPE OF RESOURCES
SUPPORT	LMS Integration Content Lessons and courses Format/Language
TOOLS	Video conference Presentation Messenger service Response Storage Collaboration Support/Adaptation Social Networks
DIGITAL UNITS	Video Audio Text
SERVICES	Access to documents Identity Search Migration

Source: Rodríguez, M.L.; Pulido-Montes, C. 2022

According to Aljanazrah et alii (2022), online platforms such as learning destination sites (LDS) and learning management systems (LMS) are transforming learning experiences by allowing the learners to access and download courses, manage and track progress, take notes and actively participate in discussions with peers and co-learners (Bekova et al., 2021). Virtual communities of practice are empowering faculties to adapt to the evolving pedagogy and course work through resource sharing and curating engaging classroom experiences (Hodges et al., 2020). Digital curriculums are enabling curriculum-aligned, next-generation assessments that can provide automatic grading, support prompt feedback, track reasoning and understanding through strong analytics from different data sources (Ertmer, 1999).

The integration of these tools in education contribute to transform some didactic methodologies. The blended learning methodology involves the integration of resources within a methodological structure that is defined by educational moments marked by asynchrony and synchrony; such a methodology seeks to enhance performance, the integration of digital technologies and collaborative learning. This approach involves the application of a blended methodology, a process of developing pedagogical reflection, skills and resources (cfr.Rodríguez, et alii, 2022).

Fig. 4 List of methodologies developed during COVID period
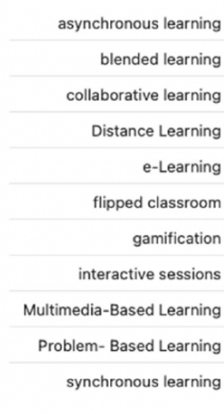
Source: Rodríguez et alii, 2022

According to UNESCO (2022), after COVID period, HEIs need to transform their supportive services for the digital transformation of teaching and learning, following these main principles:
- **Change from single services to systematical services:** HEIs need to adopt the principle of systematization to provide well-connected and integrated supportive services by linking all elements of teaching support, strengthening the connectivity between all stakeholders and breaking the boundaries between scattered services, isolated links and separate departments.
- **Change from physical space to integrated space:** As teaching expands from traditional physical space to the integration of physical and digital spaces in the wake of the digital transformation, supportive services need to cater for teachers and students anytime and anywhere in the integrated teaching space.
- **Change from single-point services to whole-process services:** As digital teaching goes beyond traditional classrooms and breaks through the limitations of time, the teaching support team needs to provide whole-process services for activities before, during and after class.
- **Change from serving groups to serving individuals:** HEIs need to move away from traditional teaching services. Instead, they should provide supportive services that can meet the individual needs of teachers and students and develop personalized instructional design, curriculum management and learning evaluation by means of learning analytics and adaptive technologies.

Hence, HEIs need to build a technical environment that has to follow these indications:

- **Upgrade physical places of instruction in a digital way:** Physical places of instruction such as classrooms can respond interactively to various requirements of the digital teaching space once they are equipped with digital equipment to realize the data transfer between physical and digital space.
- **Build an internet-based teaching environment:** HEIs need to make an overall and coordinated plan to fill the gap between what the current campus network, digital facilities and equipment, learning management system software and digital teaching resources can offer and what teachers and students really need in the process of digital transformation.
- **Apply new-generation digital technologies:** new-generation digital technologies such as AI, learning analytics, IoT, social robots and blockchain will deeply integrate with higher education teaching.
- **Emphasize security and fairness:** The development of technology should be planned with ethics, fairness and justice as the core in advance instead of afterwards. To ensure data security and privacy protection, HEIs, teachers and students need to participate in the development process of technical systems, and actions should be taken to raise awareness, build institutional systems and enhance maintenance and management. Investment in network connection, digital equipment and organizational capacity of HEIs should ensure equal access to digital education for all learners.

2.2 HUMAN CAPITAL IN HES: DIGITAL LITERACY AND COMPETENCIES

The development of ICT skills has been identified as a critical element of students' future full and active civic participation (OECD, 2015). This expression refers to the knowledge, skills and confidence required to use available technology and devices to achieve objectives and results (PWC, 2018). Digital literacy entails the correct use of available data as well as the appropriate application of new technologies (Seiler and Fischer, 2021).

According to UNESCO (2022), Digital literacy is the ability to safely and appropriately acquire, manage, understand, integrate, communicate, evaluate and create information through digital technologies to promote employment, work and entrepreneurship, including the ability to apply digital technologies, information and data literacy, the ability to communicate and collaborate with digital technologies, the ability to create digital content, awareness of digital safety and digital ethics, continuous learning, problem solving, reflection and self-improvement through digital technologies, and digital expertise and competence. Among them, digital technology application ability, information and data literacy, digital expertise and competence are the essential components of digital literacy, serving (Law et alii, 2022) teachers act as technology facilitators for a shared ICT vision (Blau & Shamir-Inbal, 2017; Hero, 2020).

Morgan et alii (2022) introduce a framework of digital literacy that is structured in three main areas:
1. technical (operational literacy);
2. cognitive (Information literacy);
3. etiquette (legal, ethical and social literacy).

The technical skills refer to the operational literacy of individuals that are at the basis of access digital competencies. Second, are the cognitive abilities of searching, assessing, analyzing, evaluating, synthesizing and communicating digital information. This cognitive dimension focuses on the use of existing information and the creation and sharing of new information (critical digital competencies). Third, is etiquette which allows for appropriate and contextual online interaction and behavior. This involves ethical and legal literacy, as well as social aspects of communicating in personal and professional digital environments (awareness digital competencies).

Based on this framework, digital literacy can be described as the ability to access, analyze, evaluate and communicate digital information, using relevant digital tools in a manner which is legally, ethically and socially aware. 'Access' refers to not only having technical, but also beholding the operational understanding, knowledge and essential skills required to use it. 'Analyze' refers to one being able to navigate, determine bias and quality, summarize and assess information or data for interpretation and processing. 'Evaluate' refers to critically reviewing and determining significance, legitimacy and authenticity when encountering an infinite supply of online information. 'Communicate' refers to producing and sharing insights and formulating messages that fit the required medium. This includes operating and communicating in a safe, legally and ethically appropriate manner.

Conceptualizations of digital literacy have also emphasized the importance of social context, such as privacy and appropriate use of language (e.g., Ng, 2012a). Therefore, digital literacy is critical for higher education graduates' employability and citizenship. Graduates face various challenges associated with technological and digital change, such as: handling big data, cyber security and the proliferation of 'fake news'(Oliver & Jorre de St Jorre, 2018). These are digital soft skills (Cortoni, Lo Presti, 2018), connected to the awareness and critical thinking competences focus on commodification, datafication and personalization processes of platform society (van Dijck at alii, 2019).

The implementation of teachers' digital competences responds to the need to prepare students for a strongly digitized socio-cultural context and represents one aspect to be included in the educational mission of universities themselves, in order to prepare 'e-leaders' in different professional fields.

The Definition and Selection of Competencies Project - DeSeCo (OECD, 2005; Salganik et al., 1999) pointed out that competences are more than just knowledge and skills, as they include the ability to cope with complex demands by putting those skills into action in specific situations (the main areas of the project are three: 1. interactive usage of media tools, 2. working with others and working in society, 3. the use of psychological resources, abilities, and attitudes. In this context, digital competence is considered one of the key skills for accessing lifelong learning (Europea Union, 2006; Morselli, 2019). The changes resulting from the introduction at the beginning of the 21st century of the concept of competences as an educational goal (Rychen & Salganik, 2003) have led the university to assume pedagogical criteria of student-centered learning (Perez Rivero, 2022).

According to Peters et alii (2022), the digital competence of teachers (TDC) has defined as the set of skills, attitudes and knowledge required by educators to function productively, safely and ethically in diverse and digitally mediated environments (Esteve-Mon et al., 2020; Falloon, 2020). The definition of Digital Literacy is connected with the definition of Digital Competences.

Finally, according to the General Secretariat of the Council of the European Union, digital competence involves the confident, critical and responsible use of, and engagement with digital technologies for learning, at work, and for participation in society. It includes information and data literacy, communication and collaboration, media literacy, digital content creation (including programming), safety (including digital well-being and competences related to cybersecurity), intellectual property related questions, problem solving and critical thinking (European Union, 2018). In this definition all areas of the European Digital Competences for citizens (DIGCOMP 2013 and the followed upgrades) are mentioned.

Starting from the international literature in this field, in the last years, many theorical frameworks on digital competences are defined. In Europe, since 2013 the framework on digital competences for educatorsm the European framework for the DC of educators (DigCompEdu), is implementing, it aimed at guiding policy and implementing regional and national training programs (Redecker & Punie, 2017). This framework analyses and validates the digital competences included in 6 areas of professional life of educators: 1. Improving Professional engagement, 2. developing educational resources, 3. designing

and enacting teaching and learning activities, 4. assessment practices; 5 enhancing the soft skills, 6. digital skills of students (Esteve-Mon et al., 2020).

In the international literature, many other International frameworks of digital competences has been analyzed such as:

- *Technology, pedagogy, and content knowledge model* (TPACK), where content knowledge has to be combined with methodological knowledge of pedagogy and technological knowledge. In this sense, teacher competences in the HE have to be soft skill.
- *International Society for Technology in Education* (ISTE) Standards for Educators, that provides competencies for learning, teaching and leading in the digital age, giving a comprehensive roadmap for the effective use of technology in educational contexts such as the HEs.
- *The ICT Competency Framework for Teachers* (ICT-CFT) (UNESCO, 2018) that is a global standard to evaluate teachers' ICT competency and it is structured in six dimensions: (i) Understanding ICT in education policy; (ii) Curriculum and assessment; (iii) Pedagogy; (iv) Application of digital skills; (v) Organization and administration and (vi) Professional learning.
- *Spanish Common Framework of Digital Teacher Competence,* developed by the National Institute of Educational Technology and Teacher Training (INTEF, 2017), which is based on the digital competence model DigCompEdu developed by the EU.
- *The European e-Competence Framework for ICT Professionals* (e-CF ICT),
- *The Global Media and Information Literacy Assessment Framework* by UNESCO 2013 (Kuzminska et al., 2018).
- *The JISC Digital Capability Framework*, that is focused on four key areas and an overarching competency enveloping ICT proficiency for digital identity and wellbeing, as the core of digital literacy – 1. Information, data and media literacies, 2. Digital creation, problem solving and innovation; 3. Digital communication, collaboration and participation; 4. Digital learning and development (JISC, 2019).
- *Digital Teaching Professional Framework* (Education & Training Foundation, 2019),
- ISTE Standards for educators (ISTE, 2018), is a widely used standard worldwide to evaluate technology leadership, or function as guidance for related training, which explains the main necessary features of technology leaders in detail. It consists of five leading practices: (i) Equity and citizenship advocate; (ii) Visionary planner; (iii) Empowering leader; (iv) Systems designer; and (v) Connected learner.
- *Competence framework for Teaching and Learning with ICT* (van Loon et al., 2018).

2.2.1 THE FRAMEWORK OF DIGITAL COMPETENCES IN HES

The main and sub-dimensions of the frameworks were identified, existing similarities were merged where necessary, and the remaining digital competencies were mapped. The result was an overview of identified dimensions. This resulted in an initial draft of the HeDiCom framework, which included four main themes: Teachers' digital literacy, Teachers' Professional Identity; Teaching and Learning with Technology; Empowering students (Tondeur et alii, 2023).

This framework is structures in three areas: professional learning that includes all competences at the basis of the development of the educator profile. This area includes social competences (communication and collaboration), methodological competences (innovation in digital practices) and teacher's professional learning (key competences of teaching professionality). In the second dimension Digital literacy the author describes three main categories of digital competences of educators:

- *Essential digital skills* based on the improvement of technical and operational skills to use digital media;
- *Information, media and data literacy* that summarize different capabilities such as: searching for information, the organization of information, and the assessment of information (Almerich

et al., 2016). Carretero et al. (2017) for instance indicate that teachers must be able to analyze and compare both the information and the sources of digital content for reliability and credibility. They therefore need the necessary competencies to actively, creatively and critically use and understand data (López-Belmonte et al., 2019). They should be able to manage Big Data. This requires certain competencies in analytical treatment based on data mining, for the extraction of useful, valuable and meaningful information from large volumes of data (Huda et al., 2017).

- *Computational thinking* is only recently described as a relevant competence in Higher Education. It refers to break down a complex problem into steps and processes that can be solved using digital technologies and apply these solutions in their educational practice (Barendsen & Bruggink, 2019; Lyon &Magana, 2020; Wing, 2006).

The digital literacy competences are central for T*eachers' digital practice dimension, that includes designing, implementing didactic activities, facilitating the relationships in classroom* with students and with colleagues, monitoring, evaluating the effectiveness of the work and modifying it for future proposal. The digital literacy competences are also at the basis to implement digital competences of students for future professions and for living, learning and working (see figure 5).

Fig. 5 The HeDiCom framework
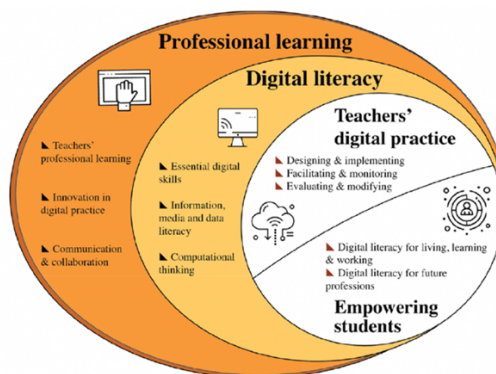
An other international framework of digital competences in HE is proposed by UNESCO in 2022. It is called Framework of teachers' digital competencies in Higher Education (UNESCO, 2022). It is structured in four main areas:

1. Digital awareness;
2. Digital literacy;
3. Digital capacity;
4. Digital research.

Each area is structured in three stages: acquisition that is the basic access stage, deepening that means intermedium stage and creation as the innovation stage (see figure 6).

In the first area, *Digital awareness*, teachers become aware of the importance of digital technology in teaching (acquisition stage); in the deepening stage, teachers acquire relevant knowledge and methods of ICT-based teaching, and start to practice innovative teaching. In the innovation stage, teachers develop ideas and methods to innovate and update teaching models.

Digital literacy area is a prerequisite for helping learners to develop core competencies of the 21st century. In addition, teachers also need to have professional literacy to integrate digital technology into teaching activities. In the acquisition stage, teachers obtain a preliminary understanding of common digital technology tools for their work (such as office software, online teaching platforms, visualization

tools, popular social media apps, etc.). In the deepening stage, teachers use various open online courses, user-generated content from social media, etc. to carry out professional learning on smart devices and develop the habit of lifelong learning. In the innovation stage, teachers develop the ability to flexibly apply models of digital teaching.

Digital capacity area refers the ability to apply knowledge and skills in practical professional activities. In the acquisition stage, teachers could master one way of integrating technology into curriculum as part of the digital teaching. In the deepening stage, teachers diagnose problems in teaching, solve problems with the help of digital technology, to improve teaching continuously. In the innovation stage, teachers flexibly apply digital technology to innovate teaching models and help students to cultivate higher-order thinking skills, as well as the ability to explore, cooperate and autonomously construct their knowledge base.

Digital Research refers to use digital competences to improve the research processes. In the acquisition stage, teachers learn to conduct research based on standardized models, to diagnose problems in teaching and improve accordingly. In the deepening stage, teachers design teaching methods based on characteristics of courses and instructional conditions, in order to continuously improve teaching models and methodologies. In the innovation stage, teachers explore teaching patterns through research, deeply reflect on teaching, innovate teaching models and encourage other teachers to develop together through sharing and communication.

Figure 6. Framework of teachers' digital competencies in Higher Education
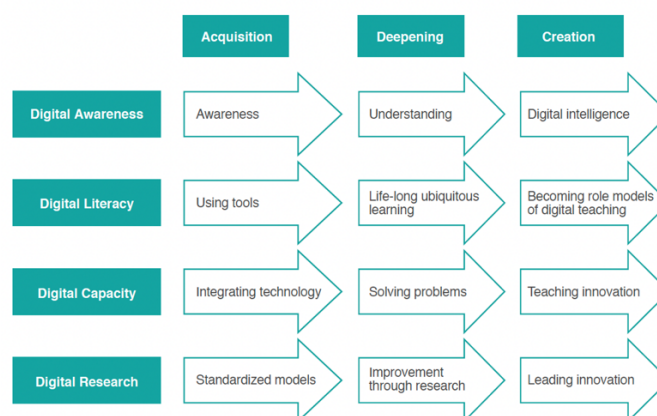
Source: UNESCO, 2022

In the HE context, teachers are leaders, they must take new responsibilities, prepare to accept, use and integrate technology in the university, and equip themselves with the newest technological knowledge and skills, as adapting to technology developments is indispensable for modern educators. Technology leadership refers to the combination of technological literacy, academic ability and management competencies to select, exercise and guide technology usage, which supports all education stakeholders to effectively deal with the exploration of technology-related tasks. Technology leaders are individuals who can empower followers to understand, select, assess, utilize and manage technology and innovation effectively (Daugherty et al., 2013). Previous studies have explored theories, conception and evaluation standards of educational technology leadership from various perspectives. Appropriate frameworks are needed to guide leaders to meet the demands of practice effective technology leadership (Zhang et alii, 2022).

Rogers [2000] argues about a paradigm in the integration of technology into higher education, due to the new requirements for the set of technological competences of teachers. According to the author, the key areas of technology integration are:

1. learning/teaching, (Planning and implementation of digital devices and other resources in the educational process in order to increase the efficiency of educational technologies. Proper management and streamlining of digital learning strategies.);
2. leadership (The application of digital technologies and services in order to enhance interaction with students, within and outside the learning process. The use of digital technologies for timely and focused leadership and assistance. Experimenting and developing new forms and formats of leadership and providing support.);
3. self-regulation of learning (The application of digital technology to support self-regulated learning, that is, to teach students to plan, monitor and reflect on their own learning, provide evidence of progress, share opinions and generate creative solutions);
4. coeducation and collaboration (Promoting and improving collaboration, cooperation and knowledge creation);
5. assessment and analysis of outcomes, formation of current and final assessment (Improving the diversity and suitability of assessment formats and approaches. Selection, critical analysis and interpretation of digital indicators of performance, efficiency and progress);
6. feedback and planning (The use of digital technology for targeted and timely feedback from students. Adapting learning strategy and providing targeted support based on indicators obtained by digital technologies. Enabling students and parents to understand digital technologies and use them to make decisions).
7. differentiation and personalization of learning (Meeting a variety of learning requirements, allowing different levels and speeds, and adhere to distinct learning paths and objectives);
8. accessibility and inclusion, (Ensuring the availability of educational resources and activities for all students, including those with special needs. Reflection on students' expectations, skills, uses and misconceptions, as well as contextual, physical or cognitive limitations on the use of digital technologies);
9. active engagement (The use of digital technologies to promote active and creative participation in the study of subjects. The use of digital technologies in pedagogical strategies promoting students' diverse skills, deep thinking and creative self-expression).

Starting from these features of teacher competencies in HE, the scolar describes a general list of specific teacher competences such as:

1. Knowledge and understanding of the subject area, professional activity.
2. Possession of critical thinking skills.
3. Possession of communication skills, ability to show empathy.
4. The ability to use information and communication technologies.
5. The ability of searching, processing and analyzing information from various sources.
6. The ability of personal and professional development.
7. The ability to generate new ideas, creativity.
8. The ability to apply best practices in professional activities.
9. The ability to motivate people and move towards a common goal.
10. The ability to act based on ethical considerations, motives.
11. The ability to show tolerance and respect towards cultural diversity.
12. The ability to conduct socially responsible and conscious actions (Kravchuk et alii), 2022.

This list of competence is comparable with the European framework of digital Competence of citizen (DigComp and following upgrades) that considers 5 main areas of digital competences: 1.Information and data literacy (connected with the Possession of critical thinking skills and The ability of searching, processing and analysing information from various sources); 2. Communication and cooperation (connect with the Possession of communication skills, ability to show empathy and The ability to use information and communication technologies); 3. The content creation (connected to The ability to generate new ideas, creativity; 4. Safety (connected with The ability to act on the basis of ethical considerations, motives; The ability to conduct socially responsible and conscious actions); 5. Problem solving (Knowledge and understanding of the subject area, professional activity; The ability to apply

best practices in professional activities; The ability to motivate people and move towards a common goal; The ability to show tolerance and respect towards cultural diversity.

2.3 INTEGRATION DIGITAL TECHNOGIES IN HE

According to Kravchuk and other scholars (2022), HEIs combine different approaches depending on the field of application of digital technologies in Higher Education. The Constructivism is the basic principle for the integration of technology in the context of the dynamism of scientific and technological progress, requiring teachers, administrators and students to constantly update their knowledge in the process of practice.

The components of constructivism are as follows: 1) the concept of lifelong learning, in order to update digital skills; 2) competence-based approach, involving the education of basic and special competences of teachers and students; 3) centralized approach to technical support of academic staff and students by creating standards, rules of procedures for the use of technologies; 4) systemic and structural-functional approaches for the integrated use of technology in various fields of higher education; 5) theory of student-centered learning based on the principle of student-centrism as the basis for the implementation of technologies, for instance, in the quality assurance system of HEIs for assessment of students' learning outcomes. (Englund at alii, 2017).

Within the framework of the constructivism concept, new approaches to teaching using technologies at HEIs are emerging. For example, **the Technological, Pedagogical, and Content Knowledge (TPACK)** framework is distinguished among approaches to the application of technologies by teachers in accordance with the strategies of teaching and the content of higher education (Dysart et alii, 2015). The gamified approach is also the innovative one, increasing students' motivation, productivity and performance through new principles, the possibility of adapting courses to students' interests [Kopcha et alli, 2016; Subhash et alii, 2018].

The digital transformation of higher education teaching and learning is not the application of digital technologies to education, but the integration of digital technologies and education, and that the aim is to improve the operations, strategic directions and values of HEIs and develop new education systems adaptive to the digital age. The digital transformation of higher education involves changes in institution's space, operations, strategic directions and values, as the digital age takes on different characteristics.

UNESCO (2022) defines four stages in applying digital technologies to education:
1. *building readiness stage*, focused on building infrastructure and developing teachers' digital competencies;
2. *applying stage*, focused on applying digital competences and tools in the daily activity to develop high-quality digital education resources and to improve learning management systems;
3. *infusing stage on innovative methods of teaching* based on the digital environment;
4. *transforming stage* focused on integrating emerging technologies to reshape education ecosystems.

It proposes a framework for the digital transformation of Higher education teaching and learning in three steps:
1. **integration**, where the curriculum development and delivery will not be limited by time or space. The core elements such as teaching objectives, contents, activities, assessments, and environment will be reshaped and reorganized by the integration of physical and virtual spaces. At this stage, students will enjoy more flexible learning by blending online and offline methods and HEIs will expand internet-based teaching.

2. **early transformation**, HEIs will gain access to external resources for curriculum development, such as those from other HEIs, relevant enterprises and social organizations. At this stage, HEIs will develop individualized curriculum designs with a flexible combination of course modules from different schools and academic programs to meet the diverse needs of students.

3. **advanced transformation**, digital technologies will completely break boundaries between HEIs, enabling connectivity between HEIs, between HEIs and society, and between HEIs and other stakeholders. By that time, sharing academic programs, curriculum, teachers, facilities, and services will become possible, and social resources will be fully utilized. As learners will have ownership over digital spaces, they can choose online courses and digital resources of other HEIs to meet their individualized needs.

Fig.7: Framework for the digital transformation of higher education teaching and learning
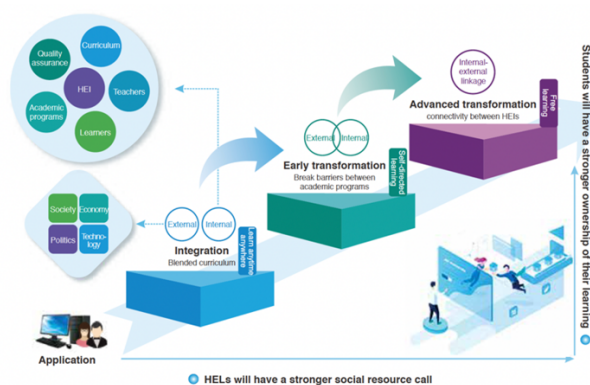

Source: UNESCO, 2022

In order to realize joint development and sharing of digital teaching resources across HEIs and academic programs, it is necessary to develop unified standards for developing shared resources to facilitate resource access and use; following the conditions of the Creative Commons (CC) licenses to protect the copyright of resource developers.

Second, establish a sound system for the management of shared resources. it means to develop relevant assessment and evaluation mechanisms to evaluate the quality of resource development and results of resource sharing and introducing a number of policy incentives based to encourage greater initiative, deliver higher-quality digital teaching resources, extend the life cycle of the sharing process, and promote the sustainable sharing of digital teaching resources. Third, adopt "customized" digital teaching resource sharing. Relying on digital teaching resource sharing platforms, students can have access to "personalized and customized" resources to meet their different needs (see figure 8).

Fig. 8: Key dimensions and their relationship in the digital transformation of teaching and learning
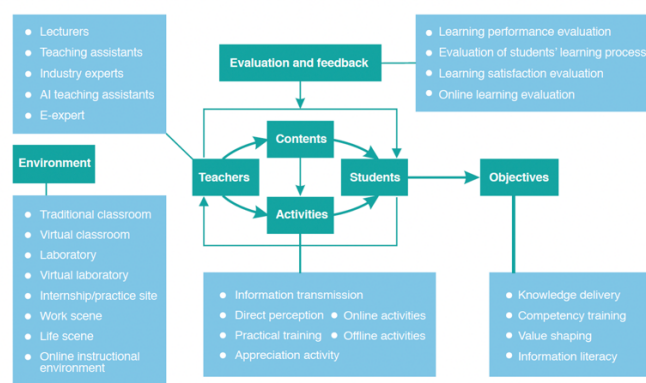
In this scheme, curriculum objectives refer to equipping students with the skills and abilities needed in the digital age and preparing them for the 21st century.

Curriculum contents is changing from fixed and structured knowledge to dynamic, open, unstructured and diverse contents. As big data, internet and other technologies advance, knowledge has been increasing and updating more quickly. Curriculum contents become more closely linked with social life and production, especially with the development of the latest science and technology and they are delivered by means of multimedia. Systematic, high-quality and dynamic digital open instruction resources have become an important source of curriculum contents.

Teaching activities are changing from face-to-face instruction limited to specific physical space to diversified instruction combining both the digital and physical spaces. Diversified electronic devices and technical systems such as smart phones, tablet, e-schoolbags, online instruction platforms and video conference systems provide strong support for carrying out various teaching activities.

Learning assessment and feedback change from static and summative assessment to dynamic, diverse, formative and big data-supported assessment and feedback. As new technologies such as mobile internet, cloud computing, big data, data mining, learning analytics and AI emerge, new methods for learning assessment keep springing up, making it possible to use big data generated in the teaching process to carry out multi-dimensional analysis, process evaluation and dynamic feedback.

Teachers will change from the role of one-way imparting knowledge to supporting students' autonomous, cooperative, and inquiry-based learning with technology. Students will change from passive receivers to autonomous learners supported by digital technology. Teaching environment: Changing from closed physical space in school to borderless and multi-channel connected physical and virtual spaces.

In this new hypothetical context new didactical methodologies have to be designed and experimented. Generally, this approach involves the application of a blended learning methodology. It is a process where all technological resources and others are integrated within a methodological structure that is defined by educational moments marked by asynchrony and synchrony.

After the COVID period, the new educational system, known as the hybrid model, has been defined by UNESCO as a 'learning approach that combines both remote and in-person learning in order to enhance the learner experience and ensure continuity' (UNESCO, 2020, p. 6). This model comprises different formats: flipped classrooms, live synchronous teaching through video conferencing, asynchronous activities to be carried out autonomously by students, and other remote features through technology platforms that professors use to provide instruction and feedback.

In this mixed format, educational institutions must make substantial technology investments in the classroom; in addition to the investment in technological resources, all universities have had to provide professors with training to cope with this new model by scheduling courses related to virtual teaching, content generation and new educational applications (De Obesso & Nu~nez-Canal, 2021).

According to Perez, Rivero et alii (2022), active methodologies such as flipped classrooms or the learning by doing approach have changed the role of educators. Instead of reinforcing the cognitive function, the educator becomes a facilitator and an active part of the teaching and learning process (Ladeveze & N!u~nez-Canal, 2018). Technology has contributed to this change in perspective and the new professors' role (Marcelo & Yot- Dominguez, 2019).

Some examples of international didactical methodologies already considered in HE, are described below:

- According to Arsenijević, J. et al. (2022), *The Community of inquiry model in online teaching* (Col) developed by Garrison, Anderson and Archer (1999), is based on three types of presence: social, teaching and cognitive presence. The teaching presence includes roles, activities, pedagogical forms and interventions of the teacher in order to establish interaction with students in the online learning process. According to this, Swan (2003) identified six best practices for teaching presence: establishing clear learning aims and instructions for students; using a wide range of presentations of course content; developing learning methods or exercises that enable students to be active and to be involved; providing students with feedback; being fexible in ways of achieving learning outcomes and providing students support and mentoring as much as possible. The second element of the Col model is Social Presence, which represents the extent to which students feel socially and emotionally connected to others and to the online environment in which they learn. The third element is Cognitive Presence, that includes the following phases: developing students' interest in the subject through the setting of a learning problem, researching and reflecting on problems and finding possible solutions, problem solving and its application (Garrison and Archer, 2003). These phases are organized by the teacher, but they can be also the result of the social interaction among students, because it is feasible in an atmosphere of proactivity, dialogue and reflection (Garrison, Anderson and Archer, 2001).
- According to Jakoet-Salie and Ramalobe (2023), *the Online Collaborative Learning* (OCL model), proposed by Linda Harasim (2017), is a well-known teaching approach in online education. It entails people cooperating, exchanging ideas and perspectives, establishing a shared understanding of specific themes and creating collaborative products (Magen- Nagar and Shonfeld, 2017). This theory emphasizes the Internet as a source of learning through encouraging cooperation and knowledge creation (Demuyakor, 2020). The OCL model is thought to aid in three stages of knowledge acquisition and building:
  1. Idea generating: This is a phase in which brainstorming will happen. Divergent concepts are brought together during this period.
  2. Idea organising: in this phase students compare, analyze and categorize the many concepts that have been created earlier, once again via debate and argument.
  3. Intellectual convergence: Intellectual synthesis and consensus occur during this stage. Assignments are written in the form of essays and collaborative pieces of work and students are encouraged to agree to disagree (Harasim, 2012).

CONCLUSION

Reflection and research on the impact of digital technology on the university is still an open and unexplored field of investigation that would require systematic government policy intervention at a European level, capable of providing guidelines for research and design of training interventions on and through digital technology in various spheres: from teaching to research, up to the third mission.

In this regard, an initial international mapping of what has been analyzed, studied and written by specialists in the field can certainly help to identify one or more theoretical frameworks on the subject, which can be adequately defined through reference dimensions, indicators and descriptors. Starting from such descriptors, it would be possible to circumscribe in a more conscious and targeted way the scholars' study and research interest on the different areas underlying the digitization process, such as the diffusion of digital skills in teachers and students, the degree of technological infrastructural endowment of universities, the type and level of integration of the same in daily professional practices, and the use of digital for the management of administrative practices.

After identifying the theoretical framework best suited to the characteristics of the educational context of the university system, shared at the European level, the second step that could be taken to work on the impact of digital technology at the university would concern the establishment of a research observatory capable of monitoring geographically and over time the digitization process in the various universities, enabling a longitudinal data comparison, but also on a geographical, national or international basis.

The third step, finally, could concern raising the awareness of political institutions on the issue of digital in universities, with a view to a governmental economic investment, on a European and national basis, able to work systematically on the implementation of digital and its culture in universities in terms of training of teaching and administrative staff on digital literacy, design and testing of management systems for teaching and administrative practice in universities, continuous technological updating and assistance, and on innovative teaching methodologies to be applied to universities in the perspective of the implementation of digital education within teaching and learning practices.

 To achieve this goal, there is still a long way to go although there are local best practices on the use of digital in specific contexts and for equally specific objectives. Within this framework, the essay takes the form of a further small contribution of critical reflection on the issue of digital at universities, certainly not exhaustive in terms of theoretical reflection on the subject, which may however stimulate one to think about the complexity of the path to be taken in an interdisciplinary key and not to overlook the inevitable involvement of various stakeholders, directly or indirectly involved and interested in the implementation of digital policies and practices for the university.

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