

Higher Education as a Promoter of Soft Skills in a Sustainable Society

5.0

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Abstract

The growing digitalization that is taking place in most current societies, shaping a super-smart society – such as, for example, the aimed Society 5.0 – raises profound implications in the learning that the higher education context should foster, and which is summarized in the following question: what kind of skills should be taught and how? This perspective paper aims to analyze the centrality of soft skills in this new and unavoidable context, as well as the implications in the learning process. The results of a bibliographical search point toward the fact that, in addition to professional and scientific skills, soft skills are critical for professional and personal success, which implies a profound reformulation of the teaching processes in the overwhelming majority of higher education institutions and their actors. For this challenge to become a reality and for the success of these processes, elements such as digital literacy, sustainability and interculturality are paramount.

Keywords: digital literacy, higher education, Society 5.0, soft skills, sustainability, transversal competences

1. Introduction

The digitalization of societies (observable in the existence and growing interconnection of elements such as Internet of Things, Virtual Reality, Artificial Intelligence, Clouds, Big Data, Blockchain, Mixed Reality, and Hyper-Connectivity) – which increasingly shapes social relationships, despite social differences embodied in digital divides – was accelerated with the COVID-19 pandemic, triggered by the Severe Acute Respiratory Syndrome Coronavirus Type 2 (SARS-CoV-2) (Ferreira & Serpa, 2021; Sá, Santos, Serpa, & Miguel Ferreira, 2021; Sá, Santos, Serpa, & Ferreira, 2021; Sá & Serpa, 2020a, 2020b, 2021; Asonitou, 2021).

One of the potential achievements of this digital society is Society 5.0 – the super-smart society (Sá et al., 2021; Ferreira & Serpa, 2018). This concept originated in Japan and means, in a simple way, that this type of society “[...] promotes sustainable social development, mobilizing the potential of the relationship of individual-cyber-digital technology” (Sá et al., 2021, p. 4) that is embodied in an improvement of the quality of sustainable life (Ferreira & Serpa, 2018).

Higher education institutions (HEIs) operate in this context, characterized by increasing interculturality due to the mobility of people, goods and ideas around the planet, and soft skills or transversal competences emerge as a critical

element to be taken into account. How should soft skills be considered and how can they be a factor of (re)legitimization of HEIs in a context of digitalization, sustainability and interculturality? This paper seeks to contribute with new insights to the discussion on this topic by analyzing strategies and processes that aim to promote the development of soft skills in higher education students – as well as the difficulties and challenges these processes entail – always making the link between digitalization and sustainable higher education development. The paper is structured as follows: first, the methodology adopted in the study that is the basis of this paper is presented; afterwards, the paper analyzes the topics (i) promotion of soft skills in higher education; (ii) definition of the concept of soft skills and its questioning; and (iii) some (un)certainities and challenges associated with the process of teaching and learning soft skills. The article closes with the main conclusions and implications.

2. Method

The methodology adopted in this paper is qualitative in nature, and the content analysis technique was used. A literature search was carried out, namely of articles and books, using, as search terms, Society 5.0, digital society, higher education, soft skills, digital, universities, and super-smart society, which were mentioned either in the title or in the abstract. The search took place between December 1 and 8, 2021, and the databases searched were Biblioteca do Conhecimento Online (online) and SCILIT (online). This literature search resulted in 47 publications, described in Table 1.

Table 1. Document Sources Analyzed and Their Characterization

Type of Document		Geographical Scope		Year of Publication			
Theoretical	Empirical	International	National	2021	2020	2019	Prior to 2019
33	14	31	16	16	16	4	11
Total: 47 publications							

Source: Authors' production.

Regarding the treatment of the data gathered, the authors used the content analysis technique (Bardin, 1995) to meet the purposes of this paper.

3. The Promotion of Soft Skills in Higher Education

Digital technology currently plays a central role in the (re)construction of higher education identity, both in individual terms – i.e., in the identity of the various actors that make up the institution, namely students, teaching and non-teaching staff and institutional leaders – and in institutional terms – i.e., in the identity of higher education institutions themselves (Sá, Serpa, Ferreira, & Santos, 2020).

In this scenario of (re)identity construction of the higher education system and academics themselves in an increasingly digital society, it is critical to rethink the role of academics in the teaching-learning process (Sá et al., 2020). On the other hand, these dynamics may be an opportunity for change, reshaping and reinvention of the academy and its place in society. In this process, it is, however, important to safeguard the respect for the academics' professional autonomy (Sá, Ferreira, & Serpa, 2020).

3.1 Digitalization and Sustainable Higher Education Development

Society 5.0, one of the paradigms of digital society, is based on the idea that the approach and resolution of social issues are carried out using technologies, based on artificial intelligence, with the purpose of offering services that improve citizens' lives, namely with the development and increase of digital infrastructures (Narvaez Rojas, Alomia Peñafiel, Loaiza Buitrago, & Tavera Romero, 2021). According to these authors, the goal of this new social functioning is to enable the "[...] establishment of societal foundations where anyone can develop value, at any time and place, in a safe environment and according to natural environments" (Narvaez Rojas et al., 2021, p. 1). This concept of Society 5.0 assumes, in short, that the resolution of everyday social problems occurs through (or with the support of) advanced technology, promoting a people-centered society (Fukuyama, 2018).

The process that Society 5.0 uses to address and solve social issues begins with the collection of data in the context where they occur, i.e., in the real world. Subsequently, these data are processed using information technology, and the results of this processing are then implemented in this real world. An iterative cycle underlies this process, which

starts with the collection of data in the real context where social issues occur, which are analyzed and form the basis for solutions implemented in the real world. There is a close connection between virtual and physical space, and the central goal of Society 5.0 is to create, in virtual space, models based on the real world, which are applied in this same real world in a differentiated and particular way according to the real problems that they intend to solve, involving society as a whole in this integrative process (Ferreira & Serpa, 2018; Gladden, 2019; Deguchi et al., 2020).

Furthermore, the ability of the various social actors to demonstrate digital literacy as consumers but also as producers of digital artifacts is vital for a necessarily sustainable development (Sá & Serpa, 2020c): a sustainable digital society (Sá et al., 2021).

As Mensah (2019) contends,

Sustainable development centres around inter-and intragenerational equity anchored essentially on three-dimensional distinct but interconnected pillars, namely the environment, economy, and society. Decision-makers need to be constantly mindful of the relationships, complementarities, and trade-offs among these pillars and ensure responsible human behaviour and actions at the international, national, community and individual levels in order to uphold and promote the tenets of this paradigm in the interest of human development (pp. 1-2).

Table 2 depicts eight key competences that individuals in general, decision-makers and social systems themselves should hold for the promotion of sustainability.

Table 2. Key Competences for Sustainability

Key Competences for Sustainability
Recognize and understand relationships, assess complex systems, and deal with uncertainty.
Anticipatory competence – analyze, understand and assess various future scenarios.
Normative competence – analyze and understand the norms and values that base one’s actions and negotiate sustainability values, principles and goals, in a setting of conflicts of interests and trade-offs.
Strategic competence – cooperatively design and implement innovative actions that promote sustainability at the local and global levels.
Collaboration – learn from others; understand and respect others’ perspectives, understand, be sensitive to others, manage group conflicts and enable collaborative and participatory problem-solving”.
Critical thinking – question norms, practices and opinions; reflect on one’s values, perceptions and actions; and take a position in sustainability issues.
Self-awareness – reflect on one’s role in the local community and society, continually assess and motivate one’s actions, and deal with one’s feelings and desires.
Integrated problem-solving competence – apply different problem-solving frameworks to sustainability problems and design viable, inclusive and equitable solutions that foster sustainable development.

Source: Adapted from Sá & Serpa (2020c).

Education for Sustainable Development (ESD) plays a key role in empowering people to change the way they think and act in and in interaction with the world and be active participants in the transformation of society. ESD is transformative inasmuch that it prepares people to be equipped with tools to develop their knowledge, skills, values and behaviors that are fundamental for developing a sustainable future and world. This new educational paradigm is based on the design of an interactive, student-centered and action-oriented teaching-learning process (Granado-Alcón et al., 2020).

In this process, and specifically in terms of the higher education arena, the notion of Sustainable Higher Education Development (SHED) is all-inclusive and involves, for example, the interaction of higher education with the surrounding environment, economic growth, social equity, equality and the improvement of populations’ quality of life (Sá & Serpa, 2020d). Education in general and, in particular, higher education thus take on high centrality, in an increasingly digital context (Santos & Serpa, 2020a), in promoting in students both competences to effectively address and meet Sustainable Development Goals (SDGs) and individual sustainability (Sá & Serpa, 2020d).

In addition to the complexity that characterizes both the environment surrounding HEIs and their functioning, the growing internationalization and even competition for attracting students between countries and institutions that have been occurring in recent decades (José Sá, Ferreira, & Serpa, 2019) increase cultural diversity in higher education (academics, syllabus, students, ...) (Sá & Serpa, 2020d). In turn, this growing cultural diversity that permeates HEIs creates the need for their actors to hold or create intercultural competences (Sá & Serpa, 2020a), considering and respecting cultural multiplicity (Mytra, Wardawaty, Akmal, Kusnadi, & Rahmatullah, 2021). Nowadays, HEIs operate in a “[...] globalized, digitalized, and multicultural world, intensely competitive and evolving at a fast pace” (Magano et al., 2020, p. 1).

3.2 Definition and Discussion of Soft Skills

The concept of competence is complex and, therefore, difficult to define. The literature offers a plurality of definitions of terms such as competences, skills and soft skills, as can be seen, for example, in the studies by Asonitou (2021), Sá and Serpa (2018), Drobotenko, Nazarova, Smagina, and Panasenko (2021), Cornali (2018), Abelha, Fernandes, Mesquita, Seabra, and Ferreira-Oliveira (2020), and Sutil-Martín and Otamendi (2021), among many others: “Soft skills, or transversal competences, are person-related and not task-specific because they are relevant in any context. Soft skills enable specific professional behaviours and are critical to the transferability of skills to different activities” (Emanuel, Ricchiardi, Sanseverino, & Ghislieri, 2021, p. 2).

Abelha et al. (2020), for example, explain the term competence as depicted in Figure 1.

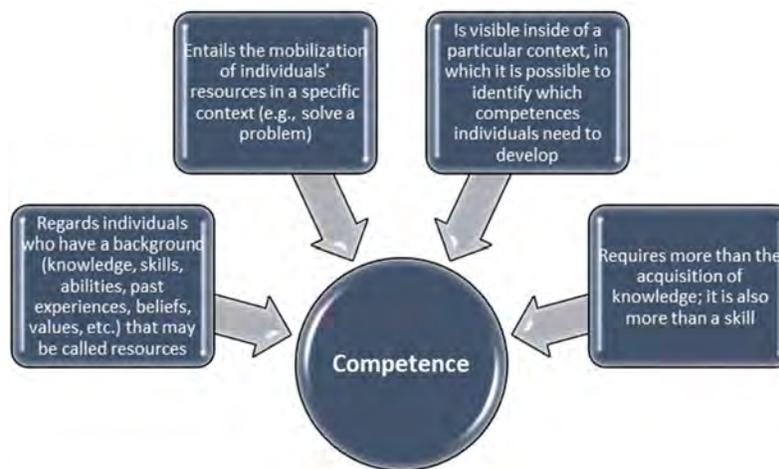


Figure 1. Features of the Concept of Competence

Source: Adapted from Abelha et al. (2020).

Regarding the term *skills*, Cornali (2018) distinguishes between two fundamental types of skills: hard and soft skills, advocating their centrality in employability. While the former entail “[...] cognitive and technical, job-specific and discipline-specific abilities” (p. 962), the latter include “[...] transferable skills that are common to almost all complex endeavours and apply across all fields” (p. 963), namely communicating, critical thinking, problem-solving, resilience, innovation and creativity.

Hard skills are more technical and specific and enable people to perform their function from a mechanical point of view. On the other hand, soft or transversal skills are transversal to all types of professions and regard characteristics that are difficult to measure because they are intangible and personal (Laguna-Sánchez, Abad, de la Fuente-Cabrero, & Calero, 2020). It is thus possible to distinguish these two types of skills according to their applicability in the labor market: soft skills can be applied to all professional or personal situations, whereas hard skills are only applicable in the situations for which they were developed (Sá & Serpa, 2018; Caggiano, Schleutker, Petrone, & González-Bernal, 2020). While the former are transversal and valued in any type of context or situation, the latter may lose their value if the context for which they were developed changes (Sá & Serpa, 2018).

Regarding the more specific notion of soft skills, which are, according to Almeida and Morais (2021),

complementary to technical and scientific training, they are explained by the authors as follows:

Soft skills are behavioral skills that are fundamental in the formation of an individual. Unlike hard skills, which include technical skills, soft skills are more difficult to define and measure. Although their definition is not consensual, [...] they are associated with social, emotional, and behavioral skills (Almeida & Morais, 2021, p. 1).

Also referred to as 21st-century skills, among the soft skills that students should develop to be successful, both throughout their academic training and, downstream, in their professional life, are critical thinking; problem-solving; collaboration; adaptability; entrepreneurialism; ability to work in teams; effective oral and written communication; information search and analysis; curiosity; and imagination (Snape, 2017). Laguna-Sánchez et al. (2020) also list these soft skills, pointing out skills such as adaptability, teamwork, work organization, autonomy, orientation towards results, ability to learn, ability to negotiate and responsibility.

Pluzhnirova, Zhivoglyad, Kulagina, Morozova, and Titova (2021) put forth the fundamental differences between hard and soft skills (Table 3), warning that, although there are professional fields in which hard skills take precedence over soft skills, these are the “skills of the future” (Pluzhnirova et al., 2021, p. 116), and, as such, should be developed in parallel and complementarity with hard skills.

Table 3. Key Differences between Hard Skills and Soft Skills

Key Differences between Hard Skills and Soft Skills	
Hard skills (professional competencies)	Soft skills (general cultural and general professional competencies)
The right hemisphere is involved (IQ, logic)	Left hemisphere involved (emotional intelligence)
Requirements remain the same regardless of the organization and its corporate culture	Requirements are fluid and situational
Mastering is carried out in professional educational institutions step by step	There are no strictly defined stages. The formation is carried out in the process of acquiring certain experience
There are certificates and diplomas	Have no certification

Source: Pluzhnirova et al. (2021, p. 116).

In their literature review on the development of non-technical competences in Information Technology (IT) students (but which can be extrapolated, to some extent, to other areas of knowledge), Hagen and Bouchard (2016) offer a conceptual framework for the improvement of non-technical competences in higher education students. The list of these competences and their explanation is presented in Table 4.

With the development of this broad set of soft skills, in parallel, naturally, with the more technical training in each curricular area, students will be more capable and prepared to face the labor market, analyzing problems and offering integrated solutions, in a logic of collaborative work. Thus, to successfully enter the current professional context, characterized by high volatility and constant dynamics, graduates should have been able to develop, throughout their higher education training, in addition to the hard skills – which are essential for the performance of a specific function or profession –, the soft skills, which are transversal and complementary to any profession (Sutil-Martín & Otamendi, 2021; Goulart, Liboni, & Cezarino, 2021).

In this growing complexity, training for the competences that allow individuals to respond effectively to the existing needs in the real world is critical, both in terms of the hard skills (directly linked to the performance of a specific function or profession, of a more technical and specific nature), and the soft skills, which include “[...]autonomy, responsibility, social interaction, personal and professional development, leadership, willingness to learn, communication, problem-solving, teamwork and creativity” (Sá et al., 2021, pp. 2-3), and also “[...] self-motivation” (p. 7). The assumption of this relevance implies that competence training in higher education should be rethought to improve the effectiveness and efficiencies of students’ specific and transversal learning.

Table 4. Classification of Non-technical Competences

Classification of Non-technical Competences	
1. Active listening	Conceptual understanding, feedback, and confirmation that a message has been effectively understood through cognitive interpretation processes.
2. Communication	Exchange of thoughts, ideas and messages aiming to solve problems.
3. Collaboration	Work-related relationships that foster benefit and risk-sharing in the process of information exchange, involving collaborative processes, notably via technology.
4. Communication technologies	Skills in the use of new technologies and media for communication of complex information to all members of the organization that aim to gather information, increase learning and/or foster consensus.
5. Creativity	Process of evaluating cognitive domains that seek to develop creative ideas.
6. Critical thinking	Ability to critically analyze and assess information.
7. Knowledge of communication	Ability to communicate with audiences based upon the understanding of communication patterns, processes and expectations.
8. Cultural knowledge of self	Ability to understand and interpret preconceptions, biases, or displays of incongruence vis-a-vis one's culture and the culture of others.
9. Knowledge of diversity	Understanding of, and respect for, diversity in race, gender, ability, and/or perspective that seeks to improve organizational results.
10. Ethics	Rules, standards, codes or principles that guide morally right behaviors and truthfulness.
11. Innovation	Conception or development of original or new processes, products or technologies.
12. Interpersonal relationship management	Relationship quality and the ability to develop and manage relationships.
13. Problem-solving	The application of problem-solving models and processes in seeking adequate solutions to problems; the ability to integrate information from different sources through the integration of several platforms, functions and technologies.
14. Professionalism	Conduct or abilities that foster value and respect for the profession.
18. Re-structuring of problems/situations	Restructuring one's mental models to better understand, interpret, and negotiate organizational problems and/or situations.

Source: Adapted from Hagen and Bouchard (2016, p. 4).

3.3 Teaching and Learning Soft Skills: (un)certainities

It follows from the above that HEIs have the key task of creating, developing and enhancing soft skills in their students so that the transition between higher education and professional life can be successful (Caggiano et al., 2020).

Employers increasingly value soft skills in the recruitment and selection processes and the candidates who hold them, as they are important for individuals to move around in today's society; thus, it is paramount that HEIs find strategies to develop both types of skills in their students (Fernández-Arias, Antón-Sancho, Vergara, & Barrientos, 2021). These authors argue that there is currently a strong awareness on the part of HEIs globally in terms of their role in the development in their students of hard and soft skills, so they have been increasingly adopting and promoting new and innovative methodologies in the teaching-learning and assessment processes, warning that teachers should also be experts in these types of skills (Fernández-Arias et al., 2021).

However, although there is this awareness of the importance of soft skills and the need to transform pedagogical practices so that these skills can be effectively developed in students, this process is not easy or straightforward. Even today, the teaching-learning and assessment processes in higher education often use primarily expository and traditional methods to train their students, which hinders a training process oriented toward soft skills (Cornali, 2018). This leads to a disparity between the skills for employability that HEIs develop in their students and the ones they actually need to succeed in the labor market. Therefore, HEIs need to foster cooperation with all stakeholders

(faculty, students, providers and employers) that bring together adequate educational processes, models and curricular approaches that promote the development and attainment of soft skills in higher education students (Arnold, Mazalu, & Uggeri, 2019).

Moreover, HEIs are characterized by their deep complexity, as they involve human beings and their education. The organizational culture as a mechanism that has proven to be successful over time in the external adaptation and internal integration of the organization (Schein, 2010), shaped by the history of HEIs, may be called into question in this change (Sá et al., 2021; Sá & Serpa, 2020c, 2020d; Serpa, Sá, & Ferreira, 2020). The organizational culture, which is specific to each organization, exerts an important influence on how the actors who are part of it view, react, respond and resist the changes it goes through over time. Here, the role of organizational leaders is vital, as they should be the first ones to accept and promote change, and, more than that, to find “[...] strategies to help their teams overcome possible foci of resistance” (Sá & Serpa, 2020d, p. 4).

Thus, HEIs need to transform themselves and their educational strategies and practices at all levels of their operation, involving, among other aspects, new pedagogical approaches that foster, in addition to formal learning, also non-formal and informal learning, placing specific emphasis on the development of transversal competences and the flexibility of the curriculum, favoring a teaching-learning process that places students at its center and ascribes them a more active role, through the use of new technologies and forms of assessment (Sá & Serpa, 2018).

Asonitou (2021) conducted a detailed literature review of impediments to skills development in higher education, depicted in Table 5.

Table 5. Impediments to Skills Development

Impediments to Skills Development	
Incompatible with teachers' professional values	<ul style="list-style-type: none"> - Development of vocational skills' agenda is against a liberal education - Absence of social, environmental and political dimensions of accounting - PABs limit academics' freedom choice about what to teach based on society's benefit - Incompatible teachers' attitudes and perceptions
Accreditation & marketization of HE	<ul style="list-style-type: none"> - Development of vocational skills' agenda shift university's purpose to support particular societal interests - Business schools have been colonized by the PABs and the business community. - Increasing marketization and commercialization of HE business and accounting courses - Reluctance to implement changes and innovations by school leadership - Accreditation limits the breadth of knowledge in Universities - Lack of space and time after accreditation requirements are met - Absence of theoretical basis to motivate academics to promote vocational skills in order that may satisfy employers' expectations. - Absence on curriculum experimentation and the continually expanding volume of knowledge
Variety of skills & expectation gaps	<ul style="list-style-type: none"> - Endless lists of skills and frameworks create confusion to educators - Significant expectation gaps in skills development make it even more difficult to find consensus - Variety and complexity of skills
Teaching vs research incentives	<ul style="list-style-type: none"> - Teaching is not as important as research - Teaching skills are a distraction to teachers' research agenda - Accounting teachers prefer to discuss research issues with their colleagues but not explore pedagogy and learning issues. - Research productivity is ranked over and above teaching excellence - Insufficient staff incentives such as promotion criteria & lack of rewarding
Resources & various teaching limitations	<ul style="list-style-type: none"> - Resource limitations - Difficulty to grade students with regards to such activities as cases and presentations objectively - Difficulty to assess teamwork activities - Lack of teaching time - Difficulty to assess the possession of the actual skills by graduates

	- Business simulation and teamwork not successfully applied as expected in universities
	- Worsening staff-student ratio (SSR)-production of technicians
	- Big class size
Students' attitude & capabilities	- Lack of student readiness, passive attitude of students, passive learning preferences of students
	- Time-management issues, unwillingness to engage actively in their learning
	- Students' lack of maturity, resistance to changes, high rate of students' absenteeism
	- Social loafers or free riders and the extra time it takes both for students and teachers
	- The level of cognitive growth of students during university
Teachers' attitudes	- Teachers risk to receive bad evaluations from students
	- Teachers' reluctance to undertake teamwork activities
	- Traditional teaching and assessment methods
	- Ethics and professional values are treated as peripheral to main program or for the sake of appearances
	- Silo structures and bureaucracy
Physical barriers	- Communication apprehension
	- Language barriers
	- Skills is a function of genetic and home/environmental factors
Cultural dimension	- Soft skills are culturally specific therefore people do not realize the necessity to re-adjust
Absence of consensus, pedagogy & teacher training	- The lack of consensus on the effective ways and the overall pedagogy that should be implemented in the accounting curriculum
	- Educators are not trained on how to teach teamwork skills based on proper methodologies
	- Part of educators find teamwork experiences frustrating
	- Doubts regarding the effectiveness of their efforts on teamwork skills with regards to their expectations
Teachers' low digital abilities & lack of resources	- Low ability of educators to embrace educational technologies
	- Lack of necessary funding and of suitable games for accounting courses

Source: Adapted from Asonitou (2021).

Thus, the literature reveals a wide range of obstacles to the implementation of strategies oriented toward the development of soft skills in higher education students, which are not only organizational or contextual but also inherent in the institutional actors themselves, namely the teaching staff and the students. HEIs are, therefore, faced with the challenge of overcoming or, at least, mitigating these obstacles to provide their students with the possibility of developing such important soft skills concurrently with the hard skills for personal and professional success at the end of their higher education studies.

In this teaching-learning relationship, the teacher abandons his/her role of dominator to become a mediator, taking on the role of helping students organize themselves in this process (Sá et al., 2021; Ferreira & Serpa, 2018; Hagen & Bouchard, 2016; Makhachashvili & Semenist, 2021). In this reshaping of the teaching-learning process, dimensions such as “[...] student-centeredness, self-reflexivity, and collaborative learning of students and teachers (co-production of knowledge)” (Sá & Serpa, 2020a, p. 6) take on a central role, insofar that they are pivotal in preparing both students and faculty for this student-centered learning (Sá & Serpa, 2020c).

All this requires a “smart education”, in which learning takes place through students’ autonomy, always mediated by the teacher (Sá et al., 2021; Makhachashvili & Semenist, 2021; Freiman et al., 2017; Santos & Serpa, 2020b; Suzuki, 2021), in a student-centered process that poses several challenges in terms of “what to teach, how to teach and why teach” (Martínez-Clares & González-Morga, 2018, p. 234). This learning of transversal competences or soft skills poses, hence, new challenges both to faculty, students and HEIs (Ferreira & Serpa, 2018; Sá & Serpa, 2020d) while respecting their specific and complex characteristics (Emanuel et al., 2021).

4. Conclusions

The increasing digitalization of a super-smart society, such as the sought after Society 5.0, raises profound

implications for learning fostered in the context of digitalization, sustainability and interculturality in higher education. What kind of competences should be taught and how? This position paper sought to analyze the centrality of soft skills in a context of increasing digitalization of a super-smart society, as well as the role and responsibility of higher education in the creation, development and improvement of this type of skills in its students.

The results of the literature search and analysis developed point toward the need for a new academic culture and greater interdisciplinarity in the higher education arena (Ferreira & Serpa, 2018; José Sá et al., 2019), understood as the promotion and use of synergies from several scientific fields (Serpa, Ferreira, & Santos, 2017, p. 45).

This context of increasing digitalization of education and society in general, being globally transversal to all HEIs, presents very variable realities, depending on contextual factors such as location, size, mission, the educational model followed and the level of access to technology (Emanuel et al., 2021; Rodríguez-Abitia & Bribiesca-Correa, 2021).

The higher education culture of interdisciplinarity enables and promotes the development in students of soft skills, which are valued, more than ever before, by the labour market, through a transformation of the teaching-learning processes toward new and innovative pedagogical approaches and curriculum flexibility, and distancing from the more expository and traditional methods. By mobilizing new technologies and forms of assessment, these new approaches also entail a shift in the institutional actors' roles, with students playing a central, active and autonomous part and teachers taking on the role of mediators and enablers. HEIs should seek to implement these new educational models based on SHED, interacting with the surrounding environment, economic growth, social equity, equality and the improvement of populations' quality of life. This is the core of "smart education".

Future research in this topic should, then, look closely at this re-shaping of higher education teaching-learning processes, assessing whether these fundamental changes are taking place and whether hindrances are being addressed and overcome.

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