EDULEARN22

14th annual International Conference on Education and New Learning Technologies

Palma de Mallorca (Spain). 4th - 6th of July, 2022.

Student's Digital Transformation During Higher Education: Entrance and Exit Digital Profile

Inês Messias | Ana Loureiro

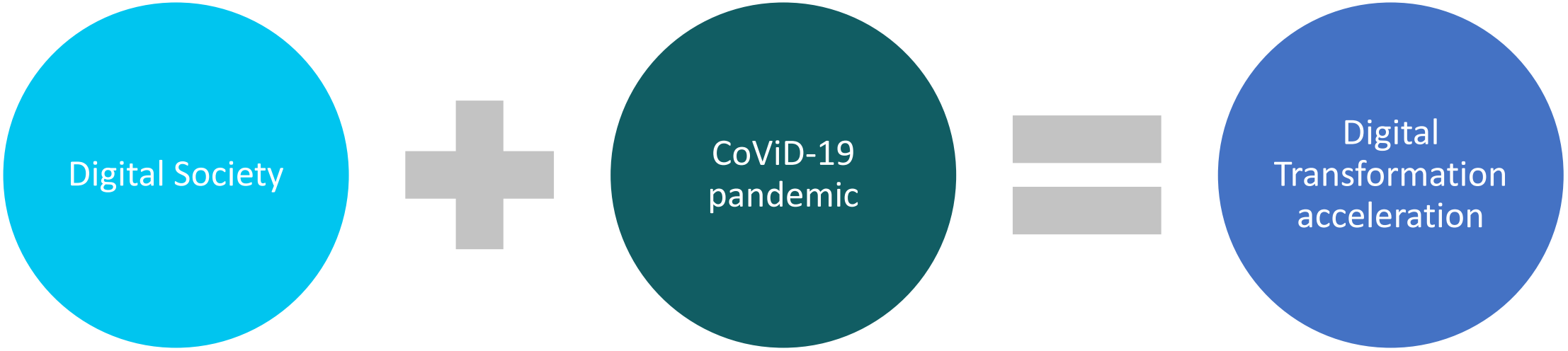
POLITÉCNICO DE SANTARÉM
ESCOLA SUPERIOR DE EDUCAÇÃO

LE@D LABORATÓRIO DE EDUCAÇÃO A DISTÂNCIA E ELEARNING

istar_iscte

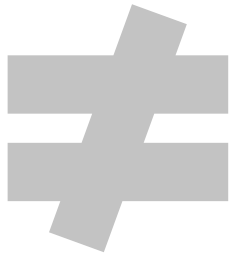
cieqv

The study's context



The study's context

Digital Natives
(Pensky, 2001 & 2007)



Digital Competency

Being born surrounded by digital technology does not automatically empower people with the competencies and skills required to master the more technical and complex digital tasks, such as computational thought and programming (Sánchez-Caballé, et al, 2020).

The study's context

Digital tools are used daily to…

Facilitate daily tasks

Informal communication

Leisure activity

The study's context

Students have only
basic level competencies
(A. Sánchez-Caballé et al.; 2020)

Lower than EU average
Human Capital
(DESI indicator for Portigal in 2021)

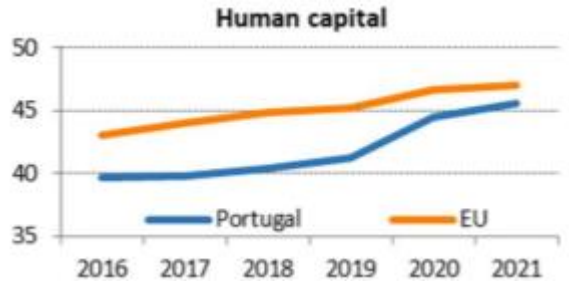


Figure 3. Human capital DESI indicator for Portugal in 2021

The latest 2021 Portuguese DESI report states that our country's initiatives to improve this indicator includes the "digital literacy of schools, by increasing the digital literacy of 1,000 students in the third and secondary study cycles."

The study's context

European Institutions have as goal to empower students and by extension all citizens to master higher level computational skills.

DigComp 2.0 (2013)

DigComp 2.2 (2016)

Gothenburg Summit (2017)

European Skills Agenda (2018)

European Education and Research Area (2021)

Europe's Digital Decade (2021)

The study's context

European Institutions have as goal to empower students and by extension all citizens to master higher level computational skills.

DigComp 2.0 (2013)

DigComp 2.2 (2016)

Gothenburg Summit (2017)

European Skills Agenda (2018)

European Education and Research Area (2021)

Europe's Digital Decade (2021)

The study's context

ICT skills are offered as part of basic to secondary study cycles, however, classes are only 45 min per week, and most school offer only ICT during 5th grade.

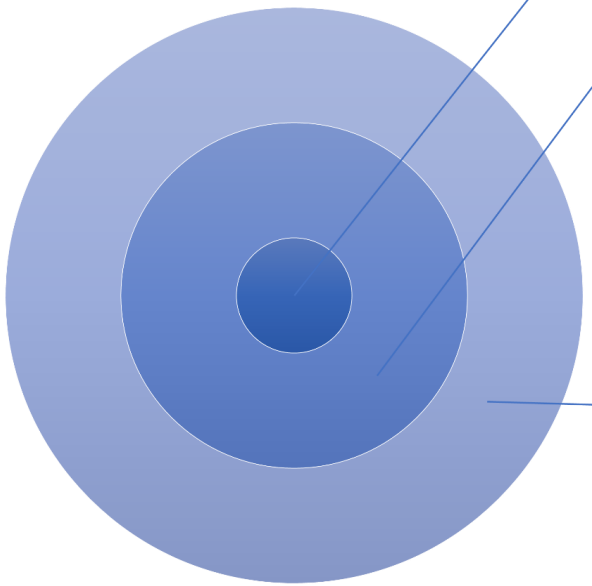
7 years without ICT classes have gone through when they reach Higher Education Institutions.

The study's Goal

To **understand HEI students' ICT and Digital skills**, when they enter and when they leave **HEI**, enabling us to portrait their **transformation and growth**, as well as their **exit profile**, and the verification that our students enter the labour market with all the skills needed.

Students' profile at the end of basic education

In 2017 the education department of the Portuguese Republic defined and published a referential to set a common matrix to all schools of basic learnings that students have to acquire when they reach the 9th grade.



Values: Freedom, Responsabilty and Integrity, Citizenship and Participation, Excelency and Exigence; Curiosity, Reflection and Innovation

Competencies areas: Language and Texts, Information and communication, Critical and criative tought, Reasoning and Problem Resolution, Scientific and Technological knowledge, Interpersonal relationship, Authonomy and Personal development, Health, Well being and Environment, Aestectic and Artistic Sensitivity, Coinciousness and master of the body.

Principles: Learning, Inclusion, Stability, Adpatabilty and boldness, Coherence and Flexibility, Sustainabilty, Humanist based, Knowledge

Conceptual framework of the students' profile at the end of basic school - OCDE 2016 Education and skills framework document

ICT Skills offered in the basic study cycles

In Portugal, since 2018, the Information and Communication Technologies (ICTs) subject is considered to the part of the Essential Learnings, to be taught during all basic school, from 1st to 9th grade and, according to the Essential Learning Framework document, 4 main skills are addressed:

1. Security, Responsibility and Respect in digital environments;
2. Investigate and Research;
3. Collaborate and Communicate;
4. Create and Innovate

ICT Skills offered in the basic study cycles

According to these established documentation by the end of 9th grade a student must be able to:

- Have consciousness of the ICT and emerging technologies' impact on society and daily activities, comprehend the need to use digital tools and internet safely, the need to adopt the rules of ergonomics to digital devices usage as well as the use of rules of creative commons and copyrights.
- Have knowledge of how to plan and do research online, formulation the right questions to gather the needed information as well as to define the right keywords, the right tools, and platforms.
- Mobilise the right strategies and tools for online communication and collaboration.
- Know the digital tools and strategies to support creativity and computational thought, producing creative digital artefacts, as well as comprehend the concept of algorithm analysing them and elaborating them to find solutions to problems, using programming concepts to mobile devices, produce, test and validate application for mobile devices.

Digital competences required at the end of University studies

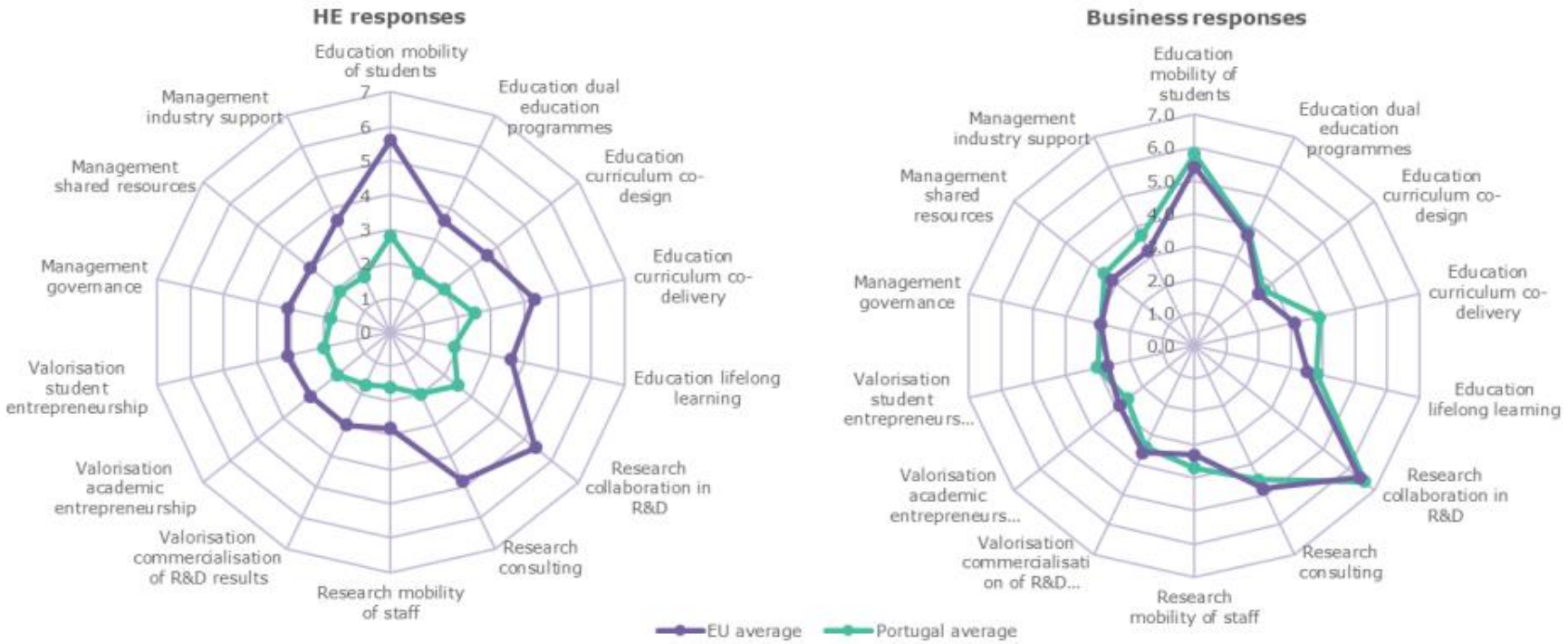
HE has a crucial role in the acquisition of the specific abilities that students will have to master as future professionals in their fields of study.

Portuguese tertiary education attainment is still very much under the European average (European Commission, 2019)

34.6% of Portuguese companies find it difficult to fill in vacancies requiring ICT skills (European Commission, 2019)

The recommendation of the EU council for Portugal included to “increase the number of HE graduates, particularly in science and information technology”

Digital competences required at the end of University studies



Source: DG EAC calculations, based on data from *State of University-Business Cooperation in Europe 2019*. Code: 0: Not at all; 1-4: Low; 5-7: Medium; 8-10: High.

State of cooperation from Portuguese HE and Business viewpoints.

Digital competences required by the work market

Training students in the digital field has positive results on students careers (Starčič et al. (2016), as cited by Sánchez-Caballé et al., 2020)

The number of jobs based on the usage and work with new technology will increase, and HE will have to answer to the call (World Economic Forum Insight Report of 2018)

Analytical thinking, innovation, active learning and learning strategies, technology design and programming, critical thinking and analysis are portrayed as trending skills, once more with focus on ICT, as shown on the following figure (World Economic Forum Insight Report of 2018).

Digital competences required by the work market

Skills demand comparison:

Today, 2018	Trending, 2022	Declining, 2022
Analytical thinking and innovation	Analytical thinking and innovation	Manual dexterity, endurance and precision
Complex problem-solving	Active learning and learning strategies	Memory, verbal, auditory and spatial abilities
Critical thinking and analysis	Creativity, originality and initiative	Management of financial, material resources
Active learning and learning strategies	Technology design and programming	Technology installation and maintenance
Creativity, originality and initiative	Critical thinking and analysis	Reading, writing, math and active listening
Attention to detail, trustworthiness	Complex problem-solving	Management of personnel
Emotional intelligence	Leadership and social influence	Quality control and safety awareness
Reasoning, problem-solving and ideation	Emotional intelligence	Coordination and time management
Leadership and social influence	Reasoning, problem-solving and ideation	Visual, auditory and speech abilities
Coordination and time management	Systems analysis and evaluation	Technology use, monitoring and control

Source: Future of Jobs Survey 2018, World Economic Forum.

Study Methodology

Implementation plan of the study's data gathering instruments.

Class/degree	Entrance /Exit	Questionnare numbers	Questionnaire date	Interview numbers	Interview date
Environmental Education and Nature Turism	Entrance	30	October 2022	3	October 2022
Basic Education	Entrance	70	October 2022	3	October 2022
Social Education	Entrance	60	October 2022	3	October 2022
Multimedia Production for Education	Entrance	30	October 2022	3	October 2022
Entrance Subtotals		190		12	
Environmental Education and Nature Turism	Exit	30	June 2023	3	June 2023
Pre-School Education	Exit	15	June 2023	3	June 2023
Pre-School Education and Teaching in 1st cycle of Basic Education	Exit	15	June 2023	3	June 2023
Teaching in 1st cycle of Basic Education – Math and Science 2nd cycle	Exit	10	June 2023	3	June 2023
Teaching in 1st cycle of Basic Education – Portuguese, History and Geography 2nd cycle	Exit	10	June 2023	3	June 2023
Social Education	Exit	60	June 2023	3	June 2023
Multimedia Production for Education	Exit	30	June 2023	3	June 2023
Exit Subtotals		170		21	
Totals		360		33	

Future Work…

The next step in order to achieve the much-needed results, will be to finalise the questionnaires and interview scripts, by validating them, so it will be possible to implement them in the planned schedule. Data will then be analysed enabling us to present the first results by next year. As we aim to also develop a framework to help us replicate this study in other HE Institutions, data and results concerning that framework will also be published in the next year, has we hope that this study can contribute to perfect the Portuguese HE offer and empower our students with the best set of skills possible.

Thank you for you attention!

Authors and contacts

Inês Messias
Laboratory of Distance Education & eLearning, Portugal
(ines.messias@uab.pt)
Polytechnic Institute of Santarém, Portugal
(ines.messias@ese.ipsantarem.pt)
Instituto Universitário de Lisboa (ISCTE-IUL), ISTAR, Lisboa, Portugal
(itsms@iscte-iul.pt)

Ana Loureiro
Laboratory of Distance Education & eLearning, Portugal
(ana.loureiro@uab.pt)
Polytechnic Institute of Santarém, Portugal
(ana.loureiro@ese.ipsantarem.pt)
Life Quality Research Centre (LQRC-CIEQV)