University students' perceptions on e-Learning: Cross-study in Portugal and Italy

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Abstract

The COVID-19 pandemic imposed dramatic changes on educational practices worldwide. This study aims to evaluate the distance learning experience of students during the COVID-19 pandemic by comparing results obtained in two countries: Italy and Portugal. A cross-sectional survey was used to analyse a survey questionnaire focused on two domains: digital skills and motivation to engage in distance learning. The results from Italian and Portuguese students indicated that majority showed a positive attitude towards online learning and the digital hybrid pedagogy. The recent e-learning experience created complex challenges and a variety of opportunities at the same time. Students and university staffs' need for training was highly associated with motivation, engagement and connection with colleagues rather than with the infrastructures offered or the development of computer literacy.

Keywords: COVID-19; digital skills; students' perceptions; students' motivation.

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1.   Introduction

The Coronavirus pandemic (COVID-19) has had a major impact on higher education worldwide. In culture, science and education, 80 million higher education students were deprived of face-to-face learning due to the outbreak of the epidemic (Khan, Nabi, Khojah & Tahir, 2021; Cavus, Sani, Haruna & Lawan, 2021). While public health officials mainly agree that the general threat of COVID-19 is best fought with measures of social distancing, the specific acts of instituting emergency e-Learning protocols do not alter the pandemic itself, but only indirectly, by limiting face-to-face classroom interactions. In response to this pandemic, European universities have been closed since March 5-9, 2020. Faculties rushed to transpose curriculum to an online environment and, throughout the course of March, Italy, the most severely affected European country in the early phase, imposed strict measures on March 9th and 11th, 2020.

In Portugal, stringent measures were imposed at the same time, a few days later, between 14-17 March. This involved mastering a nationwide quarantine in response to the alarming increase in the number of cases, which posed a serious threat to the capacity of the Italian and Portuguese healthcare systems (Farinha, Azeiteiro & Caeiro, 2018). HEIs immediately turned to online learning to launch educational and pedagogical programs. To control the spread of COVID-19, the minister of higher education decided to keep universities under lockdown and proceed with e-learning education until September. After this moment, many universities continued to support and encourage online classrooms (Borges & Benayas, 2019; Mishra, Gupta & Shree, 2020).

To reduce the flow of people, many universities and polytechnic schools decided to function with a week at school with presential classes and a week at home with distance learning (Pereira, Dias, Carvalho & Noronha, 2021). At Porto Polytechnic schools, half of the students, with an inscription number impair, class goes to school one week, the other group, students with an inscription number pair, goes on the next, and so on. In the week where students are at home, they have classes at a distance, and they perform tasks in the schedule as if they were at classes, with the support of a teacher, which guides them through the script of distance learning classes. In other schools, students have classes at distance and go to school two days a week only for practical subjects.

E-learning is one of the current methods of this century that provides greater effectiveness to students and allows them to manage greater responsibility (Ionescu et al., 2020). The learner becomes more skilled to find out, research, set up, and acquire high-level learning skills (Lynch, 2020).   It is valued as a modern form of student-centred, interaction-oriented learning delivery that provides a learning environment from anywhere, at any time, with various sources of digital technology (Popa et al., 2020; Aboagye, Yawson & Appiah, 2021). In this learning environment, the teachers' role is not limited to providing knowledge (Alves, Lopes & Precioso, 2021).

1.1. E-learning education perceptions, barriers and opportunities

They go further by creating new situations that stimulate learning and give meaning to knowledge. International tendencies towards a more overall blended learning approach using more

digital pedagogies to encourage and grow students' learning have emerged in higher learning institutions since late 2000/1999.

Within two decades, there have been advancements in the use of technology in the field of education (Alves, Lopes & Precioso, 2021). There have been increased levels of sophistication and effectiveness in several universities that have embraced digital learning (Becker, Newton & Sawang, 2013). Technology will reshape the universities by 2030. Though the online system of education is considered as rather new, according to research, in the future, it will just be as effective as university-based methods (Ali, Uppal & Gulliver, 2018). Rapid developments in technology have made distance education easy (Almaiah, Al-Khasawneh & Althunibat, 2020). "Most of the terms (online learning, open learning, web-based learning, computer-mediated e-learning, blended learning, m-learning, for ex.) share the capability to use a computer connected to a network, that offers the feasibility to learn from any place, anytime, with any means" (Bucea-Manea-Țoniş et al., 2020). It is crucial that researchers reflect on, and analyse the efficacy of online learning in educating students. Extensive literature reviews on e-Learning education as a digital pedagogy pertaining to academic performance and perceptions revealed that most university students were enrolled in either contact learning mode or in a blended learning mode and, to a lesser extent, in open distance e-learning (ODeL) environments.

There are currently very few studies conducted on education during the COVID-19 period (Sidhu & Gage, 2021). The literature highlights that this modern method of teaching requires adequate digital pedagogy. We are moving from traditional learning to e-learning, teaching via the Internet is very different from traditional teaching methods (Valenti & Rossi, 2021). The current literature shows the students perceptions, the barriers and the opportunities related to this learning method. The literature noted that the transition from the traditional education system to the online education system had been successful and can be useful in the post-pandemic period, especially for disabled students (Valenti & Rossi, 2021). The results of empirical studies publish a wide variety of students' perceptions towards e-learning. Swowalter (2021) found that the majority of undergraduate students tended to seek factual information on the Internet, and only about 27% of them tended to use any printed text as a source in their studies. Meanwhile, Liu et al., (2018) studied the screen reading habits and found that postgraduate students no longer preferred reading a text on a computer screen when they needed to examine the text carefully because they lacked possibilities of highlighting, underlining, and noting – i.e. all these functions possible while using printed texts. The reports provide a good number of reasons as why students are likely to learn effectively through online studies. According to the reports, students have more control over their studies and have more opportunities at their disposal for reflection. It is reported that successful online students tend to be organised and are self-starters who can accomplish their work without close supervision (Zhang, Shaikh, Yumashev & Chłąd, 2020).

Directions in educational research suggest a rising interest in how learning environments and teaching strategies may influence the growth of critical thinking (CT). E-learning environments forwarded the opportunity to apply constructivist overviews and customised learning in any case of time and frontiers. It is demanding to foretell what the educational view will observe like after COVID-19 passes, in part because of the mark of the people spread threat caused by campus interactions (Radha, Mahalakshmi, Kumar & Saravanakumar, 2020) . However, works to normalise emergency e-Learning monitors exactly because post-pandemic pedagogy appears unreasonable to hold up the education

sector of the opportunity for open discussion on how the branch can be emancipatory for all students. Distance, scale, and distinctive teaching and learning are the three biggest challenges for online teaching. Innovative solutions by institutions can only help us deal with this pandemic (Radha, Mahalakshmi, Kumar & Saravanakumar, 2020).

1.2. Purpose of study

The primary purpose of this study is to investigate university students' perceptions towards the sudden transition to online learning during the COVID-19 outbreak and to determine the type of learning that the university students, Italian and Portuguese, will adopt after the lifting of the containment measures COVID-19 (post-COVID-19). This context leads to the questions:

What are the perceptions of university students towards online learning during the COVID-19 outbreak?

Are there any significant differences in university students' perceptions of online learning during the COVID-19 outbreak regarding their gender, age, and nationality?

Regarding education level, are there any significant differences in university students' perceptions of online learning during the COVID-19 outbreak?

Which type of learning will university students adopt after lifting the containment measures COVID-19 (post-COVID-19)?

2. Materials and Methods

2.1. Participants

The sample is non-probabilistic and consists of 140 subjects: in particular, 70 subjects belong to the Portuguese group, coming mainly from Porto city and other cities of northern Portugal; 70 Italian subjects, concentrated in the Region of Lazio. The sample's geographic distribution is based on the relationship between <authors 1, 2 university> and <author 2 university>.

2.2. Data collection instrument

The adopted method is the descriptive quantitative based on a questionnaire on Student Perceptions of Online Learning. Relying on the study conducted by Peters et al., (2020) the researchers developed the questionnaire. It includes 4 positive and 2 negative items in addition to demographic variables (age, sex, and level of education, digital tools, and the Internet) and a question on the mode of education that students will adopt after the coronavirus lockdown. The students' perceptions of online learning were assessed on a five-step Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The Cronbach α obtained showed that the questionnaire is highly reliable ($\alpha = 0.864$, N = 140).

The data were collected through an online survey using a Google Forms tool conducted over 30 days from July 2020 for Italian students and 30 days from June for the Portuguese. It was conducted anonymously; no personal information has been identified.

2.3. Data analysis

The researcher applied descriptive statistics (means, standard deviations), one-way analysis of variance (ANOVA), and an independent t-test for the interactions among the variables of the study using SPSS software (Statistical Package for the Social Sciences), version 26. In the Portuguese sample,

around 72% of students are female and 28% male. The ages are in the range of 21- 30 years, which is about 91,4% of the students.

Regarding their city, 82,9% are from the district of Porto. From the total of the students, 78,6% of them are in the second year of the Accounting and Management Course (daytime schedule) and 72,9% of them don't work. Most of them intend to continue studies in accounting and finances, management and auditing. In the Italian sample, more than 85% of the students are female. The range for age 21 to 30 years old has 85,7% of the students.

Regarding location, more than 65% of the students are from Rome and 24,3% from the rural area around Rome. About 91,4% of the students are in the third year of frequency at the Roma Tre University Degrees. The majority of students don't work, around 74%; however, the ones that work have more than three years of experience in the labour market. Concerning their intention to continue studies, the majority intends to continue their studies in the field of Educational Sciences (35,7%), Education and Continuous Training Sciences (17,1%).

3. Findings

3.1 Portuguese students: perceptions, barriers and opportunities of E-learning

This section provides a concise and precise description of the experimental results, their interpretation, as well as the experimental conclusions.

Table 1 :*Descriptive analysis of the Portuguese sample*

		Gender	City	Age	HEI	Course	Course year	Work situation	Work field	How long work	Continue studies	Field of studies (cont.)
N	**Valid**	70	70	70	70	70	70	70	70	70	70	70
	Missing	0	0	0	0	0	0	0	0	0	0	0
Mean		1,27	1,39	1,97	1,00	1,27	2,19	1,73	4,07	4,03	1,17	2,56
Median		1,00	1,00	2,00	1,00	1,00	2,00	2,00	5,00	5,00	1,00	2,00
Std. Deviation		,448	,982	,293	,000	,448	,597	,448	1,428	1,494	,380	1,390
Variance		,201	,965	,086	,000	,201	,356	,201	2,038	2,231	,144	1,931

From the values presented above it is essential to highlight the value of the media in the variables gender, course, work situation and continued studies. The mean values in the variables indicated in the range (1.17; 1.73), showing that the number of female students is higher than the number of males, the course they attend is accounting and administration in daylight hours and a large number of students intend to continue their studies. The standard deviation values in the range (0.380; 0.448) indicate that the number of observations is within the mean value, so there is a low variability of the data. The variables in the range 1;5, cover city, university, year of course, area of work, how long they have been working and area of study, for students wishing to continue their academic process, have very diverse mean and standard deviation values. The city of origin of these students are cities of the district of Porto. Students who have been working for 27% for more than 5 years in accounting, management and commercial (31.4%). Of the students who intend to continue their studies in accounting, finance and management (42.9%) and auditing (35.7%), at the Masters level.

Regarding the substitution of face-to-face classes with distance classes in a situation of confinement due to COVID disease, most of the students agreed (83%). Regarding academic rigour and rules during this period of distance learning students strongly believe that it is not the same as if they were in the classroom. Students assume that the interaction between them and teachers was not the same as if they were in the classroom (54,3%), and some of them argued that "it depends on the teacher". Concerning distance learning vs their performance, students believe (57,1%) that it was detrimental to their level of proficiency and ultimately in their grades, mainly due to the evaluation tests are done in Moodle.

From the digital platforms, they used ZOOM, Microsoft Teams and Moodle, the last one was the one that students liked the most. The major difficulty in distance learning was the fact that students felt easily disconnected while at distance lessons (75,7%) and some of them argued that difficulty in reading on a computer or mobile phone was a strong constraint to be connected and motivated in distance lessons. When asked about their motivation and if it was the same when they were in the classroom, students presented arguments such as: "The extension in time of this teaching method"; "The lack of face-to-face contact with colleagues"; "Easy distraction at home"; "The lack of interaction with the teachers made the lessons very monotonous" and "Lack of concentration and tiredness", to point out the lack of motivation during this period (80%). Would it have advantages in the continuity of face-to-face complemented by distance learning? The question intended to know what students felt, in general, during the distance learning and if they considered their maintenance in the future. From the students who answered the questionnaire, 80% considered that distance learning shouldn't be combined with face-to-face classes.

3.2 Italian students: perceptions, barriers and opportunities of E-learning

The questionnaires for the Italian sample were administered via Google Form and through Skype calls. Data were collected and analysed by quantitative analysis, according to the method previously used by the Portuguese group of researchers. Bearing in mind the figures in the figure below, minimum and maximum values, differ in the variables gender, labour status, intention to continue studies, where the response scale was "Yes" or "No", for these variables the mean values vary between 1.14; 1.73 and 1.30, meaning that the responses are in the median value of 1 for the first and third variable and 2 for the second. For the remaining variables, the minimum and maximum values are between 1 and 5, with the variable "University values of 1, since all the students who answered this questionnaire were from the University of Rome Tre. The mean values in these variables are in the range (2.19 and 4.07).

Table 2: *Descriptive analysis Italian Sample*

		Gender	Location	Age	University	Course	Frequency year	Work situation	Work field	Years of work	Intend to continue studies	Field of studies
N	Valid	70	70	70	70	70	70	70	70	70	70	70
	Missing	0	0	0	0	0	0	0	0	0	0	0
Mean		1,14	2,19	2,21	1,00	2,93	3,03	1,73	4,07	3,36	1,30	2,93
Median		1,00	1,00	2,00	1,00	3,00	3,00	2,00	5,00	4,00	1,00	3,00
0td. Deviation		0,352	1,747	0,562	0,000	1,722	0,510	0,448	1,428	0,948	0,462	1,722
Variance		0,124	3,052	0,316	0,000	2,966	0,260	0,201	2,038	0,900	0,213	2,966
Minimum		1	1	2	1	1	1	1	1	1	1	1
Maximum		2	5	4	1	5	5	2	5	4	2	5

For the variables gender, age and intention to continue studies the values are 8,882, 7,268 and 3,132, respectively. Thus, we can measure that the distribution is asymmetrical positive, to a significance level of 0.05, showing that there is a predominance of women aged between 21-30 years and the intention to continue with the studies is higher than that of not continuing.

Regarding the substitution of face-to-face classes with distance classes in a situation of confinement due to COVID disease, about 63% of students agree, while 9% say they have no opinion. Concerning the fact that interaction between teacher and student is similar to face-to-face classes and about whether the rules and academic rigour are the same in distance learning, 54% of the respondents believe that interaction is not the same and 47.1% consider that academic rigour is not the same because "it depends on the teachers involved". Students express their concern about the fact that there is no single way of teaching at distance, so that there is not the same treatment for students, both in terms of interaction and in terms of academic rigour.

The limitations or threats intern to the teaching method are customisable for each student but have strictly the same academic program. There aren't enough guidelines to design and customise a new scenario post-pandemic. Students identified major difficulty in distance learning the technological tools made available and other aspects related, such as accessibility, internet connection, not having a computer, not being easy to read from a mobile phone (32,9%). Regarding the time dedicated to organising, planning, to perform the works and tasks proposed by teachers in all the subjects (27,1%) considers Digital competencies were the last difficulty identified by students, some of them acknowledge the lack of mastery in using computers (17,1%).

To the question "How many hours a week do you spend studying", 84,3% of the students referred more than 3 hours. When asked if they felt "overburdened by the tasks you have to perform during this period" 51,4% don't agree. When asked if DAD has been detrimental to their learning process, 60% of the students answered "No", which has been a surprise, considering their answers to the previous questions. Many students even refer that they had more time to reflect on the thematic. Concerning the digital means made available and their adequacy to the distance learning imposed, most of the students agree that the technological means were not adequate.

The digital media used in this distance learning, such as ZOOM, Microsoft TEAMS and Moodle were in general "good" for students, followed by Microsoft TEAMS (58,6%) and ZOOM with 58,5%. The support provided by the teachers during this period was sufficient for 72,9% of the students. It would be advantageous to continue DAD combined with face-to-face for 87,1% of the students in a normal situation.

3.3 Portuguese Students: Soft-Skills at DAD

Regarding soft skills acquisition versus distance learning, the data shows a mean between the range 2,64; 3,57, for soft skills present in this study. Adaptability and flexibility are the skills that students consider the most important in digital environments. Critical thinking and self-confidence present similar values for mean 2,97 and 2,91 respectively; however, the variance indicates that students had distinct considerations on critical thinking, 35,7% of them consider excellent, while 48% consider insufficient and sufficient.

Table 3: *Descriptive Statistics Soft Skills Portuguese Sample*

	Mean	Std. Deviation	Asymmetry	
			Statistics	Std. Error
DAD is fundamental for the acquisition of soft skills	1,79	,939	,510	,287
Teamwork	2,64	1,570	,480	,287
Critical thinking	2,97	1,541	,220	,287
Adaptability/Flexibility	3,57	1,399	-,363	,287
Self confidence	2,91	1,432	,155	,287
Ethical work	2,76	1,449	,439	,287
Creative leaderships	2,80	1,461	,301	,287

The soft skill self-confidence has a distribution of answers similar for all the scale values, near 20%. As for teamwork and ethical work soft skills, the positive asymmetry 1,672 and 1,529 explain the value of 58,6% of students "insufficient and sufficient" answers. In general, and regarding the answers to the question "DAD is functional for the acquisition of soft skills" 58,6% of the students agree. These values are fundamental for understanding students' opinions concerning the six soft skills in analysis.

In Anova analysis independent variables are called factors, and there is only one factor before One-Way Anova. This is an extension of the Student t-test used in the comparison of two averages, as One-Way Anova allows two or more averages to be compared. It can be seen that the percentage of the variation of the variables under analysis explained by the students' agreement that distance learning can enhance certain soft skills lies in the range 1.93 - 10.17, and with other factors falling within the range 89.83 - 98.06, for critical thinking and creative leadership, respectively.

3.4 Italian Results: Soft-Skills at DAD

The aim is to find out whether distance learning enhances the acquisition of specific soft skills, namely teamwork, critical thinking, adaptability/flexibility, self-confidence, ethical work and creative leadership.

Table 4: *Italian sample and soft skills' significance and development potential*

	N	Mean	Std. Test Statistics	Minimum	Maximum	Percentiles		
						25º	50º (Median)	75º
DAD is fundamental for the acquisition of soft skills	70	1,76	,939	1	3	1,00	1,00	3,00
Teamwork	70	2,87	1,970	1	7	1,00	2,00	4,25
Critical thinking	70	3,17	1,857	1	7	2,00	3,00	5,00
Adaptability/Flexibility	70	4,04	1,967	1	7	2,00	4,00	6,00
Self confidence	70	3,10	1,762	1	7	2,00	3,00	4,00
Ethical work	70	3,01	1,907	1	7	2,00	2,00	4,00
Creative leaderships	70	3,01	1,845	1	7	2,00	2,00	4,00

By analysing the answers to the question "Do you think the DAD is functional for the acquisition of soft skills" the mean (1,76) and the median in 1 demonstrate that students agree that distance learning can enhance certain soft skills. The minimum and maximum values for the 6 soft skills in question are between 1 and 7, with average values above 3, the soft skills critical thinking, self-confidence,

ethical work and creative leadership. The soft skill adaptability/flexibility was the one with the highest value 4.04.

Normality is inferred by the Kolmogorov-Smirnov and for the K-S test; the normality of the sample has been checked. In Anova analysis it can be seen that the percentage of the variation of the variables under analysis explained by the students' agreement that distance learning can enhance certain soft skills lies in the range 1.78 -11.11, with other factors falling within the range 88.88 to 98.20.

4. Discussion

This study aimed to investigate university students' perceptions towards the rapid passing to online learning during the COVID-19 outbreak and to determine the type of learning that students of the university will adopt after lifting the COVID-19 containment measures (post-COVID-19). Many past studies have found that students' perceptions of online learning are more positive than negative (Betancourt-Odio et al., 2021).

A greater number of these studies were conducted in developed countries and before the period of containment of COVID-19, where students were well-prepared to use e-learning. Thus, the students or the participants of the sample of this study experienced several technical, psychological, and pedagogical obstacles to online learning (Tejedor, Cervi, Pérez-Escoda & Jumbo, 2020). They found flaws with the lack of personal computers, deficiency of communication with teachers, stress, lack of time, and the number of homework assignments.

Considering gender effect, this empirical contribution found that both female and male students held relatively similar negative perceptions towards the sudden transition to online learning (Capone, Caso, Donizzetti & Procentese, 2020). Contrary to what was expected, the older students were more positive than the younger ones. The older students were more positive towards online learning than younger students were. (Savarese et al., 2020). The older students want to finish their academic year as they get closer to their graduate academic degree.

With the containment measures and social isolation due to the COVID-19 pandemic, online learning becomes their only way to achieve their goal (Poce et al., 2021; Appolloni et al., 2021). Generally, online learning has saved time and assisted the educational process. Online learning answered many difficulties; for example, the university students who were compared with several theoretical and psychological barriers and the inadequacy of interactivity with the teachers were untied from a fixed university time commitment that is imposed by traditional education (Quintiliani et al., 2021).

5. Conclusions and Recommendations

A correct comparison between countries would need appropriate analytical consideration of variables considering sociocultural, involving educational systems, political, and structural circumstances in each country. In an essay to help the reader better perceive each country's punctual setting, we incorporate information about the containment measures established in these countries in a timeline specifying the data collection period. We also have observed some challenges unfolding with alternate delivery structures, particularly concerning the rapid digitalisation of curriculum. The authors can already specify from the analysis carried out that the differentiation between the e-learning university students' perceptions is not very positive. The findings from the study suggest that the implementation

of online learning programs was a great idea as the majority of the sampled students supported the initiative

In conclusion, this work presents some fields of future action in our research. On one hand, there is an imperative for higher education to rethink curricula by employing more teaching-integrated technologies into pedagogy to accommodate diversity in student learning. It is imperative that emancipating and transforming teacher education programs for a quality education system will require creative and innovative strategies for empowering students and teachers for the classroom of the future. On the other hand, we must design an array of potential teacher education programs relevant and compatible in this challenging society.

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