COVID-19 y el aprendizaje en línea en la educación superior. Un estudio de caso de alumnos de los Institutos Politécnicos de Portalegre y Beja

COVID-19 and online learning in higher education. A case study of students from Portalegre and Beja Polytechnic Institutes

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RESUMEN.
Desde principios de la primavera de 2020, las instituciones de educación superior portuguesas, así como otras instituciones educativas de todo el mundo, han experimentado una "migración" masiva sin precedentes de la educación presencial tradicional a la educación en línea. El cambio masivo de modelos de enseñanza y aprendizaje saca a relucir diferentes percepciones de varias partes. Hay algunas ventajas y desventajas en este tipo de modelo de aprendizaje. El propósito de este estudio es investigar la percepción de los estudiantes sobre el aprendizaje en línea en un escenario de una pandemia de COVID-19. El sujeto de esta investigación son estudiantes de dos Institutos Politécnicos Portugueses (Portalegre y Beja). El instrumento utilizado es un cuestionario de encuesta en línea, anónimo y voluntario, enviado a estudiantes de licenciatura en ingeniería de las dos instituciones. Este estudio no solo informa que el aprendizaje en línea es bueno en medio de la pandemia de COVID-19, sino que también destacó la disponibilidad de acceso a Internet y computadoras o teléfonos celulares. Las principales conclusiones muestran que el impacto fue varonilmente negativo desde la perspectiva de la percepción de los educandos, habiendo referido principalmente la carga de trabajo y también la dificultad para aclarar dudas en el tiempo como factores importantes que influyeron muy negativamente en su rendimiento académico. Asimismo, se mencionó como aspecto negativo el distanciamiento social de los compañeros. Finalmente, la gran mayoría de los encuestados expresó una clara preferencia por la educación presencial para el próximo año académico.

PALABRAS CLAVE.
Covid-19, aprendizaje en línea, educación superior.

ABSTRACT.

Since the early spring of 2020, Portuguese higher education institutions, as well as other education institutions around the world, have been experiencing an unprecedented massive "migration" from traditional in-class face-to-face education to online education. The massive changing models of teaching and learning brings out different perceptions from various parties. There are some advantages and disadvantages in this kind of learning model. The purpose of this study is to investigate the learners' perception on online learning in a scenario of a COVID-19 pandemic. The subject of this research are students of two Portuguese Polytechnic Institutes (Portalegre and Beja). The instrument used is an online survey questionnaire, anonymous and voluntary, sent to undergraduate engineering students of the two institutions. This study not only report that online learning is good during COVID-19 pandemic, but also spotted the light on the availability of internet access and computers or cell phones. The main conclusions show that the impact was manly negative from the learners' perception perspective, having mostly referred the workload and also the difficulty in clarifying doubts in time as major factors that had a very negative influence on their academic performance. Also, the social distancing from colleagues was mentioned as a negative aspect. Finally, most respondents expressed a clear preference for face-to-face education for the next academic year.

KEY WORDS.

Covid-19, online learning, higher education.

1. Introduction.

In formal educational context, the use of expository methods essentially supported by teacher's action are still frequent in Higher Education. However, the defence of a new educational model centred on the student, oriented to promoting meaningful and profound learning that results from action and active student involvement has increased. In line with the defence of a new teaching paradigm, educational policies for Higher Education, both in Portugal and in other countries, has been trying to print a pedagogical change with respect to the teaching-learning model, with a growing appreciation of student-centred learning. In the European context the Bologna Process was responsible for intensifying the defence of an educational paradigm shift that will from teaching to learning (Almeida and Vasconcelos, 2008; Leite and Ramos, 2014; Ramos et al., 2013; Sin, 2015). Recent guidelines related to the Bologna Process, specifically the Standards and Guidelines for Quality Assurance in the European Higher Education Area (ESG, 2015), clearly announce the need to prioritize the student-centred learning: "institutions must ensure that programs are developed in a way that encourages students to take an active role in creation of the learning process, and that the students' evaluation reflects this approach " (ESG, 2015, p. 9). The Bologna Process has therefore been an important driver of changes in pedagogical practices that the investigation had been highlighting. COVID-19 pandemic has a massive impact on global human life and was felt also by the education world. According to Allo (2020) this has been recognized by the United Nations education, Scientific and Cultural Organization (UNESCO) on 5th Mars 2020 and also that nearly 300 million students interrupted their school activities thus threatening

their future. Several studies have been recently reporting the impacts of the massive online learning in different fields and levels of education, as for instance the Bączek *et al.* (2020) July preprint, concerning the perception of Polish medical students. These studies have showed that some positive aspects of online learning are far outweighed by negative aspects, and that the maintenance of online teaching and learning, in face of the maintenance of a pandemic situation, will imperatively need adjustment and improvement of pedagogical methodologies for an assertive transmission of knowledge in order to mitigate such aspects. The purpose of this study is to investigate the learning perception of undergraduate engineering, education, and health students from two Portuguese Polytechnic Institutes (Portalegre - IPP and Beja - IPBeja), located in two low density territories of Portugal.

2. E-learning.

E-learning is recognized being particularly suitable for adults' students as it offers the possibility to happen anywhere at any time. The exploration of the role of the teacher who teaches distance learning is duly grounded in the literature regarding the teaching / learning process of adults at a distance. This investigation takes this into account, and explores the perspective of how the educational process and the role of the teacher is developed at a different pace, with different approaches to teaching and learning. This difference results from the entirely online environment helping to develop new skills and dynamics that influence the teaching-learning process and differentiate it from the traditional process. Distance learning is aimed at adults and presupposes that adults tend to be responsible, practical and social, contributing their varied experiences to the learning process. These adult students have different levels of autonomy, diverse in situations (Grow, 1996), requiring different types of intervention by teachers at different stages of the learning process. Bandura (1986) describes the importance of social learning and the validity of learning by observation. Lawler (2000), on the other hand, suggests that learning environments should be based on previous experiences, which help to promote active participation by promoting collaborative learning, and should provide real and transferable applications. There is an increasing need for the teacher to adopt flexible functions in response to the needs of adult students. According to Palloff (2001), the discussion about the role of the "online teacher" in adult learning is guided by a constructivist perspective, where adult students create their own knowledge, which is centered on the student and not on the teacher. In Portugal, distance learning is still not common in all higher education. however, due to the pandemic, the country was forced to resort to this type of education, albeit in a different way between universities, polytechnic institutes, and regular education.

3. Higher education and distance learning.

From 2006, the Portuguese higher education system (ES) has undergone profound changes, having expanded its training offer. Licentiate degrees, in general terms, registered a significant increase in the number of students enrolled. This increase is due to students who entered under the age of 23 (M23), through Higher Technical Specialized Courses (TeSP), those coming from foreign mobility systems and students from PALOP's (Countries of Portuguese Official Language) and also adults who attend the post-employment regime. With the

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extension of compulsory education, up to the 12th year, it is expected that young people continue their academic path, that is, that they move from secondary education to higher education, in order to graduate and work in a specialized area. Thus, employability and economic reasons are increasingly in the sights of universities. The training of specialized labor for a competitive labor market is increasingly their role (Stiglitz *et al.*, 2014; United Nations, 201). Higher education reforms aim to place universities in an international environment, where the priorities are to develop high-level research and guarantee the quality of the teaching-learning process. The reality is still far from these goals, since teachers and researchers are increasingly pressured by bureaucratic responsibilities and management positions, reducing their freedom and autonomy. In the 2020 spring, most educational institutions were forced to adopt new pedagogical practices and new ways of teaching. Teachers and students all over the world, had the need to adapt quickly to this type of education, due to the imposition of the pandemic (Covid-19) that literally threw us into "this new world" of distance learning that turns the teacher into an instrument of computer, which controls programs, content and working times. There are many roles of the teacher, in the case of the online learning teaching process. The teacher must be able to structure the materials to support learning in an effective way, being able to use a variety of techniques based on ICT (Information and Communication Technologies), as well as including problem-based learning (Rowntree, 1994). Non-traditional ways of teaching, whether based on ICT or in print, must involve and commit students in terms of time, doing to learn, since effective learning involves doing things. Students need to be guided when they are carrying out a task, thus the teacher's role is to guide them towards the sources of information they need to complete the task. In this way, students are promoting their self-learning, reaching a significantly higher level of sophistication (Laurillard, 2002).

4. Advantages and disadvantages of e-learning.

Distance education (online) has grown at phenomenal rates over the past three decades. One of the main reasons is due to the fact that more students access the higher education after completing their undergraduate education. Worldwide, enrollments in higher education have been growing steadily. Between 2000 and 2015, the number of students in higher education institutions more than doubled, from 100 million to 213 million students. In the same period, the gross enrollment rate in global higher education increased from 19% to 36%, giving access to those to whom higher education has been denied for generations (Dhanarajan, 2001). Allied to these new opportunities is also the intention to improve and develop the teaching-learning process as well as the associated additional resources, using the appropriate technology. Several studies show that distance education offers students and teachers a variety of benefits, including (i) freedom of choice / greater flexibility, (ii) time autonomy, (iii) saves time and money, (iv) more time and dedication, (v) flexibility of the place of study (for example, scarcity of space is not a problem, more scalable than instruction dependent on local resources) (Valian and Emami, 2013), and (vi) evidence results similar to traditional classroom teaching (Navarro and Shoemaker, 1999; Lin and Davidson, 1995; Sujo and Gonzalez, 2000; Dede *et al.*, 2009). Some of the disadvantages of distance learning are well identified (i) lack of productivity coupled with difficulties in dealing with programs and software used online

(Brace-Govan and Clulow, 2001), (ii) lack of interaction between student and teacher which does not happen in teaching traditional, in which they are in person in the classroom, (Schwartzman, 2001), (iii) the emergence of any feelings of isolation that the lack of face-to-face interaction can create (Stelzer and Vogelzangs, 2000), (iv) social division (Kruse, 2001).

5. Objective.

The main objectives of this study are the understanding on how the abrupt change from face-to-face to online learning was felt in the student's perspective regarding not only the academic performance, but also the impact on his personal, economic and social life. It was intended to assess what are the main difficulties experienced by students and if these difficulties were differentiated according to the undergraduate course they attended, the year and the curricular units of each course. The other objective is related to the perspective on what is the preferred type of learning (face-to-face, e-learning or mixed) and the major reasons that support that choice. The results of this study could be also used in further investigations about the attitudes and academic performance of higher education students in similar areas.

6. Methods and materials.

The survey study was based in an online survey questionnaire (of anonymous and voluntary response) structured in fifteen questions (four of them with text responses and the others ones with multiple choice) sent to all the undergraduate students attending e-learning classes of Mathematics and Statistics in the two institutions (IPP and IPBeja) in a total of 107 enrolled students. In the first part of the survey questionnaire (five questions) students were asked to enter their demographic details (gender, kind of undergraduate course, and year of study). In the second part (ten questions), respondents were given sets of options regarding the advantages and disadvantages of e-learning, from which they could choose as many as were true for them. Finally, students were also asked to rate their choice from the two methods for the next academic year or for a mixed method. The study was conducted between Mars and July months of 2020.
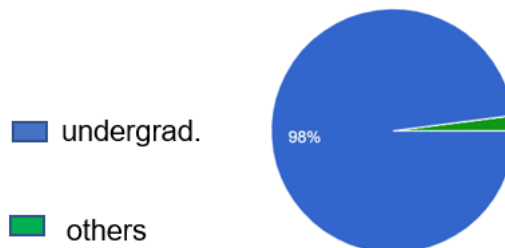
7. Results and discussion.

From the total responses, 48 were validated, thus representing 45% of response rate. From these, almost 70% are from masculine gender and 30% are feminine (graphic 1) and the large majority (98%) are students from engineering undergraduate courses (graphic 2).
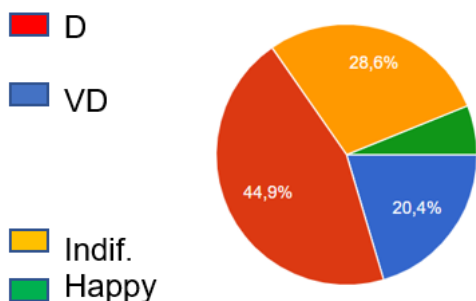

Graphic 1. Students gender.
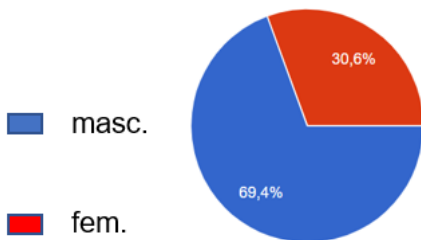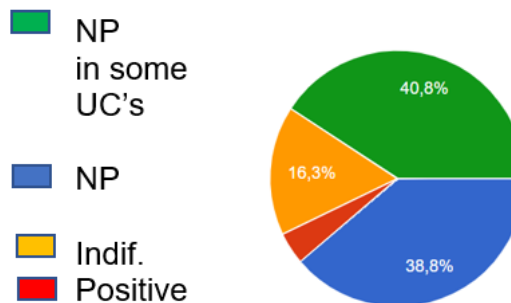
Graphic 2. Students courses.

Most of the respondents have feeling disappointed (D) and very disappointed (VD) when they knew that the rest of the semester would be made by e-learning (graphic 3).

Graphic 3. Students feeling regarding the e-learning *versus* face-to-face learning.

Graphic 4. Students perception of impact in their school performance.

According to the results obtained in the survey questionnaire, 79,6% of the student's state that e-learning as promoted a negative impact on his school performance (NP) – graphic 4. Also 75% have referred as a negative aspect the increased workload in all curricular units when compared to classroom teaching. The difficulty in clarifying doubts in time with the teacher, is another negative aspect referred by 46% of the respondents. Technical problems with IT equipment and internet access (54%) were also referred as disadvantages. These reported disadvantages are online with the statements of Brace-Govan and Clulow (2001), and Schwartzman (2001). A large majority of the respondent's (86%) state that the knowledge assessment was equal (ED) to more demanding (MD) – graphic 5. The main disciplines were these impacts are more notorious and worsen were Chemistry, Mathematics and Statistics. The positive side of online learning was the study autonomy (29%). The positive aspects of e-learning referred by the students were also identified by the Valian and Emami (2013).

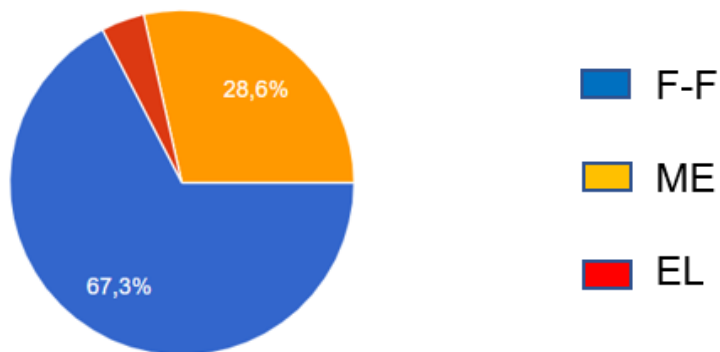Graphic 5. Students perception regarding the knowledge assessment.
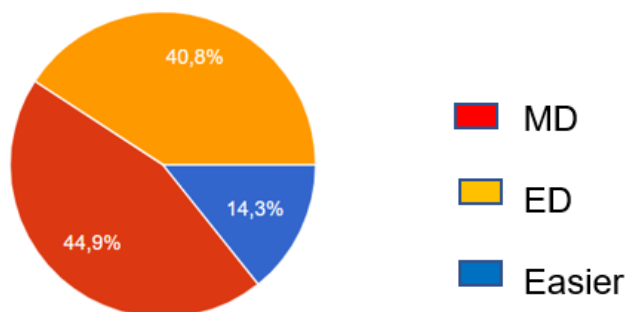
Finally, 69% of respondents indicated preference for face-to-face education (F-F), 27% mixed education (ME) and only 4% the e-learning (EL) for the next academic year – graphic 6.

Graphic 6. Students preference to type of education for the next.

This research leads us to the conclusion that, in the impossibility to restart the face-to-face teaching in a pandemic scenario, it will be absolutely necessary to keep students informed of proper education and teaching, introducing more appealing teaching methods leading to greater autonomy in the learning process.

8. Conclusions.

Self-learning requires the student to maintain self-discipline, especially in the first years of undergraduate courses, which can be difficult without direct supervision from the teacher, as stated in *Self-Directed Learning* article: "Signs of readiness for self-directed learning include being autonomous, organised, self-disciplined, able to communicate effectively, and able to accept constructive feedback and engage in self-evaluation and self-reflection" and also that "Communication of learning goals between a student and the advising instructor is critical". Poor interaction between learners and facilitators, and a lack of clarity of the purpose and goals of the learning can block the learning process. As stated by Reeve (2006), self-determination theory (SDT) assumes that all students, irrespective of their backgrounds, possess inherent growth tendencies and psychological needs that provide a motivational foundation for their optimal functioning, academic engagement, constructive social development, and personal well-being. The same theory assumes that students need supportive resources from their environment to nurture and in-volve these inner motivational resources. If they were neglected or frustrated, then students' motivation and engagement flounder. We found it interesting that respondents also assessed that they were less active and motivated during e-learning than during face-to-face classes. One of the reasons could be the lack of an interactive approach when developing e-learning courses, thus meeting what we have righting previously. Like referred by Bączek *et al.* (2020), there are different ways to boost the interactivity of online learning and one new and promising method is gamication.

Another strategy could be the implementation of a collaborative learning with colleagues from more advanced years as tutors. In this type of learning, the development of interpersonal skills is as important as the learning itself. The development of social skills in group work-learning to cooperate is key to high quality group work. Finally, this study as leads us to the conclusion that, in the impossibility to restart the face-to-face teaching in a pandemic scenario, it will be absolutely necessary to keep students informed of proper education and teaching introducing more appealing teaching methods leading to greater autonomy in the learning process centred in the student. Further research is needed to complement this study, specially conducting a survey questionnaire to other students of different undergraduate courses than engineering courses and also to students from postgraduate studies.

References

- Almeida, L.; Vasconcelos, R. (2008). *Ensino superior em Portugal: Décadas de profundas exigências e transformações. Innovacíon Educativa*, *18*, 23-24.
- Almeida, L., Araújo, C., Amaral, A. & Dias, D. (2012). *Democratização do acesso e do sucesso no Ensino Superior: Uma reflexão a partir das realidades de Portugal e do Brasil*. Avaliação, *17* (3), 899-920.
- Allo, M. (2020). *Is the online learning good in the midst of Covid-19 Pandemic? The case of EFL learners. Journal Sinestesia*, *10* (1), 1-10.
- Bączek, M., Zagańczyk-Bączek, M., Szpringer, M, Jaroszyński, A. & Wozakowska-Kapłon, B. (2020). *Students' perception of online learning during the COVID-19 pandemic: a survey study of Polish medical students*. https://doi.org/10.21203/rs.3.rs-41178/v1.
- Bandura, A. (1996). *Social foundations of thought and action: A social cognitive theory*. Englewood Cliffs, NJ: Prentice Hall.
- Dede, C.; Ketelhut, D.; Whithouse, P.; Breit, L. & Mc Closkey, E. (2008). *A research agenda for online teacher professional development.* Journal of Teacher Education, *60*(1), 8–19. doi:10.1177/0022487108327554
- Dhanarajan, G. (2001). *Online learning a social good or another social divide?* Proceedings of The Commonwealth of Learning, International Conference on Learning and Teaching Online. 10th January 2001, Guangzhou, China.
- Grow, G. (1996). *Teaching learners to be self-directed: A stage approach*. Adult Education Quarterly, *41*(3), 125-149.
- Kruse, K. (2001). *The benefits and drawbacks of e-learning &lt*. Retrieved from: http://www.elearningguru.com/articles/art1_3.htm
- Lawler, P.; King, P. (2000). *Planning for effective faculty development: Using adult learning strategies*. Malabar, FL: Krieger.
- Laurillard, D. (2002). *Rethinking University Teaching: a framework for the effective use of educational technology*. (2nd edition) London.
- Leite, C.; Ramos, K. (2014). *Políticas do Ensino Superior em Portugal na fase pós-Bolonha: implicações no desenvolvimento do currículo e das exigências ao exercício docente. Revista Lusófona de Educação*, *28,* 73-89.

- Lin, C. & Davidson, G. (1995). *Effects of linking structure and cognitive style on students' performance and attitude in a computer-based hypertext environment.* Paper presented at the National Convention of the Association for Educational Communications and Technology, Nashville, TN.
- Morgan, K; Cooper, A. & Toole, T. (2002). *Online learning must address the needs of students.* Western Mail (13th March 2002), p.13.
- Navarro, P. & Shoemaker, J. (1999). The power of cyberlearning: An empirical test. *Journal of Computing in Higher Education, 11*(1), 29-57. doi.org/10.1007/BF029408414-8ecf-d0041cedb26
- Palloff, R. & Pratt, K. (1999). Building learning communities in cyberspace: Effective strategies for the online classroom. San Francisco.CA: Jossey-Bas.
- Self-Directed Learning*: A Four-Step Process.* Centre for Teaching Excellence, University of Waterloo. Retrieved from: https://uwaterloo.ca/centre-for-teaching-excellence/teaching-resources/teaching-tips/tips-students/self-directed-learning/self-directed-learning-four-step-process
- Sin, C. (2015). *Teaching and learning: a journey from the margins to the core in European higher education policy.* In A. Curaj, L. Matei, R. Pricopie, J. Salmi & Peter Scott (Eds.), The European Higher Education Area: Between Critical Reflections and Future Policies (pp. 333-350). Springer.
- *Standards and Guidelines for Quality Assurance in the European Higher Education Area (ESG) (2015).* Brussels, Belgium.
- Ramos, A., Delgado, F., Afonso, P., Cruchinho, A. Pereira, P., Sapeta, P. & Ramos, G. (2013). *Implementação de novas práticas pedagógicas no ensino superior. Revista Portuguesa de Educação, 26* (1), 115-141.
- Reeve, J. (2006). *Teachers as Facilitators: What Autonomy-Supportive Teachers Do and Why Their Students Benefit.* Retrieved from: https://www.researchgate.net/publication/249134478_Teachers_as_Facilitators_What_AutonomySupportive_Teachers_Do_and_Why_Their_Students_Benefit
- Rowntree, D. (1994). *Preparing materials for open, distance and flexible learning: an action guide for teachers and trainers.* London: Kogan Page.
- Smith, B. & Mac Gregor, J. *What is Collaborative Learning?* Retrieved from: https://ucarecdn.com/0f543508-7516-42e
- Sujo, L.; Gonzales, C. (2000). *Been there, done that: Teaching teachers through distance education. Journal of Technology and Teacher Education, 8*(4), 351-371.
- Valian, E. & Emami, H. (2013). Online Education: definition and advantages in adult education. *Life Science Journal, 10*(6), 27-39.