Higher Education Polytechnic Students' Perspectives on the Transition to Emergency Remote Teaching

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Abstract—**COVID-19 pandemic forced higher education institutions to make a sudden transition from face-to-face to distance learning, which involved a huge effort by all those involved in adapting to a new learning system. The analysis of students' responses to questionnaires applied in a Portuguese higher education institution highlighted the main positive and negative aspects experienced, bringing contributions to a discussion on factors that determine the success of remote education and the preparation of the next semester.**

Keywords—COVID-19 pandemic, emergency remote teaching, higher education, students' perspectives.

I. INTRODUCTION

Due to the rapid scale of contagion of COVID-19, Portuguese higher education institutions suspended face-to-face classes in March 2020, having suddenly started the transition to distance learning. Some institutions partially retook face-to-face classes in mid-May, however Polytechnic Institute of Santarém (IPSantarém) decided to maintain classes fully online until the end of the 2019/2020 academic year.

Most of the degrees provided by IPSantarém are offered as a face-to-face format, as a result, the courses were not designed for online instruction, which implied a huge effort by teachers in adapting to remote education. At this moment, the academic year 2020/2021 is expected to work as a combination of online and face-to-face learning (blended learning), therefore, it is urgent to identify positive and negative aspects and learn from this previous experience through the students' voice, to plan the teaching-learning process in time and overcome identified constraints, namely to develop training offers for teachers [1].

II. THEORETICAL FRAMEWORK

A. *Distance Education and Emergency Remote Teaching*

Distance education has gained expression in recent decades, following international recommendations that stated the need to prioritize lifelong learning and the development of essential skills in the digital society [2] [3]. The confinement caused by the COVID-19 pandemic is accelerating the digital transition in education, as it leads to the rapid spread of adoption of distance learning and providing an opportunity to prepare students for the complexities of the ever-changing globalized world [4].

However, this author invokes the preeminence of discussing the various problems that arise with this sudden change. One of these weaknesses is the mere replication of the less effective teaching methods of face-to-face instruction, such as, for example, lectures (through videoconferencing platforms) and not to favor more individualized learning activities [4], which encourage the active participation of students and interaction between students, and between teacher and students [5].

We cannot consider that the answer to the global crisis in education, caused by the pandemic of COVID-19, is distance learning, which requires the voluntary participation of students and a complex process of planning and developing learning environments [5]. For these authors, it is, rather, a temporary and forced response, which they call remote emergency teaching. The difference between these concepts is noticeable if we analyze the definition of distance education expressed in the Portuguese legislation that regulates distance education in higher education institutions [6]:

"teaching predominantly provided with physical separation between participants in the educational process, namely teachers and students, in which:

i) Interaction and participation are technologically mediated and supported by online academic and technological support teams;

ii) The curricular design is oriented to allow access without constraints of time and space to the contents, processes and contexts of teaching and learning;

iii) The pedagogical model is specially designed for teaching and learning in virtual environments."

The transition to an education system with such complex characteristics does not happen overnight. For this reason, the distinction between concepts is important in order not to make false assumptions about distance learning [5]. On the one hand, when things are back to normal, teachers and students will associate the bad experiences they had during this period with distance learning. On the other hand, there is a tendency to consider that technology is the most important in distance learning, when the focus should be on pedagogical approaches [5].

In the wake of natural disasters or due to troubled political and social situations, several times in the past, universities have had to suspend most of their face-to-face classes.

However, teaching carried out in times of emergency should not be called distance education, under penalty of this teaching method being forever associated with hasty and remedial teaching practices, right in the antipodes of pedagogical innovation [7].

Emergency remote teaching was the possible response to continue the teaching and learning process in an extreme context, however situations like the one we are experiencing allow us to identify support mechanisms for students and teachers that guarantee equal access for students in times of crisis [8].

B. Students' Perspectives about Emergency Remote Teaching

Research has shown that student satisfaction with distance education has a positive correlation with the quality of learning outcomes, so it is important to identify the factors that influence students' online experience and adapt learning environments accordingly [9].

In the context of emergency remote education, which higher education institutions have been forced to develop, the need to assess students' difficulties is even more demanding. Tables I and II present a synthesis of a literature review findings focused on the factors that determine the success of distance learning for students in two categories: students (Table I); and teaching and learning process (Table II).

TABLE I. SUCCESS FACTORS FOR DISTANCE EDUCATION RELATED TO STUDENTS

Categories	Subcategories	Research Studies
Students	Technological resources Work conditions Digital competences Attitudes towards technology	[10] [10] [10] [11]

Based on the literature review, this study, carried out in a Portuguese higher education institution during the COVID-19 pandemic, analyzes students' perspectives on remote education seeking to discuss the success of the initiative and make useful considerations for the future, in the short term, in which a combined teaching approach (b-learning) is being considered.

TABLE II. SUCCESS FACTORS FOR DISTANCE EDUCATION RELATED TO TEACHING AND LEARNING PROCESS

Categories	Subcategories	Research Studies
Teaching and Learning Process	Online Resources	[9] [12]
	Interactive Resources	[13]
	Online assignments submission	[9]
	Learning management system (LMS)	[13]
	Flexibility of methods that enhance students' autonomy	[9] [11]
	Teacher feedback	[9] [14] [15]
	Interaction with students	[9] [12] [13] [14] [15]
	Align assessment practices with learning activities	[16]
	Clearly present the assessment criteria	[12] [16]
	Diversify assessment strategies and instruments	[11]
	Technologies that promote collaborative work and formative assessment	[16]
	Well-organized instruction	[14] [17]
	Provide clear guidance to students	[14]
	Active/traditional learning methods	[11] [13] [15] [17]
	Diversify learning activities	[12] [13]
	Teacher preparation	[12] [15]

III. METHODOLOGY

A. Participants

An online questionnaire was applied to IPSantarém students in the second half of May and responses were collected until June 30, 2020. The IPSantarém Campus consists of five higher schools from which 315 students answered the questionnaire (about 7,5% of the total students); 35,2% attend a course at Education School, 28,6% at School of Management and Technology, 14,9% at Health School, 14,9% at Agrarian School and 6.3% at Sports School. Regarding the cycle of studies, 81,3% were attending a degree course, 11,7% a master's course and 7,0% a Higher Professional Technical Course.

Considering the age of the students, they are between 18 and 60 years old; the average age of students who answered the questionnaire is 26 years old, with a median of 21 years. Among the 315 students, 31.4% indicated that they were working students.

B. Data collection

The questionnaire was developed based on the literature review, from which some categories emerged, contributing to define its structure. In the first part, it was intended to characterize the respondent: age; school; course and year attended; place of residence; working student.

Then, the academic working conditions were checked, namely the available technological resources and the appropriate environment to study remotely. The third part of

the questionnaire integrates issues associated with the distance learning process in the confinement period, presenting seven questions using a Likert Scale that focused on different aspects, such as student satisfaction with synchronous and asynchronous activities, communication with teachers, learning management platforms, work and interaction with peers, workload. etc. In this section, two open-ended questions were also included, in which it was requested to describe a positive and a negative experience in the context of remote learning.

The next section of the questionnaire focused on online assessment. Five questions were presented to respondents, using a Likert scale, in order to assess their degree of agreement with the methods and instruments used at the evaluation process. It was also given the possibility to make suggestions regarding the exams.

The last section was dedicated to the main challenges and opportunities of distance learning, through open-ended questions whose content analysis has not yet been concluded and, therefore, these aspects were not considered in this communication.

C. Data analysis

For treatment and analysis of the data we´ve used the SPSS program. This is an exploratory analysis of the data and therefore it is presented only a descriptive analysis of a selection of variables.

IV. RESULTS

One of the central concerns in this study was to know the conditions of students to continue studying remotely. The majority of the respondents indicated that they had the essential conditions to study remotely, with 60.6% saying that they had all the required conditions and 31.7% saying that they had almost all the conditions; 7.7% (21 cases) indicated they had only a part of the necessary conditions (21 cases) and one case reported not having the essential conditions.

When some essential conditions were analyzed so that students could effectively continue their distance learning activities, we found some interesting results as shown in Table III.

With regard to technical conditions and access to technologies, most respondents stated to have good conditions to develop their academic work remotely: unlimited access to the internet (85,7%); a personal computer for exclusive use (83.8% %); webcam (89,8%); microphone (92,1%) and Smartphone (87,6%).

However, there were some discrepancies. Namely, the number of participants reporting to have access to online resources is lower than those who indicated unlimited access to the internet. This may mean that they have some difficulties in accessing resources that are not available online in open access (for example, with installation problems and/or connection to the institution's VPN) or, also, difficulties at a user's perspective - how to find and select the appropriate resources. This subject deserves deepening attention from the institution's training team in order to be clarified with the students. It should be noted that at the level of the environmental context, conditions worsen for most students, with about half not being able to work in a private

place and almost 40% are not in a quiet place to carry out distance learning activities.

TABLE III. CONDITIONS FOR CONTINUITY OF ACADEMIC ACTIVITIES IN REMOTE MODE

	n	%
Technologies and resources		
Unlimited internet access	270	85,7
Limited internet access	39	12,4
Personal computer for exclusive use	264	83,8
Shared-use computer	50	15,9
Tablet	63	20,0
Webcam	283	89,8
Microphone	290	92,1
Smartphone	276	87,6
Access to online resources	251	79,7
Environmental context		
Quiet environment	197	62,5
Private environment	175	55,6

The Fig. 1 illustrates students' satisfaction with synchronous, asynchronous activities and online assessment.
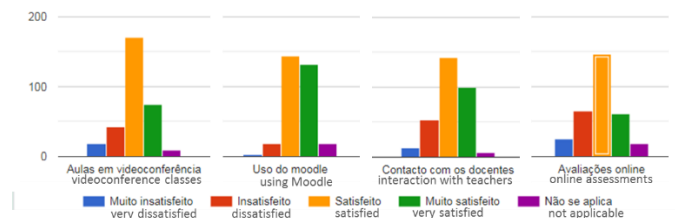

Fig. 1 Students' satisfaction with synchronous, asynchronous activities and online assessment

Regarding synchronous teaching sessions using the videoconferencing platform (Zoom), the students declared themselves globally satisfied (54,3%) and very satisfied (23,8%). As Moodle is used in IPSantarém as the management platform for teaching-learning activities, students were asked about their degree of satisfaction with the asynchronous activities developed using this platform: 87.6% rated positively the work done (satisfied: 45,7%; very satisfied: 41,9%). With regard to interaction with teachers, although the degree of student satisfaction remains positive (together, 76,8% said they were satisfied and very satisfied) it is possible to verify that the degree of satisfaction is low in relation to others evaluated indicators. In the open-answer questions, students pointed out the need for greater feedback in some curricular units and the importance of an organized and planned interaction with information made available more quickly.

As for online assessment activities, like the previous indicator, a lower level of student satisfaction is also identified. Although they consider themselves satisfied (46,3%) and very satisfied (19,4%), analyzing together the relative weight of those who consider themselves dissatisfied and very dissatisfied is 28,5%.

Considering the interaction between peers, the majority of students (79,1%) stated that they contact their colleagues every day or almost every day within the scope of teaching activities, namely for group work: 11,7% reported that they do it once or twice a week and 9,2% rarely or never.

Regarding students' perception of their own performance and skills development [Fig. 2], it should be noted that, overall, they present a positive self-assessment with regard to the ability to team work (66,7% disagree that this ability has worsened), with regard to the ability to perform autonomous work (together the 3 items that positively evaluate this dimension correspond to 74,9%) and with regard to the development of working methods (60,3% consider that they have developed new working methods and 55,6% consider that they have developed more effective work). It should also be noted that 87,6% of respondents indicated that they have improved their knowledge of work platforms and tools.

Although the results are not dramatically negative, it is advisable to reflect on the fact that about a third of the students claim to have worsened their ability to do team work and also in the development of working methods - indicating the need to train these students in collaborative distance working methodologies.

Throughout the period of remote work, in meetings of teaching teams and of different IPSantarém Bodies, overwork and the difficulty of reconciliation between family / personal and professional life were repeatedly stressed - this aspect was identified both in relation to teachers and in relation to students considering academic activities.

Regarding to the reconciliation of school requirements with other tasks of personal and family life [Fig. 3] 56,2% of our respondents stated that this ability has improved; therefore, again, about a third of the students expressed difficulty in articulating the various spheres of personal life.
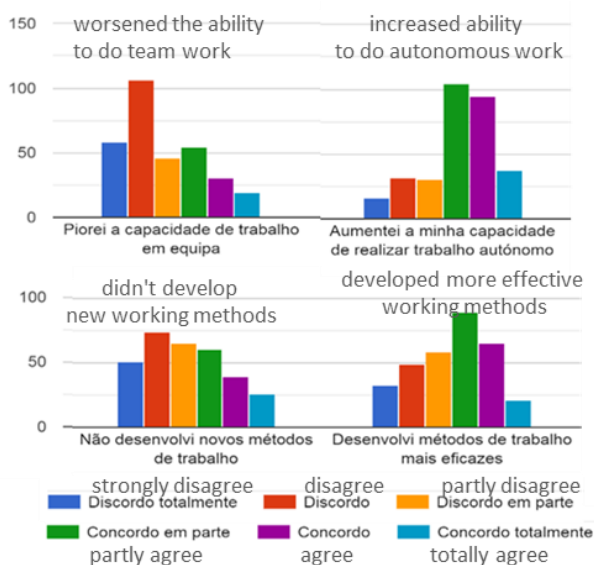

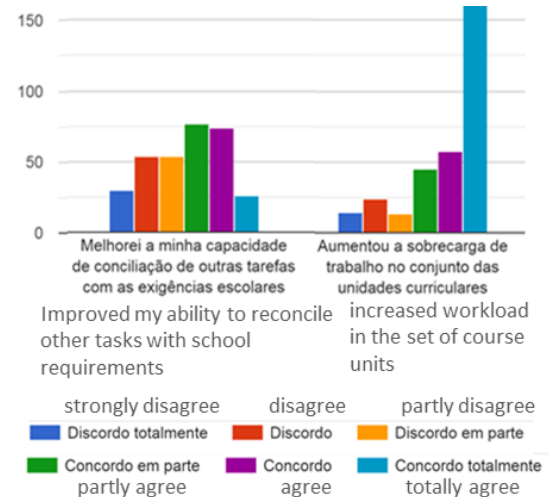Fig. 2 Students' self-perception of performance and skills

Fig. 3 Students' self-perception of the reconciliation of activities

The main negative aspect presented in relation to this remote teaching experience refers to the existence of a high work overload – 83,8% of the respondents indicates their agreement with this statement and 51,4% even affirm that they fully agree.

On the positioning of students in relation to the 2020-2021 school year [Fig. 4], namely in the 1st semester, given the unpredictability of the evolution of the pandemic situation, only 12,9% stated that face-to-face education should be resumed without restrictions. The most consensual option is to organize the school year in a mixed mode, combining classroom sessions with remote teaching (59,2%). It should also be noted that a considerable number of students assume that they prefer a completely at distance teaching-learning process (28,0%) - which includes working students, who identified remote teaching as positive for the reconciliation of their studies with their professional activities, as well as students living outside the city and/or Municipality of Santarém, who stated that developing their school activities in distance learning was beneficial because it represents savings in expenses and travel time.
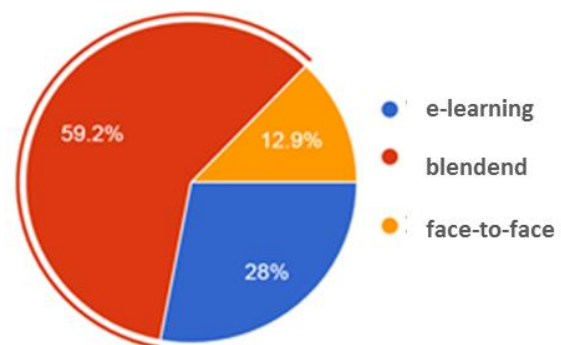

Fig. 4. Organization of classes during the first semester of 2020-2021

Considering the support in recent literature on, the study carried out by [10], which looks at the barriers to distance learning experienced by older students (in the Portuguese context they access higher education through a special application "over 23"), which have to reconcile studies with family and employment, and which generally come from more disadvantaged socioeconomic backgrounds, although this reality is not completely equivalent to that of the participants in our study, the results obtained by [10] approximate working conditions to which our students were

subjected in the confinement situation resulting from the COVID-19 pandemic; as an example of this, sharing a computer with other members of the household, the lack of a quiet and private space to work, the poor quality of internet access, the use of outdated devices (PC, tablet, etc.) and even the limited digital skills.

The analysis of the survey applied by [9] to students at an Australian university, demonstrated the value of e-learning: access to online resources; submission of papers online; autonomy and flexibility at work; from teacher feedback to assignments and interaction with students. It should be noted that students showed great dissatisfaction with the last topic.

The results obtained by [15] also revealed that the variables related to teachers are the most determining factors for the satisfaction of students in online courses, among which communication, feedback, preparation, and teaching methods stand out.

The study developed by [16] presents fundamental aspects for the successful integration of students in distance education, namely the alignment between tasks proposed to students and assessment practices, the explanation of assessment criteria and the integration of technologies that encourage collaborative work and formative assessment. In our study, it was possible to identify that, although globally high satisfaction rates are presented in relation to the remote teaching experience lived, the practices that encourage collaborative / team work are highlighted as necessary and, also, methods of work that promote formative evaluation.

[14] identified in their study that student satisfaction with distance education is strongly influenced by the lack of organization of the teaching sequence, clarity in the instructions given to students and feedback. The situation experienced in the current circumstances brought difficulties to teachers and, consequently, reflected in the students' learning processes. Notably due to the impossibility of having timely planning - although LMS platforms are used to support classroom teaching, they are not designed for the development of distance work in its true sense.

Most of the factors inhibiting e-learning pointed out by students are related to teachers' attitudes and skills (few digital skills, little interest in the use of digital tools, conservative and traditional mentality, lack of time, transmissive teaching methodologies). Respondents refer as advantages, among others, flexibility, centralization of resources on a single platform, proximity between teacher and student and interactive resources. Students also warn against the risk of distance learning to focus on the transmission of content and to reduce the interpersonal and interactive dimension, especially with students in the first years of the course [13], so special care should be taken in preparing the year school considering precisely the students who will start their training process at IPSantarém in 2020-2021. In this preparation, it is important to consider the impact of the management of the teaching-learning process through LMS platforms in online courses on student satisfaction and the three key elements that [17] identifies as determinants for success: the accessibility of the platform; the activities available on the platform; and the promotion of critical thinking.

V. CONCLUSIONS

In order to face the challenges of adapting face-to-face teaching in times of crisis, it is necessary to strengthen the communication channels between students and teachers; prepare teachers to use distance methodologies; prepare students to work independently and at a distance; and ensuring accessible and diverse technological resources [8].

These are also conclusions that we can draw in this first analysis of the information collected through the application of a survey to a group of higher education students.

Although students, globally, have pointed out significant aspects in the development of their skills and abilities to work remotely; although they have revealed skills in carrying out autonomous work and even if they have positively evaluated a set of indicators, as mentioned, they have also identified less successful aspects which should be a matter for in-depth reflection in the context of the institution.

As the results of the study by [12] point out, factors such as teacher preparation and accessibility; the precision of the evaluation criteria; the proposed asynchronous activities (combination of strategies); and the resources available online, are aspects that can only be achieved with time to prepare and to plan. Having not been able to predict in the school year that has just ended, it is possible to envision in relation to the future. The students' contributions enhance the discussion around dimensions such as pedagogical innovation, the development of training offers in distance learning modalities (b-learning or e-learning) and, consequently, the training of different stakeholders.

Thus, the conclusions of the study are expected to have an impact on the preparation of the academic year at IPSantarém and, in addition, bring contributions to other research in other higher education institutions.

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