COLECCIÓN CONOCIMIENTO CONTEMPORÁNEO

Entornos virtuales para la educación en tiempos de pandemia: perspectivas metodológicas

Coordinadoras
Alba Vico Bosch
Luisa Vega Caro
Olga Buzón García

Dykinson, S.L.

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ALBA VICO BOSCH
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Diseño de cubierta y maquetación: Francisco Anaya Benítez
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Madrid - 2021
N.º 33 de la colección Conocimiento Contemporáneo
1ª edición, 2021

ISBN 978-84-1377-640-8

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CHALLENGES AND OPPORTUNITIES OF THE TRANSITION FOR ONLINE TEACHING ON A PORTUGUESE SCHOOL OF EDUCATION

MARISA CORREIA
Polytechnic Institute Of Santarém. School Of Education. Santarém, Portugal
Life Quality Research Center, Rio Maior, Portugal

PERPÉTUA SANTOS SILVA
Polytechnic Institute of Santarém. School of Education. Santarém, Portugal
Centre for Research and Studies in Sociology – CIES IUL, Lisbon, Portugal

BENTO CAVADAS
Polytechnic Institute of Santarém. School of Education. Santarém, Portugal
CeiED. University Lusófona. Lisbon, Portugal

1. INTRODUCTION

The global intensification of academic work (McInnis, 2010) and limited time constraints (McCune, 2018) hinders higher education teachers to foster developmental processes relating to pedagogy. However, there is evidence that higher education change, namely promoted by digital technologies, can shift higher education teachers' roles and identities (McNaughton & Billot, 2016).

Due to COVID-19 pandemic a dramatic higher education contextual change had occurred related to a rapid shift for online environments. According to Major (2020), higher education teachers have done an amazing job in putting workable short-term technological solutions for online teaching and learning, many of them with synchronous activities using video-conferencing apps such as Zoom® and Skype®. This movement pushed forward educational innovation, although without time to prepare a pedagogical development plan for academics about virtual learning environments. Offering high-quality instruction requires a huge amount of planning and work, including reframing and

reconceptualizing communication, engagement, and community (Major, 2020).

This exploratory study focuses on which challenges and opportunities teachers of a higher education institution (HEI) faced on their teaching experiences along the transition period for online education during the COVID-19 pandemic. Our intention was to understand how teachers were dealing with this new and complex situation, in order to be able to develop support strategies that could respond to the needs of the educational community. It was also our concern to obtain information that would contribute to a better preparation and organization of the following school years. Therefore, learning from the present to anticipate problems that would continue to arise in the short term.

2. THERETICAL FRAMEWORK

2.1. Pedagogical Development in Higher Education

A review about the definitions of pedagogical development allowed Inamorato et al. (2019) to characterize it as both organized, structured, and intentional practices and informal and unintentional practices of learning, addressed to the teaching staff working in higher education, in order to improve their academic skills. According to Knight et al. (2006), educational pedagogical development involves "attending to the person (the subject) and to the system's tools, rules, beliefs (located in the community of practice) and division of power (or division of labour)" (p. 321). Kneale et al. (2016) centre their definition of pedagogical development on activities targeted to strengthen and extend the knowledge, skills, and conceptions of academics in a way that will lead to changes in their way of thinking and their educational behavior.

McCune (2018) has done research about how experienced academics describe which factors shaped their pedagogical practices over time. The findings of McCune' (2018) work highlights the importance of time, technologies and conversations about teaching and learning as the main factors that shaped the development of experienced teachers teaching practice. The participants also mentioned that it is very

important to align developmental opportunities with their multiple roles and institutional identities (McCune, 2018).

Concerning time, the participants in the study mentioned that due to lack of time, development of teaching practice is often inhibited relative to other activities, such as research, administration activities or leadership, for example, because those activities are closer to those teachers' identities (McCune, 2018). For that reason, McCune (1028) suggests "Workload allocation needs to take into account that reflecting on and developing pedagogic practice should be mainstream, not pushed to the margins of colleagues' time." (p. 319).

In McCune's (2018) study, changes in pedagogic practices were described as closely related with the digital technologies available. There is evidence that technologies, rather than passive tools, promote changes in teachers' practice due to the pursuit of new learning experiences for students (McCune, 2018; McNaughton & Billot, 2016). One foremost change are new forms of communication and interaction between teachers and students which may shift the power and patterns of communication in academic contexts (McCune, 2018). Nonetheless, some teachers demonstrated reluctance in using some digital technologies in teaching because they associate them with forms of controlling academic practice (McCune, 2018) and some teachers felt technical innovation created unpredictable and uncomfortable terrain (McNaughton & Billot, 2016). For example, McNaughton and Billot (2016) noticed that the "(..) daily doing and being of videoconferencing did not align with teachers' personally held values, creating role and identity ambiguity" (p. 656). Therefore, the authors concluded that teachers need support to assimilate those changes into dynamic and coherent narratives of institutional, professional, and personal identities.

A great deal of professional learning in higher education is non-formal (Knight et al., 2006). Another important factor that influences pedagogical development in higher education are conversations about teaching and learning with different actors, in formal or informal contexts (Haigh, 2005; McCune, 2018; Thompson, 2015). Informal conversations are an important context for professional learning and development because it enhances academics to learn about teaching from

colleagues (Haigh, 2005; McCune, 2018; Thompson, 2015). The themes of those conversations are diverse and approach assessment practices, teaching innovations, curricula, norms and standards, and policies and structural changes affecting teaching (McCune, 2018). In fact, Boud and Brew (2013) had already suggested that the everyday practice and academic work of professionals should be a focus on academic development. Some teachers related insights to improve their teaching after conversations with colleagues of the same disciplinary field or with colleagues from other fields of knowledge, revealing interdisciplinary conversations are also very important for teaching innovation (McCune, 2018). The institutional organization could also benefit or prejudice conversations about teaching, because McCune (2018) observed participants preferred to discuss those issues in smaller than bigger organizational contexts. Workshops to encourage higher education teachers to share their experiences could also be an effective strategy to improve online teaching (Glass, 2017).

Pedagogical development can be a strategic activity of HEIs (Knight et al., 2006). To foster pedagogical development of higher education academics is very important that higher education leaders provide teachers with time and resources to support pedagogic change (McCune, 2018). Policies around workload, recognition, and reward could also promote sustainable change in the culture and practice of the institution and engage staff in developing their teaching (McCune, 2018). Glass (2017) also suggests that differentiated workloads could be a way to recognize and foster faculty members' effort' on online teaching. With those workload adjustments, faculty members could maintain their knowledge of the state-of-art on evidence-based research on online education, build networks, share their expertise, and support other colleagues about their online courses (Glass, 2017).

Higher education leaders must have in mind the high value academics attribute to autonomous choice in reconstructing individual identity during institutional change (McNaughton & Billot, 2016). This means educational innovation should not be imposed by higher hierarchies of HEIs but negotiated and participated by academics.

To foster pedagogical development of teachers in higher education it is crucial to support the creation of learning departments, teams and academic leaders that treat student learning as a priority (Knight et al., 2006). Inamorato et al. (2019) stress that the most important aspect of pedagogical development is when it has a positive impact on students' learning due to empowering high education teachers with skills that promote change in their educational practices. Another essential policy could be the creation of spaces for informal conversations about learning between heterogeneous groups of academics (McCune, 2018).

About teacher's pedagogical profiles and their relation to professional development, a study done by Almeida (2018) with higher education teachers of teacher training institutions revealed three clusters of pedagogic profiles, associated with Robertson' (1999) developmental model. In Almeida' (2018) work, one group was integrated by teachers with a focus on teaching and content knowledge of its disciplinary field (cluster 1). In opposition, another group was focused on students' learning and teaching strategies (cluster 3). The third group, with hybrid characteristics, is constituted by teachers that reveal a focus on disciplinary content, but also the best teaching approach to achieve success on student's learning (cluster 2). Almeida (2018) associated the cluster 3' teachers to a more advanced professional development state than cluster 1' teachers. This classification is correlated with the Robertson (1999) model that describes developmental positions regarding teachers' work. Cluster 1 teachers seem to be in the egocentrism position, associated with teacher-centeredness, and cluster 3' teachers seem to be positioned on aliocentrism, associated with learner-centeredness. Finally, cluster 2' teachers have similarities with systemocentrism, characterized by teacher/learner-centeredness. According to Robertson (1999), a teacher-centred teacher is on an initial developmental model stage, followed by a student-centred teacher and a teacher-centred teacher, which is on a deeper developmental model.

2.2. Online teaching in Higher Education

There seems to be a difference between the value administrators' and faculty members attribute to online teaching (Straumsheim et al. &

Lederman, 2015). For instance, Allen and Seaman (2015), in a study about the efficacy of online learning outcomes, concluded that the number of US chief academic officers which rated it as "the same" or "superior" rose from 43% to 74%, compared to face-to-face learning outcomes. Though, in the same period, only 28% of faculty members accepted the value and legitimacy of online education (Allen & Seaman, 2015). This reveals problems of online education to convince high education faculty members of its efficacy (Allen & Seaman, 2015).

Nevertheless, due to increasing competition for recruiting students, many institutions turn to online instruction to recruit and retain students. Consequently, at least on the United States the growth of traditional enrolments has been successively outpaced by the growth in online enrolments (Allen & Seaman, 2011, 2014). We believe that a similar process is currently underway in Portugal, but yet we do not have enough data to allow us to demonstrate this assertion, since in several institutions a greater interest in the development of distance education modalities seems to have emerged from or due to pandemic crisis.

Online teaching has the power of changing how faculty members teach and the meaning they attribute to teaching itself (Glass, 2017). Recent findings (Glass, 2017) suggest higher education teachers' attitudes towards online education could be affected by their perception of the quality of student learning, but also by their own experiences on online courses. In fact, faculty resistance is one of the barriers to the development of online education (Hermann, 2013; Horvitz et al., 2015), namely from those faculty members who have never taught online before (Hermann, 2013). Krug et al. (2016) also concluded students' presented resistance in face of the transformation of a commuter university from a traditional and face-to-face teaching to offering only online and compressed courses. Students considered online courses supplementary and not a substitute for traditional face-to-face instruction (Krug et al., 2016).

An analysis of the literature highlighted the main barriers pointed out by faculty members about online teaching. For instance, many concerns related to the technology are mentioned, such as its reliability; outdated

equipment; instructor and students' skills; and institutional support (De la Cruz et al, 2005; Lloyd et al., 2012; Perreault et al., 2002).

Regarding students, some authors focused their heterogeneity (De la Cruz et al, 2005; Hunt el al, 2014), limited interaction with peers and instructors (Hunt el al, 2014), and incapability of planning their time in online teaching approach (De la Cruz et al., 2005). De la Cruz et al. (2005) research about teachers' experience in designing resources for online teaching concluded that technical issues related with the use of those resources could demotivate students.

The heterogeneity of teachers' competences and experience concerning online teaching in higher education is a problem emphasize by many studies (e.g. Almpanis, 2015; De la Cruz et al., 2005). Some authors referred that pressure and challenges of time managing faced by faculty members (Lloyd et al., 2012; Mansbach & Austin, 2018) can damage their professional growth (Mansbach & Austin, 2018). In addition, inadequate opportunities to learn how to teach online effectively and the unfamiliarity with online pedagogy raise concerns among faculty members about quality in online learning (Lloyd et al., 2012; Shea, 2007).

Much of the literature about faculty members difficulties on adopting online learning referred to a change in teachers' role aligned with student-centered practices (Baran et al., 2013; Perreault et al., 2002) and cultural barriers, including resistance to innovation and to online teaching methods (Horvitz et al., 2015). Nevertheless, other problems related to the particularities of online teaching are also pointed out in the literature, namely the increase workload associated with online teaching (Bolliger & Wasilik, 2009; Hunt et al., 2014; Lloyd et al., 2012; Liu et al., 2007; Xu & Morris, 2007); test administration (Perreault et al., 2002) and overall course evaluations (Bolliger & Wasilik, 2009); and impersonal nature of online courses and absence of face-to-face interaction (Liu et al., 2007; Shea, 2007). As Mansback and Austin (2018) mentioned there is a sense of isolation when faculty members teach online.

Although problems and concerns were identified, teachers envision advantages of online teaching, primarily for the flexibility and increased

opportunities for adult learning that it provides (Perreault et al., 2002). Faculty members also perceived the potential of online learning for balancing their personal and professional life (Mansbach & Austin, 2018) and increasing access to education for a wider variety of students (Major, 2010). Furthermore, higher education teachers experiencing a new intellectual challenge could make online teaching appealing (Jaschik & Lederman, 2016; Xu & Morris, 2007).

Many faculty members felt that they were offered inadequate incentives for the development of online teaching programs (Herman, 2013). A strategy to change the value faculty members attribute to online teaching can be read is presented in Glass' (2017) work. Glass (2017) suggests a shift from a focus on how faculty members adapt instruction to teach online courses effectively to a complementary focus that considers how online education affects the subjective meaning of teaching for faculty members. Glass (2017) found faculty members' attitudes towards online education where shaped by their personal experiences related with the way these two efforts where facilitated or frustrated: their ability to perform personally valued social roles in online courses (e.g., mentor, subject matter expert, nurturer, master lecturer or advocate for social change) and their ability to self-express subject matter of personal significance in online courses (e.g., express facets of their distinctive personalities, perspectives on teaching and life histories), while creating meaningful learning experiences for students. This last aspect was also found in other works (e.g., Mansback & Austin, 2018), since autonomy and academic freedom, mainly on designing online courses, was valued by faculty members on online teaching. Aspects such as creativity, the sense of connection, or isolation, and the satisfaction feeling retrieved from online teaching were valued by the higher education teachers that participated in Glass' (2017) study. So, intervening in those aspects could change the experiences faculty members have with online teaching and, therefore, the value they attribute it.

HEIs can also promote online teaching through incentives to faculty members (Green et al., 2009; Herman, 2013; Hunt et al., 2014; Orr et al., 2009), as recognition in tenure and promotion (Herman, 2013; Hunt et al., 2014), course releases or other time incentives (Herman, 2013;

Orr et al., 2009), technology award (Herman, 2013) and retention of intellectual property rights for an online course (Herman, 2013; Hunt et al., 2014) and additional financial remuneration (Green et al., 2009; Herman, 2013). Even though all those incentives are relevant, financial incentives have not been reported by faculty members as important as their efforts to help students (Orr et al., 2009; Herman, 2013).

Many faculty members also related the need for greater organizational change and institutional direction concerning online teaching and clarity in distance education mission (Orr et al., 2009). In this respect, Hunt et al (2014) refers to the lack of institutional support/commitment that often concerns faculty members while adopting online teaching practices. Infrastructure and course management systems were also related as important to faculty members regarding online teaching (Orr et al., 2009).

As mentioned about pedagogical development, being part of a supportive and inspiring group of colleagues about online teaching was mentioned as very important by some faculty members to enroll on this approach (Green et al, 2009; Mansback & Austin, 2018; Orr et al., 2009). There is some evidence that a collaborative course development for online courses could engage faculty members and have positive outcomes due to the combination of the experience of instructional designers and disciplinary experts (Xu & Morris, 2007). The efficient backing from instructional faculty centers, with their technical expertise and support, can also foster online teaching (Green et al, 2009; Hunt el al, 2014; Mansback & Austin, 2018; Orr et al, 2009).

Another strategy is improving online teaching self-efficacy because faculty members with high self-efficacy usually try to change their work environment and persist at their work when facing negative outcome expectations and experiences (Horvitz el al., 2015). In its study, Horvitz et al. (2015) found that the variables that most impact faculty members' online teaching self-efficacy are perception of student learning, satisfaction with online teaching and future interest in teaching online. It seems the confidence of faculty members in managing online courses increased with their experience in online environments, thus, it is important they maintain consistent opportunities to teach online

teaching during consecutive academic years (Horvitz et al., 2015). Faculty training and support structures could help to raise teachers' self-efficacy on online environments (Baran et al., 2013; Horvitz et al., 2015). In this regard, González (2013) stresses that training on technical skills would not be enough and emphasizes student-focused approaches in both face-to-face and online learning environments. This could increase the sense of professional growth of faculty members, an aspect valued by them about the intellectual challenges they had to face on online teaching (Mansback & Austin, 2018).

Implementing effective practices is also an important strategy that institutions and faculty members individually could observe to foster online teaching and students' learning. Both pedagogical knowledge and content knowledge are required for effective instructional design (Renes & Strange, 2011). Lewis and Abdul-Hamid (2006) concluded that fostering online interaction among students and with the instructor and students is a major strategy for students' satisfaction and retention with online teaching. This strategy is side-by-side with the need of maintaining enthusiasm and organization with energetic and structured communication provided by the instructor presence in online environments (Lewis & Abdul-Hamid, 2006). This could also be done by the creation of heterogeneous and interdisciplinary groups of students to solve engaging problems or the motivation of students using the resources of eLearning platforms (De la Cruz et al., 2005). Students revealed its importance for them to feel not only the presence, but also proximity with higher education teachers in online environments (Baran et al., 2013; De la Cruz et al., 2005; Lewis & Abdul-Hamid, 2006). Another practice with substantial effects is providing prompt and substantive feedback and monitoring students' learning (Baran et al., 2013; Lewis & Abdul-Hamid, 2006). Facilitating learning, through clear learning goals, connecting the personal experiences of students or current events with the learning goals, inviting specialized speakers to share their knowledge with students and the use of meaningful digital resources were all strategies mentioned by faculty members capable of contributing to students' learning on online environments (Lewis &

Abdul-Hamid, 2006). The effective good use of technology could also enhance online teaching (Renes & Strange, 2011).

According to Baran et al. (2013) there are four areas in which teachers need to adapt their practices to promote online teaching: "(1) increasing structure and planning in the course design, (2) increasing organization in the course management, (3) increasing teacher presence for monitoring student learning, and (4) reconstructing teacher–student relationships" (p. 7).

3. METHODOLOGY

The COVID-19 pandemic forced HEIs across the globe into a huge shift to online learning, suddenly and without any planning. Now, to be able to prepare the institutions to face the future, it is urgent to reflect on this experience, identifying possibilities to overcome difficulties and opportunities for improvement and pedagogical innovation. Findings from multiple studies have revealed a diversity of concerns and opportunities regarding online learning. Thus, in this study we focused on how faculty members experience online teaching throughout the COVID-19 pandemic, collecting and analyzing evidence of the main barriers encountered as well as the opportunities they foresee in online teaching.

The research design combined different approaches although a single questionnaire was applied. The first part of the questionnaire (with closed questions) covered dimensions such as participants characterization, working conditions, previous experience in the use of digital tools as well as in distance education; the second part (open-ended questions) was focused on teachers' perspectives concerning challenges and opportunities of online teaching.

Data analysis was both quantitative and qualitative. Content analysis of qualitative data began with open coding and proceeded until theoretical saturation, informed by predetermined categories that emerged from literature review. Through the constant comparative method (Strauss & Corbin, 1998) emerged several subcategories included in the same category.

Challenges about teaching online were grouped into three categories: Students' Constraints, Teachers' Constraints and the Teaching and Learning Process itself. Related to opportunities of online learning, teachers' views refer to the latter to which a fourth category is added – institutional impact.

The online survey was launched from the end of March to June 2020, and 33 of the 55 teachers with assigned academic work completed the questionnaire (corresponding to a response rate of 60%).

The School of Education offers graduate and postgraduate training, as well as professional technical courses that do not confer an academic degree, but whose successful conclusion grants the diploma of higher professional technician. We are currently developing the following training offer: Monitoring of Children and Youth and Digital Design (Professional technical courses); Basic Education (Teacher Training), Environmental Education and Nature Tourism, Social Education and Multimedia Production in Education (graduation courses); Educational Administration, Social Education and Community Intervention, Digital Resources in Education (academic masters); Pre-School Education, Primary Education, Teaching Mathematics and Natural Sciences and Teaching Portuguese, History and Geography of Portugal (Master's degrees that qualify for teaching).

Thus, the respondents are teaching in one or more of the courses identified, from all Departments and covering the different scientific areas.

The representation according to gender corresponds to the distribution that we can find in the school, in which there is an overrepresentation of women in relation to men (18.2% male). Regarding ages, it is also possible to verify a representativeness of the universe, with more than half of the teachers aged over 45 years old (54.6%).

Considering the implications in the covid period for those who have dependents, namely children and young people at school age, it is noteworthy that 63.7% of our respondents indicated that they have dependents under their care, 36.4% of whom are aged equal to or younger than 12 years old; there were also some cases (18.2%) with young dependents older than 12 and with elderly people (9.1%) under their care at home. This represents a great impact on the management of daily routines,

particularly in a situation of confinement with all the schools in lock down and, therefore, contributing to the increase of the workload, a fact that was significantly highlighted by respondents.

4. RESULTS AND DISCUSSION

Before specifying some more significant aspects related to working conditions, we emphasize that 54.5% of the teachers who answered the questionnaire were teaching Curricular Units they have never taught before, what implies an increased effort in the preparation of classes; also, to note that 48.5% of the teachers were teaching 4 or more different curricular units (one of which taught eight).

More than half of the respondents considered that they have all the necessary conditions (57.6%) for remote teaching, 33.3% considered that they have almost all conditions and 9.1% considered that they have few conditions.

As for technological resources, there are no substantial constraints, which are mainly related to the working environment - calm (72.7%) and private (60.6%). Indeed, teachers have unlimited access to the internet at any time of the day (97%), their own computer for exclusive use (90.9%), access to online resources (articles, books, etc.) (93.9 %), web camera (93.9%) and microphone (93.9%).

54.5% of teachers already had experience with online education, which according to Glass (2017) and Hermann (2013) can affect teachers' attitudes concerning online education. Teachers also say that this experience forced by the pandemic implied a considerable increase in the volume of work and expanded their knowledge about methodologies and digital technologies to support online learning. Throughout this process, 57.6% of teachers took the opportunity to attend training initiatives on: online learning methodologies (50.0%); online assessment (tests, exams, etc.) (39.9%); digital tools (38.9%); Moodle platform (22.2%); others (cybersecurity, impact of the pandemic on IE, etc.) (11.1%). Perreault et al. (2004) research likewise revealed that teachers primarily used self-training for the design and delivery of on-line courses. A survey conducted by Almpanis (2015) showed that teachers'

training preferences are on virtual learning environments, e-assessment tools, and other supporting digital tools (plagiarism, e-portfolios, web 2.0, web conferencing, etc.). Results also converged with González (2013) perspectives that training should focus on methodologies and less on digital tools.

Online learning activities were mostly conceived in collaboration, especially among colleagues who share courses (78.8%); and, in collaboration with other teachers from the same department (45.5%), from other departments (24.2%) and from other schools (12.1%). Collaboration was also reflected in the development of educational resources (60.6%). These results are quite contrary to the results obtained by Mansback and Austin (2018) which reported the sense of isolation when faculty members teach online. Many researchers (e.g., Green et al., 2009; Mansback & Austin, 2018; Orr et al., 2009) suggested that being part of a supportive and inspiring group of colleagues about online teaching was very supportive for addressing this educational approach.

The analysis of the teachers' answers allowed us to identify the main types of educational resources used, standing out in decreasing order: PowerPoint; videos; webpages; scientific articles; and digital books. Regarding students' assessment, the most prominent strategies/instruments mentioned were projects, assignments' oral presentation, discussion activities and collaborative activities. In smaller numbers, some references were done to the resolution of exercises and less to questionnaires, portfolios, and reports/critical analysis. Some teachers highlighted tests in a standard format and open book tests. Few mentioned the use of games and simulations.

Comparing students' attendance in synchronous online learning sessions with face-to-face classes, teachers consider that it remained identical (84.8%), yet, for some it has increased (15.2%). In line with these results, teachers estimate that course learning objectives' achievement in online learning is like face-to-face context (72.7%), even if 18.2% had a negative view about this and 9.1% a positive one. These results do not show that meeting learning outcomes may be at stake for

teachers or concerning course quality, unlike the study developed by Hunt et al. (2004).

Most teachers agree that classes in the next school year will take place in a mixed teaching system (81.8%), combining online and face-to-face classes. 15.2% even support the idea of full online learning and a small fraction defends the resumption of the face-to-face system, without restrictions.

4.1. CHALLENGES OF ONLINE TEACHING

It was possible to group the main challenges faced by teachers in three categories in the current context of migration from face-to-face teaching activities to remote teaching in relation to: students' constraints (24.2%); teachers' constraints (57.6%); the teaching and learning process itself (100%).

Concerns related to student's report a reduced availability of technology (equipment, internet, etc.) (12.1%) that allow them to continue their learning processes. For instance, one teacher referred: "Students are in unequal circumstances when it comes to availability and use of educational technology, which favors some and excludes others. Besides, all of this implied additional work for the teacher" (T2). The findings related to technology were also pointed out in several studies (De La Cruz et al., 2005; Hunt et al., 2014; Lloyd et al., 2012; Perreault et al., 2002). Teachers also mentioned concerns about the students' working conditions, learning difficulties and constraints related to group work. Communication among students working on team projects was also considered problematic by the respondents in the study of Perreault et al. (2002). One teacher also mentions challenges concerning international students who struggle with reduced digital literacy and the understanding of the Portuguese language. These concerns about the heterogeneity of students were also found in other studies (e.g., De la Cruz et al., 2005; Hunt et al., 2014). However, one teacher revealed concerns about student attendance and active involvement in learning activities, in tune with other studies (De la Cruz et al., 2005; Hunt et al., 2014).

Some difficulties expressed by teachers in relation to students are also highlighted for themselves, namely the conciliation between personal and professional life (12.1%) and aspects about the technological resources (equipment quality, internet access, etc.) (6%). The aspect most mentioned by the participants was the workload increase with the transition for online learning (18.2%), quite related to several studies (Hunt et al., 2014; Lloyd et al., 2012; Liu et al., 2007; Xu & Morris, 2007). In this regard, one teacher mentioned that "There was a necessary adaptation of both students and teachers to the new model very quickly and without the necessary preparation. This implied a greater volume of work for all at the beginning, which, after a period of adaptation (I would say one month) has stabilized" (T3). There were two references about the negative impact of this transition on teachers' scientific production and the deficient mastery of digital tools to support online learning. There were also concerns about workload in the institution (with classes and administrative positions). The workload quantity was an issue highlighted in studies about pedagogical development that could prejudice online teaching (e.g., Glass, 2017). Finally, some teachers also addressed the insufficient training on online learning methodologies and on digital assessment tools. These are some issues related to faculty members' concerns about online teaching expressed in literature (e.g., De la Cruz et al., 2005; Hunt et al., 2014; Lloyd et al., 2012; Perreault et al., 2002; Shea, 2007).

Regarding the challenges related to the teaching and learning process, the adaptation to a new teaching methodology stood out (27%), followed by the concern with the substitution of face-to-face classes of laboratorial, practical and/or field work (15.2%) and internships (12.1%). For some teachers the worst part of this sudden transition to remote teaching was the impossibility "to replace the internships, nor the planned practical activities involving the presence of children" (T5) and to "adapt practical activities to online teaching" (T27). The lack of time to prepare and monitor the course was also pointed out by faculty members in Hunt et al. (2014) research. Some teachers mention the difficulty in preparing and promoting synchronous sessions to actively involve students (6%). One of those teachers' complaint about:

> The fact that students can have their videos/images turned off in class. As the class is voluntary, except for technical impediments, all students and teachers should have their videos turned on. This is a basic trust issue essential to the work and also a facilitator of communication. (T16)

There is only one reference to the adequacy/creation of teaching materials and the volume of work requested from students. Student orientation and feedback (9.1%) and communication between teacher and students (12.1%) were important challenges for some teachers. On this last point, one teacher mentioned "the constraints inherent to (…) the lack of face-to-face social contact, the absence of non-verbal language, the most evident evidence of learning" (T31). The challenges related to assessment in this context (15.2%) lie between adapting strategies and criteria, and the test format, also problematic aspects highlighted by faculty members in previous studies (Bolliger & Wasilik, 2009; Perreault et al., 2002). Though, only one teacher expressed discomfort with the decision to replace "face-to-face tests with distance assessment methods" (T10). Respondents do not show difficulties working with peers, and many share course units with other colleagues, and do not reveal concerns about the possibility of remote exams or with oral presentations of students' assignments at the end of the semester.

4.2. Opportunities of online teaching

Teachers' observations regarding the challenges they faced were considerably higher than the observations related to opportunities. Many challenges mentioned were also considered as opportunities for innovation and professional development in the way of overcoming them - ongoing or looking to the future. This intellectual challenge was also reported in other studies (e.g., Jaschik & Lederman, 2016; Xu & Morris, 2007).

57 observations were clearly stated as opportunities, among which 45.5% refer to students, 51.5% to teachers, 63.6% to the teaching and learning process and 12.1% to the institution. In the first dimension, it was identified as an opportunity to strengthen student autonomy and their involvement in the teaching and learning process (12.1%),

resulting in a recognition of the increase in student participation in learning activities (9.1%), an increase in the possibilities of "attendance" by student workers and the possibility for students to develop work at their own rhythm. Thus, in contradiction with the results obtained in terms of the challenges, remote teaching facilitates the conciliation between personal and professional life (12.1%), given its flexibility in the management of time, spaces, and the rhythm of work and learning. For example, one teacher highlighted that: "The development of student autonomy seems to be greatly reinforced in this regime, it requires a work by the teacher in this sense, but it allows the student to explore different resources and control their work and learning pace" (T3). According to teachers' perspective, the transition to remote teaching also constitutes an opportunity for students to explore different digital resources and expand their knowledge at that level, as well as to share and learn with peers. These findings are consistent with the literature that points out that online learning provides flexibility to students and new opportunities to adult learners (Perreault et al., 2002).

This experience with online teaching due to the COVID-19 pandemic provided teachers with opportunities for pedagogical innovation and the development of new learning methodologies (15.2%) with implications for immediate practices and for future ones - either by acquiring or deepening technological skills (24.2%), autonomously, through participation in training courses (6%) or through peer collaboration (6%). Like one teacher emphasized: "This experience created the opportunity to broaden knowledge about distance learning methodology and the use of digital tools (T4). Another one focused on some of those aspects:

> There was, gradually, an adaptation to distance learning by teachers and students, along with a great deal of learning about the use of methodologies and resources suitable for distance learning. This learning may be useful in the future in the framework of innovation programs in higher education (…). Collaboration among colleagues was an asset for the construction of work proposals and the clarification of doubts about methodologies and resources used in distance education. (T21)

Results obtained by Perreault et al. (2002) also indicated that faculty members considered the use of new teaching approaches important.

This forced experience may have contributed for overcoming some resistance about the use of digital resources; either because it has been perceived, through direct experience, potential in online teaching methodologies and recognized contributions to the pedagogical practices, even if, in the future, we will return to face-to-face learning (or b-learning).

These perspectives find continuity in the "Teaching and learning process" category, highlighting that the transition to online teaching enhances new methodologies and pedagogical innovation (24.2%), adaptation/creation of materials pedagogical (12.1%), the organization of the teaching and learning process (9.1%) and the production of multimedia resources (3%). Other aspects focused on this category point, precisely, to overcome some barriers that are commonly associated with practices developed online: the relationship with students. In effect, 12.1% of the responses indicate that remote teaching promotes the interaction between teacher and students and 9.1% highlighted the systematic monitoring of student learning. About this, one teacher emphasizes that "contrary to what would be expected, this modality, by requiring systematic monitoring of students, makes it possible to reduce "distances" between teacher and student (T4). Regarding assessment, no opportunities were mentioned. In summary, the possibilities of increasing teacher's perception of the students' individual needs and the opportunities of pedagogical innovation and diversification of learning activities were perceived as a way for fostering students' autonomy; the potential for the development of different forms of interaction with students were also valued. It was clearly stated that these are potentialities for being explored, given that, due to the circumstances, some barriers have been exceeded in relation to online teaching.

For some teachers, online teaching brings contributions for a reflection at the institutional level (12.1%), mainly due to the possibility of diversifying the training offer to attract new audiences (6.0%) (national and international), namely those that are distant from the current higher education system. A teacher summarized these ideas:

> I think it is an opportunity for the institution to reflect on its working models and practices, on the way it positions itself in the current context

> of higher education - extending the training offer to new audiences, combining models, diversify the offer, work in networks (…), review strategies for attracting international students; develop more innovative work methodologies, thus promoting the training of its human resources. It is urgent to make decisions. (T19)

Major (2010) found that the possibility of expanding access to education for a large and diverse audience motivates teachers towards online teaching. This idea seems to be in line with the teachers' manifest desire to maintain a hybrid model (face-to-face/remote teaching). With less expression, the need for permanent support infrastructures for online education (3.0%) and networking (other schools or other HEIs) (3%) is also mentioned.

5. CONCLUSIONS

Teachers suggested different strategies for meeting the challenges and addressing the concerns while teaching online. The analysis of the teachers' perspectives allows us to conclude that the contact with a different context of development of the teaching practices, even though it has presented strong challenges to the teachers, requires, in a very short time, an adaptation of procedures, materials and strategies. However, despite concerns about the quality of teaching and the possibility that the situation may remain in the future, teachers point out several advantages of online learning. For instance, one of the most important concerns revealed itself as a strong advantage of remote teaching – students' involvement in their learning. According to Bolliger and Wasilik (2009) this factor positively impacts faculty acceptance of online teaching and learning in higher education and the expansion of online course offerings.

If curricula in higher education must be prepared for times of uncertainty (Anderson & McCune, 2013), COVID-19 pandemic showed that pedagogical development of staff must also be a focus on HEIs. Some researchers highlighted the importance of formal or informal conversations about teaching on academic's pedagogical development (Haigh, 2005; McCune, 2018; Thomson, 2015). This may suggest that it could

be important if teachers have had during confinement an online forum for discussing their pedagogical approaches on online teaching.

An online forum for teachers discussing pedagogical approaches could be an important resource on future initiatives of online teaching. This online forum could benefit if teachers of all areas discuss their approaches, because this interdisciplinary context of reflection could benefit the pedagogical development of teachers from other fields of knowledge.

This research findings, as well as the results achieved with a questionnaire applied to students (Correia & Silva, 2020), were widely discussed in the School's Pedagogical Council, the Counselors drafted a set of recommendations that were sent to the management team and that were taken into account in the organization of the following academic year. During the pandemic crisis, some training actions were carried out for colleagues from the 5 schools that make up the Polytechnic Institute, namely on the use of the Moodle platform and the management of educational resources in virtual environments, as well as on assessment. The classrooms were all equipped to allow streaming sessions in all classes (anticipating the situations of students considered at risk COVID who could not attend classes in person), several teachers developed innovative educational resources, namely in the area of natural sciences; the internship processes were rethought in order to ensure that the institutions received the interns without risk to both parties. This represents an improvement either in teachers' skills or on the work conditions that will remain for the future. Above all, a large project is under development with public funding and a time frame of 3 years, with the objective, among other things, of developing digital inclusion capabilities in the business areas of the Polytechnic Institute.

Nevertheless, leaders must take into consideration that the value academics attribute to autonomous choice in reconstructing identity (McNaughton & Billot, 2016) implies that educational innovation should not be imposed by higher hierarchies of institutions but negotiated and participated by academics.

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