

**Adult education
in times of crisis
and change:
perspectives
on access, learning
careers and identities**

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This book is dedicated *in memoriam*
of our colleagues and friends
Henrique M.A.C. Fonseca and Joaquim Luís Coimbra

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Chapter 8

Ana Cristina D. Lopes & Maria Natália P. Ramos

Educational and cultural challenges: Digital technologies in higher education

Introduction

Humanity has evolved over the last few years into a multicultural society where we all have gone through a process of acculturation, if not as active participants, at least as spectators. Technologies brought to us (new) cultural realities that exists in varied places in the world and facilitated the contact between cultures. As digital technologies became part of people's daily lives, and, in particular, of student's life, it was more than expected that they would become part of education. There so, the inclusion of digital technologies in education was an arising need, leveraged with the real possibility of adverse situations, such as the pandemic, but that can also be extended to any other, such as a war scenario. Its importance goes beyond the need for intercultural communication and integration. The introduction of technologies allows greater cross-cutting accessibility to education for students around the world, regardless of the level of development of their own country. As long as students can have access to a computer with a camera and microphone connected to a reliable internet

connection, they can attend an e-learning course in another country (Byram, 1997; Ramos, 2011, 2016; Williamson et al., 2020).

In Portugal, over the last three and a half decades, the traditional classroom teaching has coexisted with a different method of teaching, the model adopted by the Universidade Aberta. The model of Universidade Aberta has evolved through the years and is nowadays mainly an asynchronous and collaborative model that promotes interaction based on the Anderson's 'Equivalence Theorem' (2002) (Pereira et al., 2012, p. 3017) that defines three pillars of interaction: between student-teacher; between student-student; and between student-content. Nevertheless, the model of Universidade Aberta is much more complex as it has a high focus on the students (promoting an active learning), allowing flexibility (students can learn when and where they want, without no time or geographical restrictions) and favouring digital inclusion once it stells in digital technologies. Also, Universidade Aberta is more than just an e-learning higher education institution, as it provides three dimensions: open (open resources and educational practices), on distance and online learning. It is important to highlight that the absence of presence is not synonym of lack of proximity. Even within a non-presential teaching approach, it is possible to ensure proximity through dynamic activities, debates on chats in among others (Mendes et al., 2018; Pereira et al., n/d).

This brief explanation on the methodology implemented in Universidade Aberta allows us to understand that there is a huge difference between Universidade Aberta methodology approach and what has been implemented during the confinement, designated as 'emergency remote teaching'.

Despite the advantages that online learning and the use of digital technologies can provide, the intend of this article is not to transform face-to-face teaching into distance learning, we believe that face-to-face learning in higher education is essential for most of the students.

Nevertheless, it is indispensable to emphasize the importance of incorporating a technological evolution in traditional teaching and also re-think global education. There are still students currently unable to follow face-to-face teaching, due to personal, organizational, professional, or

cultural limitations, and is important to integrate them in higher education avoiding marginalization.

In this debate it is also important to keep in mind that the pedagogical model implemented must take advantage of the information society and the global knowledge in which we live. Also, it should be valued by solidifying the relations between knowledge and society, allowing social integration, and favouring the establishment of intercultural relations, as well as an open, inclusive, digital, and networked education (Aires, 2007; Dias, 2013; Ramos, 2007, 2008, 2016; Ramos & Lopes, 2021b).

Digital Technology in Higher Education

Through the last decade, there has been an increasing preoccupation of the European Commission in including a more digital approach in teaching (Mendes, 2010; Ramos, 2016). Introducing technology has the aim of improving teaching, but naturally this can only be achieved if there exists a previous preparation, in terms of resources and in terms of training. This highlights the importance of training sessions, that according to Vidal and Mercado (2020), should start on initial training and be continuous throughout the teaching career.

With the aim to integrate technology in teaching, Koehler and Mishra (2005) developed a model named TPACK – Technological Pedagogical Content Knowledge. This model integrates content knowledge, with technological knowledge and pedagogical model. Naturally, in order to introduce any innovation, it is necessary to overcome teachers' resistance. Torres and Brocado (n/d) defined a five stage model that should be followed in the process of training. First, there is a need of recognition, followed by acceptance, adaptation, exploration, and advanced. By recognizing the importance, future application is enhanced.

This is one of the aspects that was positive due to 'emergency remote teaching'. Despite all the aspects that did not evolve as they should, it become clear that technology was essential and could allow teaching despite advance

circumstances. There so, we now have an opportunity to discuss potential new approaches, more active, more inclusive supported by technology. One important aspect is that technology individually does not contribute to the improving of teaching, it is the correct use of technology that can innovate and contribute to deepening learning and improving teaching.

In a global society, such as the one we live today, when the number of students from different nationalities in higher education is increasing, the need for training also extends to intercultural and communication competences. For a teacher, having intercultural and communication competences means being able to accept diversity and adapt activities ensuring the understanding of the message. A knowledge of this areas contributes to break down barriers while improving an approach of proximity that increases social cohesion and a positive integration (Oliveira, 2021; Purnell & Palanka, 2010).

Methods

The present research was carried out through a mixed method approach, with a qualitative initial phase followed by a quantitative phase.

Study Phases and Data Collection

Qualitative Phase

The qualitative data was collected through in-depth interviews conducted between July and December 2021, and the subjects were higher education teachers. All the interviews to teachers were held via Zoom in the aim of a doctoral research.

The teachers were asked to identify the main difficulties experienced at the level of the 1st cycle of higher education.

The collected qualitative data was analysed using content analysis (Bardin 2014). Throughout the analysis, defined codes/ categories, and dimensions were compared.

Quantitative Phase

The quantitative phase was collected through an online survey between November 2021 and February 2022, and the subjects were degree students, in at least their second year in higher education.

The instrument used in collecting the data was an anonymous online questionnaire, to allow responses from different locations, as long as they attend Higher Education in Portugal.

The students were invited to: identify the implemented changes during the confinement due to the COVID-19 pandemic; evaluate the measures adopted for cultural inclusion; share their own expectations regarding their life in the university. It is important to remember that traditional academic experiences were cancelled or reduced to minimum and instead students lived a conditioned reality at a social, relational, and academic level.

Collected data was object of descriptive, multivariate, and inference statistical analysis, using the support of the Statistical Package for the Social Sciences (SPSS).

Characterization / Data Sample

Qualitative Phase

The answers of 24 teachers were recorded. For this study, teachers from Universities and Polytechnic Institutes from the North to the South of the country and from different areas of knowledge were invited to participate.

As can be seen in next figure, the characterization of teachers was very diverse:

	North	Centre	Great Lisbon	South	Universidade Aberta
One year experience	-	-	1	-	-
1 to 5 years of experience	-	-	-	-	2
Over 5 years of experience	3	2	4	2	10
Total	3	2	5	2	12

Figure 1 – Qualitative data sample

In particular, the teachers interviewed were from the following institutions: University of Trás-os-Montes and Alto Douro (UTAD), Polytechnic Institute of Viseu (IPV), University of Minho, University of Beira Interior (UBI), University of Coimbra (UC), Polytechnic Institute of Lisbon (IPL), NOVA University Lisbon, Piaget Institute, Polytechnic Institute of Portalegre (IPP), University of Algarve (UAlg), and Universidade Aberta (UAb).

Quantitative Phase

In addition to the contacts established regarding the qualitative phase, there has also been established contacts with other institutions, such as: Polytechnic Institute of Castelo Branco, Polytechnic Institute of Setúbal and University of Évora to collect their students' opinions. Aside the collected answers by institutional means, responses were also collected from students who shared the link of the online questionnaire in their network of friends. In total, 322 validated responses were collected from degree students in their second year at higher education, characterized as followed in the following figures:

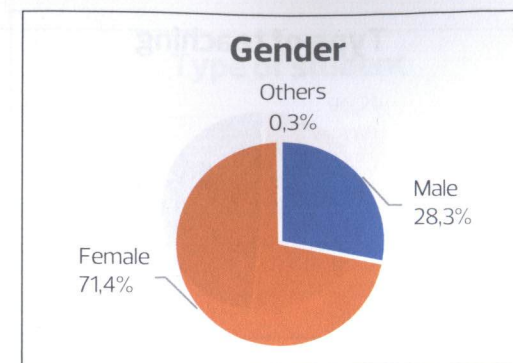


Figure 2 – Gender characterization of the students

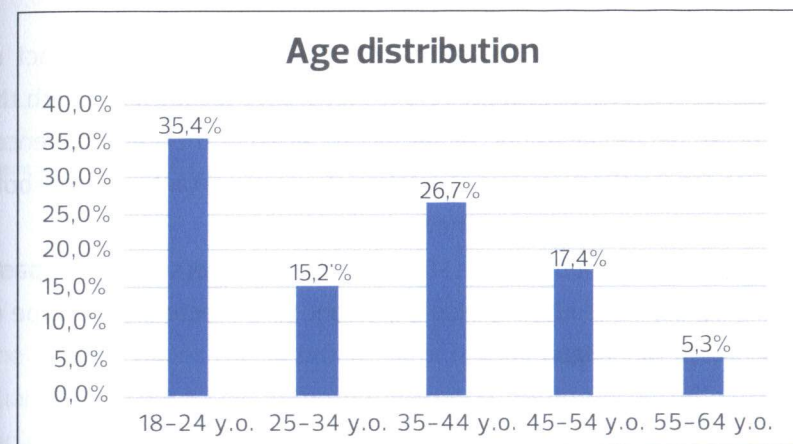


Figure 3 – Age distribution of the students

In this group, there was a subsample of students that attend Universidade Aberta (e-learning) and students that study in a traditional regime: face-to-face learning.

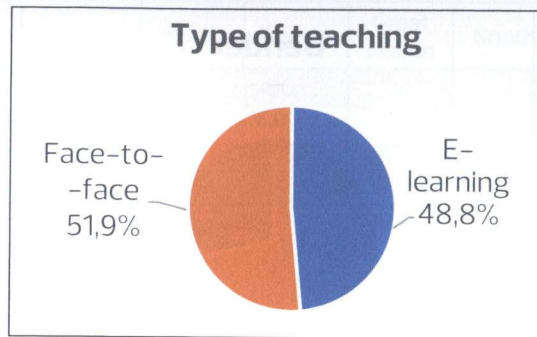


Figure 4 – Type of teaching

As one of the aims of the study was to understand the impact of technologies, in higher education, to overcome several difficulties with the focus on intercultural integration, by identifying whether there are differences in attitudes among the surveyed population, it was important to ensure both sub samples representativity as showed in Figure 4.

As the social condition of the students and their personal life impacts in the willingness to study was also important to characterize the type of student interviewed (Figure 5).

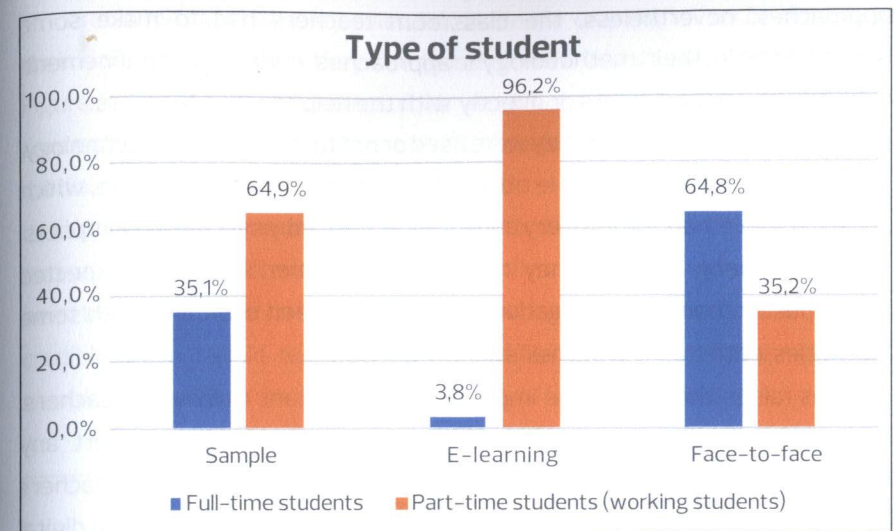


Figure 5 – Type of student

Results

The study revealed a very broad set of results, both in the qualitative and quantitative phase. Only some of the aspects will be addressed in this article, focusing the perspective of the changes imposed and their impact. With this aim, at the level of the students, the results were separated by type of teaching: classroom vs. e-learning and by the type of student: full-time student vs. part-time student.

The first objective of this study was to identify the respondents' relation to technology.

Teachers' Relation with Technology

When asked about relation with technologies most of the teachers assumed to use it daily, and all said they were used to include PowerPoint presentations in their routines. Also, some referred they already used more dynamic

approaches, nevertheless, the classroom teachers had to make some adjustments in their methodology's approaches during the confinement, supported by departments or directly with the help of other teachers.

Regardless of whether they were used or not to include digital technology, some teachers stated that the obligation of maintaining an online life, which meant they've had to do everything online, caused psychological impacts, such as anxiety, because they did not feel prepared for this unexpected and imposed change. The negatives impacts had been overcome with some difficulties, with the help of their support network.

This raises the veil on the importance of constant training of teachers, so that teachers are always up-to-date and prepared to support any eventuality. This aspect will be detailed on the results discussion. If teachers had, in the past, frequent training sessions on digital technologies or in digital approaches, they would have been more prepared to overcome the imposed transformation that occurred in Higher Education.

Students' Relation with Technology

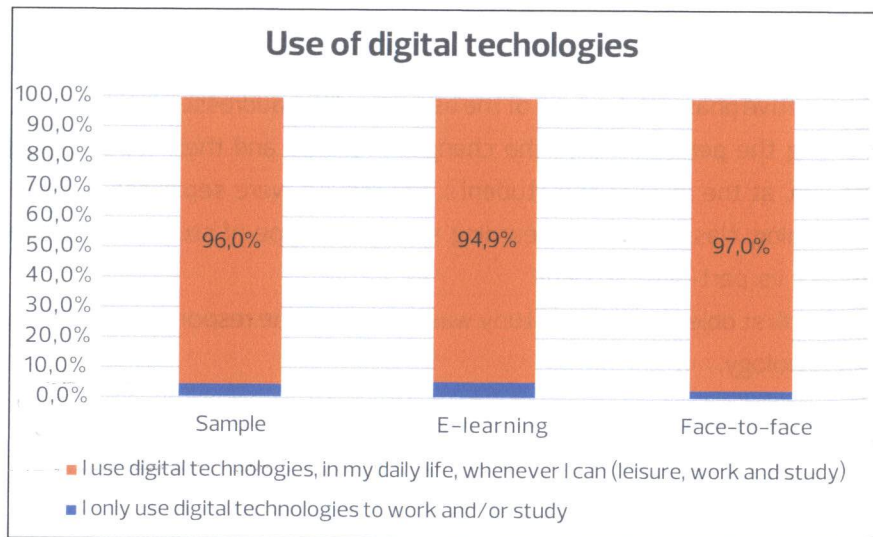


Figure 6 – Use of digital technologies

Around 96% of the interviewed students use digital technologies, in their daily life, whenever they can (leisure, work and study), as observed in Figure 6. This is an expected result as we observe that everybody is always connected worldwide, showing an evident necessity for interaction on social media, or on searching for daily updates.

When students were asked about the difficulties that they have felt and would like to see overcome, the aspect more highlighted was that they need training on 'how to research in repositories, meaning, on how to conduct credible bibliographic research', aspect referred by 11% of the student's sample (Figure 7).

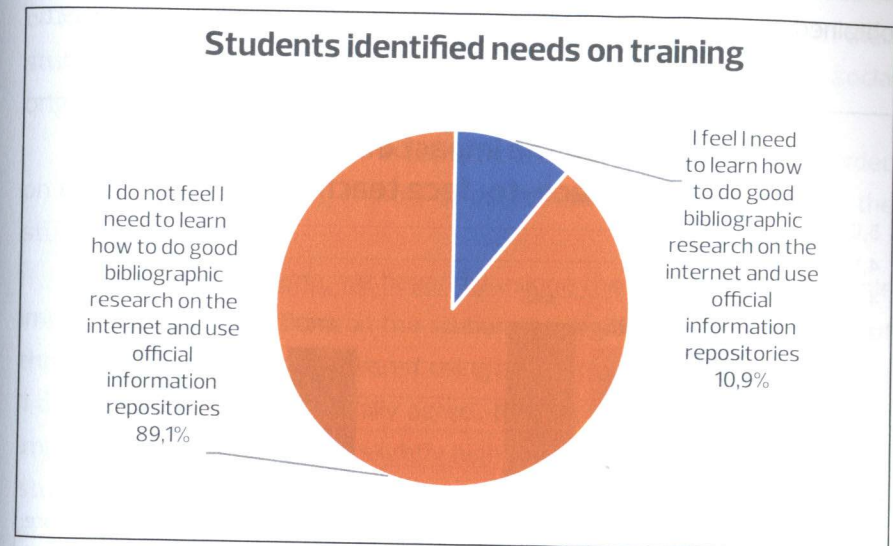


Figure 7 – Evaluation of the necessity of training to learn how to do bibliographic research

Regardless of all the difficulties, as showed in Figure 8, the balance resulting from the inclusion of technologies was positive, according to the evaluation of the students of face-to-face teaching, who were the students most affected by this new reality. In this case, for the two compared groups of respondents, a significant different was recorded from a statistical point

of view (p -value⁴ <0,05). The obtained results showed that the respondents who were part-time students considered that the inclusion of digital technologies helped them improve their academic performance.

This question, as it is, was not done to e-learning students, as they already attended distance learning—already based on digital technologies. To those students the changes implemented were minimum, only final evaluation happened online.

It is also considered by the face-to-face students that digital technologies contribute positively to a more integrative and equitable teaching due (Figure 8). Also in this case, for the two compared groups of respondents, a significant different was recorded from a statistical point of view (p -value <0,05). The obtained results showed part-time students agreed more with this aspect.

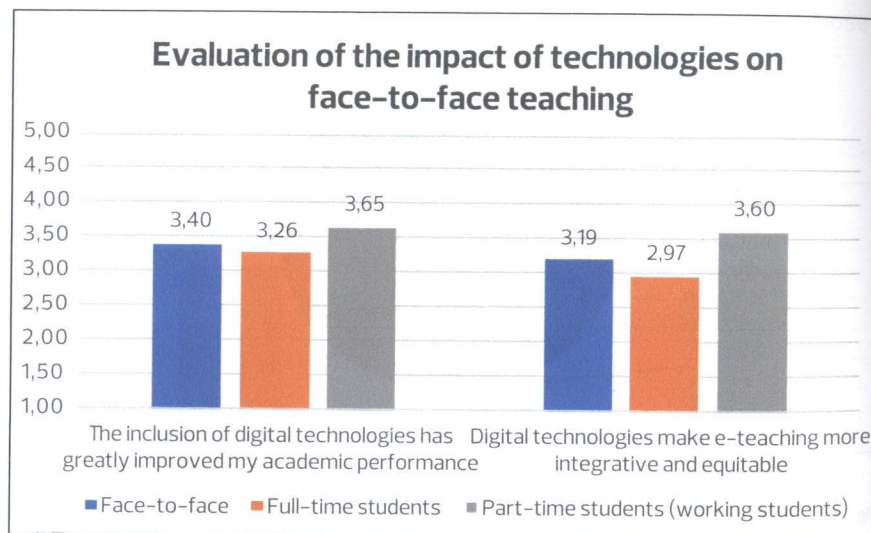


Figure 8 – Evaluation of the impact of technologies on face-to-face teaching

4 The p -value is the probability of obtaining the observed results of a test, assuming that the null hypothesis is correct.

Teacher's Training

The second objective of the research was to identify the teachers needs on training, considering the point of view of teachers (qualitative phase) and the students (quantitative phase).

When the teachers were asked about what they thought there were their needs of training (in the qualitative phase), the tendency of response was that they did not need additional training. After exploring this aspect, it was possible to understand that most of the teachers did not have regular formal training. Also, almost none have had training in technological literacy or in aspects related to cultural integration; nevertheless, regarding inclusion of foreign students, they have been introducing some strategies with their students to avoid marginalization independently from the cultural or social origin of the students.

Due to the importance of this aspect, this same theme has been aborded on the quantitative phase, in order to understand the point of view of the students.

To deepen this theme, we began by asking the students about visible impact of teachers' actions on the student's integration. Questioned about this aspect, the students answered, using a scale from 1 to 5, in which 1 means 'I don't agree at all' and 5 'totally agree', that on average 4,4 recognize this importance. The average was slightly higher in the case of distance learning students, although the difference in between the perception of both group of students (e-learning and face-to-face) was not statistically significant (p -value >0,05).

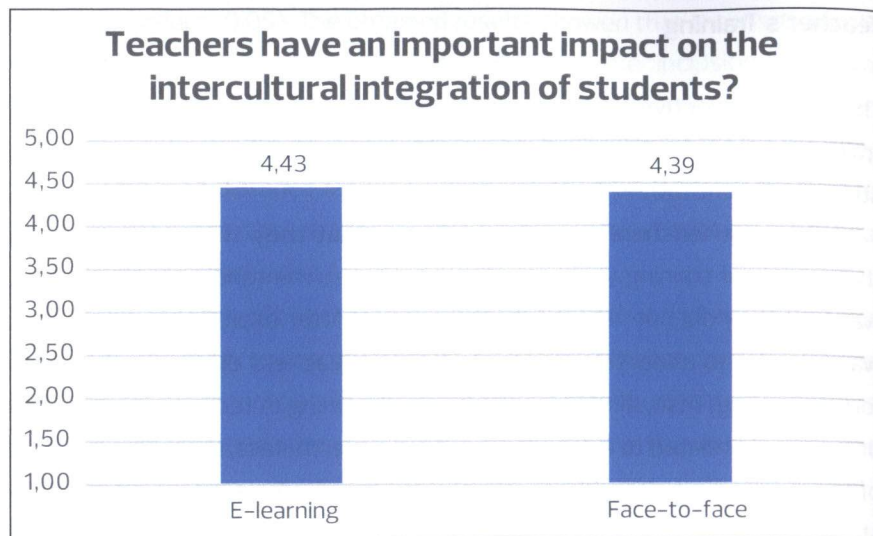


Figure 9 – Accordance with the sentence that: 'teachers impact on students' intercultural integration'

Next, the need for additional training has been evaluated. In detail, the students were asked to analyse teachers needs of training, using a scale from 1 to 5, in which 1 means 'I don't agree at all' and 5 'totally agree'. The average obtained in this question was not so high, but it was still visible as a necessary improvement (Figure 10).

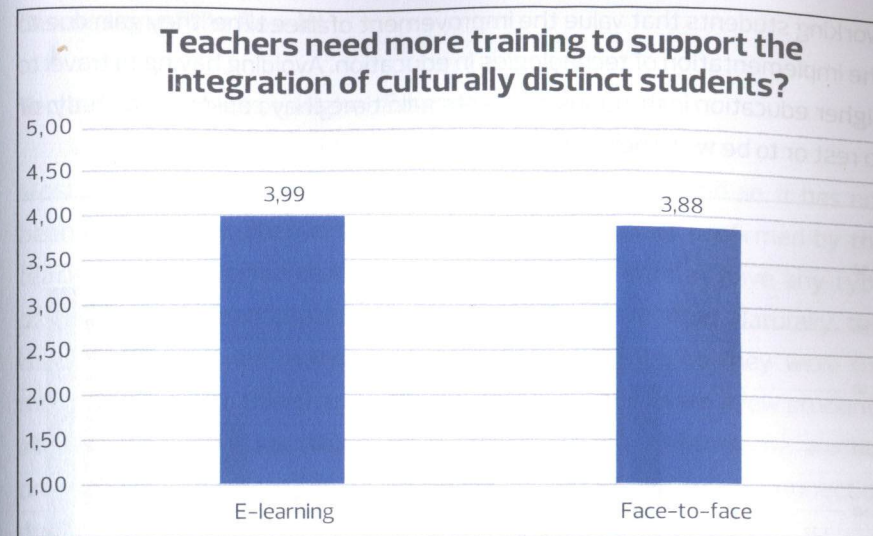


Figure 10 – Accordance with the sentence that: 'teachers need more training to support the cultural integration of the students'

Comparing the 'need of training' with the 'importance of training', it is noticed that the average is slightly lower on the need (Figure 10) regarding the importance (Figure 9), meaning that the students possibly recognized the integration actions of the teachers, but the need for training is still evident.

Post-pandemic Education

The third and last objective was to identify possible changes in the future approaches in order to improve education, regarding face-to-face students' expectations.

When questioned about what they (the students) would like to see changed (quantitative phase), some aspects were highlighted. It was clear (as shown in Figure 11) that there was a significant difference in the expectations of full-time students vs. working students. The first group desired a more integrative and personal experience, in contradiction to the

working students that value the improvement of 'free time' they gain due to the implementation of technologies in education. Avoiding having to travel to higher education institutions, students gain time they could use to study, or to rest or to be with their family and friends.

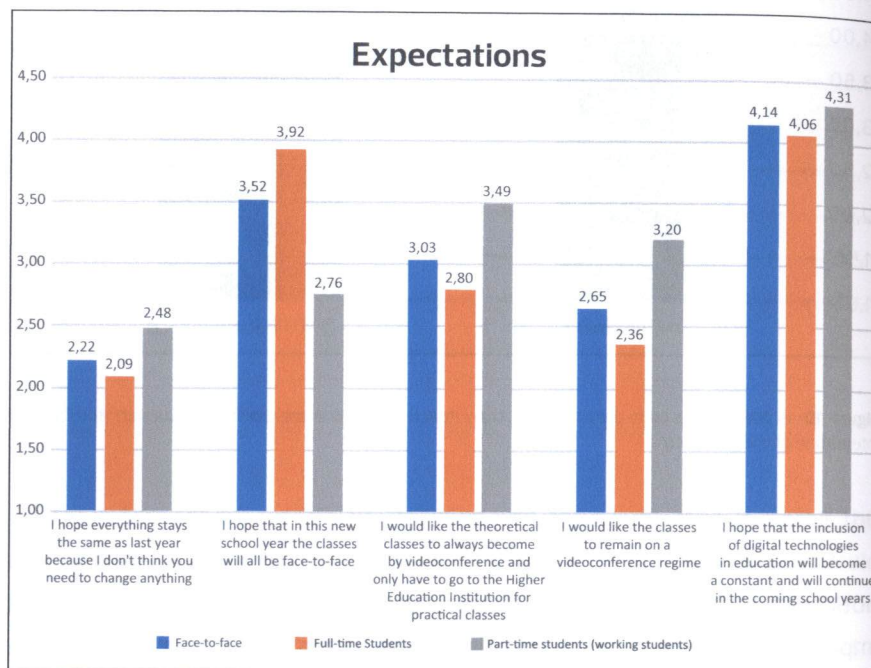


Figure 11 – Students expectations/desire changes

In concrete, face-to-face students agreed on the necessity of being implemented changes. Particularly full-time students wanted to return to a total face-to-face regime, with a significant difference from a statistical point of view (p -value $<0,05$) to the part-time students' opinion that do not manifest it so explicitly. Regarding the intention of maintaining videoconference classes, there was some students that agreed on the hypothesis of having theoretical classes on this regime. Independently on the differences observed in both groups, all believed and agreed on the importance of including technologies as a resource to improve learning.

Discussion of the Results

Technology Impact on Higher Education

Most of the students used technology in their daily life, and so, it has not been noticed difficulties in the use of technologies, fact confirmed by the teacher's that referred that most of the students did not have any type of difficulty in the adaptation to a more technologic relation. Naturally, this issue was addressed mainly to face-to-face students, as they were the most affected with this change. Despite this fact, there were a few students attending Universidade Aberta that stated they have felt some anxiety on final evaluation days due to some fear of losing the internet connection during the exams.

Regarding face-to-face students, some issues have been highlighted by the teachers on how they evaluated the student's integration during 'emergency remote teaching'.

The first point indicated was the fact that the students that normally use technology, did not necessarily have the necessary conditions to follow a virtual class (computer with a camera and microphone connected to a reliable internet connection), as some of them used the available computers at the institute to study or do their works during the semester. There so, became clear that there were many cases of students who did not have a computer at home, or that the computer did not have a camera or microphone, which conditioned their access to virtual classes. The access to a stable internet connection was also a challenge, and another difficult, shared also by some teachers that did not have a reliable internet connection at their homes. This aspect was even more noticeable in families, specially the most vulnerable who did not have financial capability to have a stable internet contract. This conditioned was not exclusive from Portuguese reality and has also been highlighted in other countries (Gonzalez et al., 2020).

In addition, the fact that the whole family was confined to the same space, showed the lack of conditions in some households, impacting the

level of concentration that attending a class requires, highlighting again the marginalization of the most vulnerable groups that already are the ones that need more support to maintain their student path.

The teachers also referred that some of the non-Portuguese students that lived and studied in Portugal, and that already live on precarious conditions, felt deeply these impacts which committed their performance during evaluation.

From the previous analysis it became clear that the pandemic situation revealed the most unprotected students and allowed us to identify the greatness of cases of students who need support to continue their studies.

Here, and once again the educational community was tireless, joining forces to share second-hand material (such as computers, cameras, among other means) with the most disadvantaged students. There were teachers who stated that in addition to material donations, there were also people who donated money to acquire new computers/cameras to equip students, allowing them to continue studying, avoiding their marginalization.

Aside vulnerability issues already stated, there are also some other aspects that need to be overcome before technology becomes an aspect of full success and integration of all students. The following aspects are transversal even to more mature students that already chose an e-learning model. There so, it is also important to highlight that some students, despite having regular access to the internet and use it as a research source, do not use it correctly. The majority of the students don't know how to use reliable sources and need training on research in open-source resources such as universities repositories or in credible scientific publications (Figure 7). This lack of knowledge is reflected in the work received from students in which sometimes they just copy and paste any information collected, without verifying the source or its scientific validity.

To overcome these difficulties the documentation services at Universidade Aberta provide regular training on this theme, training that remains relevant either by the point of view of teachers and students, and that continue to be necessary to overcome the manifested difficulties. This

is an aspect that should be transversally implemented in all higher education institutions.

Moreover, and in a more practical way, the fact that the students normally use social networks does not necessarily give them the knowledge they need to attend online teaching. For example, some students revealed performance difficulties of an online final evaluation test, not due to the content but due to the application. These difficulties impact negatively on their evaluation score.

However, and despite the highlighted difficulties, teachers observed that the students were pleased with the inclusion of technology, even though a small group of the older students, who entered higher education at a later stage of their life, and who were not so familiar with technologies, have had some difficulties that either themselves or the colleagues help overcome.

Psychological Impact

Full-time students had joined the higher education with more expectations regarding social activities. This group is normally younger students that need more support from their network, obtained due to presential attendance to classes by socializing with their peers. They are always connected online, even outside their home, but when forced to stay at home they felt more anxious, and so it was possible that in a certain way, they started to associate technologies to less personal support. This association may have reduced their enthusiasm to a more technological teaching, in opposition to part-time students that revealed positive impact on this measure and believe that technology improves inclusion and contributes to a more integrative education (Figure 8). Thus, in negative terms of the impacts that occurred, and in line with what was observed in other realities than the Portuguese one, it is necessary to highlight the stress, anxiety, and psychological exhaustion that social isolation has created (APA, 2020; WHO, 2020).

Systematizing, anxiety affected teachers, because in some cases they could not guarantee the necessary conditions to teach classes, and because they observed in first-hand the students lack conditions and the negative

impact on their academic performance. Also affected students who in many cases had no conditions in their homes, nor technological, nor for the necessary concentration to attend classes (Ramos & Lopes, 2021b).

In addition, it should be noted that, and in a very curious way, and because the students are constantly connected through the internet, they seem to feel demotivated, anxious, and less integrated in the group when they were prevented from leaving their houses and just contact their network friends through the internet. Some of the students felt they have less support as they could not talk in person with the colleagues. Naturally, this affected more people that were already shy and with more difficulties of integration. Also, non-national students, that return to their homes in a foreign country, were also more affected as they did not attend the regular integration activities provided by the higher education institutes or sometimes were in a time zone that prevented them to even attend virtual classes. Nevertheless, it is also important to refer that integration activities were not yet universal, and the measures implemented were very different among the universities, also stressing that some universities do not implement any inclusion measures.

Substantialising, feeling lack of support is one of the factors that correlates strongly with the experience of anxiety in students, and this support in the traditional students is related to physical presence on classes, and presential contact with teachers and other students (Irawan et al., 2020; Thompson et al. 2016; Salman et al., 2020).

How did the students overcome the negative impact?

Increasing the incidence in social media was one of the ways to overcome the symptoms of anxiety and stress (Al-Tammemi et al., 2020; Weiss & Murdoch, 2020). Nevertheless, some teachers stated, during their interviews, that some psychological support to overcome the negative symptoms of their students was provided by themselves or the universities. According to Garfin this was an essential strategy to avoid the burnout of the students (Garfin et al., 2020).

The Importance of Teacher Training

The (un)success of teaching is based on three aspects: the student, the social environment, and the school institution. Based on the established relationship among teacher and student, implying that learning should go beyond the predefined contents (Ramos & Lopes 2021b; Silva, 2010).

Considering these facts, it is important that the teachers keep evolving and keep updating their knowledges as this is fundamental not only for the success of the students, but also for their integration and evolution as human beings.

This need is not exclusive of a pedagogical model, it is a necessity of all teachers regardless the type of teaching. Update skills, both technological and cultural is indispensable in today's global society (Ramos & Lopes 2021b; Sales, 2018).

Post-pandemic Education

It is not simple to think about the world, about the education after the pandemic, as it is not yet overcome. Nevertheless, life goes on, as is communally said, so the education evolved even though many of the aspects are now exactly as they were before the pandemic crisis.

Despite this fact, what has really changed?

The classrooms were equipped with systems to allow the students to attend virtual classes, and according to one of the teacher's testimonies, there are still some universities that divided the classes in a b-learning model, allowing the students to stay at home in some specific cases. Also, there was still a possibility of a student to attend a class from home when is sick. The number of courses e-learning or b-learning has also increased, aside the ones provided by Universidade Aberta.

Several conferences are still occurring online, or at least in a mixed way, online and presential, allowing a more varied access to students and a more frequent interaction with teachers from other countries.

All these aspects are positive and allow integration, equality, and knowledge improvement and have a positive impact on education. Probably this is not yet enough, and this topic needs to be on the teachers' agendas. There has been a huge investment in technology that needs to be monetized, not only for the financial impact, but because the global and current uncertainty exists and universities need to be prepared for any eventuality.

Limitations

Although this study provides some answers to several questions regarding the comparison of e-learning with face-to-face learning, it has some limitations. The Great Lisbon students' sample is substantially higher than in the rest of the country, when we know that the reality is very different among regions, especially in the interior of the country. Starting with these results is important to conduct another research focusing on specific aspects that need to be more detailed, conducted with institutional support to be able to be distributed proportionally throughout the country.

Conclusion

We live in a global world, facing a migratory crisis. There is a need to adapt and develop strategies, competences, and policies to integrate multi/intercultural diversity while ensuring an equity in education for all genders, regardless of their age group, social and cultural backgrounds.

To improve education, it is important to identify substantial pillars based on the testimonies of teachers and students. This will allow us to understand what should be maintained and what needs to be changed to improve the quality of higher education and make it more equitable and egalitarian, both from an educational and intercultural point of view.

From what was observed in the results, it is important to evolve, define strategies that are adapted to all different targets of students and allow the inclusion not only cultural, but also social. Each university needs to analyse

these results according to its reality, as the difference between regions and local realities exists and is important.

As we have started by emphasizing, (un)success of teaching depends on the ability to integrate not only individual, social, and cultural diversity, but also adaptable to unforeseen, adverse, and atypical situations by taking advantage of the identified opportunities.

It became clear that there are still some aspects that do not generate consensus, and the outcome of its implementation depends on the social context and individual characteristics of the students. There so, it is fundamental to keep on discussing solutions to be implemented in the higher education institutions. Nevertheless, regular training for teachers, including content, pedagogical, and digital skills (as defined in TPACK) associated to intercultural and communication skills is imperative and fundamental, as the teachers are one of the pillars to promote open and inclusive education (Ramos, 2016; Ramos & Lopes, 2021a).

We live in a changing, open, digital, transnational society, where it is important to monitor and produce innovations, particularly in the context of education, which is fundamental to the evolution of society (Dias, 2013; Ramos & Lopes, 2021b; Sales, 2020).

Data availability

Due to the nature of the data, it is not possible to allow public availability in accordance with the General Data Protection Regulations (GDPR). Specific access to some data can be evaluated according to the GDPR.

Informed consent

All the participants were adults (more than 18 years old) and gave permission for their data to be used in this study.

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