Abstract: This article analyzes international students’ assessment of remote teaching and learning (T&L) during the second year of the COVID-19 pandemic in Portugal. While all students have suffered the consequences of campus lockdowns and distance teaching, international students represent a particularly vulnerable group since, even under normal circumstances, they already have to deal with the challenges of new academic and living conditions. In Portugal, most international students come from Portuguese-speaking (designated as Lusophone) countries. Students’ experiences were gathered via an online cross-sectional survey (N = 672), and the quantitative analysis compared Lusophone and non-Lusophone students and undergraduate and postgraduate students. Non-Lusophone students were more negative about remote education than Lusophone ones, being less interested in continuing to study online and giving a more negative assessment of the T&L experience than their counterparts. For them, cultural immersion is probably as important as degree attainment. Postgraduate students reported a lesser increase in study time and rated the pedagogical aspects better than undergraduate students, which suggests, by comparison, a better adaptation to the remote regime. Implementing flexible and hybrid education solutions is critical to maintaining international students’ interest.

Keywords: COVID-19, emergency remote teaching, foreign students, higher education, Lusophone countries

1 Introduction

Although distance education is not new, the COVID-19 pandemic, as an unprecedented event, boosted online education like never before (Baggaley, 2020; Kidd & Murray, 2020). Higher education institutions (HEIs) were forced to switch completely to an online learning environment, raising multiple questions about what kind of education they would offer their students (Kanwar & Carr, 2020; Kidd & Murray, 2020). Several authors stress that there is a difference between distance education and the remote teaching emergency solutions adopted following the campus closures and the suppression of physical contact, which have been referred to as “emergency remote education” (Bozkurt et al., 2020; Hodges, Moore, Lockee, Trust, & Bond, 2020) or “COVID-19 online learning (CoOL)” (Tsang, So, Chong, Lam, & Chu, 2021). Distance education requires a particular instructional design and pedagogic practices, which the urgency of the response allowed no time to be developed or implemented.

Since the emergence of the pandemic in 2020, studies have highlighted the difficulties faced by HEIs – such as the lack of adequate planning, design and development of online instructional programs (Bruggeman, Garone, Struyen, Pynoo, & Tondeau, 2022; Haleem, Javaid, Qadri, & Suman, 2022), the lack of teaching staff skills in online teaching and learning (T&L) environments (König, Jäger-Biela, & Glutsch, 2020; Paetsch & Drechsel, 2021), and the lack of a proper IT structure to accommodate the migration of all staff and students to the digital environment (Roman & Plopeanu, 2021; Vicente, Lucas, Carlos, & Bem-Haja, 2020). In addition, other studies have highlighted the challenges faced by students, such as the impact of the lack of social interaction and the stress caused by the pandemic on students’ mental health (El Said, 2021; Flores et al., 2022; Lemay, Bazelais, & Doleck, 2021; Morvay-Sey, Trpkovici, Ács, Paár, & Pálvölgyi, 2022).

To the best of our knowledge, there are no studies about international students’ T&L experiences during COVID-19 in Portugal. These students represent a particularly vulnerable group and are expected to suffer more from the consequences of lockdowns and closures of institutions since online T&L disrupts not only their learning experience but also their entire international experience. Cairns, França, Calvo, and de Azevedo (2021) argue that the learning experience of these students in Portugal changed from being a relatively positive experience to one characterized by risk
and uncertainty. Online teaching, a poor substitute for “real teaching,” has contributed to social isolation, and it is unclear whether and what learning occurred in the virtual classroom. The authors highlight differences between students from inside and outside the EU, as well as between those on short-term exchanges and longer-duration educational migrants. They found that those who come from more remote countries have been the most affected, given their limited prospects for returning home, coupled with political and economic problems in sending societies (Cairns et al., 2021).

1.1 Objective, Research Questions, and Hypotheses

This study analyzes international students’ perceptions of remote T&L in Portuguese HEIs. Portugal is an interesting case because it is an under-researched context: international enrolments have grown fast and have become increasingly diverse (Sin, Tavares, Aguiar, & Amaral, 2022) and international recruitment is relatively novel for HEIs. These have recently realized their potential benefits and have become proactive recruiters, placing Portugal among the semi-peripheral countries in the international recruitment landscape (Sin, Tavares, & Cardoso, 2019; Sin, Antonowicz, & Wiers-Jenssen, 2021). Most international students seeking Portugal are from the Global South (Brazil and African Portuguese-speaking countries), therefore, not among the most studied groups of international students. The article acknowledges, however, that international students are not a homogeneous group: besides the international students who come primarily from former Portuguese-speaking countries (designated as Lusophone), non-Lusophone students have become more numerous over the past decade (Sin et al., 2022). Given the heterogeneity of international students regarding cultural, linguistic, and academic conditions in their home countries, their experiences are likely to differ according to cultural distance (Finn, Mihut, & Darmody, 2022; Neto, 2019). For example, Lusophone students are more familiar with the Portuguese language and culture, which facilitates learning. Additionally, the academic experience is different between the undergraduate and the postgraduate levels, with the latter being more mature and more autonomous learners. It is known that a successful online T&L program depends on many aspects, including students’ skills such as organization, time management, self-discipline, and study motivation (Dixson, 2012; Farrel & Brunton, 2020). Thus, since postgraduate students generally have a more organized study routine due to their previous experience, they are more likely to better adapt to the online T&L than their counterparts. Their perceptions of the online regime may therefore be different.

Thus, the article addresses the following research question: What were the perceptions of international students in Portugal of remote T&L during COVID-19? To understand how the heterogeneity mentioned above affects perceptions, the article aims to answer two different sub-questions: Are there any differences between Lusophone and non-Lusophone students? Are there differences between undergraduate and postgraduate students? According to the APA Dictionary of Psychology (American Psychological Association, 2015), perception is defined as the process of becoming aware of something through activities that includes recognition, observation, and discrimination.

Considering the heterogeneity of international students in Portugal and the qualifications they are enrolled in, the current study aims to test two hypotheses:

H1: Given the cultural and linguistic proximity, Lusophone students perceive their learning experience better than non-Lusophone students.

H2: Given the greater autonomy required in advanced degrees, postgraduate students have a more positive perception of their learning experience during COVID-19 than undergraduate students.

1.2 T&L During COVID-19 and International Students

T&L have been severely disrupted by the massive change from face-to-face education to distance education which has occurred all over the world (Chan, Bista, & Allen, 2021; Farnell, Matijevic, & Schmidt, 2021; Gu & Huang, 2022; Jensen, Marinoni, & Van’t Land, 2022; Marinoni, Van’t Land, & Jensen, 2020; Santiago, Troy, & Weko, 2021). HEIs, even in developed countries, were unprepared for the sudden digitalization of their teaching offer, and access to the necessary technology and tools could prove problematic (Farnell et al., 2021; Marinoni et al., 2020; Santiago et al., 2021). Rijks and Fenter (2020) reported significant variation in the readiness levels within HEIs to work remotely based on perceptions of their staff. While in some countries, respondents were overall confident about the digital preparedness of their institutions (74% in Sweden, 71% in China, 66% in the United States, and 62% in the United Kingdom), in other countries, respondents were less confident (36% in Brazil, 50% in Spain, and 58% in Germany). It is worth noting that even in European countries, some institutions are not ready for the digital transition (Rijks & Fenter, 2020).
Learning has also been affected, and students have experienced negative effects on learning performance, effectiveness, and satisfaction (Doolan, Barada, Buric, Krolo, & Tonkovic, 2021; Farnell et al., 2021). A survey conducted by the European Students’ Union (Doolan et al., 2021) reported that 47.43% of students indicated their performance as a student had worsened since the cancellation of on-site classes and more than half saw an increase in their workload, as teachers compensated the lack of on-site classes with more assignments. The negative experience was aggravated by isolation (Lemay et al., 2021; Naidoo & Cartwright, 2021) since learning is also a social activity requiring interaction, dialog with peers and teachers, and mutual support between students. Indeed, student–student dialog, instructor–student dialog, and course design were the key predictive factors of learning effectiveness of online learning during COVID, likely to determine its ultimate success (Tsang et al., 2021). The European students’ survey found that most students preferred real-time face-to-face teacher–student interaction during all teaching formats (lectures, seminars, practical classes, and supervisions) (Doolan et al., 2021). While teachers responded to questions in a timely manner and were receptive to students’ suggestions for improvement, students agreed to a lesser extent that lecturers had provided feedback on their performance on the assignments and informed students of the new modes of assessment (Doolan et al., 2021). Remote learning could also lead to disengagement. Szopiński and Bachnik (2022) found that students who were less involved before the pandemic could not move teaching online because of the students’ lack of resources, internet connectivity, and were receptive to students’ suggestions for improvement. While they faced all of the above challenges, there are additional difficulties that international students struggled with. COVID-19, besides trapping foreign students as the borders closed, put at risk the sense of community that is created through learning as a social activity. Tham, Lajunno, and Driml (2021) argue that universities should learn how to combine face-to-face and virtual teaching while maintaining a sense of community on campus, reasserting their societal benefits. One also needs to bear in mind that international students are displaced and, therefore, have no family to turn to and, even under normal circumstances, there is a greater incidence of mental health problems among international students who were less involved before the pandemic.

Remote education during the pandemic has also been criticized for aggravating existing inequalities (Bozkurt et al., 2020; Chan et al., 2021; El Said, 2021). First, the students who were most vulnerable, struggling academically, and in need of learning support have been deprived of direct contact and interaction with their teachers and the on-campus support units (El Said, 2021). Second, the shift to online T&L has revealed the digital divide between with access to Internet and computers and those without (Bozkurt et al., 2020). The European-wide survey (Doolan et al., 2021) found that adjusting to remote education was more difficult for students without a good Internet connection and as well as students with lower levels of digital and social bonding capital. For disadvantaged learners, for example, coming from low-income families, minority groups, or migrants, the digital environment could represent an additional barrier to learning (Santiago et al., 2021).

Digital inequality can be observed within countries, even in the most developed ones, but also between countries (Chan et al., 2021; Jensen et al., 2021; Marinoni et al., 2020). According to a global survey conducted by the International Association of Universities (Jensen et al., 2022), European institutions were very fast to shift to remote T&L from the very start of the pandemic. Although institutions in most countries around the world faced challenges during this transition, especially those from Africa (Tefera et al., 2022), but also other low- and middle-income countries could not move teaching online because of the students’ lack of internet access from home (Marinoni et al., 2020). Moreover, institutions in low-income nations have struggled to launch quality distance education programs because they lack resources, experienced educators, and strong institutional capacity. Jensen et al. (2022) report that while 8 out of 100 students are likely to have missed out on remote T&L in Europe, the number rises to 26 out of 100 in Africa.

Fewer studies dwell on international students’ experiences. While they faced all of the above challenges, there are additional difficulties that international students struggled with. COVID-19, besides trapping foreign students as the borders closed, put at risk the sense of community that is created through learning as a social activity. Tham, Lajunno, and Driml (2021) argue that universities should learn how to combine face-to-face and virtual teaching while maintaining a sense of community on campus, reasserting their societal benefits. One also needs to bear in mind that international students are displaced and, therefore, have no family to turn to and, even under normal circumstances, there is a greater incidence of mental health problems among international students who were less involved before the pandemic.
students than domestic students (Forbes-Mewett & Sawyer, 2016). According to Doolan et al. (2021), living away from home aggravates the sense of isolation, as students who were living in their family homes reported higher levels of bonding social capital in comparison to students who were living in rented accommodation or student residences (Doolan et al., 2021).

Szopiński and Bachnik (2022) assessed to what extent nationality determines the evaluation of online studies, the frequency of participation in online courses, and the preferences regarding the mode of study in the future. Again, the authors claim that e-learning causes significant trouble to students, who become isolated and alienated due to their hesitation to participate in online communities. Some of the reasons which may explain this isolation and alienation are personality, a sense of transactional distance in the online environment, lack of confidence and trust in an online community, lack of nonverbal communication, connection difficulties, poor writing skills, or language barriers (Rasheed, Kamsin, & Abdullah, 2020). Moreover, international students tend to rate online studying lower than local students and participate less due to their probably poor knowledge of the local language and, in some cases, poor internet connections. Additionally, many international students may decide to study abroad to possibly take up legal employment (Szopiński & Bachnik, 2022), which online education impedes, and therefore, their preference for the face-to-face mode of study is understandable.

Gu and Huang (2022) found that, for international students, the shift to online T&L has mitigated the loss of culturally immersive, place-based study-abroad experiences. However, while this shift may have the potential to give students flexibility and a safety net to pursue higher education at a distance, digital education has frequently weakened the effectiveness of T&L. Tavares (2021), for instance, found that online teaching platforms broke the sense of a learner community established in the face-to-face classes as it decreased individuals’ fully embodied behaviors and interactions to very limited texts and visuals on the screen (particularly as most students chose to keep the camera off), hence dehumanizing the class. Likewise, the digital mechanism of communication, which implies texting in the online classroom, appeared to make students more conscious of their “non-native-speaker of the local language” and less prone to communicate, as their linguistic mistakes were more exposed.

However, despite the risk of marginalizing students who have limited access to digital technologies and the Internet, Obadire, Mashau, and Misumi (2020) argued that the online or distance education approach adopted by many HEIs in South Africa enabled virtual international mobility for international students in a more inclusive and equitable manner than those requiring physical transnational mobility, as it is far more affordable for students with financial difficulties.

The current work contributes to knowledge by expanding the literature on international students’ experiences with remote T&L during the pandemic. While many studies have focused on students’ mental health and academic stress during these challenging times, little research has focused on international students’ perceptions of remote education. Although this model is more of an emergency education than of distance education, the results may bring insights into international students’ interest and receptivity in a fully remote education in Portugal and the necessity of bearing in mind specific student characteristics (study level and region of origin) when developing online courses to ensure a good learning experience and academic success. The international students in Portugal come mostly from the Global South (Brazil and African countries), which is less researched in the literature. This is also Portugal’s case as a destination country. In addition, the study also adds initial evidence of psychometric validation of an instrument from its factorial analysis and data reliability.

2 Method

2.1 Sample Characteristics

In the context of a larger project about international students in Portugal, a survey was targeted at international students in Portuguese HEIs. A non-probability sampling method was used because of the restricted time and circumstances for data collection caused by the pandemic, which made it impossible to reach the entire population (N = 47,072). Moreover, since participation in the study was voluntary, we had to rely on the willingness of students to answer the survey; thus, a convenience sample seemed to be the most logical option. This approach allows for exploring variations between groups of respondents and enables theory and hypothesis development. Students were considered international if they indicated that their home country was not Portugal and that they did not have Portuguese nationality.

The minimum necessary sample size was estimated considering a 5% confidence interval and a 95% of confidence level (Z score = 1.96). Incomplete and missing cases were excluded, leaving a sample of 672 valid responses.

The sample was quite balanced in terms of gender, with just over half (58.5%) female and 39.8% male. About 1.6% were non-binary or preferred not to answer. Most participants (84.8%) were full-time students, and 89.7% were studying in
Portugal to obtain a degree. The majority (63.5%) were enrolled in undergraduate programs. Table 1 shows the most frequent countries/regions of origin. Brazil is the most frequent country of origin, counting half of the participants. Portuguese-speaking countries in Africa (PALOPs) – Angola, Cape Verde, Mozambique, Guinea-Bissau, and Sao Tome and Principe – represent the second most frequent origin. Thus, most participants (62.7%) were Lusophone students.

The students’ disciplinary areas of the courses were quite diverse. Around 33.5% of the sample were students from the Engineering area, 24.1% were from Social Sciences, Business and Law, and 15.9% studied Arts and humanities. The remainder were spread across Natural Sciences, Mathematics, and Computer Science (10.3%), and Health (10.3%). According to national data, it is worth noting that the first three fields have the highest number of international students enrolled in Portuguese HEIs (DGEEC, 2022).

Almost all the participants were in Portugal. Only about 1% of the students in the sample were still in their home county, waiting for the borders to open to move to Portugal, although they had already started their studies exclusively online.

Most students (76.5%) stated that they did not have a scholarship or any other type of funding besides their own and family resources. At the time of the survey, when the state of emergency had been decreed in the country, the majority of students were in an exclusively remote teaching-learning regime (86.9%), while the remaining stated that they still went to the institution occasionally because they were engaged in activities such as laboratory practices and internships, for example.

The representativeness of the sample was also examined based on the most recent data on the total number of international students (N = 47,072) enrolled in Portuguese HEIs in the 2020/2021 academic year (DGEEC, 2022). As reflected in our sample, Brazilian students were the majority in the population (N = 17,629) and, following the Lusophone countries, the most frequent countries of origin were France (N = 2,563), Italy (N = 1,075), and Germany (N = 1,069). However, in our sample, the ratios were slightly different. The sample differs with respect to the gender of the students, as female students were over-represented in our study, while they represent 47.7% of the population.

### 2.2 Data Collection, Instrument, and Procedures

The authors developed a cross-sectional survey and published it online using the Lime Survey platform. It was designed in a semi-structured format, comprising multiple-choice questions and free-text fields for further elaboration. The sections analyzed in this study, in addition to the sociodemographic ones, are those related to T&L, namely, plans for the following academic year and perceptions of the online T&L experience (see Appendix). The survey was disseminated online, mainly through social media (i.e., Facebook open groups created by students’ associations in Portuguese HEIs) and mailing lists, in the spring of 2021, a period that corresponded to the end of the second lockdown and the beginning of the gradual deconfinement. The survey could be accessed via a smartphone or any other Internet-connected device. Data collection was carried out in compliance with the code of research ethics of the researchers’ institution. Respondents were informed about the objectives of the study, that their data would remain anonymous, and that they could withdraw at any time. Their participation was voluntary, and a section was included for participants to consent after being fully informed about the objectives of the study.

Students assessed the remote T&L experience in two ways. First, they rated different aspects of their experience during the remote T&L regime through 14 items (lectures, homework, contact with peers, Internet access conditions, etc.), using a 5-point Likert scale, which ranged from strongly disagree to strongly agree. Then, in a second question, the students compared the two situations (remote learning and face-to-face) and rated remote learning as equal, worse, or better than face-to-face. The 14 items were subjected to an exploratory factor analysis (EFA) in order to verify how they were organized in terms of dimensionality and to assess their adequacy in explaining the pattern of correlations.

First, we performed the Kaiser–Meyer–Olkin (KMO) test for sampling adequacy and Bartlett’s sphericity test to verify how suited the data were for EFA. The obtained indexes (KMO = 0.865; χ² = 2582.712; df = 378; p < 0.001) indicated that factor analysis was highly recommended.

### Table 1: Most frequent origins of international students (N = 672)

<table>
<thead>
<tr>
<th>Country</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brazil</td>
<td>50.0</td>
</tr>
<tr>
<td>PALOP*</td>
<td>12.7</td>
</tr>
<tr>
<td>Germany</td>
<td>3.1</td>
</tr>
<tr>
<td>Italy</td>
<td>2.6</td>
</tr>
<tr>
<td>Spain</td>
<td>2.2</td>
</tr>
<tr>
<td>France</td>
<td>1.9</td>
</tr>
</tbody>
</table>

*Portuguese-speaking African countries.
(Tabachnick & Fidell, 2013). A forced two-factor solution by principal component analysis was assessed as an extraction method. To maximize the orthogonality of the factors, the main components were analyzed using the varimax rotation method. Components with an eigenvalue greater than 1.0 were retained in consonance with the scree plot (Marôco, 2018). Only items with a factor loading greater than 0.40 and with a minimum saturation difference of 0.15 between components were retained in each factor. The first dimension was called Student resources and context, and the second one Pedagogy and teacher–student interaction, as shown in Table 2.

The two-factor structure was then found to be suitable for assessing the T&L experience of the students in the sample. The means of each dimension were calculated, and the higher the score, the better the perceived experience.

Data reliability was assessed through internal consistency, using Cronbach’s alpha coefficient, which estimates how evenly items contribute to the unweighted sum of the instrument (Marôco & Garcia-Marques, 2006). Cronbach’s alpha coefficient ranges on a scale of 0–1, considering values equal to or higher than 0.7 as adequate to rely on the data (Marôco & Garcia-Marques, 2006). For Student resources and context, the estimated value was \( \alpha = 0.79 \), and for Pedagogy and teacher–student interaction, \( \alpha = 0.78 \).

### 2.3 Data Analysis

The descriptive and inferential analyses were performed using IBM SPSS Statistics (v.26), and a type I error probability (\( \alpha \)) of 0.05 was considered. The sample of students was divided into groups – first, according to the students’ region of origin and, second, according to their education level – so that different comparisons could be made. Namely, for the first sequence of comparison between groups, students from Brazil and PALOPs were in the “Lusophone” group (\( N_1 = 421 \)), and students from other areas were in the “non-Lusophone” group (\( N_2 = 251 \)). Then, another type of comparison that took into account the level of education divided the sample between “Undergraduate” (\( N_1 = 427 \)) and “Postgraduate” students (\( N_2 = 245 \)). To verify the effect of either the students’ region of origin or education level (independent variable) on the perception of the remote T&L experience (dependent variable), independent samples \( t \)-tests were repeatedly performed. In addition, the Mann–Whitney test was used as a non-parametric equivalent to independent \( t \)-tests in the case of the ordinal dependent variable, and Pearson’s Chi-square for the other comparisons of nominal-type variables.

Finally, regression analyses were carried out to identify significant predictors of students’ experience of online T&L during emergency remote education. Specifically, we aimed to determine whether the students’ perceptions of their study resources/context and the pedagogy/interaction with lecturers enhanced the T&L experience beyond that provided by the sociodemographic variables.

### 3 Results

#### 3.1 Students’ Perceptions

Descriptive analyses of time spent on the individual study (i.e., excludes time spent on classes), plans for the next...
academic year, and interest in continuing to study online are shown in Table 3. An association was found between the time spent on individual study and both origin ($\chi^2 (2) = 6.548, p = 0.038$) and education level ($\chi^2 (2) = 12.934, p = 0.002$). More specifically, among those who responded that they currently study more than before the pandemic, there were fewer in the Lusophone group than in the non-Lusophone group and fewer among postgraduates than undergraduates. No association was found regarding students’ plans for the next academic year. Participants were also asked about their intention to physically remain in the country if the remote regime continued. Regardless of their origin or education level, the majority of respondents (around 80%) reported that they intend to continue their studies in Portugal. The intention to continue studying, however, seemed to be conditioned by other circumstances. When asked how interested they would be in continuing their studies if the exclusively online format were to be maintained in the next academic year, almost half of the respondents said they were not interested or were neutral about it. However, the Chi-square test revealed an association between students’ origin and the intention to remain in the exclusively remote regime, with non-Lusophone students showing less interest in this education mode. The non-Lusophone students attribute greater importance to being physically present in Portugal during their studies, suggesting that the cultural immersion in the country is just as valued as the degree. Whereas Lusophone students, more familiar with Portugal, may not feel the cultural encounter with the country as important as the attainment of the degree, it appears that non-Lusophone students are less willing to make concessions regarding their cultural experience in the country, which would be curtailed in an online regime.

Regarding the perceptions of the remote T&L experience during COVID-19, we first performed Levene’s test, which confirmed that an equality of variance could be assumed. An independent $t$-test showed an effect of origin ($t(670) = 2.973; p = 0.003$; effect size Cohen’s $d = 0.24$) on student resources and context. In fact, students in the Lusophone group revealed more positive perceptions of their study conditions ($M = 3.35; SD = 0.6$) than those in the non-Lusophone group ($M = 3.19; SD = 0.7$). When comparing the education level, no differences were found between postgraduate ($M = 3.28; SD = 0.6$) and undergraduate students ($M = 3.29; SD = 0.7$) in this dimension. However, there was an effect of the education level on pedagogy and teacher–student interaction ($t(670) = -2.063; p = 0.039; d = -0.17$), with postgraduate students having more positive perceptions ($M = 2.97; SD = 0.7$) than undergraduate students ($M = 2.85; SD = 0.6$). It is worth noting that undergraduate students rated the pedagogic dimension worse and reported spending more time studying than they did before the pandemic (perhaps to compensate for the learning difficulty they feel in the remote education mode). Together, these two results suggest that international undergraduate students struggled more to adapt to the remote T&L regime than postgraduate students, regardless of their home country (for the pedagogy and teacher–student interaction dimension, there is no effect of origin).

Concerning the specific question that asked students to compare remote and face-to-face T&L, the Mann–Whitney

### Table 3: Student’s perception of time spent on study, plans for the next year and interest in continuing to study online

<table>
<thead>
<tr>
<th>Time spent on study</th>
<th>Lusophone (%)</th>
<th>NL (%)</th>
<th>$\chi^2$</th>
<th>Undergraduate (%)</th>
<th>Postgraduate (%)</th>
<th>$\chi^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than before</td>
<td>15.5</td>
<td>10.5</td>
<td>6.548*</td>
<td>14.2</td>
<td>12.4</td>
<td>12.934**</td>
</tr>
<tr>
<td>Same as before</td>
<td>31.7</td>
<td>27.0</td>
<td></td>
<td>25.2 (−3.6)</td>
<td>38.7</td>
<td></td>
</tr>
<tr>
<td>More than before</td>
<td>52.9 (−2.4)</td>
<td>62.5</td>
<td></td>
<td>60.6</td>
<td>48.9 (−2.9)</td>
<td></td>
</tr>
<tr>
<td>Plans for the next academic year</td>
<td>ns</td>
<td></td>
<td></td>
<td></td>
<td>ns</td>
<td></td>
</tr>
<tr>
<td>Cancel/postpone studies in Portugal</td>
<td>6.2</td>
<td>5.8</td>
<td></td>
<td>5.7</td>
<td>6.0</td>
<td></td>
</tr>
<tr>
<td>Continue to study but in my home country (remote learning)</td>
<td>12.8</td>
<td>14.3</td>
<td></td>
<td>12.5</td>
<td>15.7</td>
<td></td>
</tr>
<tr>
<td>Continue to study in Portugal</td>
<td>81.0</td>
<td>79.9</td>
<td></td>
<td>81.7</td>
<td>78.3</td>
<td></td>
</tr>
<tr>
<td>Interest in continuing to study online</td>
<td>ns</td>
<td></td>
<td></td>
<td></td>
<td>ns</td>
<td></td>
</tr>
<tr>
<td>Not interested</td>
<td>41.8 (−3.3)</td>
<td>55.0</td>
<td>13.657***</td>
<td>46.9</td>
<td>47.1</td>
<td></td>
</tr>
<tr>
<td>Neutral</td>
<td>19.0</td>
<td>18.9</td>
<td></td>
<td>19.7</td>
<td>16.4</td>
<td></td>
</tr>
<tr>
<td>Interested</td>
<td>39.2</td>
<td>26.1</td>
<td></td>
<td>33.4</td>
<td>36.4</td>
<td></td>
</tr>
</tbody>
</table>

Note: NL: non-Lusophone. *$p < 0.05$. **$p < 0.01$. ***$p < 0.001$. ns: non-significant. Values in brackets represent the adjusted residuals. Values higher than |1.96| indicate that there are more (or less) cases in the cell, than there would be if the variables were independent. Bold value cells highlight when the distribution is lower than expected if the variables were independent.
test revealed that there were statistically significant differences between the Lusophone and non-Lusophone students ($U = 46,091,500; p = 0.007$; effect size $r = 0.01$), with Lusophone students perceiving more negatively the remote T&L ($M_{an} = 350.52$) than non-Lusophone students ($M_{an} = 310.11$). No effect of the education level was found.

Then, a hierarchical regression analysis was carried out to investigate in depth which variables could significantly predict students’ comparative rating of face-to-face versus remote T&L. We compared two models using the enter method. Table 4 shows the summary of regression models and the coefficients. In Model 1, categorical independent variables previously coded as dummy were forced to enter the equation. Specifically, we tested the predictive capacity of student status (i.e., full-time or part-time student), gender (male or female), student funds (having a scholarship or own funds), HEI sector (private or public), HEI type (university or polytechnic), type of mobility (degree or credit), degree level (undergraduate or postgraduate), and origin (Lusophone or non-Lusophone country). In Model 2, in addition to these variables, the centered means of student resources and context and pedagogy and teacher–student interaction were entered into the equation.

The results indicated that Model 2 fitted better than Model 1 as a significant predictor of a good online T&L experience, $F(8, 665) = 42.067, p < 0.001$. The variables tested in Model 1 explained very little (1.8% of the variance) regarding students’ experience of online T&L. On the other hand, when the two dimensions assessed through the survey (namely, student resources and context and pedagogy and teacher–student interaction) were included in the equation, the percentage of explained variance increased to 39.2%. This indicates that neither students’ characteristics nor institutional characteristics explain students’ overall comparative assessment of remote T&L versus the face-to-face one. Their perceptions of resources and study conditions, as well as their lived pedagogic experiences and interaction with the teachers, influence their assessment of the remote regime.

### 4 Discussion and Conclusion

The current study captures international students’ assessment of remote T&L during the COVID-19 pandemic in Portugal. Although in the 2019–2020 academic year, students and institutions were taken by surprise and forced to move to a fully online environment, at the time of the study, the country was already in the second year of the pandemic, and during the second lockdown. By this time, institutions had already had some time to adjust their education provision to a remote format.

Overall, the results indicate a hardly positive perception of the remote learning experience by international students, similar to students in general (Doolan et al., 2021; Farnell et al., 2021; Flores et al., 2022). However, for international students, satisfaction with their online pedagogic experience can impact their mobility decisions. International mobility, to be a meaningful experience, implies a physical and face-to-face environment, such as integration into the host institution and its community, immersion in the local culture, and the fostering of soft skills through an intercultural and international experience (Gu & Huang, 2022; Szopiński & Bachnik, 2022; Tavares, 2021). A sense of community on the university campus and in the

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**Table 4: Summary of hierarchical regression analysis for variables predicting a positive online T&L experience**

<table>
<thead>
<tr>
<th></th>
<th>Model 1</th>
<th>Model 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$B$</td>
<td>$SE$</td>
</tr>
<tr>
<td>Gender</td>
<td>$-0.08$</td>
<td>$0.08$</td>
</tr>
<tr>
<td>Mobility type</td>
<td>$0.08$</td>
<td>$0.15$</td>
</tr>
<tr>
<td>Scholarship</td>
<td>$0.02$</td>
<td>$0.11$</td>
</tr>
<tr>
<td>Student status</td>
<td>$-0.02$</td>
<td>$0.12$</td>
</tr>
<tr>
<td>HEI sector</td>
<td>$0.29$</td>
<td>$0.10$</td>
</tr>
<tr>
<td>HEI type</td>
<td>$0.42$</td>
<td>$0.17$</td>
</tr>
<tr>
<td>Degree level</td>
<td>$0.02$</td>
<td>$0.09$</td>
</tr>
<tr>
<td>Region of origin</td>
<td>$-0.21$</td>
<td>$0.09$</td>
</tr>
<tr>
<td>Student resources and context</td>
<td>$0.80$</td>
<td>$0.05$</td>
</tr>
<tr>
<td>Pedagogy and teacher–student interaction</td>
<td>$0.018$</td>
<td>$0.392$</td>
</tr>
<tr>
<td>$R^2$</td>
<td>$0.018$</td>
<td>$0.392$</td>
</tr>
</tbody>
</table>

Note. $^*p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$. 
classroom is essential for international students’ satisfaction (Tavares, 2021; Tham et al., 2021), but this is harder to achieve through remote learning. Indeed, in this study, most students, regardless of their degree level or origin, intended to remain physically in Portugal, which shows that living in the host country was a highly valued aspect of the mobility experience. Moreover, a large majority reported that they were not interested (or at best were neutral) in continuing to study in an exclusively remote format in the following academic year. Thus, considering that distance education was not the first intention of these students when they decided to study abroad, it is understandable that the remote emergency regime is not perceived as positive. Studying online requires several internal (such as autonomy and self-regulation) and external resources (such as a suitable place to study, IT equipment, and time management) that are specific to this mode of education delivery and that directly impact the academic success (Flores et al., 2022; Naujoks et al., 2021). During the emergency remote education, it is likely that international students did not have adequate conditions for either resource, which is reflected in the fact that over half of the students reported that they were studying more hours than before the pandemic. The study aimed to investigate differences between Lusophone and non-Lusophone students, considering the heterogeneous international student body in Portugal, and between undergraduate and postgraduate students. The decision to analyze these groups was driven by two assumptions. First, there are different degrees of cultural distance among international students, and the cultural and linguistic proximity of Lusophone students may lead to a better perception of their learning experience than non-Lusophone students. Second, different qualification levels require different degrees of autonomy, which, in turn, may influence students’ assessment of remote T&L (which requires more independence and self-discipline). As advanced degrees require more autonomy, postgraduate students were expected to adjust better and therefore have a more positive perception of their learning experience during COVID-19 than undergraduate students. The hypothesis that considered the students’ origin – Lusophone students perceive their remote learning experience as better than non-Lusophone students – was confirmed, suggesting that less cultural distance facilitates learning (Finn et al., 2022; Neto, 2019). Although more than half of the students in each group (whether grouped by educational level or origin) reported that they were not interested in continuing to study exclusively online, there was a statistically significant difference between Lusophones and non-Lusophones, with the latter showing even less interest in this format of education delivery. This lack of interest was also reflected in the perceptions of remote T&L compared to face-to-face, where non-Lusophone students gave a more negative assessment than their counterparts to the remote mode. This may be explained by the perceptions of poorer study conditions and resources for online learning, as reported by non-Lusophone students. It may also be related to higher expectations from the mobility experience, which is associated with immersion in a new cultural environment. Moreover, language-related learning difficulties are likely to affect the experience, as these are higher in the online environment than in the face-to-face one (Rasheed et al., 2020). The results also confirmed the hypothesis that postgraduate students would have a better online T&L experience, given their higher autonomous learning competencies (Dixson, 2012; Farrel & Brunton, 2020). Compared to undergraduate students, they reported a lesser increase in the time spent on individual study, suggesting that this more autonomous learning regime was less challenging for them. Second, they rated the pedagogical aspects and the professor–student interaction better than undergraduate students, although there were no differences between the two groups concerning study conditions and resources. The findings also reveal that, notwithstanding the differences between the groups, the perceptions of remote compared to face-to-face learning are only to a small degree explained by sociodemographic and institutional characteristics. It is perceptions of student resources and context, and pedagogy and professor–student interaction that emerge as the most important factors explaining the better or worse online experience. These results are in line with previous studies that have found teacher–student dialog to be a key predictive factor of learning effectiveness during COVID-19 (Szopiński & Bachnik, 2022; Tsang et al., 2021).

5 Implications for Research and Practice

The unprecedented online transition can represent a turning point to change higher education and to promote innovation. Online education corresponds to a new model that would unavoidably have emerged with or without COVID-19 (Choi et al., 2021; Zhu & Liu, 2020), with the pandemic having just sped up the inevitable path education is taking anyway (Murphy, 2020). This study contributes to the knowledge of international students’ experience of remote T&L during COVID-19, as it reveals that the emergency solutions adopted by institutions were hardly satisfactory. Several implications for practice come to mind following students’ negative perceptions. Against the pivot
to online learning, if the emergency solutions are maintained as such, instead of a properly designed distance education, the attractiveness of international mobility, in the long run, will diminish. In fact, the findings may also be indicative of international students’ negative attitudes to distance education in general, as it hinders the cultural immersion and the opportunities for future employment and settlement in the country that students are also interested in when studying abroad.

Institutions, therefore, need to pay attention to students’ resources and their expectations of pedagogy and teacher–student interaction. To maintain alive international students’ interests, institutions need to transform their practices to suit international students’ preferences, probably by implementing flexible and hybrid modes of T&L, in which distance education is an option, among others, but different from the emergency remote education adopted during COVID-19. This is particularly important for non-Lusophone students who may require more support adapting to new academic and living conditions. It is also important to note that tailored pedagogic support for undergraduate students may be necessary, as they showed greater difficulties adapting to online education.

The findings also reinforce that HEIs need to consider the cultural and linguistic backgrounds of international students when designing and delivering distance T&L programs. It could include providing language and cultural support services to help students overcome language and cultural barriers and facilitate opportunities for cultural immersion, even in online environments.

Finally, the study stresses the importance of ongoing evaluation and monitoring of distance T&L programs to ensure that they meet the needs and expectations of students. By doing so, HEIs can improve the quality of their programs and maintain the interest and satisfaction of their international student body.

The study also opens up avenues for further research. International students’ perceptions of online education post-COVID-19 may be investigated to understand if they continue to be reluctant to this education mode under normal circumstances, without the stress associated with social distancing measures and health concerns. This may represent valuable information for institutions that consider investing in distance education for international students.

The non-probability sampling used in this study, although serving the purpose of the study, also presents limitations. While suitable to reach groups that are less accessible, especially in extraordinary times like the COVID-19 pandemic, and to explore variations between groups, this method does not allow making statistically reliable generalizations nor establish causality between the analyzed variables. Therefore, the findings presented here need to be interpreted with caution and parsimony.

**Funding information:** The author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article. This work was supported by EDULOG-Fundação Belmiro de Azevedo (EDULOG/ENI/2020) and by the Fundação para a Ciência e a Tecnologia (Grant number UIDB/00757/2020).

**Author contributions:** All authors contributed to the conception of the study. JA took responsibility for the design and administration of the survey, as well as for data analysis and interpretation. CS and OT took responsibility for planning the research activity and carrying out the literature review. All authors worked jointly on the discussion and approved the final version of the manuscript.

**Conflict of interest:** The authors state no conflict of interest.

**References**


Appendix

SOCIO DEMOGRAPHICS

Q1. Are you a Portuguese citizen?
☐ Yes  ☐ No

Q2. Are you:
☐ Male  ☐ Female  ☐ Other/ I prefer do not say

Q3. What is your country of origin?

Did you move to Portugal to study or for other reasons (family migration, work, etc.)?
☐ To study  ☐ Other reasons ______________________________

Q4. What is your student status?
☐ Full-time  ☐ Part-time

Q5. What qualification are you studying for?
☐ CTESP  ☐ Bachelor  ☐ Master  ☐ Integrated Master  ☐ PhD

Q6. Please indicate your main field of study
☐ Education  ☐ Arts and Humanities
☐ Agriculture  ☐ Health  ☐ Social Sciences, Business and Law
☐ Engineering  ☐ Natural Sciences, Mathematics and Informatics

Q7. Which type of institution are you enrolled in?
☐ Public University  ☐ Public Polytechnic  ☐ Private University  ☐ Private Polytechnic

Q8. In which region is the educational institution located?
☐ North  ☐ Centre  ☐ A. M. Lisboa  ☐ Alentejo  ☐ Algarve  ☐ Açores  ☐ Madeira

Q9. Do you receive a scholarship for your studies?
☐ Yes, I do.  ☐ No, I don’t

Q10. Have you come to Portugal in an exchange programme or to study for a full degree:
☐ Exchange programme  ☐ Full degree

If you are enrolled in a “Full degree“: What are your plans now for the next academic year?
☐ Continue to study for my degree in Portugal
☐ Continue to study for my degree, but in my home country (assuming the institution offers online learning)
☐ Postpone studies  ☐ Cancel studies
ACADEMIC LIFE

Q1. Have your regular classes (those taking place in the location/campus of your institution) been cancelled due to the pandemic?

☐ No  ☐ Yes  ☐ Not applicable, I do not have regular classes this semester

If you answered Yes: Which of these forms of online lectures has been most dominant? Please select at maximum two.

☐ Online in real-time (video-conference)  ☐ Online with a video recording (not in real-time)
☐ Online by sending presentations to students  ☐ Written communication (forums, chat etc).

Q2. So far, how do you evaluate your learning experience in the online/remote classes compared to face-to-face classes? Please rate your agreement with the following statements.

<table>
<thead>
<tr>
<th>Strongly disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly agree</th>
<th>Not applicable</th>
</tr>
</thead>
<tbody>
<tr>
<td>I get distracted more frequently during online classes in comparison to face-to-face classes.</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>The online format better fits my needs than face-to-face classes.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I frequently have computer/internet problems that hinder my learning</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>It is more difficult to understand the material.</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>My lecturers have responded to my questions in a timely manner.</td>
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</tr>
<tr>
<td>My lecturers have been open to students’ suggestions and adjustments of online classes.</td>
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<td></td>
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<tr>
<td>Overall, my lecturers are good at teaching in an online format.</td>
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</tr>
<tr>
<td>My lecturers have informed me on what exams will look like in this new situation.</td>
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<tr>
<td>Homework/assessment have gotten easier.</td>
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</tr>
<tr>
<td>Assessment methods were successful in testing learning.</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I have received feedback on my performance.</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
I interact more with the professors during online classes or office hours.

I am confident in using online teaching and communication platforms (Moodle, Blackboard, GoToMeeting, etc.).

I do not have a suitable place to study in an online/remote format.

**Q3. How satisfied have you been with the organization of:**

<table>
<thead>
<tr>
<th></th>
<th>Very dissatisfied</th>
<th>Dissatisfied</th>
<th>Neutral</th>
<th>Satisfied</th>
<th>Very satisfied</th>
<th>Not applicable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lectures</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tutorials/seminars and practical classes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Assessment</td>
<td></td>
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<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Supervisions (mentorships)</td>
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<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

**How would you rate your learning experience in the online/remote format?**

☐ Much worse than in-person classes ☐ Slightly worse than in-person classes

☐ Same as in-person classes ☐ Slightly better than in-person classes

☐ Much better than in-person classes

**Q4. Regarding the next academic year, how interested are you in continuing to study your degree online because of the coronavirus?**

☐ Very interested ☐ Interested ☐ Somewhat interested ☐ Little interested ☐ Not at all

**As a result of COVID-19 pandemic, how has your time allocation changed? Time spent on...**

<table>
<thead>
<tr>
<th></th>
<th>More than before</th>
<th>Same as before</th>
<th>Less than before</th>
</tr>
</thead>
<tbody>
<tr>
<td>Classes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Studying by myself</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Studying with peers

Extracurricular activities

**Broadly speaking, how many hours approximately have you studied per week in the last two weeks? Excluding classes**

**Were it not for the COVID-19 pandemic, how many hours approximately would you have studied per week in the last two weeks? Excluding classes**

**Q5. Thinking more generally, when do you expect everyday life to return to 'normal'?**

- [ ] Within the next 3 months
- [ ] 3 to 6 months
- [x] 6 to 12 months
- [ ] 1 to 2 years
- [ ] >2 years

**Q6. What would have improved your academic experience during the COVID-19 pandemic? Can you suggest any measures you would welcome?**
