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Exploring inclusive education in times of COVID-19: An international comparison of German, Austrian and Portuguese teachers

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With the start of the Coronavirus (COVID-19) pandemic, the global education system has a faced immense challenges and disruptions resulting in and the necessity for an immediate redesign of teaching and learning in the school context. Face-to-face classroom instruction had to be replaced by 'emergency remote teaching', requiring teacher to adapt their daily routines to a new and unprecedented educational reality. Researchers and policymakers worldwide have agreed that, despite the fact that efforts were made to immediately adapt to emergency remote teaching, disadvantaged and vulnerable students may be especially at risk in emergency remote teaching. Given the differences in schooling organization across countries during the COVID-19 pandemic it can be expected that teachers performed inclusive instructional practices significantly different. Against the unpredictable situation, cross-country research has been urgently required to provide data that could inform education policy. Thus, this study explored teachers' perceptions of supporting at risk students during the first COVID-19 school closures, as well as examining teachers' inclusive teaching practices in three countries: Germany, Austria and Portugal. ANOVA results revealed important country differences. In general, it appears that teachers in Germany and Austria reported to have implemented less practices to address vulnerable and at-risk students compared to Portuguese teachers. Implications of the results, as well as further lines of research are outlined.

KEYWORDS

inclusion, emergency remote teaching, cross-country, differentiated instruction, inclusive education

Introduction

Spring 2020 will be remembered as a time of disruption for the global education system, as schools were forced to switch to distance learning for several weeks or months due to the COVID-19 pandemic. In order to prevent the spread of the virus and high infection rates, governments around the world imposed strict school closure measures which required a rapid and hasty transition into online teaching formats (Haug et al., 2020). With the COVID-19 school closures, 'emergency remote teaching' (ERT) was implemented (Bozkurt and Sharma, 2020). This meant that teachers had to find other ways to teach their students, e.g., by teaching online with the help of learning management platforms and additional digital media. Students, on the other hand, had to learn from home in a more autonomous way compared to regular classes and without having face-to-face contact with their teachers and classmates, while parents had to support their children in their learning process (Letzel et al., 2020a; Lockl et al., 2021). ERT differs from a distance learning approach, as it serves as a response to an educational crisis. Furthermore, it includes transposing or replicating activities planned for face-to-face teaching into distance learning environments. The necessary conditions and resources such as infrastructure, appropriate teaching methodologies, teacher training, or planning were not available (Seabra et al., 2021). Thus, ERT in the COVID-19 emergency context can be understood as a temporary solution in which teaching and learning takes place in an online environment through the use of information and communication technologies (Bozkurt and Sharma, 2020; Flores and Gago, 2020). ERT can either occur in synchronous formats (where students can interact with teachers and classmates) or asynchronous settings. As a result, learning does not depend on physical co-location (Singh and Thurman, 2019). With this background, ERT brought both immense challenges and consequences into the educational landscape.

Although efforts were made to immediately adapt teaching practice to ERT conditions, educational researchers and practitioners worldwide agreed that disadvantaged and vulnerable students were going to fall further behind, aggravating existing social inequalities and widening the educational gap (Fokken, 2020; Huber et al., 2020; Stein, 2020; Sweeny, 2020; van Ackeren et al., 2020; Frohn, 2021). In this vein, technical equipment, for example, became an important topic in terms of educational equity as students relied on access to, e.g., computers, smartphones and an internet connection in order to actively participate in online classes and/or have access to online learning material (Frohn, 2021). The access to technical equipment such as digital devices and online resources varies greatly across countries, as well as within the countries, where students living in rural areas or stemming from socio-economically disadvantaged backgrounds (low family SES) were disadvantaged (Huber et al., 2020; Opalka et al., 2020; UNICEF, 2020; OECD, 2020b; Thomas and Allen, 2021). Similarly, students with special education needs (SEN) were severely affected by ERT as those students especially need individualized teaching and support from trained professionals (Goldan et al., 2020; Berasategi Sancho et al., 2021; Woltran et al., 2021). Therefore, it can be said that inclusive teaching was and will continue to be a central condition within online learning, in particular for students at risk (Goldan et al., 2020; Schwab et al., 2020; Woltran et al., 2021). Recent empirical results have revealed that a majority of teachers were not able to address and support adequately students with SEN (Letzel et al., 2020a; Thorell et al., 2021). Hence, educational researchers and practitioners have raised concerns over the higher risk of losing students with SEN in an online teaching environment (Haeck and Lefebvre, 2020; Lindner et al., 2021). With this context, it can be argued that educational equity can be fostered through inclusive teaching practices that are free of discrimination and exclusion (Ainscow and Messiou, 2018; Frohn and Simon, 2022) and which serve as a mean to avoid learning barriers for students who are likely to be disadvantaged in educational settings (Lindner and Schwab, 2020; UNESCO, 2020). Inclusive teaching practices in an online environment could be for example, to individualize tasks and learning material to the needs of the students, to give individual formative feedback or to establish tutoring systems (Schwab et al., 2019).

In the context of this challenging and unpredictable situation caused by the COVID-19 school closures, research has been urgently required to provide data that could inform education policy and practice (Huber and Helm, 2020). As a result, there has been an important research output exploring the different experiences and difficulties faced by educational stakeholders (Ferdig et al., 2020). Nonetheless, even though it has been strongly suggested to conduct cross-country research (OECD, 2020b), there are still few cross-country studies that explore variations across countries (Huber and Helm, 2020; Thorell et al., 2021), in particular concerning inclusive teaching and learning. In this context, the present study aims at exploring teachers' perceptions of supporting at risk students during the first COVID-19 school closures, as well as examining teachers' inclusive teaching practices in three countries: Germany, Austria and Portugal. Cross-county studies enable researchers to evaluate the impact of school systems (Montt, 2011) and allow the exchange of knowledge to identify how countries are responding to the COVID-19 educational crisis (OECD, 2020a). The structure of the article is as follows: first a review on the inclusive teaching practice of differentiated instruction is presented, additionally a description of how differentiated instruction has been implemented online before and during the COVID-19 school closure. Finally, a summary on the three countries' educational systems and educational response during the first COVID-19 related school closure is presented.

Differentiated instruction

Given the highly heterogenous student population (Dijkstra et al., 2016; Watkins, 2017; Maulana et al., 2020), and given the manifold facets and expressions of student heterogeneity, the

concept of inclusion has been shifted from the inclusion of students with SEN to the participation of all students (European Agency Statistics on Inclusive Education, 2017; UNESCO, 2020; Schwab, 2021). As a result, inclusive education has been affirmed ever since the United Nations Convention on the Rights of Persons with Disabilities [United Nations General Assembly, 2007; Beauftragte der Bundesregierung für die Belange von Menschen mit Behinderungen UN-BRK, 2008]. In this sense, De Jager (2013) states that "the aim is that the inclusion of diverse needs should enable both learners and teachers to see it an enrichment in the learning area and as a challenge rather than as a burden in education" (p. 81). Thus, teachers are responsible of creating educational contexts following the principles of social justice that ensure valuable learning to all students regardless of their gender, culture, language, special needs, or social background (Haug, 2017; Jordan, 2018; Pit-ten Cate et al., 2019).

Despite the fact that inclusive policies shifted from a focus on students with SEN, recent practices in implementing inclusive education are still using this categorization. For example, in Austria, Germany and Portugal, classes where students with and without SEN are educated together are so-called "inclusive classes" while classes were solely students without SEN are educated are called regularclasses. These rather poor definitions are not tackling the variety of needs of all students nor that in inclusive education particular attention to inclusive teaching practices and multiplicity of teaching approaches are required (see, e.g., also Jordan et al., 2009).

Within the context of inclusive education, differentiated instruction (DI) has been often discussed as a multitude of possible inclusive instructional strategies to respond adequately to students' diverse social, economic, cultural, and learning needs (Bourdieu and Coleman, 1991; Tomlinson, 2014; Bondie et al., 2019). DI can be defined as the intentional, systematically planned and reflected practices that enable teachers to meet the needs of all learners (Pozas and Schneider, 2019; Graham et al., 2020; Pozas et al., 2020; Letzel, 2021). Suprayogi et al. (2017) discuss that, in order for teachers to differentiated their instruction, they must reflect on their students' heterogeneity, monitor individual student needs, pursue optimal learning a variety in learning activity, as well as use a variety of learning strategies. In this sense, teachers can implement DI through a variety of instruction behaviors such as tiered assignments, homogeneous or heterogeneous subgroups based on learners' performance or interests, tutoring systems, open education practices, and variants of mastery learning strategies (Lawrence-Brown, 2004; Darnon et al., 2012; Coubergs et al., 2017; Tomlinson, 2017; Hachfeld and Lazarides, 2020; Maulana et al., 2020).

DI has been related to positive achievement and non-achievement student outcomes. For instance, multiple studies have reported positive effects of teachers' use of DI on students' mathematics and reading achievement (Reis et al., 2011; Goddard et al., 2015; Bal, 2016). Furthermore, studies by Lindner et al. (2021) and Pozas et al. (2021) revealed that students' perceptions of their teachers' DI use strongly predicted students' well-being,

social inclusion, and academic self-concept. Likewise, DI has also been reported to foster learners' interest, motivation, and self-confidence (McQuarrie and McRae, 2010; Eysink et al., 2017). Moreover, recent empirical research has recognized DI as an important teaching quality domain (Maulana et al., 2020) and core element of effective teaching (OECD, 2012; Valiandes and Neophytou, 2018; Lindner and Schwab, 2020). Hence, the implementation of DI is by no means just a normative recommendation, but an important criterion of high-quality teaching (Helmke, 2017; Klieme, 2018). Furthermore, DI has been included within teaching quality model conceptualizations and empirical studies regarding the domains of teaching quality (Hattie, 2009; van de Grift, 2014; Praetorius et al., 2018; Bell et al., 2019). A study by Maulana et al. (2020) has provided empirical evidence that DI may be considered as a specific domain of teaching quality in different countries like the Netherlands and South Korea.

DI in online teaching and learning contexts

In general, the goal behind teachers' implementation of DI is the achievement of students' optimal learning outcomes (Suprayogi et al., 2017). This aim has become even more important during the COVID-19 school closures, which as aforementioned, has placed once again the spotlight on equity challenges (OECD, 2021). Nonetheless, it is necessary to point out that the switch to ERT brought additional facets of student heterogeneity into play. For instance, in order to plan and perform meaningful ERT, teachers must take into consideration their students' technical equipment into account as well as their learning environment and parental support, summing up, students social, and economic backgrounds (Bourdieu and Coleman, 1991). Furthermore, given that students during the COVID-19 school closures did not learn together with their peers in a classroom with the support of pedagogically trained personnel (Fischer et al., 2021), students were required to structure their learning in a more autonomous way. This situation could have led to challenges especially for low achieving students that face difficulties to structure their autonomous learning (Fischer et al., 2020). In order to offer their students, the chance to profit from the potentials, teachers had to foster students' self-regulated competences (Klieme, 2020; Köller et al., 2020), which according to Klieme and Warwas (2011), can be considered as one of the objectives of individualized differentiated teaching. All in all, the implementation of DI practices into teaching is highly recommended as a way to adjust teachers' instruction according to different learning needs in class, but as well, in online teaching (Tomlinson, 2017; Prast et al., 2018).

Differentiated learning supported by technology has considerable potential (Beck and Beasley, 2021). On the one hand, it helps teachers to differentiate their instruction in a more flexible way by making teaching and learning more accessible for heterogeneous student populations (Cumming,

2014; Schwab et al., 2020; Demski et al., 2021). As a result, teachers' role in students' learning shifts from leading the teaching process to rather supporting the learner in their learning process (Häcker, 2017). On the other hand, online or digital DI can also build a "link between school and home by enabling students to access materials anywhere at any time" (Cumming, 2014, p. 134). Thus, during the COVID-19-induced ERT, teaching and learning online was the only way to keep education and inclusive teaching going. Taken together, distant online learning offers an important path for differentiation, which is not only important for the unpredictability of the ongoing pandemic but also after the post pandemic period (Porsch et al., 2021).

As described in the previous section, teachers may use a wide range of DI practices in a digital environment. According to Cumming (2014, there are a number of literacy apps, writing apps, and numeracy apps that can different the content not only according to different complexity levels, but as well make content accessible through different means such as videos, texts, pictures, podcasts, etc. Additionally, teachers can create tiered assignments using learning managements systems such as Moodle or Blackboard, which can be also linked to such apps (Letzel, 2021). Furthermore, *via* the use of tools such as *Skype*, *Zoom*, *Teams,* or *Google meet*, teachers can build different groups and promote as well as group collaboration. Cumming (2014) also suggests to implement project-based learning using technology-based tools such as *Podio, GQueues*, or *Flipgrid*, where students work cooperatively and autonomously, whereas the teacher acts as a facilitator. However, in order for online and digital DI to work, "teacher knowledge of the technology as well as how to integrate it into the curricula" (Cumming, 2014, p. 135) is necessary.

Despite teachers being strongly advised to implement digital media into their daily teaching before the pandemic (e.g., KMK, 2017; Fraillon et al., 2019; Rubach and Lazarides, 2019; Tiede, 2020), the homeschooling situation showed that teachers' lack digital competences to implement digital media (König et al., 2020). Moreover, the need to invest in infrastructure as well as to improve teachers' ICT competencies and the learning environment became obvious (Schuknecht and Schleicher, 2020). Thus, it is not surprising that current research shows that teachers rarely make use of ICT during ERT, and teachers rarely differentiated their instruction to address students' individual learning needs (Schwab et al., 2015; Beasley and Beck, 2017, 2021; König et al., 2020; Letzel et al., 2020a; Beck and Beasley, 2021; Bond, 2021; Thorell et al., 2021). In a systematic review, Bond (2021) report that the most frequently used technologies were synchronous collaboration tools (e.g., live video lessons), knowledge organization and sharing tools (e.g., *Google Classroom*), text-based tools (e.g., *WhatsApp*, email), and multimodal production tools (e.g., recorded videos). Taken together, despite the potentials that digital and technology tools could offer teachers to implement DI practices and attend students learning needs during ERT, several barriers limited such opportunities.

Three countries, one educational crisis

Countries worldwide have been severely affected with the ongoing pandemic, from people's work, to family life, health, but also educational processes. Nonetheless, countries' responses and implemented policies were quite different based on their cultural, economic, political, and social structures (Seabra et al., 2021). With this context, cross-country comparisons are an important source of information and exchange of knowledge. This study was carried out in three European countries: Germany, Austria and Portugal. These countries were chosen because the educational conditions in these countries are roughly comparable, e.g., in terms of their students' competences in reading, mathematics and science as they all ranked slightly above the average (Germany's rank: 20; Portugal's rank: 24, Austria's rank: 27; PISA, 2018). In each of the countries, teachers had to switch to ERT at the same time (March 2020) (Flores and Gago, 2020; Pozas et al., 2021; Heidrich et al., 2022). However, in an international comparison, distinctive features characterize the three countries. First, both Germany and Austria have strictly tracked lower secondary school systems: After elementary school, the countries offer the choice between advanced secondary school (encompassing well performing students regarding their academic achievements) or other school tracks with rather diverse students' population. Only the upper track grants access to upper secondary and tertiary education. In recent decades, and to overcome this strict stratification, however, less selective school forms, such as Comprehensive Schools (Germany) or Middle Schools (Austria) have emerged (BMBWF, 2022). Despite these trends, 'classical' (i.e., strictly stratified) schools still cater to the majority of students.

Portugal, on the other hand, offers the students the opportunity to learn together in the whole compulsory education (Eurydice, 2021/22). Additionally, the countries also differ in their teacher training programs. In Germany and Austria, an additional practical phase is added to the university studies, whereas Portugal renounces the practical phase (Leite et al., 2017). According to SEN, in Austria, as well as in Germany special schools for students with SEN still exist–however, an increasing number of students with SEN have been educated in mainstream education the last years. Portugal has a long tradition of integration, since policies in the 90's, and since 2018 that uses a non-categorization model considered as a good practice (UNESCO, 2020) In this vein, more and more input on how to teach in heterogeneous settings should have been implemented in teacher training.

Educational response to the COVID-19 crisis

Given the differences on how school education is organized and administrated in each of the countries, the educational responses to establish ERT also varied significantly. Thus, in order to situate the present study, the following section provides a brief

description on each of the countries' educational response towards the COVID-19 crisis.

In Germany no nationwide measures were taken leaving the implementation of measures and concepts for ERT at the discretion of the individual schools and teachers (Freundl et al., 2021). Thus, teachers were widely left alone in setting up ERT. Research conducted in Germany during the COVID-19 school related closures indicates that teachers faced significant challenges to adapt to distance learning (Huber et al., 2020; Wacker et al., 2020). König et al. (2020) reported that only 20% of the participating teachers in their study had provided online lessons during the COVID-19 school closures, while close to 70% of teachers did not use any type of digital tools and media nor provided differentiated tasks to their students in a regular basis (Pozas et al., 2021). Moreover, although teachers reported to having maintained communication with students and parents (König et al., 2020), both parents and students reported a lack of support, communication and feedback from teachers (Wacker et al., 2020; Wildemann and Hosenfeld, 2020). Students with lower socio-economic status (SES) faced greater challenges during ERT (Wildemann and Hosenfeld, 2020; Frohn, 2021). Casale et al. (2020) reported that most German federal states had no specific regulations nor documentation concerning special education service for students with SEN during ERT. Even though research from the first school closure has shown no substantial differences regarding challenges during the time of school closures for students with and without SEN, learning outcomes of students with SEN after a longer period of ERT are estimated to be lower in comparison to regular schooling or their non-SEN peers (Nusser, 2021).

In Portugal, the ministry of education launched an initiative in which educational content was broadcasted on national television (Flores and Gago, 2020). This initiative was called "#EstudoEmCasa" (studying at home), which was launched on the 20th of April. This program provided educational resources across general education. Additionally, teachers and schools were supported through other initiatives like creating a partnership with the "Open University" which aimed to support schools to develop distance learning and the creation of the website "Support to school" where teachers could find teaching materials and resources to use in ERT (DGE, 2020). Although research shows that Portuguese teachers perceived ERT with concern and faced many challenges (i.e., lack of adequate equipment and lack of adequate training, and lack of support from parents), results indicate that a majority of teachers also viewed the pandemic crisis as an opportunity to transform teaching and learning (Flores and Gago, 2020; Seabra et al., 2021). In another study, special education teachers reported several challenges but recognized the need to change teaching practices, and thus aimed to intensify individual support and design diverse materials for students with SEN (Carvalho et al., 2020).

Similar to Germany, no nationwide measures were implemented in Austria – according to teachers, the coordination between the Austrian Federal Ministry of Education, Science and

Research was very poor (e.g., Lindner et al., 2021). The Ministry was offering four types of digital educational tools prior to the crisis, allowing teachers to ensure the continuity of education. Such tools are *Eduvidual* (moodle-based platform), Learning with a System (Learning and content creation platform), *Virtuelle-ph* and *Digi4School* (E-Learning platforms) (Ennadif, 2021). However, despite such efforts, research shows that not all students and teachers had access to the necessary technical equipment. Additionally, it appears that Austrian teachers hardly made use of digital resources for teaching (Trueltzsch-Wijnen and Trültzsch-Wijnen, 2020; Gross et al., 2021) and did not know how to didactically adapt the learning content to the online setting (Steiner et al., 2021). Moreover, teachers in Austria felt (rather) heavily stressed during this period (Lindner and Schwab, 2020; Lindner et al., 2021). Despite this, they were found to have coped well with the transition to home-based learning and were confident in their abilities to teach their subjects adequately (Schober et al., 2020). However, findings of several studies found that homebased learning only worked well for students who did not face serious obstacles and that for a minority of students (which makes up a substantial number in real terms), education was extremely limited during the home-based learning period. All in all, disadvantaged students such as students with a lower SES and/or with SEN, faced severe challenges to continue their education (Pelikan et al., 2021).

Against this background, it is clear that the result of how teaching was conducted during the first COVID-19 ERT phase could have been significantly influenced by each of the countries' educational responses. Therefore, research that follows an international approach exploring variations within and across countries are necessary in order to create an exchange of knowledge and to understand how countries responded to the COVID-19 educational crisis (Huber and Helm, 2020; OECD, 2020a,b).

Purpose and research question

Even before the COVID-19 pandemic, the need to establish inclusive schooling has been highlighted by policymakers and researches worldwide (UNESCO, 2017). With the COVID-19 pandemic, it has been hypothesized that children with SEN may be especially vulnerable to ERT (Thorell et al., 2020). Given the differences across schooling organization across countries during the COVID-19 pandemic it can be expected that teachers performed inclusive instructional practices in very diverse ways. Thus, it is necessary and worthwhile to conduct a cross-country study to enable researchers to examine how inclusive education was implemented.

To address this central aim, the research questions are specified as follows:

- What are teachers' perceptions about fostering vulnerable students (student with SEN and students from a lower SES) in ERT
- Which DI practices did teachers report implementing during ERT?

- Are there significant differences between countries as well as inclusive and non-inclusive classrooms?

Materials and methods

The present study analyses data from the SCHELLE project, otherwise known as Students-ParentsTeachers in Homeschooling (abbreviated as SCHELLE due to its German name *Schüler-Eltern-Lehrkräfte*) (Letzel et al., 2020a). This project was implemented in Germany, Austria and Portugal. Data collection was carried out following convenient and snowball sampling from April till July 2020 (first COVID-19-related school closure). Three separate online surveys were designed for each sample perspective: students, parents, and teachers. The online links to each survey were then shared. Participation was voluntary, and thus, needed to be approved with the participant's consent in order to proceed with the questionnaire. In Austria, the local school authority of Lower Austria gave ethical approval for the study, while in Portugal the board of the research centre approved the investigation. In Germany, the study was approved by the Inspectorate and Service Directorate (Aufsichts- und Dienstleistungsdirektion) of the state of Rhineland-Palatinate. Within the scope of this study, only the teacher sample will be explored.

Participants and procedure

The present study included a total of 520 primary and secondary school teachers (46% from inclusive classrooms) from Germany, Austria and Portugal. For overall sociodemographic information on each of the three samples, please refer to Table 1. In general, as seen from the data, a relatively higher proportion of female teachers participated in the survey. However, the gender distribution of the sample was found to be not significant $(X^2(4) = 4.72, p = \text{n.s.})$. In comparison to German and Austrian educators, Portuguese teachers reported a higher teaching

experience (in years), $(X^2(86) = 248.92, p < 0.001)$. Lastly, it can also be observed that in contrast to the Portuguese teacher sample, a lower proportion of inclusive classroom teachers from Germany and Austrian participated in the study, $(X^2(2) = 185.18, p < 0.001)$.

Measures

Table 2 presents the descriptive statistics of all items analyzed in the present study. Given that the items were originally developed in German, a back-translation (Brislin, 1970) process was followed. Therefore, a group of bilingual experts blindly translated the questionnaire from German to Portuguese, and afterwards back-translated the instrument from Portuguese to German. One of the authors served as consultant during this process and supported by clarifying the meaning of items for translations.

Addressing vulnerable students

In order to assess teachers' perceptions on their support of vulnerable students, teachers had to state to what extent the following statements applied to them: (1) "During homeschooling, I address adequately children with special educational needs." and (2) "During homeschooling, I address adequately students from lower socioeconomic status families." Both items were assessed on a four-point Likert scale ranging from 1 (*I do not agree*) to 4 (*I do fully agree*). In the analyses, each item as treated as a distinct variable.

Inclusive teaching practices

To measure teachers' self-reported implementation of inclusive teaching practices during ERT, an adapted version of a questionnaire developed by Letzel (2021) to assess teachers differentiated instructional practice was used. Letzel's (2021) questionnaire is based on the taxonomy of DI practices developed by Pozas and Schneider (2019). This taxonomy is framed within current differentiated instruction literature and research, and identifies six DI categories of practices categorizes the different

TABLE 1 Sociodemographic information on the German, Austrian, and Portuguese samples.

Country	Sample Size	Gender	Age	Teaching experience	Classroom setting
Germany	$N_G = 124$	27 males	$M = 38.02$ years	$M = 10.81$ years	41 Inclusive classrooms
					83 Non-inclusive classrooms
		97 females			(1 Missing Information)
Austria	$N_A = 206$	35 males	$M = 38.95$ years	$M = 12.80$ years	Inclusive classrooms = 38
					Non-inclusive classrooms = 167
		171 females			Missing = 1
Portugal	$N_P = 190$	33 males	$M = 50.25$ years	$M = 25.14$ years	Inclusive classrooms = 159
					Non-inclusive classrooms = 28
		154 females			Missing = 3
		3 missings			

TABLE 2 Descriptive statistics.

	M	SD
During homeschooling, I address adequately children with special educational needs.	2.88	1.05
During homeschooling, I address adequately students from lower socioeconomic status families.	3.13	0.90
Category I. Tiered assignments – according to the number of tasks to work on (quantitative tiering of assignments)	3.99	1.37
Category I. Tiered assignments – according to time to work on tasks (quantitative tiering of assignments)	3.80	1.45
Category I. Tiered assignments – according to the difficulty or complexity level of the task (qualitative tiering of assignments)	4.04	1.35
Category I. Tiered assignments – according to differences in the representation/depiction of the task (qualitative tiering of assignments)	3.75	1.49
Category II. Intentional composition of student groups – Heterogeneous ability grouping: grouping students with different capabilities	2.77	1.66
Category II. Intentional composition of student groups – Heterogeneous ability grouping: grouping students with different interests	3.04	1.75
Category II. Intentional composition of student groups – Homogeneous ability grouping: grouping students with similar capabilities	2.51	1.53
Category II. Intentional composition of student groups – Homogeneous ability grouping: grouping students with similar interests	2.57	1.56
Category III. Tutoring systems – assigning tutoring systems for a long period of time	2.52	1.61
Category IV. Staggered non-verbal learning aids – provide staggered helping cards that the students can obtain step by step	3.13	1.63
Category V. Mastery Learning – setting a goal for all students to achieve in a topic before starting a new topic	3.36	1.63
Category VI. Open education and or granting autonomy to students	3.94	1.44

inclusive practices that teachers can implement to address meaningfully learner variance. Thus, the questionnaire includes items regarding practices such as tiered assignments, intentional composition of student groups, tutoring systems, staggered nonverbal learning aids, mastery learning, and open education.

The scale is composed of 12 items that could be responded using a six-point Likert scale (1 = *never* to 6 = *very frequent*) and were as follows:

Instruction: "How often do you implement the following practice during teaching in homeschooling …"

- Category I. Tiered assignments – according to the number of tasks to work on (quantitative tiering of assignments)
- Category I. Tiered assignments – according to time to work on tasks (quantitative tiering of assignments)
- Category I. Tiered assignments – according to the difficulty or complexity level of the task (qualitative tiering of assignments)
- Category I. Tiered assignments – according to differences in the representation/depiction of the task (qualitative tiering of assignments)
- Category II. Intentional composition of student groups – Heterogeneous ability grouping: grouping students with different capabilities
- Category II. Intentional composition of student groups – Heterogeneous ability grouping: grouping students with different interests
- Category II. Intentional composition of student groups – Homogeneous ability grouping: grouping students with similar capabilities
- Category II. Intentional composition of student groups – Homogeneous ability grouping: grouping students with similar interests
- Category III. Tutoring systems – assigning tutoring systems for a long period of time

- Category IV. Staggered non-verbal learning aids – provide staggered helping cards that the students can obtain step by step
- Category V. Mastery Learning – setting and verifying a goal for all students to achieve in a topic before starting a new topic
- Category VI. Open education and/or granting autonomy to students

Analysis

In order to investigate the first research question, two separate analyses of variance were conducted. The first ANOVA examined teachers' perception of support for students with SEN, whereas the second ANOVA investigated teachers' responses to the support of students from lower SES families. Both ANOVAs included country and classroom setting (inclusive or non-inclusive classroom) as factors. Moreover, to explore the second research question, a mixed analysis of variance was undertaken to determine if significant differences existed between teachers' ratings of their implementation of DI practices between countries and classroom setting. All DI practices items were submitted to the mixed ANOVA as dependent variables, while country and classroom setting were included as independent variables.
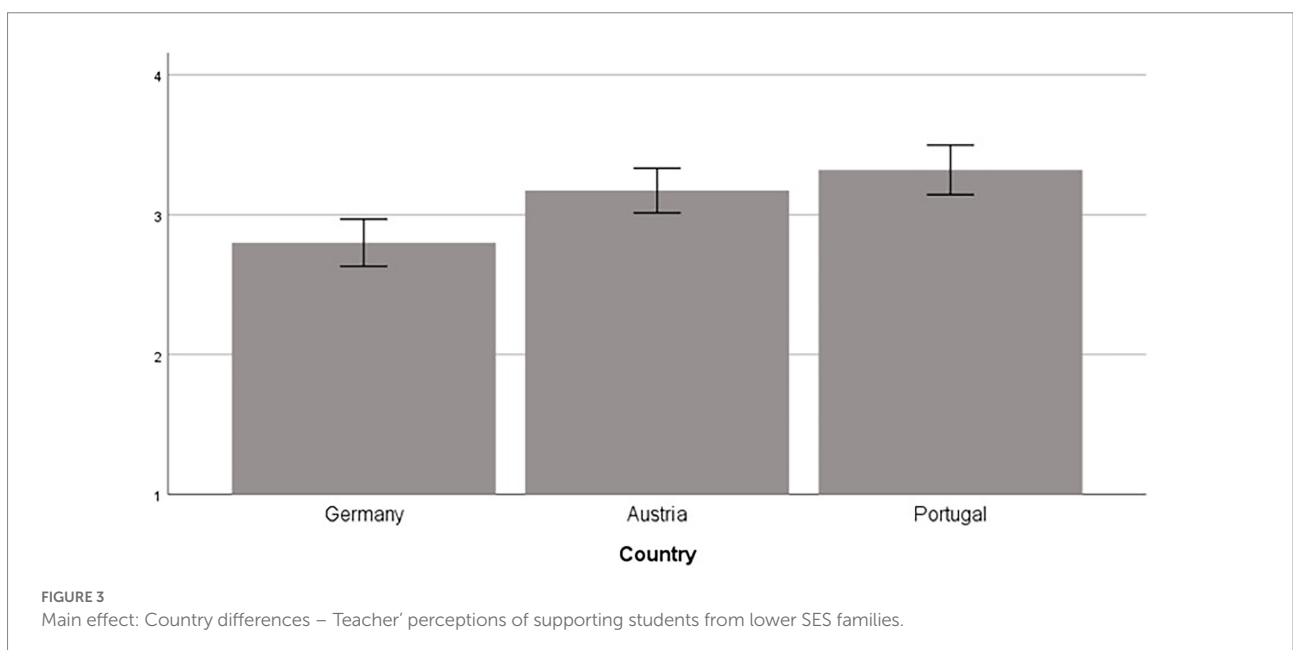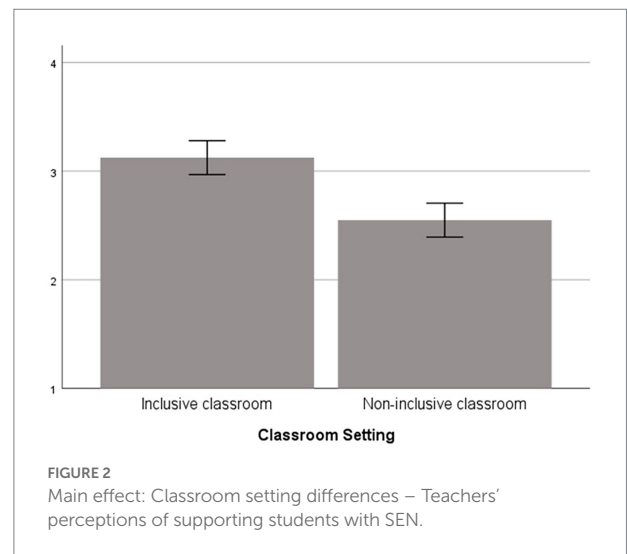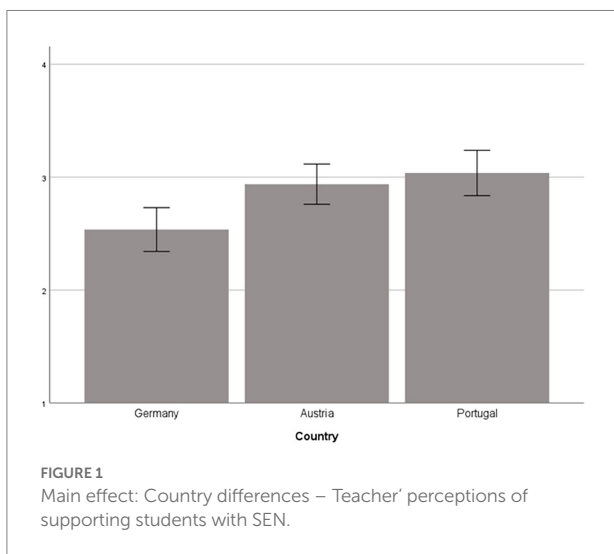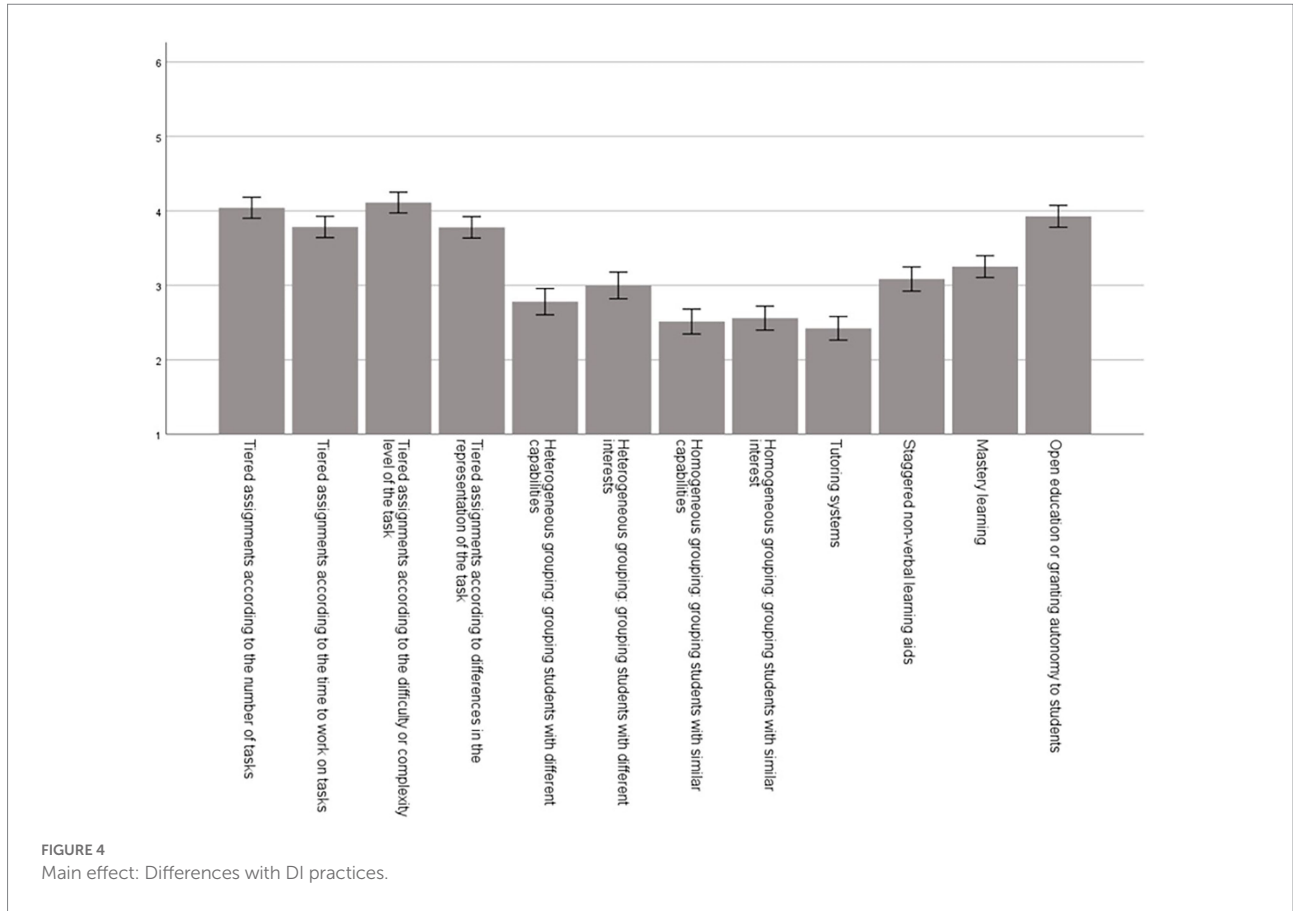
Results

Research question 1: Teachers' perceptions of supporting vulnerable students

Results from the first ANOVA (supporting students with SEN) revealed a significant country main effect, ($F(2,465) = 7.19$,

$p < 0.001$, ηp² = 0.03) (Figure 1). A Bonferroni-corrected pairwise post-hoc contrast ($p < 0.001$) showed that Portuguese teachers significantly differ from their perceptions regarding the support of student with SEN during ERT compared to their German and Austrian counterparts. German and Austrian teachers, however, did not significantly differ from one another. In detail, the results indicated that Portuguese teachers' ratings are higher when it comes to their perceptions on the support they delivered to students with SEN. Furthermore, the ANOVA yielded a significant classroom setting main effect, ($F(1,465) = 26.26$, $p < 0.001$, ηp² = 0.05) (Figure 2). The findings show that teachers from inclusive classrooms reported a higher support for students with SEN. Lastly, no significant interaction effect between country and classroom setting was found.

With regards to teachers' perceptions on their support to students from lower SES families, the second ANOVA indicated only a significant country main effect, ($F(2,494) = 9.51$, $p < 0.001$, ηp² = 0.04) (Figure 3). Specifically, a Bonferroni-corrected pairwise post-hoc contrast (all $p < 0.05$) showed that German, Austrian, and Portuguese teachers differ in their perceptions concerning their support for students from lower SES families. In particular, it appears that German teachers tend to provide a lower support to students from lower SES, whereas Portuguese teachers report a higher support followed by Austrian teachers. Finally, no significant main effect of classroom setting or interaction effect between country and classroom setting was found.

FIGURE 1
Main effect: Country differences – Teacher' perceptions of supporting students with SEN.

FIGURE 2
Main effect: Classroom setting differences – Teachers' perceptions of supporting students with SEN.

FIGURE 3
Main effect: Country differences – Teacher' perceptions of supporting students from lower SES families.

FIGURE 4
Main effect: Differences with DI practices.

Research question 2 and 3: Teachers' implementation of DI practices, differences across countries, and inclusive vs. non-inclusive classrooms

The mixed ANOVA indicates that there are significant differences between countries and classroom setting when it comes to teachers' implementation of DI practices during ERT. Specifically, the tests of between-subject effects of the mixed ANOVA results reported a significant mains effect of country, $(F(2,472) = 86.72, p < 0.001, \eta p^2 = 0.27)$. Bonferroni-corrected pairwise post-hoc contrasts reveal that Portuguese teachers implement more often DI practices during ERT in the first COVID-19 school closure, differing significantly from their German and Austrian counterparts (both $p < 0.001$). German and Austrian teachers, however, do not significantly differ from one another. In addition, a significant main effect of classroom setting was revealed, $(F(1,472) = 8.09, p < 0.01, \eta p^2 = 0.02)$.

The tests of within-subject effects showed significant variations within the single use of DI practices, $(F(11,472) = 83.76, p < 0.001, \eta p^2 = 0.15)$. In detail, teachers tend to differentiate their instruction predominantly using tiered assignments and using open education and/or granting autonomy to students, while they seldom differentiate by establishing tutoring groups as well as both formats homogeneous grouping (similar capabilities and interests) (Figure 4). Furthermore, a significant interaction effect between the DI practices and country $(F(22,472) = 3.03, p < 0.001,$

$\eta p^2 = 0.01$) (Figure 5), as well as a significant interaction effect between the DI practices and classroom setting $(F(11,472) = 2.29, p < 0.01, \eta p^2 = 0.01)$ (Figure 6) were found, indicating that in general these pattern of effects concerning the differences within the use of DI practices appear to be somewhat consistent across countries and classroom settings.
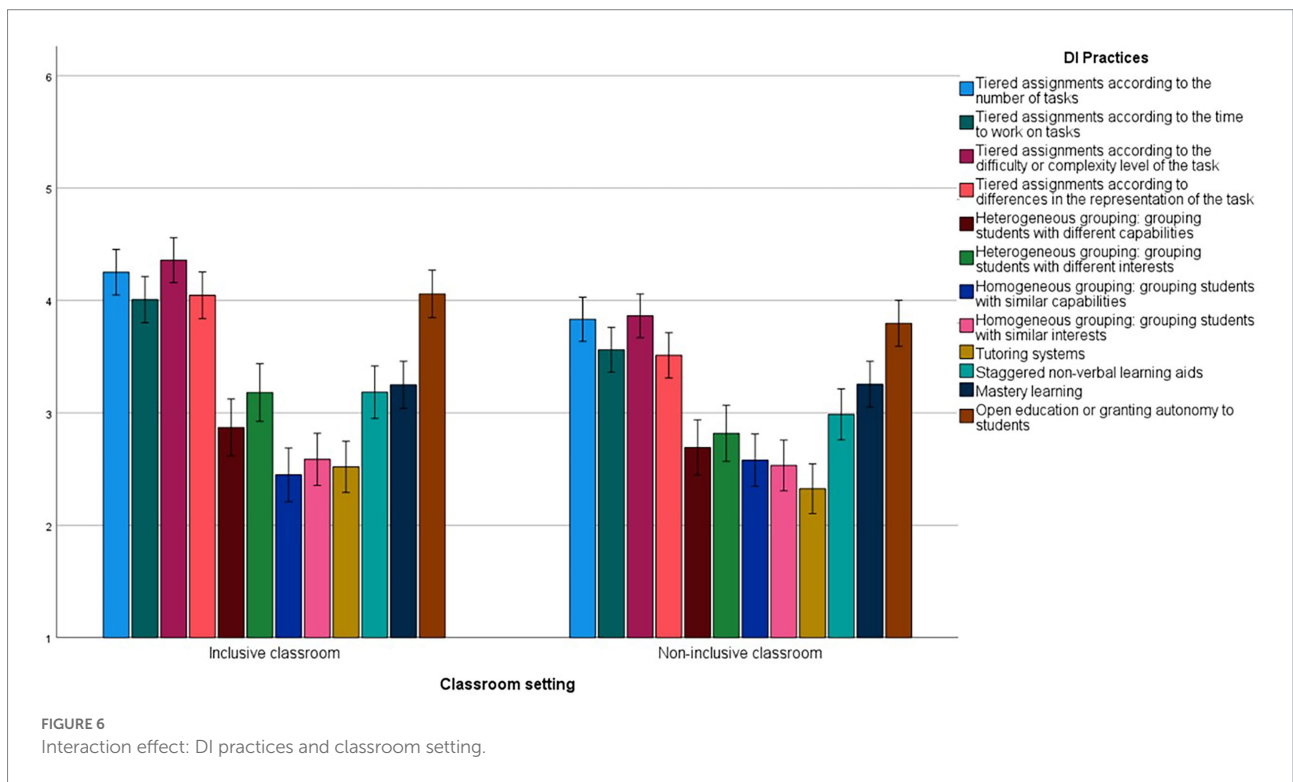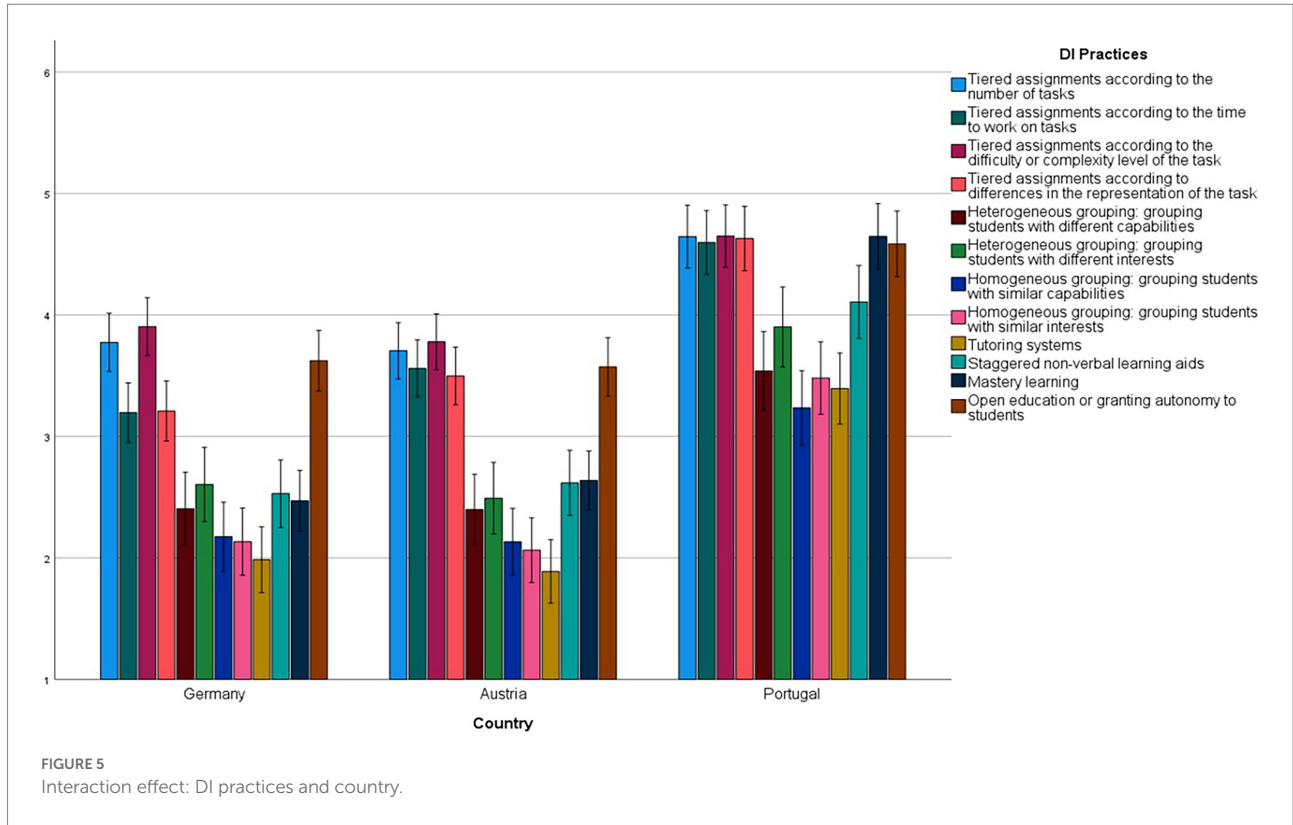
Summing up, the results indicate that: (1) in general, teachers indeed applied DI practices during their ERT, however, the frequency in which German and Austrian teachers implement such practices is far less than in Portugal; (2) at least in Germany and Austria, teachers held a rather low variance of DI practices as the mostly adhered to tiered assignments and open education/ granting autonomy to students.

Summary of results

Table 3 presents a summary of each countries' specific use of teachers' inclusive instructional practice of DI.

Discussion

With the COVID-19 crisis, most countries adopted ERT as a temporary solution (Bozkurt et al., 2020). Nonetheless,

FIGURE 5
Interaction effect: DI practices and country.

FIGURE 6
Interaction effect: DI practices and classroom setting.

educational organization and responses within each country varied significantly as a result of their own policies. With this background, this paper reports on a cross-country study of teachers' perceptions of their inclusive practice in the countries of Germany, Austria and Portugal during the first COVID-19 related school closures.

TABLE 3 Summary of teachers' DI practice in each country.

Teachers' DI practices

Germany	Austria	Portugal
In general, results indicated that Portuguese teachers supported more often vulnerable students and differentiated their instruction more frequently in comparison to both German and Austrian teachers.		
Most implemented DI practice,		
1. Tiered assignments according to the difficulty or complexity of the task	1. Tiered assignments according to the difficulty or complexity of the task	1. Mastery learning*
2. Tiered assignments according to the number of tasks	2. Tiered assignments according to the number of tasks	2. Tiered assignments according to the difficulty or complexity of the task
3. Open education or granting autonomy to students	3. Open education or granting autonomy to students	3. Tiered assignments according to the number of tasks
Least implemented DI practice,		
1. Tutoring systems	1. Tutoring systems	1. Homogeneous* grouping: Grouping students with similar capabilities
2. Homogeneous grouping: Grouping students with similar interests	2. Homogeneous grouping: Grouping students with similar interests	2. Tutoring systems
3. Homogeneous grouping: Grouping students with similar capabilities	3. Homogeneous grouping: Grouping students with similar capabilities	3. Homogeneous grouping: Grouping students with similar interests

*These DI practices are used differently compared to Germany and Austria.

Overall, the analyses showed that teachers in Germany and Austria reported to have implemented less practices to address at-risk students compared to Portuguese teachers. This result is consistent with previous COVID-19 related research in both Germany and Austria, that has shown that teachers in both countries had severe difficulties to address high-risk student needs (Letzel et al., 2020a; Helm et al., 2021; Woltran et al., 2021). Moreover, Portuguese teachers had less worries preparing their lessons online, and consequently saw this as an opportunity for new professional learning. This was also reported in a study by Seabra et al. (2021), in which teachers expressed perceiving ERT as a challenging situation, they still saw it as an opportunity to change teaching and learning, thus, they implemented more student-centered learning that aimed to adapt teaching to each individual student. Moreover, in the study conducted by Portuguese teachers highlighted that distance learning addresses the needs of specific student groups, such as students with long-term illness (Seabra et al., 2021). Based on the findings from Ávalos et al. (2021) and Seabra et al. (2021), it could be assumed that teachers' perceptions on what the pandemic situation means to the teaching and learning field could have had an important impact on their teaching behavior. While Portuguese teachers saw the pandemic as an opportunity to transform teaching and learning, and therefore were willing to intensify their individual support, German and Austrian teachers might have perceived more challenges than opportunities during ERT. Nonetheless, the results of this study indicate that Austrian teachers report a higher level of support for students compared to German teachers. Previous research has indicated that Austrian teachers faced challenges during ERT, but were still able to cope with the transition to home-based learning and were confident in continuing their teaching (Schober et al., 2020). Based on these results, it would be important to explore in detail teachers' experiences and context factors that could have supported their transition and continuation of teaching. This could provide information as to the differences between the three countries. Finally, it should also be pointed out that German teachers did not have any national or state procedures or guidelines at hand on how to establish ERT (Freundl et al., 2021) nor previous continuous contact with digital platforms or tools as in the case of Austria (Ennadif, 2021). These features could have inherently also limited their possibilities to address at risk students during distance learning. Taken together, it appears as if a lot of teachers lagged support in implementing ERT in the absence of nationwide measures to help and support teachers. Because of the federal organization of Germany, and therefore because education is not organized by the single *Länder* (federal states), it might have taken too long to find supporting measures for the teachers in the first lockdown.

Another possible reason for Portuguese teachers providing more individual support, as well as implementing more frequently DI practices than Austrian or German teachers, could be the organization of the school system and teacher training in the three countries of interest. Germany and Austria have strict tracked systems, whereas in Portugal students have the opportunity to learn together during the whole compulsory education (Eurydice, 2021/22). Although the trend in Germany and Austria is also going towards a more inclusive educational system, experts claim that the educational systems will never be reorganized towards a fully compulsory system in which students with different learning abilities will learn together in one school due to the specific educational traditions and certain political interests in the countries (Baumert et al., 2013; Hurrelmann, 2013; Tillmann, 2015). However, the tracking system seems to affect teachers' perceptions of inclusive

education, as the results of this comparative study show. In this vein, in both Germany and Austria, specific schools for students with SEN still exist, although the number of students with SEN educated in mainstream education rose in the past years (Autorengruppe Bildungsberichterstattung, 2014). Lastly, it is important to highlight that the Portuguese subsample had a higher level of teaching experience than the German and Austrian teacher subsamples (OECD, 2020a,b). Taking into consideration that teaching experience is positively associated to their inclusive practice (Wan, 2016; Lindner et al., 2021), it might be possible that this factor could have also be a reason for the significant differences between teachers' DI practice.

In this context, it seems interesting to investigate the actual inclusive practice or the design of teaching that is described as inclusive during normal operation of school. This could provide clues to the extent to which regular and special teachers' understanding of their profession and area or rather student group differ across countries. This argument follows from the differences in the organization of the school system and teacher training outlined previously (Eurydice, 2021/22). Due to the separate training and specific responsibilities of regular and special teachers in Austria and Germany, it can be assumed that regular teachers feel less committed to inclusive education and teaching or have a more neutral or negative attitude towards its implementation. Previous research regarding team teaching of regular and special teachers in inclusive education shows that the most common teaching strategy in this context still remains the 'one teach-one assist' model. This approach implies the following division of pedagogical responsibilities: One teacher (mainly the teacher who attended teacher training for regular educational settings) holds the leading function in the classroom by carrying out the basic didactic and methodological actions for whole class. His or her counterpart, namely the special education teacher, holds responsibility for specific students by assisting them individually. This special support is often focusing on students diagnosed as having SEN (Paulsrud and Nilholm, 2020). Referring to the current study, this could also be an explanation for the higher scores in the Portuguese sample, as the proportion of special education teachers in the sample of Austria and Germany was significantly lower.

According to the specific practices that were implemented in ERT, results reveal a frequent use of tiered assignments and open education/granting autonomy to students. These results are in line with pre-pandemic evidence showing that these practices were used more often than others (Smit and Humpert, 2012; Pozas et al., 2019; Smets and Struyven, 2020; Letzel, 2021). Additionally, most research conducted during the COVID-19 ERT has indicated that given that teaching was implement through distance learning, education itself was shifted to a more open, flexible and personalized instruction, were students themselves became responsible for their own learning (Fischer et al., 2020; Zhao and Watterston, 2021). On the other hand, and also consistent with pre-pandemic research is the fact, that tutoring systems or homogeneous ability grouping were used rather infrequently (Letzel and Otto, 2019; Letzel, 2021). Thus, it can be assumed that the frequency of use of specific practices does not

seem to be directly dependent on the teaching mode (e.g., online vs. in a classroom, synchronous or asynchronous) but rather on the way teachers are supported to implement those practices, technical equipment, teacher training, less demanding, and even teachers' attitudes towards the use of DI and inclusive teaching (Chiner and Cardona, 2013; Gaitas and Alves, 2017; Letzel et al., 2020b). However, in this study, information as to why teachers made use of certain DI practices over others was not collected. Further research using interviews or focus groups could provide insights into these results.

Moreover, the findings also reveal that both German and Austrian teachers are quite invariant in their use of DI practices in comparison to the Portuguese teachers. These results are again consistent with pre-pandemic research, in which German and Austrian teachers mainly differentiate their instruction by means of tiered assignments (Smit and Humpert, 2012; Lindner et al., 2019; Pozas et al., 2019). Taken together, the results from this study show that in particularly German and Austrian teachers were not able to meaningfully support students from a lower SES and with SEN. This can be concluded not only from their proper perceptions on supporting the needs of vulnerable students, but also from the limited DI repertoire in which they addressed learners. For instance, teachers reported implementing DI practices in form of open education/granting autonomy, which rely on students own ability to take responsibility of their own learning. However, previous research has pointed at the fact that students with SEN require more intensive and direct support from teachers as they cannot work independently on their learning activities (Goldan et al., 2020).

Limitations

This study has several limitations. First, the study uses data collected in the first period of school closures due to social distancing measures in order to prevent the spread of the coronavirus. The results of the study only represent what happened during the first lockdown and do not reflect teachers' teaching practices in further periods of school closures (e.g., winter 2020), nor how inclusive education was implemented in hybrid education. Consequently, the present study is based solely on cross-sectional results, thus limiting causal interpretations of the findings. Furthermore, this study uses teachers' self-reports, which can be sensitive to overestimation, underestimation, or socially desired answers. Desimone et al. (2010), however, found that teachers' self-reports regarding their teaching practices are highly correlated to classroom observations, and teachers themselves are best able to provide reasons for their actions embedded into a larger context (Clausen, 2002). A recommendation for future research is to use a combined research methodology using quantitative (e.g., questionnaires) and qualitative data (e.g., interviews, classroom observations). Additionally, Kunter and Baumert (2007) identified that teachers' perspectives might differ a lot from students' ratings of instruction. In this vein, including a second perspective, e.g., students' ratings would be a meaningful addition.

Another important limitation is that teacher characteristics, such as attitudes or self-efficacy beliefs towards DI were not included in the analysis. Given that, both, self-efficacy beliefs and attitudes are considered important predictors for teachers' inclusive practice, it is necessary for future research to consider both variables when exploring how teachers implemented inclusion during ERT (Knauder and Koschmieder, 2019). In addition to this, it would be important to explore whether teachers in the three countries differ significantly in their attitudes and self-efficacy beliefs. This could also provide information into the significant variations on the inclusive practice as seen in the results from this study.

To finalize, it is necessary to highlight that the Portuguese teachers participating in this study have significantly more teaching experience than the German and Austrian teachers. Although research has yielded mixed evidence regarding the influence of teaching experience on teachers DI practice (e.g., Wan, 2016; Letzel, 2021; Lindner et al., 2021), the present study did not control such variable in the analyses. Thus, it is necessary for future research to explore such cross-country differences in detail.

Conclusion

It is without a doubt that during the COVID-19 school related lockdowns, vulnerable students have been left behind. This situation has clearly shown that inclusive teaching is essential not only in face-to-face teaching and learning but as well in digital contexts. In this context, it is possible to conclude that DI is a requisite within education. Nonetheless, what we can also learn from this study is that we cannot assume that ERT or distance learning is inherently of low quality, but rather reflect that effective teaching practices and behaviors in classrooms do not always equate into effective teaching in an online environment. With the need of ERT, numerous applications and e-learning platforms and systems have been developed and improved. Consequently, teaching in emergency remote distance requires teachers to modify their teaching practices and behaviors used in traditional in-school settings and make use of the digital infrastructure and resources that are now available. This can only be achieved through proper teacher training and professional development, for instance developing opportunities where in-service and pre-service teachers can together plan, implement and reflect their DI practice. This would allow a critical reflection of their own practice as well as learning from other colleagues or mentors. Additionally, it is necessary to provide teachers and students with the digital tools to enable inclusive education in an online setting.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

The studies involving human participants were reviewed and approved by Ethics Committee from each country. The patients/participants provided their written informed consent to participate in this study.

Author contributions

VL-A conceived the original idea and was supported by MP in planning the research project. VL-A, MP, K-TL, SS, PD, CS, and IC carried out the data collection process and prepared the dataset. VL-A and MP took the lead in writing the manuscript with the support from K-TL, SS, PD, and CS who contributed to the interpretation of the results and shaped manuscript. All authors contributed to the article and approved the submitted version.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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