A change of perspective – Exploring Mexican primary and secondary school students’ perceptions of their teachers differentiated instructional practice

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With the increasing student diversity, the establishment of inclusive classrooms has become a top concern of policy-makers worldwide urging teachers to differentiate their instruction according to students’ individual learning needs. As the implementation of differentiated instruction (DI) relies mainly on teachers, previous research has mostly focused on examining teachers’ perspectives on their use of differentiation. In contrast, far less attention has been paid to explore students’ perspectives about their experiences in inclusive classrooms. Therefore, this study aims at examining students’ experiences of their teachers’ actual DI practice. Moreover, this study sets the spotlight on Mexico, a country that has faced changes with a recent proposed educational model. Results from a mixed analysis of variance revealed that students do in fact perceive that their teachers implement DI practices. It appears that both primary and secondary school teachers implement more frequent variants of mastery learning as well as tutoring systems as a means to differentiate their instruction. Implications of the results, as well as further lines of research, are discussed.

Introduction
Schools around the world are confronted with a highly diverse student population (Honkimäki and Kálmán, 2012). Overall, students differ not only in academic readiness, but also cultural background, language competence, learning styles and motivation, as well as social, methodological and self-regulatory competencies (Hardy, Decristan and Klieme, 2019; Jokinen et al., 2012). Thus, with the increasing student diversity, policy makers worldwide call to shift ‘from focusing on the inclusion of students

with special educational needs, to the inclusion, participation and development of all learners’ (Schwab and Alnahdi, 2020a, p. 1). Consequently, the development of an inclusive classroom environment demands teachers to adapt their instruction to address the differences between all students (UNESCO, 2017). DI has been recognised as a pedagogical approach that acknowledges differences among all students by meaningfully responding to their varying learning needs and maximising learning opportunities (Gheyssens et al., 2020). With this background, DI has been considered as a teaching strategy that can ensure a fair educational system as well as a core element of effective teaching (OECD, 2018; Parsons et al., 2018; Schofield, 2010).

Recent research into DI has shown its potential to respond effectively to the diverse student needs. Valianades (2015) found that students in classrooms where teachers implemented DI performed better in comparison with students who did not receive DI. Similarly, studies by Goddard, Goddard and Minjung (2015), Bal (2016) and Reis et al., (2011) reported positive and significant effects of teachers’ use of DI on students’ mathematics and reading achievement. Additionally, positive effects of DI have also been reported for nonachievement outcomes such as students’ learning interest, motivation and self-confidence (Eysink et al., 2017; McQuarrie and McRae, 2010).

As the implementation of DI relies mainly on teachers, previous research has mostly focused on examining teachers’ perspectives on their use of differentiation. In contrast, far less attention has been paid to explore learners’ perspectives about their perceptions of education in inclusive classrooms. Several recent studies have stressed the necessity of considering student experiences in inclusive education research (Bourke and Mentis, 2013; De Leeuw et al., 2018; Lavin et al., 2020a, 2020b; Schwab and Alnahdi, 2020b; Schwab, Sharma and Hoffmann, 2019). Against this background, the present study focuses on building on the suggestions for further research from such
studies and aims at examining students’ experiences of their teachers’ actual DI practice. Additionally, this study sets the spotlight on Mexico, a country that, as Forlin et al., (2010, p. 724) point out, has experienced significant changes in social, cultural and political environments aligned with disparate economic situations, though, have led to extreme diversity between school communities and great difficulties in enabling inclusive practices in Mexico’. Recently, Mexico has faced legal changes with a newly proposed educational model (SEP, 2017) where inclusive education has become a priority (García-Cedillo, Romero-Contreras and Ramos-Abadie, 2015; Reynaga-Peña et al., 2018). Given that there has been little research conducted and published in English on Mexican students’ perspectives (De Souza, 2013), in particular within inclusive classrooms (Lavin et al., 2020b), this study attempts to fill such research gap and seeks to take a closer look at Mexican students’ point of view about being educated in inclusive settings.

The following section will briefly describe the Mexican educational system as well as its inclusive education regulations. Afterwards, it will elaborate on the topic of DI and the available research on the topic in Mexico.

**Education in Mexico**

**General characteristics of the Mexican educational system**

Mexico’s education system is organised into three education levels (OECD, 2019): (1) basic education including pre-school education (with a total of 3 years; 3- to 5-year-olds), primary education (with a total of 6 years; 6- to 11-year-olds) and lower secondary education (with a total of 3 years; 12- to 15-year-olds); (2) upper-secondary education with options between general or vocational programmes (for 15- to 18-year-olds), and lastly, (3) higher education. School attendance is obligatory from pre-primary to upper-secondary education (Santiago et al., 2012). Students in Mexico are first formally streamed into different educational pathways before they enter upper-secondary education at the age of 15 (OECD, 2018).

The Mexican education system caters to the educational needs of a large and highly diverse population (Forlin et al., 2010). In Mexico, more than 800,000 students attending indigenous education speak 68 Indigenous languages and over 360 dialects (OECD, 2019). Additionally, more than 20% of the population lives in rural areas, while more than half of the schools have teachers that serve multi-grade students (SEP, 2012). Students with special education needs attend mainstream basic schools or specialised institutions (García-Cedillo et al., 2015). Although certain policies and practices such as delayed tracking and limited ability grouping are implemented, reports from OECD (2018) indicate that Mexico ranks among the countries with the lowest level of inclusion. However, in comparison with other Latin American countries, Mexican students perform above average in both mathematics and reading (García-Cedillo et al., 2015).

More than 90% of students attending public schools (OECD, 2019) have access to free education. In contrast, private schools are not publicly subsidised and thus, are tuition-based (Santiago et al., 2012). With this context, most private schools are attended by middle and high socio-economic status students (García-Cedillo et al., 2015). Although, private schools require the authorisation of the state educational authorities and follow the national curriculum established by the Secretariat of Public Education (Secretaría de Educación Pública, SEP), they are independent as to how they manage and implement their choice of teaching and learning approaches. Hence, teaching processes are implemented quite differently in public and private schools (Lavin et al., 2020b).

**Inclusive education in Mexico**

In 1996, the National Project for Educational Integration (Proyecto Nacional de Integración Educativa) was launched with the objective of establishing educational integration in Mexico. This project initiated with an investigation on how educational integration was conducted in the country as well as the type of supports provided by the state governments (Romero-Contreras, García-Cedillo, Forlin and Lomelí-Hernández, 2013; García-Cedillo et al., 2015). Results of the study indicated that there were no clear procedures on the implementation of education integration which inherently lead to a very limited success (García-Cedillo, 2009). Based on such results, an educational integration model was developed considering in-service teacher training, case follow-up and technical support from national and international specialists (García-Cedillo, 2009). This model resulted in the National Programme for the Strengthening of Special Education and the Educational Integration (Programa Nacional para el Fortalecimiento de la Educación Especial y la Integración Educativa, PNFEEIE).

The major changes following the PNFEEIE programme was the organisation and the delivery of services. For instance, the Support Services for General Education Units (Unidades de Servicios de Apoyo a la Educación Regular, USAER) was created and established units of groups of professionals, support teachers, a psychologist a communication teacher and a social worker serving more than one school to support educational integration (García-Cedillo et al., 2015). Additionally, the Multiple Attention Special Education Schools (Centros de Atención Multiple, CAM) were transformed. The CAMs were given general guidelines to instruct children with special education needs (SEN) using the general curriculum instead of special curriculum (García-Cedillo et al., 2015).

According to García-Cedillo et al., (2015), the provision of services as well as teacher training have been the most
important results of this educational integration model. Nonetheless, Romero-Contreras et al. (2013a) argue that inclusive education in Mexico is still unsatisfactory. In 2012, a constitutional reform established quality education as a right for all Mexicans (OECD, 2018). Within this new reform, Mexico promoted a New Educational Model (Nuevo Modelo Educativo) (2017) which was set to take place during 2018/19. This educational model established inclusive education and equity as main priorities and focused to ‘strengthen the capacities of schools and educational services that serve indigenous children, migrants and students with SEN’ (OECD, 2018, p. 9). This process was done through financial and academic support as well as improving the infrastructure of disadvantaged schools (OECD, 2018).

As mentioned before, education is implemented differently in public and private schools (Lavín et al., 2020b). Given that private schools operate without any government funding, many students with SEN are left without appropriate support for their specific learning needs. Additionally, as a result of anti-discrimination policy in federal laws (DOF, 2011), private schools cannot deny student entrance based upon a SEN. Hence, many students are unable to attend such schools as they would need to pay private school tuition as well as the additional support required within these school settings (García-Cedillo et al., 2015; Lavín et al., 2020b).

**Differentiated instruction**

DI is an inclusive practice-proven approach that acknowledges student diversity and carefully aligns learning tasks with the individual learning needs of students (Loreman, 2017). Hence, it can be assumed that DI functions as a reactive inclusive teaching approach that responds to the needs of students (Griful-Freixenet, Struyven, Vantieghem and Gheyssens, 2020; Lindner & Schwab, 2020). In order to maximise learning, Tomlinson (2017) suggests that teachers should modify the content, processes and products in correspondence to their students’ readiness, interests and learning profiles, as well as continuously monitor their students’ academic process (Dack, 2019). There is a variety of DI practices that can be implemented to address classroom diversity, such as the use of tiered assignments, homogeneous or heterogeneous subgroups based on students’ performance, readiness or interests (Coubergs, Struyven, Vanthournout et al., 2017; Tomlinson, 2017). Furthermore, tutoring systems, staggered non-verbal material such as helping cards, and open education practices, such as station-based work, project-based learning, or portfolios have been also considered as important DI practices (Tomlinson, 2017). Lastly, research has also pointed out at variants of mastery learning strategies such as jigsaw puzzles, enrichments or prioritised curricula directed at high and low achieving students as effective DI practices (Daron, Buchs and Desbar, 2012; Lawrence-Brown, 2004).

Recent research has reported that teachers’ worldwide struggle to differentiate their instruction and rarely adapt their teaching according to their students’ characteristics (DeNeve et al., 2015; van Geel et al., 2019; Schleicher, 2016). Furthermore, studies also indicate that teachers hold a low variance in their use of DI practices (Lindner et al., 2019) as they mainly differentiate by means of tiered assignments and flexible grouping (Pozas et al., 2020; Smit and Humpert, 2012). Interestingly, results from PISA 2015 revealed that students in Mexico reported that their science teachers adapt their instruction much more frequently than the OECD average, and thus, ranks among the highest in OECD countries when it comes to DI (OECD, 2016). A recent study by Lavín et al., (2020b) were Mexican school teachers were interviewed on their use of inclusive practices, shed further noteworthy results. According to the authors, although participating teachers did not directly mention commonly used inclusive practices noted in literature, they did as a matter of fact implement practices aligned with DI literature. These practices included establishing high expectations for all students, personalising curriculum, individualising schedules and routines, allowing students to work on their own pace, as well as establishing goals and continuous monitoring of student progress to inform teaching strategies (Lavín et al., 2020b). Similarly, Campa-Alvarez, Valenzuela and Guillén-Lúgigo (2020) indicated that Mexican teachers generally differentiate their instruction by means of personalising and adapting curriculum. Lastly, with regards to differences among educational stage, Sánchez-Escobedo and Camelo (2018) reported that in comparison with secondary school teachers, Mexican primary school teachers indicated a more frequent use of DI.

**The present study**

Despite the fact that international researchers (Bourke and Mentis, 2013; De Leeuw et al., 2018; Lavín et al., 2020a; Lavín et al., 2020b; Schwab and Alnahdi, 2020b; Schwab et al., 2019) have highlighted the necessity for research to consider students’ perceptions about inclusive education, there is still a very limited amount of studies that have included student views into the design. Therefore, the aim of the study is to address recommendations from such researchers and limitations from recent studies. In this line, the present study sought to investigate student perspectives on their teachers’ DI practice. Moreover, because the curriculum and teaching practices in primary and secondary classrooms are quite diverse (Schwab et al., 2019), the study further explores the potential differences across primary and secondary school students’ perceptions of DI practices. Lastly, considering that teaching methods are adopted quite differently in public and private schools, the present paper follows suggestions by Lavín et al., (2020a) and examines whether student perspectives vary across school type. With this background, the research questions guiding this study were as follows:
Which practices do students perceive their teachers to apply in order to differentiate their learning?

Does the implementation of DI practices vary across school type and educational stage?

**Method**

**Participants and procedure**
Following convenient sampling (Creswell, 2012), a total of 101 Mexican primary (NP = 24) and secondary (NS = 77) school students participated in the study. While 59% of the students attended public schools, 41% attended private schools. Out of this sample, 40% of the students were male, 60% were female and 5% were diagnosed as having special education needs (visually impaired N = 1; emotional and behavioural disorder N = 4). Primary school students had a mean age of 9.52 years, whereas secondary school students had a mean age of 14.03 years.

The participants completed a voluntary online survey, which took approximately 15 to 20 min. Given that students were underage, informed consent from their parents or tutors was obtained from all participants completing the questionnaire.

**Instruments**

**DI practices.** The student questionnaire concerning teachers’ actual in-class DI practice was developed based on the teacher DI practice perspective questionnaire by Letzel (2019). This questionnaire stems from previous work by Pozas, & Schneider (2019). Within their study, the authors provide a categorisation of the DI practices that seeks to bridge the gap between educational theory and daily instructional practice (for a detailed description of the taxonomy please refer to Pozas, & Schneider 2019; Pozas et al., 2020). The Taxonomy of DI practices is framed within the current DI literature and research, and identifies six DI categories of practices: tiered assignments, intentional composition of student groups, tutoring systems, staggered non-verbal aids, mastery learning and open education/granting autonomy to students. A recent qualitative study by Letzel et al. (2019) revealed that the underlying categories within this taxonomy covered all relevant areas of DI.

The teacher perspective questionnaire by Letzel (2019) was reviewed and adapted to assess teachers’ actual DI teaching practices from students’ perspectives. Furthermore, given that the items were originally in German, a back-translation (Brislin, 1970) process was followed. Thus, a bilingual translator blindly translated the questionnaire from German to Spanish, and afterwards a second bilingual translator independently back-translated the instrument from Spanish to German. Finally, the two versions of the questionnaire (German language and back-translated Spanish version) were compared for equivalence. Two of the authors served as consultants during this process and supported by clarifying the meaning of items for translations.

The items could be responded by students using a five-point Likert scale (1 = never to 5 = very frequent) (see Table 1 for descriptive statistics) and were as follows:

Instruction: ‘How often does your homeroom teacher use the following practice during the lesson’.

- Category I. Tiered assignments: ‘Some students receive more time to finish their assignments’.
- Category I. Tiered assignments: ‘Some students receive more challenge tasks than others’.
- Category I. Tiered assignments: ‘Some students receive extra tasks’.
- Category I. Tiered assignments: ‘Some students receive different tasks, some tasks for example, have images instead of text’.
- Category II. Intentional composition of student groups: ‘My teacher forms groups of students with similar capabilities’ (homogeneous ability grouping).
- Category II. Intentional composition of student groups: ‘My teacher forms groups of students with different capabilities’ (heterogeneous ability grouping).
- Category II. Intentional composition of student groups: ‘My teacher forms groups of students with similar interests’ (homogeneous interest grouping).
- Category II. Intentional composition of student groups: ‘My teacher forms groups of students with different interest’ (heterogeneous interest grouping).
- Category III. Tutoring systems: ‘My teacher assigns students as tutors to which I approach during the school year for support’.
- Category IV. Staggered non-verbal learning aids: ‘My teacher provides a series of helping cards when I need support’.
- Category V. Mastery Learning: ‘My teacher sets a goal for all students to achieve in a topic before starting a new topic’.

| Table 1: Means and standard deviations for all DI items |
|-------------------------------------------------------|
| **M** | **SD** |
| 1. Tiered assignments | 1.51 | 0.56 |
| 2. Heterogeneous ability grouping | 3.26 | 1.24 |
| 3. Heterogeneous interest grouping | 3.19 | 1.26 |
| 4. Homogeneous ability grouping | 2.64 | 1.19 |
| 5. Homogeneous interest grouping | 2.63 | 1.15 |
| 6. Tutoring systems | 3.38 | 1.43 |
| 7. Staggered non-verbal learning aids | 2.20 | 1.35 |
| 8. Mastery learning | 3.43 | 1.50 |
| 9. Open education | 1.45 | 0.77 |
• Category VI. Open education/granting autonomy to students: ‘My teacher allows me to choose the format of my lessons (e.g. free work, station work?’

Analyses

In order to answer the research questions, a mixed analysis of variance (mixed ANOVA) was undertaken to determine if significant differences existed between students’ ratings of their teachers use of DI practices based on the school type (public and private school) and educational stage (primary and secondary school). All DI practices items were submitted to the mixed ANOVA as dependent variables, while school type and educational stage were included as independent variables. To reduce complexity and provide comparability, items pertaining to Category I. Tiered assignments were combined into a mean score and served as a within-subject factor.

With regard to assumption considerations for the mixed ANOVA, it is important to note that the sphericity assumption was violated and the Greenhouse-Geiser $\varepsilon$ exceeded 0.75, thus, the Huynh-Feldt corrected test statistic is reported for the within-subjects factor and the interaction.

Results

The mixed ANOVA indicates that the school type has an influencing role on students’ ratings of their teachers’ use of DI practices. Specifically, the tests of between-subject effects of the mixed ANOVA results reported a significant main effect of educational stage, $F(1, 95) = 7.02$, $p < 0.001$, partial $\eta^2 = 0.07$. In detail, it appears that secondary school students’ ratings of their teachers’ use of DI practices were significantly higher than primary school students’ ratings. Moreover, no significant differences were found for school type, thus, results indicate that teachers’ overall DI practice does not vary significantly across public or private schools.

The tests of within-subject effects showed significant variations within students’ ratings of their teachers’ implementation of the single use of DI practices, $F(6, 95) = 28.78$, $p < 0.001$, partial $\eta^2 = 0.23$. In detail, students perceive that their teachers tend to differentiate their instruction mainly building heterogeneous ability and interest groups, as well as establishing tutoring systems and implementing mastery learning. In contrast, students’ ratings show that their teachers rarely differentiate by using tiered assignments and open education (Figure 1). Moreover, homogeneous ability and interest grouping appears as well to be seemingly practiced, yet far less that heterogeneous grouping formats, tutoring systems and mastery learning. Furthermore, a significant interaction effect among students’ ratings of their teachers’ implementation of DI practices, school type, and educational stage was revealed, $F(6, 95) = 2.24$, $p < 0.05$, partial $\eta^2 = 0.23$ (Figure 2a, b). It appears that in primary school, students in public schools perceive that their teachers implement heterogeneous ability grouping and tutoring systems more often that in private schools. In contrast, private school students report perceiving teachers building heterogeneous interest groups and using mastery learning formats. Whereas in secondary school, students attending public schools report, in addition to heterogeneous ability grouping and tutoring systems, that their teachers implement more often mastery learning. On the contrary, private school students report the use of tutoring systems as well as heterogeneous ability and interest grouping formats as their teachers most common way of differentiating their instruction.

Discussion

Although literature has acknowledged that students are key stakeholders in inclusive education, there is hardly any research that includes students’ perspectives about their teachers’ DI practice (Schwab et al., 2019). Against this background, this study tackles the current gap in DI research and seeks to further contribute by taking into account students’ perspectives on their teachers’ DI practice, as well as exploring potential differences across school type and educational stage (Lavin et al., 2020a). Concerning the first research question, the findings indicate visible differences within student ratings of the distinct practices that their teachers employ to differentiate their instruction. In particular, it appears that students perceive that their teachers generally implement mastery learning, tutoring systems and build heterogeneous ability and interest groups. Although establishing specific student groups have been previously reported as a common DI practice (Chiner and Cardona, 2013; Tieso, 2005), mastery learning and tutoring systems are not frequently used (Letzel, V. 2019). Nonetheless, as discussed in the theoretical background, recent studies revealed that Mexican school teachers’ main strategy to differentiate their instruction are in fact variants of mastery learning such as adapting and personalising curriculum as well as establishing expectations and goals for all students (Lavin et al., 2020a, 2020b). In contrast, the least frequently reported DI practices are tiered assignments and open education. These results are in particularly surprising for the DI practice of tiered assignments as there is numerous international research that has shown that tiered assignments are by far the most applied DI practice (Leuders and Prediger, 2016; Prast, van de Weijer-Bergsma, Kroebergen and Van Luit, 2015; Richards and Omdal, 2007; Smale-Jacobse, Meijer, Helms-Lorenz, and Maulana, 2019; Smit and Humpert, 2012). Hence, these results suggest important country-specific differences when it comes to the overall practice of DI. Comparative research is needed in order to explore this in greater depth.

In contrast to previous research (Schwab et al., 2019) is the striking result that secondary school students’ ratings of their teachers’ use of DI practices were considerably higher than primary school students’ ratings. A possible explanation for this result can be due to primary school
students lack of methodological and didactic knowledge which could result in an incorrect assessment of their teachers’ DI practice (Jennek, Gronostaj and Vock, 2019). However, a second possible explanation could be due to the small sample size as well as the higher amount of participating secondary school students over primary school students. Nonetheless, the decision to compare educational stage was derived from the available international research that has pointed out at differences between primary and secondary school (e.g. Sánchez-Escobedo and Camelo, 2018; Schwab et al., 2019).

Furthermore, considering that education is different between public and private schools (Lavín et al., 2020a), it is remarkable that results did not indicate significant variations on the overall student ratings among both school types. Results, however, revealed important interaction effects between the distinct single DI practices, school type and educational stage. In detail, findings indicate that students in private primary schools and students in public secondary schools perceive that their teachers employ mastery learning more often. It remains, however unclear, whether this result stems from the specific curriculum from each educational stage or the resources bounded to the school type.

Taken all together, findings from this study contribute to the current state of research on inclusive education in Mexico. First, given that inclusive education has become a priority in Mexico, this study provides new insights into the actual state of the new reform. Second, results indicate that Mexican teachers do in fact implement DI practices, and more importantly, they employ practices such as variants of mastery learning and tutoring systems, which according to Hattie (2009), have strong and positive effects on students’ achievement.
Limitations and further research

The present study underlines several limitations. First, this study did not focus on a specific school subject. Considering that the ways in which DI practices are employed among different school subjects can be different (Ritzema, Deunk and Bosker, 2016), it is of utmost importance that future research concentrates on exploring potential differences not only across school type and educational stage, but also among school subjects. A second limitation concerns the assessment of teachers’ DI practices by means of student reports. Although surveys addressing students’ perspectives are economical, recommended in research, and possess validity (Butler, 2012), it might be very well possible that students could incorrectly assess their teachers’ differentiation practice given their lack of didactical knowledge. In this context Fauth, Decristan, Rieser, Klieme and Büttner (2014) argue that different dimensions of instructional practices cannot be observed in the same way. Thus, it is strongly suggested that future studies integrate all stakeholders’ perspectives, that is students and teachers, and make use as well of classroom observations. Additionally, it would be important to further conduct teacher interviews that could shed light into how they plan and design a differentiated lesson. This might provide deeper insights into teachers’ purposes or intentions using particular DI practices.

A third limitation from this study is the fact that the sample was relatively small and with a higher percentage of secondary school students. With such a sample, educational stage effects have to be interpreted very carefully. Against this backdrop, it is necessary for future research to continue to investigate student perceptions, however, raising and balancing the participants accordingly. Finally, there are potential differences across public and private schools (i.e. some public schools in Mexico do indeed have tuition fees), and as such it is necessary to see whether there are other various factors influencing teachers’ use of DI (i.e. school resources). Finally, although convenient sampling (as used in this study) is a common research strategy that possess great advantages (e.g. least time-intensive and simple to conduct), it also carries important disadvantages. One of these is that the results obtained from such samples have generalisability only to the sample understudy (Bornstein, Jager, and Putnick, 2013). Hence, the findings from this study must be considered with caution. Therefore, future studies with other types of samples such as simple random, stratified or clustered samples are necessary. In particular, research designs and samples that explore nested structures (e.g. teacher-class) could be a meaningful addition to the current research in Mexico.

Implications and conclusions

This paper has presented evidence that on the one hand, functions as a starting point to fill the gap on research concerning inclusive teaching practices in Mexico (De Souza, 2013) as well as considers students’ views with regard to their teachers’ inclusive instruction (Lavín et al., 2020b), and on the other, provides important country-specific information with regard to how inclusive education is being implemented in Mexican classrooms. Based on the outcomes, and given the fact that comparative research on inclusive education is still scarce (García-Cedillo et al., 2015), this paper calls for educational researchers to conduct cross-cultural investigations on how differentiated instructions is not only designed and implemented in general education, but as well to conduct in-depth analyses on different stakeholders’ perspectives. Such data would not only extend the existing knowledge base, but also contribute to inform countries about potential new knowledge that can support their efforts in the development of inclusive education.

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