



DI (Differentiated Instruction) Does Matter! The Effects of DI on Secondary School Students' Well-Being, Social Inclusion and Academic Self-Concept

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In consideration of the substantial increase in students' learning demands, teachers are urged to address student heterogeneity in their daily teaching practice by means of differentiated instruction (DI). The practice of DI, as a vehicle to achieve inclusive education, not only aims to support all students' academic learning but also foster their social and emotional development. However, current research in the field of DI has mostly been limited to an examination of its effects on students' achievement outcomes. Consequently, the potential impact of DI on students' socio-emotional outcomes has, till now, received very little attention. In order to address this gap in the research, the current researchers seek to investigate the effects of DI on school students' well-being, social inclusion and academic self-concept. Survey participants in this study included 379 students from 23 inclusive and regular classes in secondary schools in Austria. Following multilevel analyses, the results have indicated that students' rating of their teachers' DI practice is positively associated with their school well-being, social inclusion and academic self-concept. However, a *t*-test for dependent samples demonstrated that students perceive their teachers' DI practice to be infrequent. Implications of the results along with further lines of research are also presented in this paper.

Keywords: inclusive education, differentiated instruction (DI), students' perception, school well-being, social inclusion, academic self-concept

INTRODUCTION

From the perspective of pedagogical professionalism, teachers are responsible for providing students with equal access to learning situations and enabling them to participate in academic as well as socio-emotional interactions. As teachers have a significant role to play in the creation of educational contexts, the requested access and participation of every student greatly depends on the implementation of teaching practices and strategies and the accompanying educational offers (Decristan et al., 2017; Pit-ten Cate et al., 2018). Given the fact that a heterogeneous class composition forms the pedagogical work base for teaching and learning processes, teachers are inevitably confronted with the professional demand to implement adequately adapted teaching practices that are tailored to their students' needs (Vaughn et al., 2007b; Pozas et al., 2020; Kärner et al., 2021). Diverse student characteristics as well as their various educational needs necessitate

suitable pedagogical reactions which are free of discrimination and exclusion and guarantee learning for every student (McMurray and Thompson, 2016; Petersen, 2016; Ainscow and Messiou, 2018). In this context, inclusive teaching practices are often discussed as a pedagogical solution to avoid learning barriers for students who are likely to be disadvantaged in educational settings [e.g., due to individual characteristics such as a diagnosis of having special education needs (SEN)] (Lindner and Schwab, 2020; Schwab et al., 2020; UNESCO, 2020).

DI to Students' Diversity

Given the highly heterogeneous study population (Dijkstra et al., 2016; Maulana et al., 2020; Watkins, 2017), the concept of inclusion has been shifted from the inclusion of students with SEN to the participation to all students (European Agency Statistics on Inclusive Education, 2017; Schwab 2020). As a result, policymakers urge teachers to make use of inclusive teaching strategies to provide valuable learning for all students within a learning group (UNESCO, 2020). One inclusive approach that is often discussed as a possible strategy to react adequately to students' diversity is DI (Tomlinson, 2014; Bondie et al., 2019). DI is considered to be an inclusive instructional practice that can be defined as the intentional, systematically planned and reflected practices that enable teachers to meet the needs of all learners in heterogeneous classrooms (Graham et al., 2020; Pozas and Letzel, 2020).

In order to differentiate their instruction, teachers must consider students' individual characteristics and educational needs by regarding five fundamental dimensions: 1) coping with student diversity; 2) adopting specific teaching strategy; 3) introducing a variety in learning activity; 4) monitoring individual student needs; and 5) pursuing optimal learning outcomes (Suprayogi and Valcke, 2016). Thus, the heterogeneity of class composition is a pivotal basic assumption with regard to teachers' creation of teaching and learning situations. Based on the acknowledged diversity of the students in a class, specific teaching practices must be chosen in order to include multifaceted activities that promote learning for every student. For instance, teachers can implement DI through a variety of instruction behaviours 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 (Coubergs et al., 2017; Darnon et al., 2012; Hachfeld and Lazarides, 2020; Lawrence-Brown, 2004; Maulana et al., 2020; Tomlinson, 2014). Overall, the goal of teachers' implementation of DI is the achievement of students' optimal learning outcomes (Suprayogi and Valcke, 2016).

Effects of DI on Student Outcomes

Given that DI can be often described as a collection of instructional strategies which enable teachers to ensure that all students, regardless of their individual characteristics, have positive and successful learning situations, its effectiveness is often associated with optimal learning outcomes at the level of academic performance and achievement (Loreman, 2017). However, up to know there are still diverging definitions of

the instructional approach make it a challenge to compare results from different studies on the effects of DI, thereby leading to investigations of different outlines of DI (Jennek et al., 2019; Lindner and Schwab, 2020; Prast et al., 2015; Roy et al., 2015). Taking this into account, Deunk et al. (2018) undertook a meta-analysis to investigate the effects of DI on the cognitive competences of primary students. Overall, the examination of 21 studies showed a small positive effect of DI on students' academic achievement (Deunk et al., 2018). Nevertheless, when DI was operationalized solely through grouping strategies, no significant overall effect was found. The results of a meta-meta-analysis of Steenbergen-Hu et al. (2016) showed no significant effects of DI in the context of grouping practices on students' performance. The results of Nusser and Gehrler (2020) drew a similar picture. Within the context of a longitudinal study, a positive development of secondary students' German competence was investigated, but it could not be explained as an effect of teachers' use of DI on reading competence development (Nusser and Gehrler, 2020).

By investigating DI in the sense of an overall inclusive school culture, the results of (Goddard et al., 2015) showed that DI-related school norms and teaching practices had significantly positive effects on students' academic achievement in mathematics and reading (Goddard et al., 2015). In a study of (Valiandes, 2015), teachers' implementation of DI was investigated by conducting observations, in the course of which the intensity of the use of DI was rated. The results showed a positive effect of differentiated teaching approaches on students' academic progress (Valiandes, 2015). However, it is noticeable in the context of studies investigating the effectiveness of DI that the predominant focus is placed on its effect on students' academic achievement rather than non-academic student outcomes (Smit and Humpert, 2012; Little et al., 2014; Steenbergen-Hu et al., 2016; Deunk et al., 2018; Smale-Jacobse et al., 2019).

In addition to exploring the effects of inclusion on students' achievement outcomes, supporting every students' emotional and social development can also be considered as key objectives of inclusive education. Students' socio-emotional development has been considered an important issue within policy debate (Zurbriggen et al., 2018), and thus seems important to explore the potential effect that DI can have on students' non-achievement outcomes (Pozas and Schneider, 2019). In this context, three important student outcome variables that have been extensively explored in research and literature are students' well-being, social inclusion and academic self-concept (Venetz et al., 2015; DeVries et al., 2018; Venetz et al., 2019). These three student outcome variables have been long investigated because of their relation to students' academic learning and performance as well as their general satisfaction and development (Gilman et al., 2014; Schwab et al., 2020). Additionally, assessing students' subjective well-being, social inclusion, and academic self-concept are variables that can reflect educational quality (Guillemot and Hessels, 2021). The results of a quantitative study by Alnahdi et al. (2021) indicate that students' perception of their teachers' use of DI strongly predicted students' perceived emotional and social inclusion as well as

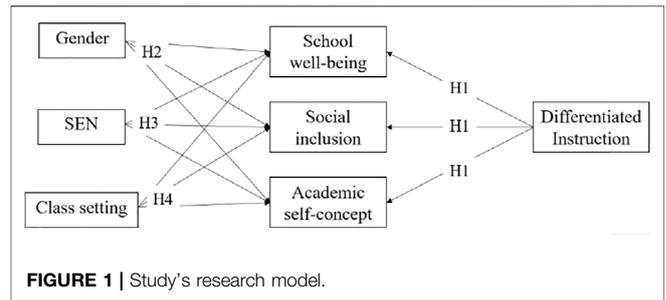
their academic self-concept. Such results highlight the relation between the implementation of DI and students' non-academic outcomes (Alnahdi et al., 2021). Roy et al. (2015) showed that teachers' implementation of DI buffered the negative Big-Fish-Little-Pond Effect (BFLPE) (i.e., the idea that high-achieving students feel motivated by their advantage over their lower-achieving peers, which can negatively affect low-achieving students' academic self-concept). As a possible explanation, the authors assume that DI can function as a motivator for all students, as the educational offers are prepared in a way that every student can be involved in learning situations rather than comparing their own performance to that of others (Roy et al., 2015). A more recent study by Kulakow (2020), which compared two learning environments, revealed that students following a competency-based DI learning approach reported higher levels of academic self-concept over students engaged with the traditional learning approach.

FURTHER PREDICTORS OF STUDENTS' WELL-BEING, SOCIAL INCLUSION AND ACADEMIC SELF-CONCEPT

Students' outcomes (in this case, students' well-being, social inclusion and academic self-concept) can be influenced not only by variables on teachers' level (teachers' use of DI, as discussed beforehand) but also those on students' level. One of the most investigated student-specific predictors in previous studies was students' gender. For school well-being, previous literature results showed a positive effect on females (Schneekloth and Anderesen, 2013; Walsen, 2013; Venetz et al., 2019). Similarly, based on the past research, girls felt higher levels of social inclusion compared to boys (Ato et al., 2014; Krull et al., 2018). For students' academic self-concept, however, it's the opposite: girls showed lower levels of academic self-concept than boys (Venetz et al., 2019).

Next to gender, having special education needs (SEN) was also discussed as a possible predictor of students' outcomes. Results showed that students with SEN are more likely to be socially excluded than students without SEN (Koster et al., 2010; Schwab, 2015; Avramidis et al., 2017; Avramidis et al., 2018). Quite clearly, students with SEN showed much lower levels of academic self-concept compared to their peers without SEN labels (Bear et al., 2002; Cambra and Silvestre, 2003; Zeleke, 2004). For school well-being, however, the results were more unclear. Some study outcomes indicated lower levels of school well-being for students with SEN (McCoy and Banks, 2012; Skrzypiec et al., 2016), while others did not investigate any group differences (Venetz et al., 2019; Zurbriggen et al., 2018).

In addition to students' level, context variables have been considered by previous studies, especially the school setting (e.g., special schools compared to regular schools). For instance, previous research identified that students with SEN who attend special schools have a more positive academic self-concept compared to students with SEN who attend regular schools (Bear et al., 2002; Marsh et al., 2006; Knickenberg et al., 2019). For social inclusion and school well-being,



Knickenberg et al. (2019) did not find any group differences between students with SEN attending special and those attending regular schools.

THE IMPORTANCE OF STUDENTS' PERSPECTIVES

In implementing an inclusive teaching practice, teachers plan and design learning situations to meet students' educational needs. Therefore, they can be conceived as recipients of teachers' pedagogical decisions and interventions. Against the background of this assumption, it seems inevitable that students' perspectives be taken into account while investigating teaching and learning processes as well as their effectiveness, as the effects are consequences of measures aimed at satisfying students' diverse educational needs (Montuoro and Lewis, 2015). By highlighting students' voices in the context of educational research, a distortion of the inclusive reality in classrooms can be prevented, as there is a risk of self-serving over-reporting strategies when it comes to the investigation of classroom phenomena by focusing of teacher samples (Wallace et al., 2016; Faddar et al., 2018; Göllner et al., 2018).

PURPOSE AND RESEARCH QUESTION

Most research that explores the effectiveness of DI has mainly focused on investigating its impact on students' achievement. Research which analyzes the impact of DI on students' non-achievement outcomes are relatively limited (Schwab and Alnahdi, 2020). As variables such as students' school well-being, social inclusion and academic self-concept are also central objectives of inclusive education and education in general (Schwab et al., 2020), it is necessary to address this research gap.

In this context, the aim of this study is to identify determinants of students' school well-being, social inclusion and academic self-concept based on their teachers' DI practice. With this background, the research question guiding this study is as follows:

Is teachers' DI practice positively associated with students' school well-being, social inclusion and academic self-concept?

Based on the existing research discussed in this paper, and as seen from Figure 1, it is hypothesized that students' perception of their teachers' use of DI will predict their perceived school well-

being, social inclusion and academic self-concept (Alnahdi et al., 2021; Kulakow, 2020; Roy et al., 2015). Furthermore, it is assumed that female participants perceive a higher level of school well-being and social inclusion but a lower academic self-concept when in comparison with their male participants (Schneekloth and Anderesen, 2013; Walsen, 2013; Venetz et al., 2019). In contrast, students with SEN perceive lower levels of school well-being, social inclusion and academic self-concept. Finally, it is expected that the class setting plays an important role on students' socioemotional variables. Thus, it is hypothesized that participants in inclusive classes perceive higher levels of socioemotional well-being and academic self-concept (Schwab et al., 2015a; Hascher, 2017).

METHODS

Sampling and Sample

The analyses of this study were conducted using data from the ATIS-SI study (Attitudes towards Inclusion of Students with Disabilities related to Social Inclusion; Schwab, 2015). The ATIS-SI study is a longitudinal study with three measurement points and the main objective was to explore the relationships between attitudes SEN and social inclusion in primary and secondary education. Informed consent was obtained from participants and their parents, and the research was approved by the Styrian Regional School Authority. Depending on the class, the time required for filling out the paper-and-pencil questionnaire took approximately 40–50 min. Members from the research team supported students with difficulties (especially those with SEN) in order to ensure that all students understood the instructions. The third series of measurements (on which this study is based) took place at the end of the eighth-school grade (May to June 2015) and which included within its instrumentation, scales that explore students' academic self-concept.

A total of 32 eight grade secondary school classes across three Austrian states (Styria, Lower Austria and Burgenland) were contacted by telephone and asked whether they would be willing to take part in the study. From the 32 secondary school classes contacted, only 23 accepted to participate in the study. The current sample consisted of 379 eight grade (age = 13–15 years) students (49% male, 51% female). Here, 46% of the students were educated in inclusive classes, whereas 54% attended regular classes. Out of this sample, 36 students ($n_M = 23$; $n_F = 13$) were diagnosed as having SEN.

In Austria, students with SEN need an official label by the local educational authority in order to be eligible for additional resources (Schwab et al., 2015b). Thus, class teachers were asked to list all children in their class that were officially labelled as having SEN. In the current study, no subgroups were distinguished because of the low number of students with SEN types other than learning disabilities (e.g., behavioral disorders). Furthermore, given that neither school achievement or intelligence was assessed within this study, it was not possible to differentiate between levels of severity of SEN. This means that SEN in this study mostly refers to SEN regarding learning

disabilities but also includes a small number of students with other disabilities.

Instruments

Students' School Well-Being and Social Inclusion

Students' school well-being and social inclusion were measured using two subscales from the FEES [Fragebogen zur Erhebung sozialer und emotionaler Schulerfahrungen/questionnaire for recording social and emotional school experiences] questionnaire by Rauer and Schuck (2003). The original scale of "school well-being" consists of 14 items based on a 4-point-Likert scale (1 = *not true at all* to 4 = *completely true*). However, for the current study, only 6 of the 14 items were used. Nonetheless, the reliability of the scale was high for the current sample ($\alpha = 0.91$). The original scale of "social inclusion" consists of 11 items based on a 4-point-Likert scale (1 = *not true at all* to 4 = *completely true*). Nonetheless, for the present study, only six items were used ($\alpha = 0.83$ for the current sample). Please refer to **Table 1** to find the list of the items of each of the subscales selected for this study. It is important to highlight that earlier research using the FEES subscales of school well-being and social inclusion have been found that the psychometric properties are suitable for students with and without special education needs in primary (e.g. Huber and Wilbert, 2012; Schwab et al., 2015c; Heyder et al., 2020) as well as secondary grades (Frankenberg et al., 2016).

Students' Academic Self-Concept

Students' academic self-concept was measuring using the general academic self-concept subscale from the SESSKO [Skalen zur Erfassung schulischen Selbstkonzepts/scales for recording the academic self-concept] questionnaire by Schöne, Dickhäuser, Spinath, and Stiensmeier-Pelster (2002). The subscale consists of five items based on a 5-point-Likert scale (e.g., "I am", 1 = *not intelligent* to 5 = *intelligent*) ($\alpha = 0.88$ for the current sample).

Students' Ratings of their Teachers' Use of DI

In order to measure students' ratings of their teachers' DI practice, the differentiated teaching scale by Gebhardt et al. (2014) (please refer to **Table 2**), which stems from previous work developed by Feyerer (1998), was utilized. The scale consists of seven items and is based on a 5-point-Likert scale (e.g., "Higher achieving students get more difficult exercises", 1 = *never* to 5 = *always*) ($\alpha = 0.76$ for the current sample).

Analyses

The nested structure of the data (students nested within classrooms) was considered by multilevel regression analyses (Level 2: classes, Level 1: individual student). As suggested by Ryu (2015), all metric variables at Level 1, such as students' ratings of their teachers' DI practice and students' school well-being, school inclusion and academic self-concept, were centered at the grand mean. Three different models were calculated for each outcome variable (school well-being, school inclusion and academic self-concept). For each of these three models, first, a model where no predictors were entered (model without any

TABLE 1 | FEES (Rauer and Schuck, 2003): items selected for the current study.

Item Nr	Original German item wording	English translation
Subscale: School well-being		
Item 1	Ich habe keine Lust in die Schule zu gehen	I do not feel like going to school
Item 2	Ich hasse die Schule	I hate school
Item 3	Ich fühle mich in der Schule wohl	I feel good in school
Item 4	Ich gehe gerne zur Schule	I like going to school
Item 5	Ich habe die Schule satt	I am sick of school
Item 6	Mir gefällt es in der Schule	I like school
Subscale: Social inclusion		
Item 1	Nur wenige Mitschüler können mich leiden	Just a few of my classmates like me
Item 2	Meine Mitschüler sind nett zu mir	My classmates are nice to me
Item 3	Ich komme mit den anderen Kindern in meiner Klasse gut aus	I get along well with the other children in my class
Item 4	Die anderen lachen mich häufig aus	The other children often laugh at me
Item 5	Ich darf beim Spielen auf dem Schulhof mitmachen	I play with my classmates in the schoolyard
Item 6	Ich habe wenige Freunde in meiner Klasse	I have a few friends in my class

TABLE 2 | English translation of the Differentiated Teaching Scale by Gebhardt et al. (2014).

Item Nr.	Original German item wording	English translation
Item 1	Schwächere Schüler bekommen leichtere Aufgaben	Low achieving students get easier tasks
Item 2	Stärkeren Schülern werden schwierigere Aufgaben gestellt	High achieving students get more difficult tasks
Item 3	Unsere Lehrer wenden für die schwächeren Schüler mehr Zeit auf	Our teachers spend more time on low achieving students
Item 4	Unsere Lehrer wissen genau über die Stärken und Schwächen jedes einzelnen Schülers Bescheid	Our teachers know exactly about the strengths and weaknesses of each student.
Item 5	Auch wenn jemand die Antwort nicht gleich weiß, lassen ihm die Lehrer genügend Zeit zum Antworten	Even if somebody does not know the answer immediately, the teachers give them enough time to answer
Item 6	Oft dürfen wir Schüler selbst bestimmen, was und wie wir lernen	We can often decide by ourselves what and how we learn
Item 7	Im Unterricht wird auf die Wünsche der Schüler eingegangen	In class, students' preferences are considered

TABLE 3 | Means, standard deviations, and correlations of all scales.

		M	SD	1	2	3	4	5	6
1	School well-being	2.87	0.80	-					
2	Social inclusion	3.49	0.52	0.36**	-				
3	Academic self-concept	3.67	0.77	0.35**	0.22**	-			
4	DI	3.01	0.73	0.19**	0.15**	15**	-		
5	Gender	-	-	0.23**	0.13	-0.08	-0.06	-	
6	SEN status	-	-	0.05	-0.08	-0.15**	0.00	-0.10	-
7	School setting (regular class VS. inclusive class)	-	-	0.01	-0.04	0.2	0.17**	-0.07	0.36**

*p < 0.05; **p < 0.01.

independent variables) was calculated to estimate the variance at Level 2. Following this, a model with predictors at the student level (gender, SEN, ratings of DI) and predictors at the class level (school setting) was calculated.

RESULTS

In relation to students' reports of their teachers use of DI, the scale mean for the whole sample was 3.01 (SD = 0.73). A t-test for dependent samples revealed that students' ratings for their teachers' use of DI did not significantly differ from the

theoretical mean of the scale (M = 3, as the scale ranges from 1 to 5). This indicates that teachers make use of DI in the teaching practice rather occasionally.

For students' social-emotional variables, t-tests for dependent samples indicated that students' ratings of their school well-being [$t(377) = 9.02, p < .001$], social inclusion [$t(377) = 36.85, p < .001$] and academic self-concept [$t(375) = 16.79, p < 0.001$] were significantly higher than the theoretical mean of the scale (M = 2.5 for well-being and social inclusion and M = 3 for academic self-concept). Such results imply that students experience higher school well-being, perceive higher values of social inclusion and have a greater academic self-concept.

TABLE 4 | Estimates of the multilevel regression analyses to predict attitudes towards school, social integration, and school concept (Model 2 with predictors).

	School well-being		Social inclusion		Academic self-concept	
	β	SE	β	SE	β	SE
Student gender (male vs. female)	0.30**	0.08	0.12*	0.05	-0.12	0.08
Students' SEN (no SEN vs. SEN)	0.24	0.14	-0.08	0.09	-0.41**	0.14
DI	0.26**	0.06	0.14**	0.03	0.18**	0.06
School setting (regular vs. inclusive class)	-0.14	0.14	-0.09	0.06	-0.02	0.08
Intra-group variance (variance at the student level)	0.517**	0.04	0.237**	0.02	0.551**	0.04
Inter-group variance (variance at the class level)	0.070*	0.03	0.002	0.01	-	-
Deviance	794.31		494.15		789.06	

* $p < 0.05$; ** $p < 0.01$.

Table 3 presents an overview of the means, standard deviations and the inter-correlations of all the variables. For dummy-coded variables, i.e., gender and school setting, point biserial correlation coefficients were calculated. However, for metric variables, Pearson correlation coefficients were calculated. Results show that students' school well-being and social inclusion is higher in girls than in boys. Furthermore, classrooms with more differentiated instruction differentiated instruction correlates positively with students' school well-being, social inclusion and global self-concept. Moreover, the correlation analysis indicates that students with SEN have significantly lower academic self-concepts. However, the school setting did not appear to be related to students' school well-being, social inclusion or to their academic self-concept.

For the subscale of "school well-being" (see **Table 4**), the model, without any predictor, showed that 13.5% of the variance (Wald $z = 2.44, p < 0.05$) is explained at the class level. In the following model with all predictors, students' gender ($\beta = 0.30, SE = 0.08, t(352.91) = 3.66, p < 0.01$) as well as ratings of teachers' use of DI ($\beta = 0.26, SE = 0.06, t(347.98) = 4.40, p < 0.01$) showed a significant influence on students' individual level and explained a variance of around 52%. The results indicated that being female and rating the instruction as more differentiated is related to greater school well-being. However, students' SEN status and school settings did not predict students' school well-being.

For of the subscale of "social inclusion," the first model without predictors showed that only 5.2% of the variance (Wald $z = 1.61, n.s.$) is explained at the class level. This indicated that there is no significant variance at the class level. When entering all the predictors into Model 2, the analyses revealed that students' gender ($\beta = 0.23, SE = 0.05, t(308.70) = 2.34, p < .05$) and ratings of DI [$\beta = 0.14, SE = 0.04, t(223.12) = 3.81, p < 0.01$] were significant predictors at Level 1 (see **Table 4**) and explained a variance of around 24%. In detail, being female and rating teachers' instruction as more differentiated appeared to be associated with more positive social inclusion among students in a classroom.

Finally, in relation to the subscale of "academic self-concept," the first model without any predictors did not explain any variance at all, indicating that there was no significant variance at the class level. The second model, introducing all the predictors, revealed that the predictors of students' SEN status [$\beta = -0.41, SE = 0.14, t(352) = -2.96, p < 0.01$] and ratings of DI [$\beta = 0.18, SE = 0.06, t(352) = 3.19, p < 0.01$] had a significant influence at students'

individual level and explained a variance of around 55%. Not having a SEN and rating the instruction as more differentiated seemed to be related to a higher academic self-concept (see **Table 4**). All other predictors were not significant.

DISCUSSION

Inclusive education aims to support every student's achievement outcome as well as non-achievement outcome (e.g., social-emotional outcome, social development) (European Agency for Special Needs and Inclusive Education, 2017; Zurbriggen et al., 2021). However, at present, empirical evidence supporting the impact of DI on students' non-achievement outcomes is scarce (Schwab et al., 2020). The present study has analyzed predictors of students' school well-being, social inclusion and academic self-concept by looking at students' individual characteristics (gender, SEN status, ratings of their teachers' DI practice) and classroom factors (school setting) in order to gain an in-depth understanding of the predictors of students' non-achievement outcomes.

As a result, seventh-grade students from Austria perceive that their teachers infrequently implement DI. Although there appears to be intercountry differences regarding teachers' DI implementation (van de Grift et al., 2017; Maulana et al., 2020), this result is consistent with previous international studies, which have indicated that, in general, teachers rarely differentiate their instruction (De Neve et al., 2015; Schleicher, 2016; Pozas and Schneider, 2019; van Geel et al., 2019). This result is not surprising given the fact that the literature has highlighted the practice of DI as a relatively demanding and challenging approach (Gaitas and Alves Martins, 2016; van Geel et al., 2019). Bearing in mind that DI has been conceptualized as a domain of teaching quality (Maulana et al., 2020) and that empirical evidence has revealed it to be a typical teaching behavior of highly effective teachers (van de Grift et al., 2017), it is important to focus on strategies to guide and coach teachers to develop and improve their DI practice.

In line with previous research, descriptive results further indicated that students reported relatively high ratings of school-wellbeing, social inclusion and academic self-concept (Alnahdi and Schwab, 2020; Schwab and Alnahdi, 2020; Zubriggen et al., 2021). However, high mean scores do not automatically imply that all students are reaching satisfying

levels in their socio-emotional well-being. In detail, within the present sample, a total of 12% of the students would be considered to be at risk. Therefore, students' social-emotional well-being should also be an important point of focus for at-risk students, and appropriate prevention and intervention strategies are necessary to be implemented.

The effects of student and classroom variables as determinants of students' school well-being, social inclusion and academic self-concept constitute the research goal of this specific study, as they were focused on less often in other studies. The results of the multilevel analyses showed that only the subscale of "school well-being" had a significant variance at the class level. Both literature and research have emphasized that school well-being is an outcome of inclusion (Schwab, 2015; Hascher, 2017). According to Hascher and Lobsang (2004), students' school well-being is strongly determined by the social relationships among students. Hence, the results emphasize the argument that both the individual and the contextual (classrooms) are decisive for the development and fostering of students' well-being (Rossetti, 2012; Garotte, 2016; Hascher, 2017). For the other two subscales, the results from the multilevel analyses lead to the conclusion that social inclusion and academic self-concept are determined by variables at the individual students' level. In particular, for students' academic self-concept, such a result seems to be in line with the outcome from (Roy et al., 2015) study. However, this result is very surprising, as effects, such as Effect (BFLPE; Marsh et al., 2008; Seaton et al., 2010) would rather suggest a strong influence of the context.

While focusing on the predictors at the individual level, variables that were noted to significantly contribute to predicting students' school well-being and social inclusion were gender and DI. In detail, the findings are in line with previous studies, which revealed that girls hold higher levels of school well-being (Schneekloth and Anderesen, 2013; Walsen, 2013) and more positive experiences of social inclusion (Ato et al., 2014; Krull et al., 2018). Surprisingly, students' SEN status did not have affect their school-wellbeing and social inclusion. Additionally, and interestingly, students' ratings of their teachers' DI implementation were found to be a significant predictor. A possible explanation for this result might be the fact that students feel more appreciated and included in the social, emotional and academic classroom setting when they perceive their teachers' ambition to provide adequate teaching and learning stimuli for them (Lindner et al., 2019). Hence, it can be assumed that teachers' didactic adaption of teaching and learning processes to the individual needs of students in a class directly affects their school-wellbeing, social inclusion and academic self-concept in a positive way. As a significant part of DI includes organizational aspects, such as using elaborated practices to group students (Vaughn et al., 2007a), more positive contact experiences between peers might result due to the implementation of this practice. Theoretically underpinned within the inter-group contact theory (Allport, 1954; Pettigrew and Tropp, 2000), it can be assumed that positive contact between peers leads to higher levels of social inclusion. Further, students' school well-being is strongly determined by social relationships among students (Hascher and Lobsang, 2004), which might

moderate the effect between school well-being and DI. A possible explanation may be that as DI seeks to match teaching to students' individual abilities (Roy et al., 2015), guided by their needs and interests (Nusser and Gehrler, 2020), and pertains to cooperative practices as well as the choice regarding whom to work in a group with (Juvonen et al., 2019; Zurbriggen et al., 2021), such a teaching approach could foster positive attitudes and social interaction and facilitate caring and supporting interactions among classmates.

With regard to academic self-concept, multilevel analyses revealed that, unsurprisingly, students' SEN status and their ratings on their ratings of their teachers' DI practice contributed significantly as predictors. Consistent with previous research, the findings from this study indicate that students with SEN have a lower academic self-concept compared to their classmates without SEN (Venetz et al., 2015; DeVries et al., 2018; Knickenberg et al., 2019; Alnahdi and Schwab, 2020). A practical need addressed with this finding might be the great importance of using an individual reference standard orientation while providing feedback to students with SEN in inclusive classes. According to the BFLPE, students are referring to their own perception of their achievement with the mean achievement of their peers. Certainly, having SEN usually indicates lower achievement compared to peers. Therefore, it is important for such students to also realize their individual improvement of competencies and not be solely compared with their peers. An important result is the fact that students' perceptions of their teachers' DI implementation significantly predict academic self-concept. A previous study by Kulakow (2020), which explored differentiated learning activities by means of competence-based learning, indicated that students following such an approach reported higher levels of academic self-concept. Thus, taken together, all these findings indicate that differentiated practices matching students' abilities are significant in decreasing peer comparisons and foster self-assessments of ability (Roy et al., 2015). However, in a study by Roy et al. (2015), this effect was revealed to be significant only for low-achieving students. Comparing the present results with the results of (Roy et al., 2015), it is not possible to state whether low-achieving students benefit from the practice of DI, mainly due to the fact that the data did not permit the attainment of such differentiated results. At the very least, it can be assumed that for students with SEN, providing DI may not be enough to reduce social comparison and offset the BFLPE. More longitudinal research is required in order to explore this notion in greater depth.

While interpreting the present results, one has to keep in mind that this study has several limitations. First, the present study is based solely on cross-sectional results. Consequently, causality of the results cannot be determined. Further studies with a longitudinal design are required to investigate the causal influences of DI on students' school-wellbeing, social inclusion and academic self-concept. Additionally, it is also recommended that the variable of students' performance be included as a control variable in such longitudinal studies. Following such a design, it would be possible to explore the casual relationships between teachers' DI practice and students' achievement and non-achievement outcomes. 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 is possible that students might incorrectly assess their teachers' differentiation practice, given their lack of didactical knowledge. In this context, Fauth et al., (2014) argued that different dimensions of instructional practices cannot be observed in the same way. However, based on the study results, Schwab and Alnahdi (2020) argued that solely using teachers' ratings or judgements as a substitution of students' own perceptions would be inappropriate. Thus, it is strongly suggested that future studies integrate all stakeholders' perspectives, i.e., the perspectives of students and teachers. Moreover, in order to gain more in-depth data, it would be prudent to use a combined research methodology, for example, quantitative data (e.g., questionnaires) and qualitative data (e.g., interviews, classroom observations). In particular, teacher interviews could shed light on how the teachers plan and design a differentiated lesson. This might provide deeper insights into teachers' purposes or intentions behind using particular DI practices. On the other hand, to obtain a broader picture of students' perceptions and how they are influenced by DI, research could use the experience sampling method and assess students' emotional experiences. A third limitation is the small sample size of students with SEN. This limited the opportunity to obtain differentiated results between students with different kinds of SEN.

CONCLUSION

Outcomes of inclusive schooling are not limited to students' academic achievement but are also relevant to their well-being at school, social inclusion and academic self-concept. Moreover, several researchers have emphasized that in order to understand students' needs, it is of utmost importance to listen to students' own perspectives. However, till now, studies that use students' own voices and those which empirically explore the link between DI and their school well-being, social inclusion and academic self-concept have been quite limited. The present study addressed such issues in the existing literature and provided evidence on the significant role that teachers' practice of DI can have on fostering students' socio-emotional outcomes. With this background, the findings from this study urge for more research to be conducted

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into the topic in order to secure a detailed depiction of how the practice of DI influences students' outcomes. This, in return, will serve as empirical evidence and solidify the effectiveness and usefulness of DI.

DATA AVAILABILITY STATEMENT

The datasets presented in this article are not readily available because the data contains information that could compromise research participant privacy and/or consent. Requests to access the datasets should be directed to Susanne Schwab.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by the Regional school authorities of Styria, Lower Austria, and Burgenland. Written informed consent to participate in this study was provided by the participants' legal guardian/next of kin.

AUTHOR CONTRIBUTIONS

The research concern as well as the interpretation and discussion were developed in a joint involvement of all the authors. MP focused on the development of ideas and was significantly involved in the data analysis and drafting of the results. VL dealt with the evaluation of the data and their interpretation and discussion. MP and VL together established a draft of the discussion sections. K-TL was responsible for the literature research, the consolidation of all ideas and the writing of the introduction and theoretical background. SS supported the research of literature and was responsible for data collection and development of the aim, focus and discussion section of the paper.

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