



Perceived Differentiation and Personalization Teaching Approaches in Inclusive Classrooms: Perspectives of Students and Teachers

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As indicated by the Warnock Report, even 40 years ago, the necessity of responding to different student abilities and needs in school and thus the importance of adequate adaptation of a regular curriculum regarding differentiation and personalization had already been described. Due to changes in policy and legislative frameworks, more and more students with special educational needs (SEN) attend regular education. However, placing the students with SEN within mainstream classrooms does not automatically lead to changes in teaching practices in these classrooms. In line with this, it would be interesting to know the way in which and to what extent students in inclusive classes perceive established inclusive practices, such as differentiation and personalization. Therefore, data from 47 inclusive classes from North Rhine-Westphalia (Germany) were collected. In total, 872 primary school students (grade 4; ages 9–11 years) were asked to rate how frequently their class teachers used inclusive instructional practices (personalization and differentiation) using the Inclusive Classroom Practices Scale (ITPS). In addition to students, teachers were also asked to rate their own teaching practices in general and then in addition for each student separately. As differentiated instruction and multifaceted teaching practices are considered to be measures for meeting the needs of children with different educational needs, results that show a high use of these approaches were expected. Descriptive results indicate a consistent homogeneous understanding of prevailing inclusive teaching practices, which could be characterized by existing, but not intensive implementation, of inclusive practices. Differences regarding students' gender, migrant background, or SEN were not found for the students' ratings of teachers' inclusive practices or the teachers' self-ratings group. Moreover, the teachers' student-specific ratings indicate that teachers did not strongly differentiate or personalize with a focus on students' characteristics. A small overlap between teachers' general

ratings of their own inclusive teaching practices and students' individual ratings was found. The results of the current study provide insights into actual inclusive teaching practices in German inclusive classrooms and make it possible to address the need for action and inclusive interventions.

Keywords: inclusive education, differentiation, personalization, students, teachers

INTRODUCTION

At least since the ratification of the United Nations Convention on the Rights of Persons with Disabilities (United Nations, 2007), inclusive education is a well-acknowledged concept within the scope of teaching and learning. Due to the trend of European countries toward the inclusive concept of including students with special educational needs (SEN) into regular schools and building inclusive classrooms, the number of diversity factors among students is increasing (Prast et al., 2018; Schwab et al., 2019). In addition to having a disability, individual educational needs can be traced back to different learning barriers (Schwab, 2018). The approach of gathering students with different needs in one classroom in order to provide a productive and diverse educational setting is not fully ensured by simply acknowledging the variety of student requirements. Coubergs et al. (2017) described diversity in education as an existing reality and therefore, teachers need to adapt their implemented teaching and learning practice to the specific needs of all of their students.

Differentiation and Personalization as Inclusive Strategies

According to the plurality of students' needs, there is more need for teachers to address the increasing heterogeneity and variety of different educational needs of children. The demand of meeting the challenges of diversity and plurality of the classroom composition seems inevitable. According to Coubergs et al. (2017), differentiated instruction and multifaceted teaching practice are seen as measures to address the needs of students with different educational needs. The approach of inclusive education is not a result of modern educational discussions. As indicated by the Warnock Report, the necessity of responding to different abilities and requirements of school children and thus the importance of an adequate adaption of the regular curriculum was already discussed 40 years ago: "The first question in planning the curriculum is frequently where to begin. One starting point is the detailed specification of each child's attributes and needs" (Warnock, 1978, p. 206). This means that in order to live up to the needs of every child within the inclusive classroom setting, it is important to focus on teaching principles, such as personalization and differentiation (Sharma et al., 2017; Schwab, 2019).

Differentiated and personalized instruction requires a lot of organization and engagement with the students' characteristics. Tomlinson (2000) states that this teaching approach, which aims for inclusion, has to be "carefully aligned with essential learning outcomes; informed by ongoing assessment; responds to student readiness, interest, and learning profile [...] uses

flexible grouping based on thoughtfully balanced individual, small-group, and whole-class work; [and] ensures that all students have 'respectful tasks' [...]" (Tomlinson, 2000, p. 295). Walther-Thomas and Brownell (2001, p. 176) described differentiated instruction as an approach within from which "teachers will create different levels of expectations for task completion within a lesson or unit." Lawrence-Brown (2004) highlighted the importance of differentiated instruction in inclusive classrooms as it provides "a simultaneous motivation and boost for all students to achieve individual goals" (Lawrence-Brown, 2004). Even more specific than differentiated instruction is individualized or personalized instruction, which can be described as "the effort on the part of a school to organize the learning environment to take into account individual student characteristics and need to make use of flexible instructional practices" (Keefe and Jenkins, 2002, p. 441). "[...] the quality of special education will ultimately depend on the headteachers and teachers concerned. Their commitment to curriculum development is crucial if special education is to be of high quality" (Warnock, 1978, p. 225).

More Than Assessing Attitudes Toward Inclusion

Considering the fact that the year 2018 already marks the 40th anniversary of the Warnock Report, the question exists as to whether educational professionals actually incorporate inclusion for all students in their teaching endeavors as inclusive education continues to grow. By considering recent studies from this perspective, it becomes apparent that many educational studies place emphasis on teachers' attitudes and perceptions toward inclusive education and differentiated instruction with a focus on normative scientific demands. The findings of Sharma and Sokal (2016) agree with findings from earlier research for example results of Jordan et al. (2009), who also found that teachers with a positive attitude toward students with disabilities and inclusive teaching tend to use more inclusive teaching practices than others. MacFarlane and Woolfson (2013) investigated teachers' attitudes and behavior in dealing with students with social, emotional, and behavioral difficulties and highlighted the central roles of in-service trainings and the promotion of an inclusive school ethos in order to motivate teachers to work within inclusive settings. Less attention has been paid to data acquisition concerning effective teaching approaches with regard to differentiated instruction and personalization within an inclusive classroom setting. Rausch et al. (2015) stated that teachers' behavior toward students might differ depending on certain characteristics, such as race or gender (Rausch et al., 2015). Within the scope of a case study, Nilholm and Alm

(2010) investigated inclusive teacher strategies in an inclusive classroom in Sweden. The authors referred to the study of Putney (2007), who also discussed conditions within inclusive classes and inclusive teaching approaches. The results of both articles are very much the same according to one theme: the participating teachers establish non-discussable basic rules, which must be followed by all students and teachers. These rules should lead to a pleasant learning environment and strengthen a beneficial class structure.

An Extension of Perspectives

Against the background of the Warnock Report, which pointed out the importance of student-centered curriculum planning and the situation the lack of research data on inclusive classroom practices, the exploration of actual inclusive educational measures of teachers in inclusive classrooms is considered a research gap. Within the scope of the recent study, the aim of this study was to investigate the way in which teachers react to the diversity of students and their individual educational needs in inclusive classrooms. Considering research that concentrates on teaching practices and principles, the sample often covers teachers in different stages (such as pre-service, in-service). The problem is that when teachers are asked about their competencies and teaching practices, there is a tendency to over-report engaging in certain behavior or attitudes in order to fit the desirable social or professional norm. This finding indicates that teachers often respond differently to specific questions for the purpose of satisfying socially desired answers. Therefore, the results distort educational and/or inclusive reality in classrooms (Faddar et al., 2018). In order to provide an extension of this perspective, it seems meaningful to include the group of insiders or recipients (students) who are strongly involved in inclusive classroom practice of teachers. In this context, it seems interesting to not only ask teachers about their teaching strategies but also question students about their perception of their teachers' consideration of the needs of individual students.

Students as Observers of Classroom Practices

As already mentioned, a number of studies addressing teaching practice and instruction focus on the perspectives of teachers and their self-assessment of their teaching. Others gain data through classroom observations conducted by external researchers. In this context, the question arises as to whether student perception surveys can be seen as reliable sources for insights in different classroom dimensions (den Brok et al., 2006; Montuoro and Lewis, 2015; Wallace et al., 2016). Wallace et al. (2016) describe students' perceptions of classroom interactions and structures as unique reports. They emphasized the fact that a sample of students evaluating the quality of teaching provides "indigenous expertise" (Wallace et al., 2016, p. 1859) in contrast to researchers who are trained and enter the research field under the influence of certain presumptions and research interests. Göllner et al. (2018) highlighted the existence of enormous differences in students' individual perceptions of the exact same instructional teaching approaches. Variances among students within the same class may be traced back to dyadic student-teacher

effects (Göllner et al., 2018). In order to exceed the demand of highlighting two different perspectives concerning instructional practices in inclusive classrooms, it seems necessary to specialize not only on the dimensions of teachers but also focus on students as active participants in classroom events. This approach enables results to be obtained within both samples considering overlaps and variances in perceptions on instructional approaches, not only separately within each group of participants, but also in relation to each other. Bourke and Mentis (2013) highlighted the importance of giving voice to students as it can lead to a meaningful process of inclusion development and improvement. However, studies investigating students' perceptions inclusive practices used by their teachers are lacking. Gebhardt et al. (2014) examined students' perceptions of inclusive teaching in mainstream classrooms in addition to inclusive classrooms and came to the conclusion that students in inclusive classes perceive more inclusive instructional features than students in regular classes. Furthermore, Schwab et al. (2019) developed a research instrument called an Inclusive Teaching Practice Scale, which asks about the perceptions of students regarding actual inclusive practices of their teachers. The samples consisted of 665 students, including students with and without SEN from 5th to 9th grade and 74 German, English, and mathematics teachers. Interestingly, their results demonstrated that students with and without SEN did not experience different levels of inclusive teaching practices (differentiation and personalization). Overall, the students perceived more inclusive practices concerning level of personalization rather than the level of differentiation. According to teachers, years of teaching experience were a significant predictor for the use of inclusive practices in secondary classes. In order to determine the effects of teacher support (emotional, instructional, communicative, feedback) on students, Tennant et al. (2015) used gender as predictor for students' perception of teachers' support. The results showed that teachers support low-achieving girls over other students by providing this group with more information and instruction.

Overlap of Students' and Teachers' Ratings

In general, students' perceptions about actual teaching practices used by their teachers and the teachers' self-ratings might differ. For instance, Kunter and Baumert (2006) measured the perspectives with respect to instructional features of both students and teachers. The authors acknowledged that both perspectives imply unconscious influences. Student ratings are often considered to be influenced by personal preferences, whereas teacher ratings are considered to be warped by "self-serving strategies" (Kunter and Baumert, 2006, p. 231). Personal preferences of students were determined regarding teachers' popularity. However, ratings by teachers that that were biased by self-serving strategies were not found. Overall, limited overlap regarding all items was investigated. The studies traced the marginal overlap back to "perspective-specific validities" in relation to external criteria and theoretical constructs (Kunter and Baumert, 2006, p. 243).

Schwab et al. (2019) investigated the student-teacher overlap in the context of their teachers' inclusive practices and found a marginal overlap. This finding might be explained by the

methodology as teachers rated their inclusive practice in general for all students, whereas students rated the way in which teachers address their individual needs and not the way in which teachers adapt their teaching practices in general for the whole class. Therefore, it might be meaningful to ask teachers about their student-specific teaching practices. This approach can be underpinned by previous work of Zee et al. (2016) who provided evidence that teachers do not perceive the same level of self-efficacy toward all of their students. The variance of teachers' self-efficacy among different students was even higher than the variance of general self-efficacy perceptions among different teachers.

Based on the literature review of the selected authors, no investigations of studies considering students' and teachers' ratings of inclusive teaching practices within a dyadic approach were done.

The Current Study

The current study is part of a research project funded by the Deutsche Forschungsgemeinschaft (DFG), a self-governing organization for science and research in Germany (founding number: 393078153). Two research gaps within this study were described. The first one was related to the psychometric properties of the research instrument. The instrument was first used within the scope of a sample of secondary grade students. It is unclear whether the ITPS, which was used in the current study, is adequate for 4th-grade students with respect to the psychometric qualities reliability and factorial structure. In addition to that, it needs to be investigated whether it is meaningful to examine teachers' self-ratings of their teaching practices in a student-specific way in addition to teachers' general ratings for the whole class. Additionally, the teachers' perception of inclusive teaching and thus, determinants of differentiation and personalization were investigated based on students' variables, such as gender, migration, and having SEN.

Against this background, several research questions were formulated:

- (1a) How do fourth grade students in inclusive classrooms perceive teaching practices in consideration of personalization and differentiation?
- (1b) Are there group differences based on students' characteristics (gender, migration, having SEN) in students' ratings of teachers' inclusive practices?
- (1c) Do teachers rate their inclusive practices different based on students' individual characteristics (gender, migration, having SEN)?
 - (2) How strong is the overlap of teachers' student-specific perceptions of inclusive teaching practices and students' perspectives?

MATERIALS AND METHODS

Participants and Settings

In the current study, students from 47 inclusive classes from urban and rural schools in North Rhine-Westphalia (a federal state in Germany) participated in this study. In total, data

from 872 fourth grade students who attend an inclusive class in primary school were assessed. In every class in which the study was conducted, there was at least one student who was officially diagnosed as SEN. The majority of the students (55.9%) diagnosed with SEN had learning disabilities. The participants were between 9 and 11 years old. Female students comprised 48.7% of the participants. German students comprised 92.1% of the participants. German was the primary language used by 79.3% of students within their families.

In order to present the teachers' sample, we divided sampling into two groups. On one hand, teachers were generally asked about their teaching methods regarding differentiation and personalization, and on the other hand, they rated the same items for each student with regard to inclusive schooling, indicating that if one class consisted of 23 students, the teacher had to fill out one overall questionnaire regarding his inclusive practices for all students and the student-specific questionnaire 23 times (one for every student). It is striking that the number of participating teachers varied when comparing the two groups. This finding was due to a smaller number of participating teachers in the student-specific survey. Twenty-three teachers (21 females and 2 males) out of the 47 participating classes filled out the general questionnaire. The small number of participating teachers can be attributed to the perceived additional work related to the study. Some teachers ensured that the students completed the questionnaires but felt that completing the questionnaires themselves was too much additional work and chose not to participate in the study.

Regarding the student-specific survey, the following should be noted: 20 of the 23 teachers who completed the general questionnaire also completed the student-specific questionnaire over the course of which student-specific data was collected from 341 students. The data from these 341 students contained the following information: of the initial cohort of 341 students, 170 were females, and 166 were males. Most of the subsample participants (89.4%) were born in Germany. Regarding SEN, 36 of students were identified as having SEN.

Research Instrument Inclusive Teaching Practices

In order to assess the extent of actual inclusive practices, the students' version of the ITPS (s-ITPS) was used (Schwab et al., 2019). This scale consists of 14 items (such as "during the lesson my teacher takes my academic achievement into account") and can be divided into two subscales ("personalization" and "differentiation"). The teacher version of the ITPS contained the same 14 items in a slightly modified version (such as "during the lesson, I take the academic achievement of my students into account.") All 14 items were rated on a 4-point Likert-scale (1 = Not at all true, 2 = Somewhat not true, 3 = Somewhat true, 4 = Certainly True). For the sample of secondary grade students, the internal consistency was above a Cronbach's alpha of 0.81. In addition, the internal consistency for the subscales was satisfactory, and the two-dimensional factorial structure was confirmed (Schwab et al., 2019).

In addition to the general teacher questionnaire, teachers were also asked to rate their teaching practices separately for

each student. For this purpose, we adapted the overall teacher version of the ITPS (Schwab et al., 2019) to the student-specific questionnaire. For the student-specific questionnaire, the items of the general questionnaire were changed into statements relating to instructional teaching behavior toward individual students, such as “During the lesson I take the academic achievement of this student into account.” These statements had to be rated individually by the teacher for each student of the class. Since not all of the 14 items seemed to be suitable for a student-specific assessment, six items were deleted in the first step (items 5–7 and 11–13) and in a second step, three more items (items 4, 10, and 14) were deleted, which yielded better psychometric qualities.

Ethics

Participation in the study was voluntary on both institutional and personal levels. All parents of the participating students gave their written consent with respect to the collection and processing of the data. The conditions of consent were strictly followed since in the event of withdrawal of consent, and the data concerned were immediately and irrevocably removed from the dataset. Participants (and parents) still had the opportunity to ask questions about the project at any time during the study. They could also withdraw their consent at any time. The University of Wuppertal Ethics Committee gave approval for the present study.

STATISTICAL ANALYSIS

Cronbach’s alpha scores were used to check to reliability. The factorial structure of the instrument was examined using confirmatory factor analyses. In order to answer the research questions, descriptive statistics and multi-level regression analyses were used. For the multi-level analyses, all metric variables were transferred into z-standardized scores.

Psychometric Properties of the Research Instrument

First, the Cronbach’s alpha reliability statistics of the two subscales and the total scale of students’ version of the ITPS were computed (see **Table 1**). Alpha values for the total sample ranged from 0.77 to 0.86 and therefore, indicated that the scale and the two subscales provide internal consistency (George and Mallery, 2003). However, for students with SEN the internal consistency was low (alpha = 0.53–0.70). For the general teachers’ version based on ITPS scale, the overall alpha was 0.865. The only alpha that was only at an acceptable level was the subscale personalization, which was around 0.69. In addition, the student-specific version ITPS scale showed good reliability with alpha = 0.88. Finally, the reliability alpha for the short version (ITPS-S) for students’ ratings (with the same five items as the student-specific teacher version) was 0.75.

Next, confirmatory factor analyses (CFA) were conducted in order to examine the construct validity. **Table 2** shows the fit indices for the hypothesized two-factor model for the students’ ratings. The chi-squared (χ^2) statistics are reported in the table,

TABLE 1 | Reliability statistics (Cronbach’s alpha).

	Items	Alpha	N
Students ITPS	14	0.860 (0.697 ^a)	807
Students ITPS DIFF	7	0.753 (0.527 ^a)	807
Students ITPS PER	7	0.773 (0.642 ^a)	807
Teachers ITPS	14	0.865	23
Teachers ITPS DIFF	7	0.805	23
Teachers ITPS PER	7	0.687	23
Teachers ITPS student-specific	5	0.883	319

^aonly students with SEN.

TABLE 2 | Fit indices of the CFA for the three scales.

Scale	SBS- χ^2	P	df	χ^2/df	RMSEA	CFI	GFI
ITPS	135.759	0.00	75	1.81	0.032	0.977	0.976
ITPS student-specific	5.186	0.269	4	1.29	0.031	0.994	0.976
ITPS short version	5.671	0.340	5	1.13	0.021	0.998	0.993

Bold, indicator for good fit.

but the results are not discussed because the test is sensitive to a large sample size (Byrne, 2010). Acceptable fit indices were found with the comparative fit index (CFI) of 0.977 as it >0.95 (Hu and Bentler, 1999; Schermelleh-Engel et al., 2003), and a root mean square error of approximation (RMSEA) of 0.032 was within the acceptable range (Hu and Bentler, 1999). In addition, another good fit indicator was χ^2 to degree of freedom ratio with a value <3 (1.81) (Kline, 1994) and the goodness of fit index (GFI) of 0.976 (Schermelleh-Engel et al., 2003). In sum, fit indices indicated that the observed data from students fit the two-factor model that was proposed by Schwab et al. (2019).

Third, CFA analysis for the teachers’ student-specific ratings scale (ITPS) showed good fit indices with CFI = 0.994, RMSEA = 0.021, and χ^2 to the degree of freedom ratio was 1.29. Fourth, a short version of the ITPS short version with five items to match the five items on the teachers’ scale ITPS, was examined via CFA analysis. The fit indices was also good for this short scale (s-ITPS) version with CFI = 0.998, RMSEA = 0.031, and an χ^2 to the degree of freedom ratio of 1.13.

RESULTS

Students’ Rating of Inclusive Classroom Practices

In order to investigate students’ perceptions of their teachers’ use of inclusive teaching approaches and teacher ratings considering personalization and differentiation, mean and standard deviation scores ($M \pm SD$) were calculated (see **Table 3**).

An initial objective of the project was to identify the way in which fourth grade students in inclusive classrooms perceive

TABLE 3 | Descriptive statistics.

Item	Sample	N	Mean score	Standard deviation
Consideration of performance of student	Student	791	3.25	0.864
	Teacher general	23	3.35	0.487
	Teacher student-specific	341	3.26	0.463
Consideration of feelings of student	Student	790	3.18	0.973
	Teacher general	23	3.57	0.507
	Teacher student-specific	340	3.39	0.507
Consideration of interest of student	Student	785	2.98	1.00
	Teacher general	22	3.18	0.395
	Teacher student-specific	323	3.17	0.433
Clear explanation of rules	Student	785	3.62	0.696
	Teacher general	23	3.78	0.422
	Teacher student-specific	341	3.67	0.471
Different options to deal with learning content	Student	782	3.20	1.75
	Teacher general	22	3.23	0.612
	Teacher student-specific			
Use of different forms of evaluation	Student	744	3.26	0.898
	Teacher general	22	3.18	0.501
	Teacher student-specific			
Variation of grouping strategies	Student	785	3.32	0.836
	Teacher general	23	3.43	0.662
	Teacher student-specific			
Switch between different learning activities to support different types of learning	Student	764	3.21	0.926
	Teacher general	22	3.36	0.581
	Teacher student-specific	341	3.30	0.497
Provision of learning environment, that encourages child to deal with topics	Student	780	3.24	0.862
	Teacher general	23	3.39	0.499
	Teacher student-specific	340	3.37	0.508
Encouragement of student to take risks and make mistakes in order to increase learning through trying	Student	776	3.26	0.934
	Teacher general	23	3.57	0.507
	Teacher student-specific	341	3.57	0.507
Variation of learning format	Student	758	3.35	0.857
	Teacher general	23	3.52	0.511
	Teacher student-specific			
Use of different techniques of presentation	Student	760	3.16	0.935
	Teacher general	21	2.62	0.921
	Teacher student-specific			
Collaboration with colleagues during class	Student	770	3.07	0.996
	Teacher general	23	3.48	0.730
	Teacher student-specific			
Individual feedback	Student	756	3.09	0.979
	Teacher general	23	3.48	0.665
	Teacher student-specific	341	3.55	0.509

teaching practices after considering inclusive practices. The mean scores showed that with regard to almost all items, the students' rating is to be placed in the range of either partial or total agreement. Only for the item "The teacher takes my interests into account," were the ratings of students between partial and total agreement with a rating tendency of 3 on the four-point Likert-scale. This value indicates an evaluation of a specific item with "Somewhat true" (2.98 ± 1.00). Regarding most items, the

teachers' rating trends within the general questionnaire were also between 3 and 4 ("Somewhat and Certainly true," respectively). Only the evaluation of the item "During the lesson, I use different presentation techniques" was rated with a mean score of 2.62 ± 0.921 , which indicates partial agreement on average. The teachers' answers on the student-specific questionnaire yielded similar results. Without exception, the evaluations of all items was between the values of 3 and 4.

TABLE 4 | Estimates of the multi-level regression model analyses to predict students' rating (the second model).

Dependent variable	Predictor	Estimate	Std. error
ITPS (students)	Gender	-0.36**	0.10
	SEN	-0.04	0.16
	Mother tongue of child: German	-0.06	0.13
	Deviance	796.5	
	Student-specific- variance	0.705**	0.06
	Variance on class level	0.281**	0.11

** $p < 0.01$.

Prediction of Students' Rating of Inclusive Classroom Practices

A multi-level regression model analysis was used for examining how much of the variance could be explained on student and class levels regarding students' ratings. First, a model with no predictors was calculated. This model indicated that 27.3% of the variance is on class-level (student-specific variance = 0.737, variance on class level = 0.273, deviance = 808.88, Wald-Z = 2.608; $p < 0.01$). In the second model, predictors were added (student-specific variance = 0.705, variance on class level = 0.281, deviance = 796.50, Wald-Z = 2.615; $p < 0.01$). There was a significant increase in fit in comparison with the model with no predictors at $p < 0.01$ by calculating the differences in deviance (12.8 with $df = 3$) between the two models (Heck et al., 2013). Regarding the variance that was explained by predictors in the second model, gender was the only significant predictor [$\beta = -0.36$; $p < 0.01$, $t_{(290,87)} = -3.55$, standard error (SE) = 0.10]. Girls perceived a higher level of inclusive teaching practices compared to boys. The other two predictors, SEN [$\beta = -0.04$, $p = 0.78$, $t_{(292,22)} = -0.28$, SE = 0.16] and migrant background/mother tongue [$\beta = -0.06$, $p = 0.63$, $t_{(303,843)} = -0.48$, SE = 0.13] in the model (see Table 4), showed no significant differences in contribution to the explanation of the variance in students' rating.

Teachers Student-Specific Ratings of Their Inclusive Teaching Practices

A multi-level regression model analysis was used to examine how much of the variance could be explained at student and class levels considering teachers' student-specific ratings. First, a model with no predictors were performed. This model shows that 79% of the variances were on the class level (student-specific variance = 0.208, variance on class-level = 0.792, deviance = 444.55, Wald-Z = 3.103; $p < 0.01$). In the second model (student-specific-variance = 0.183, variance on class-level = 0.341, deviance = 430.68, Wald-Z = 3.04; $p < 0.01$), one predictor was added, the ITPS (teachers' general ratings). There was a significant increase in fit in comparison with the model with no predictors at $p < 0.01$ for the differences in deviance (13.87 with $df = 1$) between the two models. Teachers' general ratings showed

TABLE 5 | Estimates of the multi-level regression model analyses to predict teachers' student-specific ratings (the third model).

Predictor	Estimate	Std. error
Gender (student)	-0.078	0.056
SEN (student)	0.126	0.087
Mother tongue of child (student)	0.100	0.072
ITPS (teacher)	0.607**	0.153
Years of experience (teacher)	-0.214	0.140
Number of students in class	0.074	0.154
Number of students with SEN	0.075	0.156
Number of students with migrant background	0.052	0.156
Deviance	392.501	
Student-specific-variance	0.196**	0.02
Variance on class level	0.299**	0.10

** $p < 0.01$.

significant impact on predicting teachers' student-specific ratings ($\beta = 0.618$; $p < 0.01$, $t_{(19,649)} = 4.483$, SE = 0.13).

In the third model, eight predictors were entered and included three of the student-related variables (gender, migrant background, SEN), general ratings of ITPS by the teachers, two variables relating to teachers (years of experience, gender, ITPS rating), and three variables addressing classroom composition in general (number of students in class, number of students with SEN, number of students with migrant background) (see Table 5).

This model (student-specific-variance = 0.196, variance at the class level = 0.299, deviance = 392.49, Wald-Z = 2.79; $p < 0.01$) showed a significant increase in fit in comparison with the second model with one predictors at $p < 0.01$ for the differences in deviance (38.19 with $df = 8$) between the two models. However, not one of the additional predictors in this model was significant in comparison with the second model. In both models, teachers' general ratings were a significant predictor.

Overlap of Students' and Teachers' Perspectives

In the fourth model, students' ratings on the short version of the questionnaire (s-ITPS) was added as a new predictor in addition to the eight already described predictors used in the previous model to examine whether students ratings would predict teachers' specific ratings for the same student (student-specific variance = 0.195, variance at the class level = 0.299, deviance = 390.93, Wald-Z = 2.79; $p < 0.01$). This fourth model showed no significant increase in fit in comparison with the third model at $p < 0.01$ for the differences in deviance (1.55 with $df = 1$). In summary, students' ratings did not explain significant variances in teacher specific ratings.

DISCUSSION

The previous literature review showed that hardly any research projects address actual inclusive teaching in schools using

different perspectives, such perceptions based on the views of both teachers and students. Moreover, they focus on attitudes toward inclusion of different people (such as teachers, students, parents). The purpose of the current study was to determine students' and teachers' perception of teachers' use of inclusive teaching practices with a special focus on differentiation and personalization. Following earlier research, the student version of the ITPS (Schwab et al., 2019) was used in a primary school sample and in addition, the teacher version was adopted for the assessment of student-specific use of differentiation and personalization in teaching practices.

The analysis of this scales' psychometric properties from the student version of the ITPS showed that the psychometric quality criteria for reliability and factorial validity were satisfactory. Compared to Schwab et al. (2019), who used the students' version of ITPS for 5th and older grade students, similar reliability scores were found. However, the reliability of the subscales for students with SEN was too low. Since the sample of students with SEN was limited in the present study, no further analyses were possible. A necessary next step would be to ensure that the items measure the same concept for students with and without SEN. Therefore, it seems necessary to examine possible measurement invariance for students with and without SEN, especially because of the limited reading comprehension abilities of students with SEN; the same items might be understood differently by different students (Schwab and Helm, 2015). According to the psychometric qualities of the instrument, the suggested two-dimensional data structure was confirmed with the CFA for 4th graders in line with the results of Hoffmann (2019), who showed that the factor structure for the sample of Schwab et al. (2019) can be confirmed using CFA. However, measurement invariance between primary school students and secondary school students also needs to be evaluated in the future.

Also, with regard to the student-specific teacher version of the ITPS, the reliability scores were high. However, three items had been deleted in order to increase the psychometric qualities. Against this background, the question arises whether the rationale of the deletion of nine items (six items when adapting the items to address individual students and not all students in general and three in the preliminary analysis) could have been problematic. As the goal was to compare students' ratings with student-specific and general ratings of teachers, it seems difficult to argue that the dimensionality of differentiation and personalization is the same when depending on five items on one scale instead of the initial 14 items (divided into two scales). In line with this, the possibility of slightly different results according to the limited 5-item version for student-specific ratings compared to the general teacher version with 14 items should be taken into account.

In addition, future research should address the question as to whether the general teacher version meets the required psychometric quality. Since the sample of teachers in this study was limited, there was no possibility to check the factor structure of this version.

The analysis of the mean scores showed that within all three versions (student, teacher general, and teacher student-specific versions) the same item was rated highest, which indicates that

rules are explained clearly during the lesson and belong to the category differentiation. It may be worth mentioning that this item does not directly refer to an aspect of differentiation but rather implies disciplinary measures during the lesson. This result might indicate that teachers put a lot of work into classroom management and might have occurred because the establishment of basic rules for all is seen as a starting point for an inclusive classroom environment and further inclusive practices. Nilholm and Alm (2010) in addition to Putney (2007) offered an explanation for the importance of rules by stating that the implementation of clear rules is beneficial for inclusive practices. Referring to the literature of teacher attitudes toward inclusion, studies provide insights into the struggles of teachers with deviant classroom behavior within inclusive educational settings. Therefore, the implementation of clear rules may be necessary to make learning processes possible (MacFarlane and Woolfson, 2013).

Focusing on students, general teacher, and teachers' student-specific ratings, nearly all items were rated between "Somewhat true" and "Certainly true." These results imply that there is a relatively high level of inclusive practices. However, inclusive education implementation in practice is not yet guaranteed. According to the present results, the prevailing inclusive teaching practices can be characterized as an existing approach in education but have not been intensively put into practice. This result corresponds with an outcome within the study of Göllner et al. (2018), who observed variances among students' perceptions when considering the same set of their teachers' practices.

Considering the research question concerning the dependency of students' perceptions on students' personal variables, a multi-level regression model analysis showed that intra-group aspects explained 70.5% of the variance within students' rating. The high amount of student-specific variance is in line with the results of the study of Schwab et al. (2019). However, it is interesting that students from the same classes experience a rather small overlap in the inclusive practices used by their teachers. On one hand, the results perhaps reflect individual adaption of teaching practices by each teacher for each student in his/her class. On the other hand, it might just indicate that students experience similar teacher behavior differently. However, neither a diagnosis of SEN nor the migrant background of students provide a significant prediction of inclusive practices used by their teachers. Schwab et al. (2019) explained the lack of group differences between students with and without SEN by the method (student ratings). They assumed that students with SEN are more likely to have a variety of special needs in comparison to students without SEN; therefore, they have a much higher requirement for inclusive teaching practices. Even if teachers address these students more individually in their teaching practices according to different needs, the ratings were still similar. The only students' characteristic that showed a marginal effect was the students' gender. Compared to boys, girls experience more teaching practices that are inclusive in the sense of differentiation and personalization. This finding is consistent with that of Schwab et al. (2018) who showed that girls had a more positive perception of inclusive education in terms of teacher support and care.

It is encouraging to compare this finding with the results by Tennant et al. (2015), who found that teachers provided more information and instructional input for low-achieving girls than for their other students. Against the background of the finding in which a small amount of variance in the student ratings can be explained through the chosen personal variables (gender, migrant background, SEN), the question arises as to which variables have not been considered yet since the biggest part of variances still remain unexplained.

After considering the results of the multilevel-analyses to predict teachers' inclusive practices, it appears that the outcomes of this study showed no differences for students with and without SEN or other groups (such as female or male students or students with and without migrant backgrounds). Contrary to the students' ratings, teachers did not rate their student-specific teaching strategies differently for male and female students. This might lead to the conclusion that teachers in inclusive classes realized that inclusive teaching approaches should focus on all students, not only students with SEN, and therefore, adapt their teaching practices for every student in their class. Along this line of thinking, The Warnock Report (Warnock, 1978) already states that it is the task of teachers in inclusive classes to recognize and consider the needs of all students and adapt their teaching practices accordingly. In addition, recent studies state that teachers should focus on inclusive teaching approaches in order to support all students, not only students with SEN. Teachers need to make sure that inclusive practices are stimulating for all students.

Next to variables at the student level, the characteristics of the teachers have been investigated as possible predictors for inclusive practices used by teachers. The results indicate that neither the years of teaching experience nor the number of students or the number of students with SEN/migrant background predicted the teaching strategies used by teachers. The only variable that played a significant role according to the variances was the global rating of the teaching practices used by each teacher at an individual level. This indicated that teachers rather use or do not use inclusive practices in general and that the choice of these practices is not affected by individual students.

Technically, teachers can use the ITPS in a student-specific way. However, as it takes more time to fill out the questionnaire for every student separately than rating the items one time for the whole class, it needs to be ensured that the student-specific use of the scale is meaningful for assessing teachers' actual inclusive teaching practices. It has been shown that the additional student-specific ratings of teachers could provide further results regarding previous research. In this context, the fourth research question addresses the meaningfulness of the newly developed instrument. Does it contribute to additional results in terms of research on actual inclusive education compared to simply assessing general inclusive teaching practices? Results of multilevel-analyses without predictors indicate that there is a high level of variance on teachers' inclusive teaching practices on the teacher level. The variance at the student level was much smaller. This distribution of variance is contrary to results according to teachers' self-efficacy in which teachers rated their student-specific self-efficacy relatively different for each student (see

Zee et al., 2016). However, whether teachers use or do not use inclusive teaching practices did not seem to pertain to students' characteristics. Therefore, it can be assumed that teachers adapt their inclusive teaching to the needs of all individual students and not to specific groups of students. This was further supported by the fact that being a student with SEN or migrant background in addition to specific gender did not predict ratings of inclusive practices use by the teachers. Moreover, years of teaching experience did not predict ratings of their student-specific inclusive teaching practices used by the teachers. Only the general rating of inclusive teaching practices appeared to predict students-specific rating of their selected teaching approaches used by their teachers. Also, other classroom factors, such as the number of students in class or the number of students with SEN or migrant backgrounds, were not related to student-specific rating tendencies by teachers.

During the course of the investigation of the overlap between teachers' student-specific ratings and students' ratings, students' ratings could not explain any significant variance within the teachers' student-specific evaluations. This means that the results of both sample ratings can be regarded as independent from each other. This needs to be highlighted as both students and teachers rated exactly the same items referring to inclusive practices. When considering the fact that students and teachers rated the same instructional approaches, a high interrater overlap was expected. In the light of the missing interrater-agreement, the questions arose as to whether students did not perceive their teachers' ambition to implement differentiated and personalized instruction or if teachers did not rate their inclusive teaching practices properly according to their actual instructional approaches. Kunter and Baumert (2006) named perspective-specific validities as reason for marginal overlap between student and teacher ratings. Previous experience of both sample groups, external criteria, and personal characteristics that unconsciously resonate with the perception of the same set of inclusive teaching practices can contribute to low rating consistency.

In general, all three scales allowed an economic, concise, and rapid impression of inclusive teaching practices at different school levels. Against this background, the importance of considering all perspectives should once again be emphasized. However, with regard to variance, the question remains as what is the way in which to explain it and which variables (student-specific or class level) need to be investigated. In this context, we have concluded that we have not found the appropriate instrument for presenting predictors for the implementation of inclusive teaching practices within the sample ratings yet. In this context, a further approach with additional variables could be meaningful. With regard to personal and material resources, possible predictors could be examined. What resources are available for schools and in particular for teachers of a class? Can existing resources be used effectively and flexibly as needed? It might be beneficial to explain shares of variance with the help of such predictors. Another way to clarify variance and check the seemingly non-existent student-specific differentiation and personalization would be to include another perspective in the research project, such as external observers. Given the fact that we cannot definitely state whether the rating tendencies of

students reflect the actual teaching practices of their teachers or should be seen as subjective interpretation of individuals who are influenced by diverse contexts and circumstances in different ways and to different degrees, the need for additional methods such as observations becomes clearer.

CONCLUSION

The present study was designed to examine actual inclusive teaching practices from students' and teachers' perspectives in primary schools. Because this study is one of the few research projects that takes three perspectives (students' ratings, teachers' overall rating of their inclusive practices, and teachers' student-specific ratings) into account, the present study adds important information to the present literature. Forty years after the Warnock report highlighted the necessity of inclusive teaching practices, the status quo of the two key concepts differentiation and personalization was examined within this study. This report already postulated the need for personalization and differentiation within education for the benefit of students after considering their needs. Considering descriptive data of the present study, it seems that inclusive practices are perceived as existing practices within inclusive classes in German primary schools. However, we still cannot take approaches, such as differentiation and personalization, for granted. The outcome describing no significant differences within the students' ratings as well as within the teachers' student-specific ratings regarding students' variables (such as having SEN or having migrant background) raises questions about what best practice scenarios should be included in inclusive teaching practices. Does the non-existence of group differences indicate that teachers are really aware of the fact that inclusive education in the traditional sense of the approach focuses on the individual needs of all students and has nothing to do with putting a specific student because of a single characteristic (such as having a disability) in the spotlight? Alternatively, do the results reflect the opposite, indicating that teachers treat everyone rather similarly and do not take individual needs into account? The outcomes of the

study indicate that inclusive teaching practices are a complex issue and cannot simply be explained by a single student or teacher variable. Future research might look more extensively at the reasons why inclusive practices are somehow used more in one class than another. Furthermore, the results of this study indicate the necessity of using more than one method to assess inclusive teaching practices since the integration of different methods might lead to different conclusions. Including more methods, such as observations or interviews, might yield deeper insight into what is really happening in inclusive classes.

In spite of the open questions and the need for further research, the ITPS in this context is considered to be an instrument that provides the first insight into selected inclusive teaching practices, which are in this case differentiated, and personalized teaching approaches.

ETHICS STATEMENT

The participation in the study was voluntary on both an institutional and a personal level. All parents of the participants involved have given their consent to the collection and processing of the data. Participants (and parents) have the opportunity to ask questions about the project at any time. They can also withdraw their consent at any time. The ethic committee of the University of Wuppertal gave the ethical approval for the present study.

AUTHOR CONTRIBUTIONS

Together with the involvement of all authors, the research concern, the research questions and the interpretation and discussion were developed. K-TL was responsible for the literature research, the consolidation of all ideas and the writing of the discussion and the conclusion. GA dealt with the evaluation of the data and their interpretation and discussion. SW was responsible for data collection and significantly involved in the development of the aim, focus and discussion section of the paper. SS supported the research of literature, the development of ideas and the drafting of the results and discussion sections.

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