SN Soc Sci (2023) 3:13
https://doi.org/10.1007/s43545-022-00590-7

ORIGINAL PAPER

A quantitative study of teachers' beliefs and practices regarding fair classroom differentiation

Marijke van Vijfeijken[1] · Tamara van Schilt-Mol[1] · Ron H. J. Scholte[2] · Eddie Denessen[2,3]

Received: 20 October 2021 / Accepted: 7 December 2022 / Published online: 9 January 2023

Abstract

Teachers must make choices about distributing resources and how to differentiate in the classroom. These choices are morally significant because they affect pupils' learning opportunities. This article reports the findings of an exploratory study of primary school teachers' differentiation beliefs and practices, which are assessed using the principles of distributive justice (equity, equality and need). A survey was completed by 294 primary school teachers. Latent profile analysis (LPA), a person-centered approach, was employed to explore the typology of teachers' distributive justice preferences based on their differentiation beliefs. In addition, Wald chi-square analyses were conducted to identify the differences among the profiles in terms of the application of different differentiation practices. Using LPA, we distinguished four different teacher profiles regarding their beliefs about the distribution of educational resources, such as attention and support, and educational outcomes via classroom differentiation. Most teachers predominantly supported the principle of equity alongside the principle of equality in terms of equal resources to all pupils. However, teachers' beliefs regarding differentiation had weak correlations with their differentiation practices, thus indicating that the differentiation practices used did not reflect teachers' beliefs. We suggest that teachers should use the principles of distributive justice to reflect on ethical differentiation dilemmas.

Keywords Distributive justice · Meritocracy · Education · Classroom differentiation · Learning opportunities

✉ Marijke van Vijfeijken
marijke.vanvijfeijken@han.nl

Extended author information available on the last page of the article

Introduction

A great deal of public debate regarding schooling has focused on the distribution of educational resources as a factor contributing to educational outcomes for all pupils, particularly for those who come from disadvantaged backgrounds (Mijs 2016; Resh and Sabbagh 2016; Brighouse et al. 2018). There are various types of educational resources, such as the money spent on each pupil, the ways in which teachers treat or teach their pupils and the ways in which they evaluate pupils' performance (Sabbagh et al. 2006). Although government policies determine the manner in which educational resources such as per-pupil funding are distributed across schools, it is ultimately classroom teachers who must make decisions regarding the distribution of resources (such as the attention and support that are required to help and respond to pupils) among pupils in the classroom (Brighouse et al. 2018). Educational outcomes, such as knowledge and skills can be seen as the products of teaching. These educational outcomes are valuable because they enable individuals to flourish, to reach their potential and to contribute to the growth of others (Brighouse et al. 2018) as well as because they serve as the credentials that are required for admission to further education and the labor market (Mijs 2016).

A teacher in the classroom must choose what he or she perceives to be a fair distribution of educational resources in terms of teaching practices or outcomes. This choice appeals to teachers' ethical values. According to social justice research, the principles of distributive justice can be identified as key ethical values that can help teachers make fair decisions (Espinoza 2007; Resh and Sabbagh 2016). Following these principles, teachers focus on one or more values related to distributive justice: equity, equality in terms of equal resources, equality in terms of equal output, and need (Deutsch 1975; Wright and Boese 2015; Resh and Sabbagh 2016; Cropanzano and Molina 2015). Briefly, the principle of *equity* calls for an unequal distribution of resources in proportion to the recipients' relative merit, such as effort, contribution, ability and outcomes (Wright and Boese 2015). The principle of *equality* in terms of *equal resources* is aimed at an equal distribution of educational resources. The principle of equality in terms of *equal output* focuses on equalizing the output instead of equalizing the input (Resh and Sabbagh 2016). Finally, the principle of *need* calls for resources to be assigned to the persons or groups who need the most help. As pupils from disadvantaged families tend to require the most help from the teacher, based on this principle, they are entitled to receive larger portions of the available educational resources to obtain an equal opportunity to learn (Kellough 2006).

More research regarding the actual patterns of these justice-related principles that emerge in educational settings is necessary because of the impact of these principles on the educational outcomes attained by different social groups (Resh and Sabbagh 2016). To date, little systematic attention has been given to the task of examining teachers' beliefs regarding fair classroom differentiation in relation to their differentiation practices. Previous research has shown that personal beliefs guide teachers' pedagogical choices and actions (Pajares 1992; Cross

2009). Therefore, we aim to obtain additional insights into the practices that teachers consider to be fair regarding the distribution of educational resources via classroom differentiation. In particular, in this study, we focus on the basic subjects of mathematics and language in primary schools. In the current study, we investigate the different patterns of distributive justice beliefs exhibited by teachers and relate these beliefs to their differentiation practices. By so doing, we attempt to contribute to the contemporary discourse concerning social justice in schools and the promotion of equal educational opportunities as an educational policy objective. Before describing the study in further detail, we elaborate on three main concepts used in this study: differentiation practices, principles of distributive justice and perspectives on differentiation.

Differentiation practices: organizing pupils for instruction

Differentiated instruction refers to situations in which teachers proactively modify their distribution of educational resources. Through the use of differentiation, teachers adjust their curricula, teaching methods, materials and learning activities to address the diverse needs of pupils with the aim of maximizing the learning opportunities of each pupil in the classroom (Tomlinson 2014). To practice differentiation, teachers must make pedagogical choices in the classroom. These pedagogical choices regarding the organization of differentiated instruction can lead to different grouping practices, such as homogenous grouping based on ability, heterogeneous grouping based on ability, or offering additional instruction to certain pupils (Godor 2021; Taylor et al. 2022). For this study, we address the phenomenon that what we term differentiation practices: practices intended to facilitate the organization of differentiated instruction. Based on the literature, multiple differentiation practices can be identified (Deunk et al. 2015, Taylor et al. 2022). The focus of this paper is on differentiation practices employed within classes and schools. It thus excludes approaches that involve grouping pupils into different schools based on their prior attainment of certain conception of aptitude for different types of education. These approaches are not common in the Dutch primary schools.

Grouping pupils into homogeneous groups for specific subjects based on their abilities or skills—a practice which is often known as ability grouping—is a common practice worldwide (Francis et al. 2019: Taylor et al. 2022) because it allows teachers to tailor instruction to the abilities of their pupils (Hallinan 1994). The belief underlying this practice is that ability grouping maximizes the effectiveness and efficiency of the instructional process (Hallinan 1994). Research has indicated variation in practices of ability grouping (Taylor et al. 2022). At least three forms of ability grouping within schools can be identified based on the literature: (1) within-class ability grouping, (2) between-class ability grouping, and (3) mastery learning/response-to-intervention (RTI). Using these three differentiation practices, pupils are divided into homogenous ability groups. The differentiation practice that we call *within-class ability grouping* entails that pupils within one classroom are sorted into small, homogenous groups based on their abilities or skills with regard to specific subjects. Each group has its own learning goals, instructions, and tasks (Gamoran

2011; Deunk et al. 2015; Taylor et al. 2017). Typically, there are three group levels: low, middle, and high achievers (Condron 2008; Deunk et al. 2015; Prast et al. 2015). Homogenous ability grouping can also occur between classes (Gamoran 2011). This phenomenon is known as *between-class ability grouping*. In this practice, pupils are temporarily regrouped based on their ability or prior achievements, irrespective of their grade level; thus, for example, high-performing grade 3 pupils can be grouped together with low-performing grade 4 pupils. The third practice is known as *mastery learning or response-to-intervention* (RTI). These practices can be viewed as a special form of within-class ability grouping (Deunk et al. 2015). In research and practice, mastery learning and RTI are presented as separate models, but the structural organization of differentiation is similar between the two practices (Guskey and Jung 2011). In this study, we use the term mastery learning to refer to the structural organization of both mastery learning and RTI. In contrast to within- and between-class ability grouping, in this context, all pupils have the same minimum learning goals and receive the same basic instruction. Every thematic unit starts with whole-class instruction. Similar to within-class and between-class ability grouping is the structural organization of dividing pupils into ability groups. In mastery learning, homogeneous ability groups are created based on pupils' actual performance instead of more general measures of intelligence or ability (Deunk et al. 2015). Low achievers receive additional instruction; middle achievers work independently; and high achievers receive advanced materials for enrichment (Kulik et al. 1990; Guskey and Jung 2011; Deunk et al. 2015).

Another practice used to organize differentiation involves providing each pupil with *individualized instruction*. When applying individualized instruction, each pupil has his or her own learning pace and goals and receives adaptive instruction and learning tasks (Bray and McClaskey 2014). In this practice, no basic instruction is provided to all pupils or groups of pupils. Instead, individual or personalized learning paths are offered, such that lessons and activities are adapted to the specific learning needs or interests of different learners (Bray and McClaskey 2014).

The final practice identified for this study is known as *cooperative learning in heterogeneous groups*. This term refers to a practice in which pupils in the classroom with different abilities are sorted together into small subgroups and work jointly to help each other (Lou et al. 1996; Leonard 2001; Deunk et al. 2015; Slavin 2015). In this practice, cooperative structures are created in which members of the subgroups must help and encourage their groupmates to exert the maximum effort to meet their personal and group goals (Slavin 2015).

Principles of distributive justice in a meritocratic educational system

Classroom teachers are not merely required to make pedagogical choices regarding how to organize differentiation. Teachers also make choices regarding ways of dividing the available educational resources (such as time and support) among their pupils to contribute to their educational outcomes (Brighouse 2018). Such decisions are necessary due to the simple fact that teachers cannot give all pupils full attention in a classroom containing 20 to 30 different students (Aftab 2015;

Marshall 2016). Accordingly, such decisions provide different learning experiences that can have impacts on students' motivation, academic achievements, and subsequent educational careers (Resh and Sabbagh 2016). Therefore, questions arise regarding the fair distribution of educational resources and fair educational outcomes. We address the notion of distributive justice in teachers' pedagogical choices in the context of classroom differentiation. Distributive justice emphasizes people's appraisal of the fairness of the allocation of desirable outcomes across people (Wright and Boese 2015). Terms such as *equity* and *equality* are considered to be the foundation of distributive justice, but these terms are often used as if they were interchangeable. Furthermore, additional principles are necessary to provide a basis for understanding fairness in the context of a meritocratic education system (Wright and Boese 2015).

In line with the influential work of Deutsch (1975), we distinguish among three basic principles—equity, equality and need—that teachers may endorse with regard to fair practices (Cropanzano and Molina 2015; Wright and Boese 2015; Resh and Sabbagh 2016). The principle of equity calls for an unequal distribution of resources. According to this principle, each pupil should receive resources in proportion to his or her effort, contribution, ability, and outcomes (Wright and Boese 2015). The principle of equity justifies inequality by an appeal to effort, academic achievement, and ability (Arrow et al. 2000). Equity serves as the primary justification for meritocracy in Western countries (Tyler 2015; Wright and Boese 2015; Resh and Sabbagh 2016). In a meritocratic education system, it is generally believed that any pupil who invests sufficient effort and takes advantage of all the opportunities available to him or her has the chance to succeed and fulfil his or her academic potential (i.e., his or her talents) (Tyler 2015; Wright and Boese 2015; Resh and Sabbagh 2016).

According to Wright and Boese (2015), the recognition that equity is only one possible principle related to justice provides a basis for understanding why meritocracy can be rejected as unfair. This claim can be explained by the introduction of other principles. Let us begin with the principle of equality. Multiple perspectives on the principle of equality can be adopted (Espinoza 2007). Initially, the principle of equality calls for the equal distribution of educational resources to all pupils regardless of their family origin or other inborn attributes, such as their nationality or socioeconomic status (Brighouse et al. 2018; Wright and Boese 2015). We call this view *equality in terms of equal resources*. Regardless of the differences among pupils, the share of support provided to each pupil is the same. Based solely on an appeal to equity, the best students might receive additional time from the teacher because effort and ability guides the distribution or allocation of resources (Mijs 2016). However, from the perspective of equality as in terms of resources, teachers might consider that outcome to be unfair and may prefer to distribute their time more equally (Wright and Boese 2015).

Another perspective on equality focuses on outputs instead of the inputs. We call this view *equality in terms of equal output*. The principle of equal output focuses on the probability of children from various social groupings learning the same material to the same levels at defined points in the schooling system (Espinoza 2007). This principle emphasizes the fact that education plays a role in promoting citizenship, in which context it is essential to provide some basic level of education for all (Walzer

Table 1 Conceptual framework

	Principles of distributive justice and differentiation beliefs	Differentiation practices
Divergence of educational outcomes	Equity A1 individual learning goals, learning outcomes diverge A2 learn at individual pace A3 homogeneous grouping is most effective Equality in terms of equal resources B1 same share of support for each	Within-class ability grouping (WAG) Between-class ability grouping (BAG) Individualized instruction (II)
Convergence of educational outcomes	Equality in terms of equal output C1 collective goals, learning outcomes converge C2 same learning pace for all pupils Need D1 more support provided to disadvantaged pupils D2 low achieving pupils must learn from their peers	Mastery learning (ML) Cooperative learning in heterogenous groups (HG)

1983). It thus recognizes the importance of education as a means to allow people to provide for their basic needs (Mijs 2016; Resh and Sabbagh 2016).

To ensure a basic level of education for all, it is likely that a teacher's time should perhaps be distributed unequally on the basis of *need* rather than on the basis of obtaining the best results. This principle of *need* calls for an unequal distribution of resources, such that those who are most in need receive larger portions of such resources (Wright and Boese 2015). This principle justifies inequality on the basis of need. For example, pupils who come from families with low socioeconomic status (SES) are more in need than pupils who come from families with middle or high SES because the former have less access to financial, social, and cultural capital that is relevant to education, such as the capital necessary to prepare their children for school and to support them during their schooling. The disadvantages faced by low SES pupils often influence their starting point as well as the quality of home support they receive and their performance throughout their education (Bradbury et al. 2011; Francis et al. 2019). Teachers might view it as fair to compensate for these inequalities in some way by providing these pupils with extra or additional time and support. Thus, even in a meritocracy, the principle of equity can be rejected in favor of other principles of distributive justice. Without the principles of distributive justice as need and equality, a meritocratic educational system will suffer from unfair inequality of opportunities (Mijs 2016).

Two perspectives on differentiation

Thorkildsen (1994) attempted to identify the classroom practices that are perceived as fair and linked these practices to underlying principles of distributive justice. For example, a classroom practice that stipulates that each pupil should progress at his or her own pace based on his or her capabilities was linked to the principle of equity. A classroom practice that stipulates that fast learners should not advance until slow learners have completed the task was linked to the principle of equality (Resh and Sabbagh 2016). Based on this line of reasoning, we identified teachers' different beliefs or values regarding classroom differentiation (see Table 1).

Teachers' differentiation beliefs are, implicitly or explicitly, related to the educational outcomes that they want to achieve for their classroom as a whole as well as for individual pupils (Deunk et al. 2015; Smale-Jacobse et al. 2019; Godor 2021). Theoretically, teachers can strive to promote the divergence or convergence of educational outcomes (Blok 2004; Bosker 2005; Deunk et al. 2015; Smale-Jacobse et al. 2019; Bosker et al. 2021). Striving to promote the divergence of educational outcomes means that pupils' levels of performance grow further apart after receiving teaching. Pupils with higher levels of prior achievement progress more quickly than their classmates with lower levels of prior achievement. This divergence is associated with teachers who focus on the establishment of individual, ability-appropriate goals for all pupils and with teachers who distribute their educational resources equally among pupils. When pupils with low levels of prior achievement are predominantly from lower socioeconomic backgrounds, this practice leading to divergent outcomes contributes to social inequalities (Boaler et al. 2000; Condron 2008; Oakes 2008; Andersen and Andersen 2017).

Striving to promote the convergence of educational outcomes means that pupils' levels of performance are more similar after receiving teaching. Pupils with lower levels of prior achievement progress more quickly than their classmates with higher levels of prior achievement. This convergence is associated with teachers who focus on establishing the same learning goals for all pupils and with those who distribute their resources unequally among pupils, thereby providing more educational resources to low-performing pupils (Deunk et al. 2015). In the following, we summarize how these two perspectives on differentiation relate to teachers' beliefs and to the everyday grouping and differentiation decisions that they make. Table 1 displays a schematic representation of the ways in which the perspectives of the divergence and convergence of educational outcomes relate to the principles and beliefs related to distributive justice as well as to differentiation practices.

Perspective 1—divergence of educational outcomes

From a perspective that emphasizes the divergence of educational outcomes, differentiation is viewed as a tool for offering each child the most appropriate learning opportunities. This perspective is founded on a pattern featuring two justice principles: the principle of equity and the principle of equality in terms of equal resources (see Table 1). Based on the principle of equity—in line with meritocratic beliefs—teachers may believe that appropriate performance goals must be set in line with the abilities of each people, and learning outcomes may thus diverge (A1_Equity). In addition, teachers may believe that pupils who master the subject matter at hand must always receive new material even if they are far ahead of other pupils. Pupils can learn at their own pace (A2_Equity). To adjust teaching to the ability levels of the pupils, pupils can be grouped into homogeneous groups based on their abilities or skills. For this purpose, the differentiation practices of within-class ability grouping (WAG) or between-class ability grouping (BAG) are appropriate. However, if teachers want each individual pupil to receive adaptive instruction and learning tasks, the differentiation practice of individualized instruction (II) is more suitable. Differentiation practices such as within-class ability grouping, between-class ability

grouping and individualized instruction are approaches of ensuring that pupils are challenged at their own level and preventing high-achieving pupils from becoming bored and ensuring that low-achieving pupils do not become frustrated because the subject matter is too difficult for them. Proponents of homogeneous grouping practices often rely on the principle of equity by arguing that homogeneous grouping is more effective than heterogeneous grouping (A3_Equity) because it helps teachers tailor instruction to the ability levels of their pupils (Hallinan 1994). In other words, meritocratic beliefs support the structure of homogeneous grouping in schools (Mijs 2016). These pedagogical choices may risk widening the gaps among pupils in the classroom. Viewed from the perspective of the principle of equality in terms of equal resources, teachers may believe that the share of support provided to each pupil must be the same (B1_Equality in terms of equal resources). The academic achievements of different pupils are allowed to diverge as long as each pupil has received an equal share of support. In particular, differentiation practices such as within- and between-class ability grouping and individualized instruction can be used to divide attention and time equally among pupils.

Perspective 2—convergence of educational outcomes

From a perspective that emphasizes the convergence of educational outcomes, differentiation is viewed as a tool for reducing social inequalities. This perspective is based on a pattern of two justice-related principles: the principle of equality in terms of equal output and the principle of need (see Table 1). Viewed from the perspective of the principle of equality in terms of equal output, all pupils have the same learning goals, and teachers believe that their educational outcomes may converge (C1_Equality in terms of equal output). Pupils who have already mastered the subject matter should not continue to learn new material but should rather perform other activities such as helping other pupils. The pace of learning should be the same for all pupils (C2_Equality in terms of equal output). This situation prevents educational outcomes from diverging excessively. Based on the principle of need, teachers may believe that they must dedicate additional time and effort to pupils who receive little support and guidance at home (D1_Need) to allow them to reach a level of performance in line with their abilities. In other words, teachers who adopt this approach believe in the necessity of providing more support to disadvantaged pupils than to more privileged pupils. The differentiation practice of mastery learning (ML) fits these beliefs because the same basic instruction is provided to all pupils and extended (additional) instructions are provided to low-ability groups (Deunk et al. 2015). This approach may narrow the gap between low-achieving and high-achieving pupils. Moreover, teachers may believe that pupils must learn in heterogeneous groups to allow low-achieving pupils to learn from their high-achieving peers (D2_Need). This method of teaching is well-suited to the differentiation practice of cooperative learning in heterogeneous groups (HG), which has positive effects on group cohesiveness. Cooperative learning increases caring and concern among the pupils in the class by making them feel responsible for each other's achievements (Slavin 2015). Disadvantaged pupils may benefit from these shared responsibilities. In the context of cooperative learning in heterogeneous groups, pupils can have

their own individual learning goals as well as group learning goals. Therefore, there is less concern regarding the lack of challenging tasks for disadvantaged pupils. In general, however, research outcomes regarding the effects of cooperative learning in heterogeneous groups on educational inequalities have been mixed (Deunk et al. 2015). Both low- and high-achieving pupils have been found to benefit from working together (Cohen et al. 1982; Förrer et al. 2000).

Research questions

The preceding discussion has highlighted two perspectives on differentiation. These perspectives have been described in terms of beliefs regarding and conceptions of fair distribution (e.g., equity, equality and need) and differentiation practices. In this study, we examined teachers' beliefs regarding fair differentiation and their teaching practice by means of a survey. We aim to obtain additional insights into teachers' beliefs and values regarding the fair distribution of educational resources and their perspectives on differentiation. Our research questions are as follows: (1) What are teachers' differentiation beliefs and differentiation practices? (2) Which patterns of distributive justice values are reflected in teachers' differentiation beliefs? (3) How do teachers with different differentiation beliefs differ in terms of their differentiation practices?

Method

The context of the research

This study was conducted in primary schools in the Netherlands. Most children in the Netherlands start primary school at the age of 4 (Grade 1). Primary school has eight grades. After grade 8, pupils transfer to a secondary school. Schools are free to organize teaching and learning in the school, they are not compelled to use specific pedagogies, but are committed to realizing government-defined learning goals, although quality assurance by an inspectorate addresses the quality of teaching too. The Dutch Education Inspectorate is responsible for monitoring the quality of education at primary schools. One quality indicator of the inspectorate is that there is sufficient differentiation in all lessons where differentiation is possible. Despite that teachers and school leaders strongly support this indicator, the implementation of classroom differentiation is a major issue in the provision of high-quality education in the Netherlands (Van Casteren et al 2017).

Participants

A convenience sampling technique was conducted to recruit teachers (who teach 4- to 12 year-old children, Grades 1 to 8) to participate in this study through school boards and head teachers. Consequently, there is limited generalizability. Despite this, the distribution of teachers' characteristics in the sample, as gender and age, is

comparable to national trends (OCW 2020). Participants in this survey comprised 294 teachers at 74 primary schools. There were 254 women (86% of the sample) and 40 men in the sample. Nationally, the percentage of female teachers in primary education in the Netherlands is 87 percent. The teachers' mean age was 42.4 years (SD = 12.1; range 22−66 years). Nationally, teachers' mean age is 42.7 years. The teachers' mean duration of service was 17.1 years (SD = 11.2; range 0−43 years).

Survey

Teachers were asked in a survey to rate the extent to which they agreed with eight statements on a seven-point Likert-type scale (1 = strongly disagree; 7 = strongly agree) on beliefs about differentiation in the classroom based on our theoretical framework (see Appendix A for the statements). Furthermore, teachers were presented with five descriptions of differentiation practices (see Appendix B for descriptions): within-class ability grouping (WAG), between-class ability grouping (BAG), individualized instruction (II), mastery learning (ML) and cooperative learning in heterogeneous groups (HG). Participating teachers rated how often they applied each practice for four different subjects, namely mathematics, technical reading, comprehensive reading and spelling lessons, using the following five-point scale: 1 = (almost) never; 2 = seldom; 3 = sometimes; 4 = often; and 5 = (almost) always. Teachers could also answer "does not apply" when they did not teach the subject. In that case, the score for that subject was a missing value. Subsequently, the mean score per differentiation practice was calculated based on the mean of the four scores per subject. The differentiation practice scales all had high reliabilities. Reliability analysis resulted in a Cronbach's α for within-class ability grouping of 0.84, for between-class ability grouping of 0.86, for mastery learning of 0.72, for cooperative learning in heterogeneous groups of 0.83 and for individualized instruction of 0.95.

The survey was pilot-tested by five experts to evaluate its content in terms of classroom differentiation and by 11 teachers to assess how they experienced and understood the statements. Based on the pilot study, a few statements were more clearly formulated.

Data analysis

Latent profile analysis (LPA) using Mplus 7.4 (Muthén and Muthén 2012) was employed to identify subgroups based on teachers' scores on the differentiation beliefs variables. LPA groups teachers based on shared response patterns so that teachers in one group are more similar to each other than teachers in another group. This technique uses continuous variables as profile determinants and provides probabilities of profile membership, robustness to non-normality and access to fit statistics that help empirically to determine the number of profiles. This study utilized the three-step LPA (Asparouhov and Muthén 2014) following the recommendations of latent class modelling with distal outcomes (Bakk and Vermunt 2016). The first step was to select the best-fitting latent profile model based on theoretical and empirical

factors. Through an iterative process, LPA tests the number of profiles against the model with one less profile until the appropriate number of profiles is identified (Nylund et al. 2007). The number of profiles that best fit the data was determined on the basis of the Bayes information criterion (BIC), entropy and the Lo-Mendell-Rubin adjusted likelihood ratio test (LMR-LRT) (Nylund et al. 2007). Furthermore, the smallest profile should be at least 5% of the overall sample size. Smaller values of BIC indicate better fit. Entropy values close to 1 indicate profile distinctiveness (Kline 2005). LMR-LRT indicates the significance of improvement in model fit when adding another group. In other words, it indicates whether a model with k classes fits statistically significantly better than a model with k-1 classes. The second step is the determination of the most likely profile membership, which was determined based on fit indices and theoretical and empirical understanding of teachers' differentiation beliefs.

In the third step, the previously determined best-fitting LPA model was analysed in terms of mean differences for the continuous outcome variables of the mean scores on within-class ability grouping, between-class ability grouping, mastery learning, cooperative learning in heterogeneous groups and individualized instruction. The equality tests use Wald chi-square analyses to determine mean differences between groups. The complex procedure in Mplus was used to account for non-independence of observations due to cluster sampling (teachers nested within schools).

Results

Teachers' differentiation beliefs and practices

The first research question was: What are teachers' differentiation beliefs and differentiation practices? Table 2 presents the overall preferences for the principles of distributive justice in differentiation beliefs. On average, the mean scores on the differentiation belief show more support for the principle of equity and the principle of equality in terms of equal resources than for the principle of need (more support for disadvantaged pupils) and principle of equality in terms of equal output. In other words, there is a tendency towards the perspective on differentiation aiming at the divergence of educational outcomes. There are two exceptions. First, on average, teachers scored relatively low on the belief that pupils learn more effectively in homogeneous groups than in heterogenous groups ($M = 3.40$). This belief is linked to the principle of equity. Second, teachers scored high on the belief that low achievers need to learn from their higher-achieving peers ($M = 5.56$). This belief is linked to the principle of need. This may indicate that teachers believe that divergent differentiation can also succeed in heterogeneous groups where pupils can learn from each other. Furthermore, although the principle of equity seem to dominate teachers' beliefs, in teacher differentiation practice mastery learning appeared on average to be the most widely applied practice ($M = 4.05$). Mastery learning fits the principle of equality in terms of equal output and the principle of need. With mastery learning all pupils have collective goals and additional instruction is provided to pupils who need more time and instruction to reach these goals. Interestingly, on average,

Table 2 Descriptive statistics of differentiation beliefs (scale range 1−7; $N=294$) and differentiation practices (scale range 1−5; $N=294$) with their intercorrelations

		A1	A2	A3	B1	C1	C2	D1	D2	WAG	BAG	ML	HG	II
	Mean	5.48	4.85	3.40	4.37	2.82	2.49	3.70	5.56	3.89	2.38	4.05	3.33	2.07
	SD	1.29	1.43	1.34	1.85	1.25	1.16	1.41	0.96	1.02	1.32	0.75	0.86	1.15
Differentiation beliefs. Divergence of educational outcomes														
A1_Equity	Individual goals, outcomes diverge													
A2_Equity	Learn at individual pace	0.02												
A3_Equity	Homogeneous grouping is most effective	− 0.16**	0.03											
B1_Equality-equal resources	Same share of support for each	− 0.15*	0.25**	− 0.02										
Differentiation beliefs. Convergence of educational outcomes														
C1_Equality-equal output	Collective goals, outcomes converge	− 0.32**	− 0.10	0.19**	− 0.04									
C2_Equality-equal output	Same learning pace for all pupils	− 0.16**	− 0.21**	0.06	− 0.02	0.13*								
D1_Need	More support for disadvantaged pupils	− 0.11	− 0.06	0.05	− 0.37**	0.09	0.12*							
D2_Need	Low-achieving pupils need to learn from peers	− 0.04	− 0.02	− 0.14*	− 0.07	− 0.04	− 0.03	0.12*						
Differentiation practices														
WAG	Within-class ability grouping	0.07	0.09	− 0.05	0.09	− 0.05	− 0.10	0.01	− 0.07					
BAG	Between-class ability grouping	0.13*	0.08	− 0.08	− 0.05	− 15*	− 0.07	0.08	− 0.07	0.22**				
ML	Mastery learning	0.03	0.03	0.02	0.14*	− 0.03	− 0.08	− 0.03	− 0.05	0.33**	0.08			

Table 2 (continued)

		A1	A2	A3	B1	C1	C2	D1	D2	WAG	BAG	ML	HG	II
HG	Heterogeneous grouping	0.09	0.04	− 0.18**	0.06	− 0.06	− 0.11	− 0.05	0.03	0.20**	0.16*	0.16**		
II	Individualized instruction	0.13*	0.18**	− 0.20**	0.02	− 0.16*	− 0.14*	− 0.09	− 0.04	0.25**	0.32*	0.01	0.27**	

*$p < 0.05$, **$p < 0.01$

Table 3 Fit indices of models with 1–5 profiles ($N = 294$)

Number of profiles	BIC	Entropy	LMR-LRT
1	8052.397	1.000	
2	7928.525	0.899	0.030
3	7867.240	0.892	0.278
4	7846.630	0.923	0.619
5	7850.603	0.918	0.927

BIC Bayesian information criterion, *LMRT* Lo Mendell Rubin adjusted likelihood ratio test

teachers applied within-class ability grouping almost as frequently as mastery learning ($M = 3.89$). We suggest that teachers often use mastery learning and within-class ability grouping in combination. For instance, they provide common basic instruction for all pupils according to the structure of mastery learning and subsequently adjusted instruction for each ability group according to the structure of within-class ability grouping.

The Pearson correlations presented in Table 2 show that there were generally low correlations between the belief statements and differentiation practices. There were three moderately significant negative correlations between beliefs referring to the perspective on differentiation aiming at the divergence of educational outcomes and those referring to the convergence of educational outcomes. These moderately negative correlations indicate that more support for one perspective means less support for the other.

Patterns of distributive justice preferences in teachers' beliefs about differentiation

The second research question was: Which patterns of distributive justice values are reflected in teachers' differentiation beliefs? Step one of the three-step process was conducted using the fit indices described earlier. The optimal profile solution was based on the fit indices and theoretical and empirical understanding of teachers' differentiation beliefs. Table 3 shows the fit indices of models with one to five profiles.

Although the LMR-LRT test was not statistically significant when comparing the three-profile to the two-profile model, BIC values continued to decrease until the four-profile model. Moreover, the four-profile model had the highest entropy statistics and produced four theoretically interesting profiles (while the smallest profile was above 5%). Therefore, the four-profile model was chosen. The average latent class probabilities suggested that in any of the four profiles, more than 92% of the profile members were accurately classified. Table 4 shows the means of the

Table 4 Means for the differentiation beliefs variables for the four profile groups ($N = 294$)

Variable		Profile 1 equal divergers	Profile 2 compensatory divergers	Profile 3 equal convergers	Profile 4 compensatory convergers	p	F
		45.3% $n = 134$	36.9% $n = 108$	11.4% $n = 34$	6.4% $n = 18$		
A1_Equity	Individual goals, divergent learning outcomes	5.95[a]	6.05[a]	3.06[b]	3.11[b]	< 0.001	281.56
A2_Equity	Learn at individual pace	5.16[a]	4.49[b]	5.29[a]	3.89[b]	< 0.001	8.81
A3_Equity	Homogeneous grouping is most effective	3.22	3.45	3.74	3.83	0.082	2.26
B1_Equality-equal resources	Same share of support for each	5.79[a]	2.39[b]	5.85[a]	2.89[b]	< 0.001	403.27
C1_Equality-equal output	Collective goals, outcomes converge	2.56[b]	2.81[bc]	3.56[a]	3.44[ac]	< 0.001	7.90
D1_Equality-equal output	Same learning pace for all pupils	2.34[b]	2.49	2.94[a]	2.72	0.041	2.79
E1_Need	More support for disadvantaged pupils	3.11[b]	4.27[a]	3.74	4.56[a]	< 0.001	18.73
E2_Need	Low-achieving pupils need to learn from peers	5.43	5.68	5.68	5.61	0.194	1.58

Different superscripts indicate significant differences between groups

differentiation belief scores for the four profile groups. To examine group differences in mean scores, one-way analysis of variance (ANOVA) tests was conducted. There were statistically significant differences for all variables[1] except for the mean score of the four profiles on A3_Equity and E2_Need. In all four profiles, teachers scored relatively high on the belief that low-achieving pupils need to learn from their peers and low on the belief that homogeneous grouping is more effective than heterogeneous grouping.

Post hoc comparisons using Tukey procedures indicated statistically significant differences ($p < 0.05$) between teachers' scores in the four profiles. Profiles 1 and 2 scored statistically significant higher on A1_Equity (individual learning goals and learning outcomes diverge) than Profiles 3 and 4, and teachers in Profiles 3 and 4 scored statistically significant higher on C1_Equality (collective goals, learning outcomes converge) than teachers in Profiles 1 and 2. Therefore, we labelled Profiles 1 and 2 as divergers and Profiles 3 and 4 as convergers. As expected, we found a group of teachers who preferred divergent educational outcomes and a group who preferred convergent educational outcomes. However, the divergers group was much larger than the convergers—approximately 82% of the sample compared to 18%.

Within the group of divergers and within the group of convergers statistically significant differences were found in patterns of distributive justice principles. Teachers in Profiles 1 and 3 scored statistically significant higher on A2_Equity (learn at your own pace) and B1_Equality (same share of support for each) than teachers in Profiles 2 and 4. Furthermore, teachers in Profiles 2 and 4 scored statistically significant higher on E1_Need (more support provided to disadvantaged pupils) than teachers in Profile 1. On average, teachers in Profile 3 also scored lower on E1_Need than teachers in Profiles 2 and 4 but this difference was not statistically significant. Based on these differences, we labelled Profile 1 *equal divergers*, stressing the justification of equal resources and unequal outcomes (fits the principle of equality in terms of equal resources and the principle of equity). Profile 2 is labelled *compensatory divergers*, stressing the justification of need-based education and unequal outcomes (fits the principle of need and the principle of equity). Profile 3 is labelled *equal convergers*, stressing the justification of equal resources and equal outcomes (fits the principle of equality in terms of equal resources and in terms of equal resources). Profile 4 is labelled *compensatory convergers*, stressing the justification of need-based education and equal outcomes (fits the principle of need and the principle of equality in term of equal output).

The *equal divergers* make up approximately 45% of the sample and most likely endorse the beliefs that each pupil must have individual learning goals and learning outcomes may diverge and that each pupil may learn at their own pace (the principle of equity). For teachers in this profile, equality means that all pupils must receive the same amount of support, irrespective of their family background (the principle of equality in terms of equal resources). The *compensatory divergers* (36.9%) are teachers who also support the principle of equity but, in contrast to the first profile,

[1] A1_Equity, $F(3,290) = 281.56$, $p < 0.001$; A2_Equity, $F(3,290) = 8.81$, $p < 0.001$; B1_Equality, $F(3,290) = 403.27$, $p < 0.001$; C1_Equality, $F(3,290) = 7.90$, $p < 0.001$; D1_Equality, $F(3,290) = 2.79$, $p < 0.05$; and E1_Need $F(3,290) = 18.73$, $p < 0.001$.

also support the principle of need. They believe that disadvantaged pupils must be compensated by more support at school than their more privileged peers. The *equal convergers* (11.4%) endorse the principle of equality in terms of equal output more than both diverger profiles but, in contrast to the *compensatory convergers*, also endorse the belief that pupils must learn at their own pace. The latter belief fits the principle of equity. Furthermore, in the context of dividing support between pupils at school, they prefer equal division of support (the principle of equality in terms of equal resources) to compensating disadvantaged pupils (the principle of need). The compensatory convergers (6.4%) also support the principle of equality in terms of equal output more than both diverger profiles. Moreover, they prefer the principle of need to the principle of equality in terms of equal resources. Note that although both converger profiles prefer the principle of equality in terms of equal output to the diverger profiles, the score on this principle overall was not so high (Profile 3, $M = 3.56$; Profile 4, $M = 3.44$).

Relations of beliefs with differentiation practices

The third research question was: How do teachers with different differentiation beliefs differ in terms of their differentiation practices? Table 5 shows the means of the differentiation practice scores for the four profile groups. To examine between-group differences, Wald chi-square tests were conducted. These analyses revealed that teachers in Profile 1 scored statistically significant ($p < 0.01$) higher on mastery learning than teachers in Profiles 2 and 3. This is not in line with the expectation based on the theoretical framework, because with mastery learning, pupils have collective learning goals and additional instruction is provided to pupils who need more time and instruction to reach these collective goals. In contrast, the divergers endorse own learning goals and distributing support equally. Note that Profile 4 scored approximately equally as high as Profile 1 and is a very small group of teachers. Mastery learning is in line with the distributive justice values of the compensatory convergers.

Furthermore, teachers in Profiles 1, 2 and 4 scored statistically significant higher on individualized instruction than teachers in Profile 3 ($p < 0.05$). For Profiles 1 and 2, both divergers, this is in line with expectation. With individualized instruction, pupils have their own learning goals and educational outcomes may diverge. No statistically significant between-group differences were found with regard to within- and between-class ability grouping and cooperative learning in heterogeneous groups.

Discussion

The aim of this study was to obtain additional insights into teachers' beliefs and values regarding the fair distribution of educational resources and their perspectives on differentiation. Therefore, we developed a conceptual framework of two

Table 5 Means for the differentiation practices variables for the four profile groups ($N=294$)

Outcome	Profile 1 equal divergers	Profile 2 compensatory divergers	Profile 3 equal convergers	Profile 4 compensatory convergers	p	χ^2
	45.3% $n=134$	36.9% $n=108$	11.4% $n=34$	6.4% $n=18$		
Within-class ability grouping ($n=280$)	4.05	3.81	3.79	3.46	0.359	3.22
Between-class ability grouping ($n=239$)	2.38	2.54	1.96	2.06	0.088	6.54
Mastery learning ($n=292$)	4.26[a]	3.88[b]	3.74[b]	4.14	<0.001	20.87
Cooperative learning in heterogeneous groups ($n=288$)	3.35	3.35	3.47	2.85	0.052	7.75
Individualized instruction ($n=260$)	2.15[a]	2.09[a]	2.04[a]	1.47[b]	0.012	10.92

Different superscripts indicate statistically significant differences between groups

perspectives on differentiation (Table 1). These perspectives have been described in terms of beliefs regarding and conceptions of fair distribution (e.g., equity, equality and need) and differentiation practices. We examined teachers' beliefs regarding fair differentiation and their differentiation practices by means of a survey.

Teachers are more inclined to believe that each pupil must have their own learning goals and learning paths, and to accept that educational outcomes may diverge even further than to believe that all pupils must have collective goals and same learning paths, and to accept that educational outcomes converge. This means that the principle of equity dominates teachers' differentiation beliefs. Furthermore, teachers are less inclined to believe that disadvantaged pupils may receive more support and guidance from them than their more privileged peers. The principle of equality in terms of equal resources overrules the principle of need.

The most commonly used differentiation practice in the Netherlands seems to be mastery learning. Basically, mastery learning is a differentiation practice with a focus on compensating for educational disadvantages. Through the lens of distributive justice, this practice fits the principle of need (Resh and Sabbagh 2016). Low-achieving pupils receive additional instruction to reach the common lesson goals. This can help them to catch up with higher-achieving pupils. In contrast, within-class ability grouping, which is also often used by teachers, has a focus on divergent educational outcomes. This fits the principle of equity (Resh and Sabbagh 2016) as each group of pupils can progress towards learning goals and at a pace that fits their talents and skills.

The findings show that differentiation in the classroom is even more complex than outlined by the two perspectives in the theoretical framework (Table 1). Four patterns of distributive justice beliefs seem to exist. The vast majority of teachers support the principle of equity. But within this group of equity supporters two different patterns can be observed. Almost half of the teachers seem to support the principle of equity together with the principle of equality in terms of equal resources (Profile 1, equal divergers). These teachers regard unequal educational outcomes as fair when the inequality is based on pupils' merit as achievements or ability and all pupils receive an equal share of educational resources. Hence, these teachers seem to be particularly concerned about providing each child with the most appropriate learning opportunities. A third of the teachers support the principle of equity and the principle of need (Profile 2, compensatory divergers). This may put them in an ethical dilemma in practice: tailoring instruction to the ability level of each pupil but spending additional time with disadvantaged pupils, even though this additional time may be at the expense of the time they can devote to higher-achieving pupils with a view to further improving their performance.

A much smaller group of teachers support the principle of equality in terms of equal output. A different pattern can also be observed within this group. One group of teachers supports both the principle in terms of equal resources as in terms of equal output (Profile 3, equal convergers). This may put them in another ethical dilemma in practice: supporting all pupils equally but focusing on collective learning goals. This is difficult, because some pupils require more of teachers' attention and support to reach these collective goals. A very small group of teachers use the

principle of equality in terms of equal output with the principle of need (Profile 4, compensatory convergers). They unambiguously seem to prefer to strive for equal educational outcomes for all pupils by compensating pupils who receive little support at home with extra support at school. These teachers seem to be particularly concerned about creating equal educational opportunities for pupils from different backgrounds.

Based on social justice theory and reflecting on the empirical data, three differentiation dilemmas may be discerned: the educational outcomes dilemma (divergent or convergent?); the support dilemma (equal distribution of support for all or compensation for disadvantaged backgrounds?); and the learning pace dilemma (an individual learning pace for each pupil or a collective learning pace?). Each dilemma requires teachers and schools to make ethical choices regarding the distribution of educational resources as well as on the aim of classroom differentiation.

Finally, this study shows that teachers' preferences for principles of justice are not closely related to their differentiation practices. This implies that the use of these differentiation practices is not related to particular social justice beliefs about the distribution of educational resources and contribution on the educational outcomes.

Incongruence of differentiation beliefs and practices

Differentiation practices and beliefs don't appear to be congruent. There are at least two possible explanations for this incongruence. First, teachers may perceive and practise social justice in education from different perspectives at the same time. It may be very difficult for teachers to actively discriminate between groups, even for the benefit of the weakest. Similarly, it may be very difficult to focus on each individual pupil with equal attention because teachers perceive more need from disadvantaged pupils. Complex differentiation concerns and the dilemmatic nature of teaching (Lampert 1985; Flett and Wallace 2005; Levinson and Fay 2016; Chen et al. 2017) might lead to weak correlations between beliefs and practices, which should not mean that teachers' practices are not value driven. Moreover, it seems that teachers may not intentionally use mastery learning to reduce inequalities between pupils with different social backgrounds. However, to increase equal learning opportunities in terms of equal opportunities for outcomes for different social groups, compensating for educational disadvantages (the principle of need) with a more sizeable investment of educational resources is essential (Walton et al. 2013; Wright and Boese 2015). In addition, compensating for educational disadvantages is necessary to realize the basic principles of meritocracy: open careers to those who display competence rather than through nepotism, and match educational opportunities to natural ability (Mijs 2016). Future qualitative in-depth studies may be aimed at uncovering teachers' intentions in terms of their differentiation practices and at exploring how conscious teachers are of these social justice dilemmas in their differentiation practice.

Second, decisions about which differentiation practice to use are not only those of an individual teacher. There may be other contextual factors that can influence decisions regarding differentiation practices. For example, Dutch teachers work in a

context of national standards for language and maths that may steer them toward a practice of mastery learning with which they might realize the curriculum goals for all pupils. Moreover, teachers may experience expectations on the part of parents and policymakers at school or government level. Parents may be wanting what is best for their own children rather than what is best for all children (Labaree 2011) and can pressurize teachers to differentiate to the benefit of their own child. Because, in particular, highly educated parents seem to be demanding, teachers' response to parents' expressed needs may exacerbate educational inequalities (Egalite 2016). Furthermore, in many Western countries, in order to alleviate social or economic problems, policymakers encourage schools to focus on equal learning opportunities, and to simultaneously provide the most challenging education for talented pupils (Labaree 2012). These expectations call for inconsistent differentiation practices: simultaneously giving more attention to disadvantaged pupils and to high-performing pupils. The teacher is then faced with the task of fulfilling both plans that seem to contradict. The question is which differentiation practice can serve both differentiation purposes in the best possible way (Gamoran 2011). Further research may investigate the extent to which differentiation practices are the result of individual preferences of teachers or whether teachers implement educational policies over which they themselves have little influence.

Limitations of the study and implications for practice

As a limitation of this research, we acknowledge that teachers have been asked to indicate how they organize classroom differentiation based on five descriptions of differentiation practices. However, there may be much more variation in practices and variation within the practices (Taylor et al. 2022). Furthermore, a limited variety of statements about differentiation were presented to the respondents characterizing distributive justice values. We did not examine how they deal with ethical issues in their daily work or during differentiation practices. In addition, the scope of this study was on fairness in the context of distributing resources through classroom differentiation in a meritocratic education system. We acknowledge that a more fair distribution of resources will not solve fundamental inequality issues in education. Meritocracy is problematized in many studies because it legitimates societal inequalities as justly deserved, indicating that misfortune is likely to be misunderstood as personal failure (Mijs 2016; Sandel 2020). From a critical perspective on a meritocratic education system, equality not only means equality of educational opportunities, but needs a step further, redefining the reward system of success and failure. Also, the application of meritocratic principles, regardless of the definition of merit, favors some groups in society and disadvantaged others. It contributes to the social inequality in a society (Mijs 2016; Sandel 2020). From a critical perspective, the ideal for society should not be the realization of equal educational opportunities, but a less stratified, inclusive and equal society (Sandel 2020). In a stratified society, nevertheless, the realization of equal educational opportunities is a necessary correction of injustice that should be strived for (Sandel 2020). In the context of the realization of equal educational opportunities in a stratified educational system, this

study sheds light on the distributive justice values of teachers in primary schools related to their classroom differentiation.

We suggest it may be helpful to ensure that in-service and prospective teachers reflect on values underlying various differentiation practices and compare these values with the moral goals they intentionally pursue through differentiation in their classrooms. The findings of this study can be used to develop instruments that support in-service and prospective teachers and teams by reflecting on their visions and beliefs concerning differentiation. More specifically, differentiation dilemmas can be used to create awareness of social injustice and heighten the sense of purpose and commitment to social justice and equal learning opportunities.

Supplementary Information The online version contains supplementary material available at https://doi.org/10.1007/s43545-022-00590-7.

Author contributions All authors contributed to the study conception and design. Material preparation, data collection and analysis were performed by MV, TS, RS and ED. The first draft of the manuscript was written by MV and all authors commented on previous versions of the manuscript. All authors have read and agreed to its content and are accountable for all aspects of the accuracy and integrity of the manuscript.

Funding This work was partly funded by RAAK-Public sector (RAAK.PUB04.024), which is a Dutch funding agency for projects in universities in collaboration with professionals working in the public sector. RAAK-Public focuses on promoting knowledge to enhance the innovative capacity of professionals.

Data availability The data that support the findings of this study are available from the corresponding author upon reasonable request.

Declarations

Conflict of interest The authors have no conflicts of interest to declare that are relevant to the content of this article.

Ethical approval The Ethical Committee of the HAN University of Applied Sciences have stated that our research complies with the criteria of applicable national laws (like the General Data Protection Regulation), and the Dutch code of conduct for Research Integrity.

Informed consent Informed consent was obtained from all individual participants included in the study.

Consent for publications The submitted manuscript presents original work and not being considered or reviewed by any other publication, and has not been published elsewhere in the same or a similar form.

References

Aftab J (2015) Teachers' beliefs about differentiated instructions in mixed ability classrooms: a case of time limitation. J Educ Educ Dev 2(2):94–114

Andersen IG, Andersen SC (2017) Student-centered instruction and academic achievement: linking mechanisms of educational inequality to schools' instructional practice. Br J Sociol Educ 38(4):533–550. https://doi.org/10.1080/01425692.2015.1093409

Arrow KL, Bowles S, Durlauf S (eds) (2000) Meritocracy and economic inequality. Princeton University Press, Princeton

Asparouhov T, Muthén B (2014) Auxiliary variables in mixture modeling: using the BCH method in Mplus to estimate distal outcome model and an arbitrary secondary model. Mplus Web Notes 21(2):1–22

Bakk Z, Vermunt J (2016) Robustness of stepwise latent class modeling with continuous distal outcomes. Struct Equ Modeling 23(1):20–31. https://doi.org/10.1080/10705511.2014.955104

Blok H (2004) Adaptief onderwijs: Betekenis en effectiviteit. [Adaptive education: meaning and effectiveness]. Pedagogische Studiën pp 5–27

Boaler J, William D, Brown M (2000) Students' experiences of ability grouping—disaffection, polarisation and the construction of failure. Br Edu Res J 25(5):631–648. https://doi.org/10.1080/713651583

Bosker R, Durgut F, Edzes H, Jol M, Van Tuijl C, Van der Vegt A (2021) Leidraad differentiatie als sleutel voor gelijke kansen. Effectieve interventies tegen onderwijsachterstanden in het primair onderwijs. Weten wat werkt en waarom [Guideline differentiation as a key for equal opportunities. Effective interventions to counter educational disadvantage in primary education. Know what works and why]. The Netherlands Initiative for Educational Research

Bosker RJ (2005) De grenzen van gedifferentiëerd onderwijs. [The limits of differentiated education]. Rijksuniversiteit Groningen

Bradbury B, Corak M, Waldfogel J, Washbrook E (2011) Inequality during the early years: child outcomes and readiness to learn in Australia, Canada, United Kingdom, and United States. SSRN Electron J. https://doi.org/10.2139/ssrn.1965137

Bray B, McClaskey K (2014) Make learning personal: the what, who, wow, where, and why. Corwin Press, Thousand Oaks

Brighouse H, Ladd HF, Loeb S, Swift A (2018) Educational goods: values, evidence, and decision-making. University of Chicago Press

Chen X, Wei G, Jiang S (2017) The ethical dimension of teacher practical knowledge: a narrative inquiry into Chinese teachers' thinking and actions in dilemmatic spaces. J Curric Stud 49(4):518–541. https://doi.org/10.1080/00220272.2016.1263895

Cohen PA, Kulik JA, Kulik CL (1982) Educational outcomes of tutoring: a meta-analysis of findings. Am Educ Res J 19(2):237–248

Condron DJ (2008) An early start: skill grouping and unequal reading gains in the elementary years. Sociol Q 49(2):363–394. https://doi.org/10.1111/j.1533-8525.2008.00119.x

Cropanzano R, Molina C (2015) Organizational justice. In: Wright JD (ed) International encyclopedia of the social & behavioral sciences, 2nd edn. Elsevier, Oxford, pp 379–384

Cross DI (2009) Alignment, cohesion, and change: Examining mathematics teachers' belief structures and their influence on instructional practices. J Math Teacher Educ 12(5):325–346

Deunk M, Doolaard S, Smale-Jacobse AE, Bosker RJ (2015) Differentiation within and across classrooms: a systematic review of studies into the cognitive effects of differentiation practices. University of Groningen

Deutsch M (1975) Equity, equality, and need: What determines which value will be used as the basis of distributive justice? J Soc Issues 31(3):137–149. https://doi.org/10.1111/j.1540-4560.1975.tb01000.x

Egalite AJ (2016) How family background influences student achievement: can schools narrow the gap? Educ next 16(2):71–78

Espinoza O (2007) Solving the equity-equality conceptual dilemma: a new model for analysis of the educational process. Educ Res 49(4):343–363

Flett JD, Wallace J (2005) Change dilemmas for curriculum leaders: dealing with mandated change in schools. J Curric Superv 20(3):188–213

Förrer M, Kenter B, Veenman S (2000) Coöperatief leren in het basisonderwijs. [Cooperative learning in primary education]. Christelijk Pedagogisch Studiecentrum, Amersfoort

Francis B, Taylor B, Tereshchenko A (2019) Reassessing 'ability' grouping: improving practice for equity and attainment. Routledge, London and New York

Gamoran A (2011) Designing instruction and grouping students to enhance the learning of all: new hope or false promise? Frontiers in sociology of education. Springer, Netherlands, pp 111–126

Godor BP (2021) The many faces of teacher differentiation: using Q methodology to explore teachers' preferences for differentiated instruction. Teach Educ 56(1):43–60

Guskey TR, Jung LA (2011) Response-to-intervention and mastery learning: tracing roots and seeking common ground. Clear House J Educ Strateg Issues Ideas 84(6):249–255. https://doi.org/10.1080/00098655.2011.590551

Hallinan M (1994) Tracking: from theory to practice. Sociol Educ 67(2):79–84. https://doi.org/10.2307/2112697

Kellough JE (2006) Understanding affirmative action: politics, discrimination, and the search for justice. Georgetown University Press

Kline RB (2005) Principles and practice of structural equation modeling. Guilford Press, New York

Kulik CC, Kulik JA, Bangert-Drowns RL (1990) Effectiveness of mastery learning programs: a meta-analysis. Rev Educ Res 60(2):265–299. https://doi.org/10.3102/00346543060002265

Labaree DF (2011) Someone has to fail: the zero-sum game of public schooling. Contemp Sociol 40(4):506–506

Labaree DF (2012) School syndrome: understanding the USA's magical belief that schooling can somehow improve society, promote access, and preserve advantage. J Curric Stud 44(2):143–163. https://doi.org/10.1080/00220272.2012.675358

Lampert M (1985) How do teachers manage to teach? Perspectives on problems in practice. Harv Educ Rev 55(2):178–195

Leonard J (2001) How group composition influenced the achievement of sixth-grade mathematics students. Math Think Learn 3(2–3):175–200. https://doi.org/10.1080/10986065.2001.9679972

Levinson M, Fay J (2016) Dilemmas of educational ethics. Cases and commentaries. Harvard Education Press, Cambridge

Lou Y, Abrami PC, Spence JC, Poulsen C, Chambers B, d'Apollonia S (1996) Within-class grouping: a meta-analysis. Rev Educ Res 66(4):423–458. https://doi.org/10.2307/1170650

Marshall K (2016) Rethinking differentiation: using teachers' time most effectively. Phi Delta Kappan 98(1):8–13

Mijs JB (2016) The unfulfillable promise of meritocracy: three lessons and their implications for justice in education. Soc Justice Res 29:14–34. https://doi.org/10.1007/s11211-014-0228-0

Muthén LK, Muthén BO (2012) Mplus statistical analysis with latent variables user's guide (7th ed). Muthén & Muthén

Nylund KL, Asparouhov T, Muthen BO (2007) Deciding on the number of classes in latent class analysis and growth mixture modeling: a monte carlo simulation study. Struct Equ Model 14(4):535–569

Oakes J (2008) Keeping track: structuring equality and inequality in an era of accountability. Teach Coll Rec 110(3):700–712

OCW (2020) Onderwijs Totaal, Trendrapportage arbeidsstroom leraren po, vo en mbo 2020. [Education Total, Trend report on the labor flow of teachers in primary, secondary education and secondary vocational education]

Pajares MF (1992) Teachers' beliefs and educational research: cleaning up a messy construct. Rev Educ Res 62(3):307–332

Prast EJ, Van de Weijer-Bergsma E, Kroesbergen EH, Van Luit JEH (2015) Readiness-based differentiation in primary school mathematics: expert recommendations and teacher self-assessment. Front Learn Res 3(2):90–116

Resh N, Sabbagh C (2016) Justice and education. In: Sabbagh C, Schmitt M (eds) Handbook of social justice theory and research. Springer, New York, pp 349–367

Sabbagh C, Resh N, Mor M, Vanhuysse P (2006) Spheres of justice within schools: reflections and evidence on the distribution of educational goods. Soc Psychol Educ 9:97–118. https://doi.org/10.1007/s11218-005-3319-9

Sandel MJ (2020) The tyranny of merit: what's become of the common good? Penguin books, UK

Slavin RE (2015) Cooperative learning in elementary schools. Education 3–13, 43:1 pp 5–14

Smale-Jacobse AE, Meijer A, Helms-Lorenz M, Maulana R (2019) Differentiated instruction in secondary education: a systematic review of research evidence. Front Psychol 10:2366. https://doi.org/10.3389/fpsyg.2019.02366

Taylor B, Francis B, Atcher L, Hodgen J, Pepper D, Tereshcenko A, Travers M (2017) Factors deterring schools from mixed attainment teaching practice. Pedagog Cult Soc 25(3):327–345. https://doi.org/10.1080/14681366.2016.1256908

Taylor B, Hodgen J, Tereshchenko A (2022) Attainment grouping in English secondary schools: a national survey of current practices. Res Pap Edu 37(2):199–220. https://doi.org/10.1080/02671522.2020.1836517

Thorkildsen TA (1994) Toward a fair community of scholars: moral education as the negotiation of classroom practices. J Moral Educ 23(4):371–385. https://doi.org/10.1080/0305724940230401

Tomlinson CA (2014) The differentiated classroom. Responding to the needs of all learners. ASCD, Alexandria

Tyler TR (2015) Social justice APA handbook of personality and social psychology. American Psychological Association, Washington, DC, pp 95–122

Van Casteren W, Bendig-Jacobs J, Wartenbergh-Cras F, Van Essen M, Kurver B (2017) Differentiation and differentiation skills in primary education. ResearchNed, Nijmegen

Walton GM, Spencer SJ, Erman S (2013) Affirmative meritocracy. Soc Issues Policy Rev 7(1):1–35. https://doi.org/10.1111/j.1751-2409.2012.01041.x

Walzer M (1983) Spheres of justice: a defense of pluralism and equality. Basic Books, New York

Wright SC, Boese GD (2015) Meritocracy and tokenism. In: Wright J (ed) International encyclopedia of social and behavioral SCIENCES, 2nd edn. Elsevier, Oxford, pp 239–245

Authors and Affiliations

Marijke van Vijfeijken[1] · Tamara van Schilt-Mol[1] · Ron H. J. Scholte[2] · Eddie Denessen[2,3]

Tamara van Schilt-Mol
tamara.vanschiltmol@han.nl

Ron H. J. Scholte
r.scholte@pwo.ru.nl

Eddie Denessen
e.denessen@ru.nl

[1] School of Education, HAN University of Applied Sciences, P.O. Box 6960, 6503 GL Nijmegen, The Netherlands

[2] Behavioural Science Institute, Radboud University, P.O. Box 9120, 6500 HC Nijmegen, The Netherlands

[3] Education and Child Studies, Leiden University, P.O. Box 9500, 2300 RA Leiden, The Netherlands