Making decisions about attainment grouping in mathematics: teacher agency and autonomy in Norway

Elisabeta Eriksen[a]*, Yvette Solomon[ab], Annette Hessen Bjerke[a], James Gray[a] and Bodil Kleve[a]

[a]*Faculty of Education and International Studies, OsloMet – Oslo Metropolitan University, Oslo, Norway;* [b]*Education and Social Research Institute, Manchester Metropolitan University, Manchester, UK*

OsloMet – Oslo Metropolitan University, Postboks 4, St. Olavs Plass, 0130, Oslo, Norway

elriksen@oslomet.no, yvsol@oslomet.no, anetsen@oslomet.no, wijag@oslomet.no, bodilkle@oslomet.no

Education and Social Research Institute, Manchester Metropolitan University, 53 Bonsall Street, Manchester, M15 6GX, UK

y.solomon@mmu.ac.uk

Ethics approval

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Grouping by attainment is a relatively new and contested practice in Norway, where strong historical discourses of heterogeneous education are under pressure from international test comparisons, particularly in mathematics. At the same time, research indicates that Norwegian teachers have a high degree of autonomy in education policy enactment. Analysing thirteen Norwegian mathematics teachers' reflections on grouping practices, we seek to understand their decision-making processes within this context. Our findings indicate that teachers report a high degree of autonomy in grouping practices which is exercised through considerable diversity in practice and defended when necessary. Using an ecological model of teacher agency reveals how teachers explore and explain their highly situated practice and its tensions and contradictions. We find that teachers who are removed from the central locus of autonomy have less to draw on in making and justifying their pedagogic choices, while those who are more central are able to continually reassess in this highly sensitive arena. We note the implications for practice and research on attainment grouping, particularly the need for teacher autonomy and support for professionally-based local decision-making.

Keywords: attainment grouping; mixed-attainment teaching; mathematics; teacher autonomy; teacher agency

Introduction and background

Like many other countries, Norway is concerned about standards in mathematics, not least because of international comparisons – the PISA programme, in particular, revealed that few students gained the highest scores in mathematics, and that a comparatively large number scored below the baseline necessary for full participation in society (Nortvedt and Pettersen 2016; OECD 2016). Elsewhere, the attainment problem has been addressed by various initiatives which aim to raise performance in mathematics through curriculum, pedagogy and teacher skills interventions supporting mixed-attainment teaching (e.g. Hunter, Hunter, and Anthony (2020); Taylor et al. (2017); Van Zanten and Van den Heuvel-Panhuizen (2021)),

but also – in the US, Australia, New Zealand and England in particular – through the implementation of organisational practices of tracking, streaming and setting (Steenbergen-Hu, Makel, and Olszewski-Kubilius 2016; Taylor et al. 2022).

The tensions teachers grapple with internationally – between accountability to external authorities (e.g. through standardised testing) and accountability to the profession (e.g. foregrounding student needs, adhering to the standards of the profession) – are exacerbated in Norway (Fasting 2013; Larsen, Møller, and Jensen 2022). Here, the education system has been strongly influenced by the concept of the Unitary School dating back to 1920, emphasising the school system as an organic whole, integrating theoretical and practical training for all pupils, in a comprehensive school. This became the most important educational ideological stance in Norwegian school history (Thuen 2010), and students have historically been taught together in mixed (i.e. heterogeneous, comprehensive and non-grouped) classes (Gustafsson and Blömeke 2018; Mullis et al. 2016). Another pillar of Norwegian compulsory education since 1975 is students' right to *tilpasset opplæring*, a diffuse concept related to personalised learning, and translated as 'adapted education' in Norwegian texts in English (Fasting 2013); we use this phraseology here. This emphasis on education adapted to each student's needs and aptitudes has variously appeared in political discourse over time as integration, inclusion, individualization and teaching quality in communities of learning (Jenssen and Lillejord 2009). Defining adapted education as the goal of enabling all students to gain maximum benefit from comprehensive schooling through variation and adaptation, the current curriculum follows in the spirit of the Unitary School, stressing students' right to inclusion, defined as social as well as academic participation in a class community that acknowledges the value of diversity (Ministry of Education and Research 2020).

Inclusivity is thus an integral educational principle in Norway, reinforced in Norwegian law (Education Act § 8-2), which states that students may be divided into groups, but that "pupils shall not normally be organised according to level of ability, gender or ethnic affiliation". However, while the inclusive education ethos is still strong in Norway, educationalists and policy-makers have questioned the modern relevance of the Unitary School, leading to competition-driven reform (Welle-Strand and Tjeldvoll 2002). One consequence, stimulated perhaps by the National Centre for Science Education's (2015) recommendation that high-achieving students might benefit from working together in homogeneous 'interest' groups, has been the introduction of grouping as a temporary or partial practice (i.e. within the confines of the law) according to perceived commonalities, notably 'ability', but also 'interest', 'exceptional need' and other similar characteristics. Indeed, organisational approaches based on homogeneity are now on the rise in Norway, with estimates that more than 60% of schools use some form of attainment grouping (Vika et al. 2021).

In the context of the fundamental nature of Norwegian educational ideologies of equality, attainment grouping is potentially contentious, not least because international research has for some years questioned its usefulness in raising achievement (Higgins et al. 2016; Steenbergen-Hu, Makel, and Olszewski-Kubilius 2016), suggesting that it may even reduce it for some students (Francis et al. 2017). Understanding how a move to attainment grouping plays out in Norway in this context is interesting for the insights it provides into teachers' roles in decision-making: there is no national guidance on the issue beyond the restrictions in the law, while educational policy grants a high degree of teacher autonomy through an emphasis on 'freedom of method' (Aasen, Prøitz, and Rye 2015) in terms of what to teach and how.

However, as Usma Wilches (2007) notes in his critical review of research on teacher autonomy, whether and how teachers exercise their autonomy is difficult to predict: they may reject, resist or reinterpret policy expectations, depending on complex relationships between multiple factors such as knowledge base, collegial relationships and school structures, and access to resources. The exercise of autonomy depends on agency, which goes beyond mere enactment of choices; rather, it encompasses the process of making choices (Cong-Lem 2021). Moreover, we argue that decision-making is a continual process and teachers' position in relation to the locus of autonomy will change. Thus, exploring the complexity of considerations about grouping and teachers' engagement with its inevitable dilemmas requires investigation of the nature of agency whether teachers are positioned as decision-makers or not, providing insights into both actual decision-making and the potential for decision-making on a complex issue, with implications for policy and practice in the exercise and support of teacher professionalism.

A question of values: teacher responses to grouping practice and policy

Grouping by attainment for raising achievement is a controversial issue; as Askew (2015) argues, grouping decisions speak to values: attainment grouping assumes that diversity is a hindrance, while mixed attainment classes embrace diversity (p. 129) in which teachers foster learning communities rather than attempt to cater to each individual (Davis and Simmt 2003). In mathematics, pressure towards grouping is arguably stronger than in other subjects, given the pervasiveness of fixed ability discourses (Sun 2018; Taylor et al. 2022) despite evidence that effort, rather than 'ability' affects attainment (Askew et al. 2010), and that rich, open-ended tasks enable broad participation which allows all students to engage in genuine collaboration (Askew 2015). The broader policy context is highly influential, however: Marks (2014) reported on an English primary school's process of 'educational triage' in which resources – such as stronger teachers - were directed towards those groups of

students judged to be most likely to benefit and hence to pass government performance thresholds in tests at the end of primary school. Lower-attaining students received 'reduced mathematics learning experiences' (p. 38) as a consequence and gained lower marks. Towers et al. (2020) found that teachers had professional and research-led concerns about negative impacts on students in lower attaining groups, but also felt driven towards attainment grouping by strong accountability pressures. In practice, though, there is considerable variation in modes of attainment grouping: Taylor et al.'s (2022) survey of schools in England identified a spectrum from 'soft' to 'hard' grouping, including schools which utilised largely mixed attainment grouping supplemented by lower-end nurture groups and/or high attainer groups.

Taylor et al. (2022) are at pains to point out that the major concern for both teachers and schools is that grouping practices should be beneficial for students. However, this tends to lead to an assumed need for attainment grouping driven by ability discourses (see also Marks 2014), coupled with concern over the perceived pedagogic demands of mixed attainment teaching. Thus Taylor et al. (2017) experienced difficulties in recruiting teachers to their project on best practice in mixed attainment, reporting that mathematics teachers were constrained by conservatism, concerns for accountability towards stakeholders, as well as doubts about their pedagogical preparedness, reinforced by a lack of materials and role models.

These findings highlight the complexity of teachers' decision-making about grouping and the nature of grouping practices within particular policy and historical contexts. In this paper we explore how teachers working in the context of 'freedom of method' and a historical emphasis on heterogeneous classes in Norway understand and exercise autonomy regarding grouping.

Theorising teacher autonomy and agency

Teacher autonomy speaks to 'a teacher's freedom to construct a personal pedagogy which entails a balance between personality, training, experience and the requirements of the specific educational context' (Hoyle and John 1995, 92). However, decisions are not made in a vacuum; they are subject to practical and organisational constraints such as timetabling, the availability of space and teachers, and established hierarchies within the school, and also more subjective constraints such as individual authority, expectations from others, and assumptions about educational 'value' (Helgøy and Homme 2007).

Educational values are particularly associated with the concept of teacher autonomy as a precondition for teachers' professional practice (Cribb and Gewirtz 2007; Usma Wilches 2007). In the context of our study we note therefore the paradox that, while policy grants Norwegian teachers high levels of autonomy, with the national curriculum giving scant indication of what content to teach and how (Sundby and Karseth 2021; Aasen, Prøitz, and Rye 2015), there is little attention paid to preparing them for the task: Larsen and colleagues' analysis of public policy documents found that they stress teacher development with a focus on learning outcomes rather than support for teachers' professionalism as deliberative activity (Larsen, Møller, and Jensen 2022). Furthermore, teacher autonomy can in fact increase personal costs to teachers (Cribb and Gewirtz 2007; Parker 2015): adding new tasks to already heavy workloads and delegating decisions to teachers that they may not feel suitably prepared for creates new needs for navigating the demands of autonomy (Bakken 2019; Mausethagen and Mølstad 2015). Locus of autonomy complicates the issue: there is a tension between individual and collective teacher autonomy (Cribb and Gewirtz 2007; Helgøy and Homme 2007; Hermansen 2017), while pressure from school leadership and teachers' perception that they have greater autonomy at classroom than at school level (Cribb and

Gewirtz 2007; Helgøy and Homme 2007; Salokangas and Wermke 2020) may diminish their opportunities to engage in decision-making (Parker 2015).

Of particular relevance for our context is the role of teacher collectives. In Norway, the curriculum reform of 2006 marked a policy shift from individual autonomy in the classroom to collective teacher deliberation and decision-making, yet this shift met resistance from teachers (Mausethagen and Mølstad 2015). On the one hand, well-functioning collectives can support teachers in exercising autonomy even in new, complex tasks (Priestley and Drew 2019), but on the other, teachers' collective autonomy limits that of individuals (Hermansen 2017; Parker 2015). Collective conclusions need not be unanimous, and therefore the ongoing process of decision-making is central. Thus, in addition to investigating who the decision makers are (locus of autonomy), we also need to explore teachers' sense of engaging agentically with the issues.

In a systematic review of research on teacher agency, Cong-Lem (2021) finds cumulative empirical evidence explaining it as a situated and developmental process where relational aspects play an important role. This is illustrated in Biesta et al.'s (2015) emphasis on agency as not situated within individuals but emerging from the interaction between actor and context. Thus, any understanding of action within a situation of autonomy needs to reflect this ecological perspective. Following Emirbayer and Mische (1998), Biesta et al. model the achievement of agency in terms of the interaction between the three dimensions of routine action, purpose or motivation, and judgement about the current situation. Applied to teacher agency as in Figure 1, these three temporal dimensions of past (routine), future (purpose) and present – where agency is exercised – are represented in Biesta et al.'s model. The iterational dimension (life and professional experiences) and the projective dimension (short and long-term perspectives) jointly feed into the practical-evaluative dimension of present decisions, highlighting the situational context, i.e. including cultural factors (e.g.

values, beliefs, discourses), social structures (e.g. roles, relationships, power, trust) and material factors (resources and the physical environment).

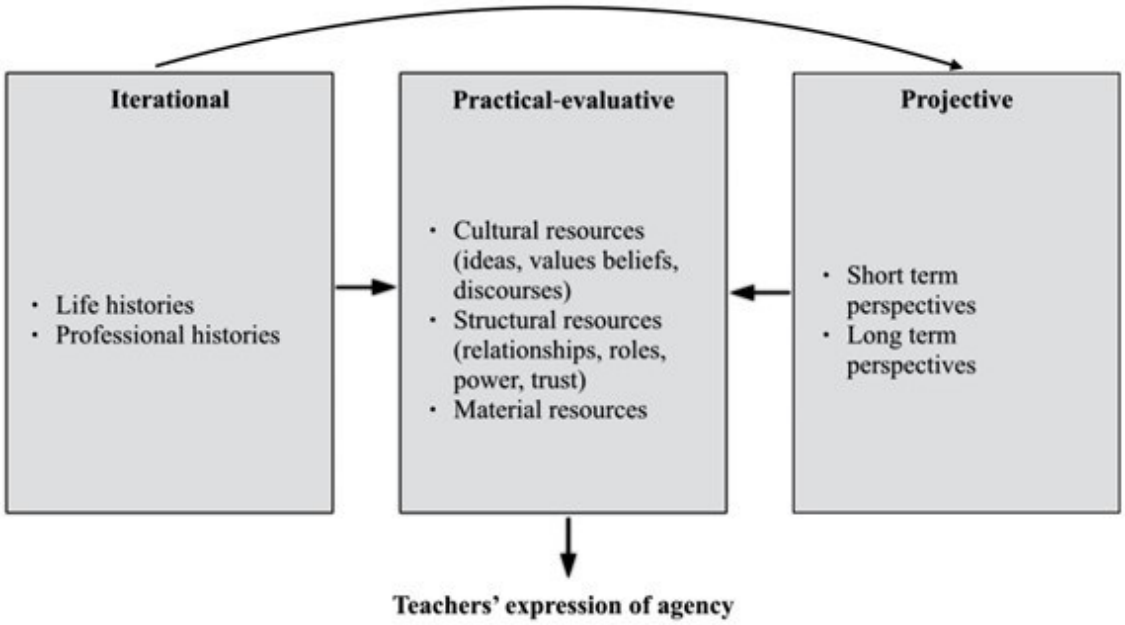

Figure 1: A model for understanding the achievement of agency, after Biesta et al. (2015, p. 627)

This model captures the exercise of agency in the absence of a unique solution to a dilemma, expressed not only through enactment (decision-making and its outcome) but also the weighing up of alternatives in a specific context. As noted above, the literature provides examples of teachers who do not exercise their autonomy. The reasons for this can be expressed in terms of Biesta et al.'s (2015) model of teacher agency, in relation to the iterational dimension (e.g. lacking professional knowledge), the practical-evaluative dimension (e.g. lack of time, the constraints of local culture of teacher collaboration) or the projective dimension (e.g. collision between the teachers' vision of equitable education and the consequences of enacting their autonomy).

This kind of analysis enables us to understand the nature of teacher agency within a situation of autonomy. It also highlights potential constraints on agency, and indicates what factors might support teachers to act autonomously in contexts such as the debate over

attainment grouping both in Norway – where it is emergent – and in other countries where it has become the norm. In this paper, we use Biesta et al.'s (2015) model to analyse interviews with thirteen Norwegian mathematics teachers, with the aim of understanding the exercise of agency in their reflections on grouping practices in both theory and practice, and relate this to their proximity to decision-making. Hence, our research questions seek first to establish the situation in which teachers are working with regard to grouping (RQ1) and their expressions of agency in considering grouping (RQ2):

RQ1 How does autonomy feature in teachers' accounts of grouping practices?

RQ2 How do teachers draw on the iterational (e.g. histories), projective (e.g. perspectives) and practical-evaluative (present discourses/relationships/resources) dimensions in explaining, justifying or challenging attainment grouping?

Methodology

We report on interview data collected from 13 mathematics teachers (ranging from 0 to 30 years of teaching experience) in two primary and four lower-secondary schools, as part of a larger study of mathematics teaching in Norway mapping the extent of grouping practices for adapted education nationally and exploring decision-making at municipal and school level (Norwegian Research Council, 2019). Focusing on schools located in and around the Oslo area to enable repeated visits, we aimed for variety in terms of demography, ethnicity (multicultural, ethnic) and size. We also aimed to ensure a range of grouping practices, based on school self-report. We gained ethics approval for this project from the Norwegian Centre for Research Data (NSD) and participants gave active and informed consent. Teachers and schools were given pseudonyms where the first letter of the school corresponds with its teachers (Ask School – Arne and Anita, Edel School – Eirik, Fredly School – Fred and Fride, Rogn School – Rune and Reidar, Syrin School – Samuel, Sindre and Sara, Nure school – Nina, Noah and Nils).

The semi-structured interviews were individual, except for a joint interview with Fred and Fride who co-teach; data from this joint interview will be flagged in the analysis. Each teacher was interviewed face to face 1-3 times, for 30 to 60 minutes, depending on their availability and the extent of classroom observations. The aim was to investigate teachers' views and experiences of giving all students opportunities to succeed and be challenged in mathematics. We asked about: their reflections on grouping practices; their views on how adapted and inclusive education should be approached; how they approached these ideas in their own teaching (what were their educational choices and actions); their reflections on what system-level factors may play a part in potential differences between what is desirable and what is done (what was their scope of action); and, their reflections on the nature of their pupils' experience in mathematics classrooms.

Initial analysis was carried out by the four Norwegian-speaking members of the team, who identified any passages which concerned grouping strategies (attainment grouping and mixed attainment) and accounts of any related decision-making, including arguments and theorising regarding benefits and disadvantages of the decisions made. We focussed on within-school attainment grouping that breaks up the normal mixed attainment class structure. Passages were translated into English by the authors, who include both native Norwegian and native English speakers, with the aim of capturing sense in plausible English rather than literal translation (e.g. metaphors were not translated literally where these would not make sense in English). Appropriate translations were extensively discussed between the authors.

To answer the first research question, 'How does autonomy feature in teachers' accounts of grouping practices?', we looked for references to how grouping practices in mathematics were decided (who the decision makers were, and what decision-making processes might be followed).

For the second research question, 'How do teachers draw on the iterational (e.g. histories), projective (e.g. perspectives) and practical-evaluative (present discourses/relationships/resources) dimensions in explaining, justifying or challenging attainment grouping?', we identified expressions of agency with respect to grouping practices, where agency "denotes a quality of the engagement of actors with temporal–relational contexts-for-action" (Biesta, Priestley, and Robinson 2015, 626). These episodes where the teachers reasoned about grouping practice were analysed on the basis of the concepts in Biesta et al.'s (2015) model (Figure 1), operationalised as in Table 1. This operationalisation enabled preliminary categorisation of passages which was checked and discussed among the authors as our analysis of the cases developed and we aimed to understand individual teacher narratives and, where relevant, their fit with colleagues in the same school.

Table 1. Operationalisation of dimensions in Biesta et al.'s (2015) model.

Dimension	**Operationalisation**
Iterational	References to: professional histories; experiences from other schools; own schooling/teacher education; knowledge base (e.g. research literature/theory they draw on)
Practical-evaluative	References to: beliefs, ideas, and values, in relation to existing discourses (e.g. on inclusion, adapted education, accountability, ability); school organisation/features (e.g. established structures of collaboration, judgements on colleagues' professional competence); available resources (e.g. timetabling issues, access to suitable tasks)
Projective	References to the role of grouping practice in long- and short-term personal aims (e.g. avoiding teaching tasks perceived as impossible, or aspiring to teach in certain ways) and educational aims (e.g. supporting students' success in tests, or positive self-concepts)

Findings

In what follows, we first report on teachers' accounts of who made decisions about grouping in their schools and the role of constraints, resources and pressure in what actually happened. We then turn to an analysis of the decision-making process, focusing on the dilemmas and discussions that teachers report, and the role of collective and individual deliberations.

Teacher autonomy in grouping practices

To understand teachers' perspectives on their autonomy with respect to grouping, we asked them about existing grouping practices in their schools. In all cases teaching was generally conducted in mixed-attainment classes (except for groups consisting exclusively of students formally identified as having special needs), but beyond that there was considerable variability in practice, as shown in Table 2. Our analysis examines the locus of autonomy (i.e. whom the teachers see as decision-makers) and what pressures (e.g. from the teachers' collective or the leadership) and constraints might be in operation in their particular context (e.g. organisational constraints).

Table 2. Types of groups.

Targeting some students	
Nurture groups	Small pull-out groups consisting of students perceived to need additional support
Special interest groups	Small pull-out groups consisting of students perceived to need additional challenge
Acceleration	One or more students perceived to need additional challenge in form of faster progression through the curriculum

Targeting all students	
Half-classes	Splitting up the class for increased teacher-student ratio
Self-selected groups	Occasionally splitting up the cohort, with students choosing what group to join. Groups could be formed by topic (e.g. revising fractions or probability), difficulty, type of mathematical practices (e.g. skills or problem-solving), etc.

Teachers reported considerable variability in group composition in relation to established classes (e.g. selection from one class, selection across grades), criteria for establishing groups (e.g. grades, compatibility), relation with normal school hours (substituting or supplementing regular whole class teaching), duration (of groups and their membership) and the extent to which students had opportunities to join their regular heterogeneous class for some mathematics lessons. Indeed, we found that schools did not necessarily have a common grouping practice: some teachers were aware of differences among colleagues (e.g. 'I don't do attainment grouping. [...] I know others do', Rune; 'the maths teacher is entirely free to decide', Reidar), while others did not know exactly what their colleagues did (e.g. 'I don't have an overview [of how teachers in other grades organise the [teaching] team]', Fred).

Teachers also reported a high degree of autonomy in how grouping practices were determined, often describing a collective decision among the mathematics teachers, e.g. for no attainment grouping at Syrin, or for ongoing mixed learning supplemented by small nurture groups (see Table 2) at each grade band as in Nure.

Occasionally teachers said that resources had an impact, sometimes as constraints on options for grouping ('classes cannot run in parallel when one teacher has two of them', Sara), and sometimes as enablers ('it's a way of using the extra resources [for a student with special

needs] effectively', Noah). School leadership played varied related roles. In some schools, they managed resources, creating potential constraints, but teachers nevertheless maintained autonomy; Fred attributed this fact to leaders' recognition of professional knowledge:

> We asked if we could use [for a special interest group] the one hour a week that we normally used for [teacher development courses] [...]. I think as a professional you have a bit of power when it comes to such things – we are talking here about mathematics [...]. So I think it helps to be a specialist teacher in that subject. (Fred)

In other schools, teachers reported that leaders limited teacher autonomy, making decisions they disagreed with. Anita was critical of Ask's self-advertising support for acceleration (see Table 2):

> I don't quite believe in it [...] How do we project this? 'We are doing well because we have a lot [of students] doing accelerated learning'. (Anita)

Although Anita felt unable to counter this practice, other teachers reported active resistance to pressure. Here, Eirik recalls how he cited research evidence in support of the teachers' experience-based views:

> [The principal] tried last year to get us to group by attainment [...] I started to search in the research literature [...] [What I found] was not very positive [...]. Also, our experiences with level grouping were negative, so they [the leadership] actually listened.

Teachers' collective handling of pressure was especially clear in Nils' account of a similar request for attainment grouping by the leadership at Nure. Treating with heavy sarcasm their idea that homogeneity would improve mathematics teaching, he relates how the mathematics teachers responded by creating an arbitrary number of groups (one group per available teacher, with no particular pedagogic rationale for the number) to test the idea. Ultimately, the trial was abandoned. Looking back on the experience, he dismisses the idea of extensive attainment grouping, but recognises that other teachers may reach different conclusions:

> I don't think it is anything revolutionary. And it's a bit stigmatising! [...] So I don't know [...] Other than that, I think the neighbouring school does it a lot and feel it works for them so... (Nils)

This situation speaks to a high level of teacher autonomy in grouping despite pressure from school leaders (and potentially parents, who, as noted by Arne, can exert pressure for their child to become part of a special interest group). It emphasises the extent and role of collective discussion and learning as teachers make decisions within this context. In the next section, we explore teachers' expressions of agency as they weigh up the alternative grouping solutions, real or imagined, structuring the analysis in two parts according to teachers' positions in relation to the locus of autonomy.

Expressions of teacher agency

In this section we draw on data from three of the six schools, chosen to capture the differences in teacher collectives between the situations – participation as decision-maker or not as a decision-maker (because of timing or status), as detailed in Figure 2. We apply Biesta et al.'s (2015) model to explore how case teachers envisaged and considered their alternatives, navigating their way through the interplay of the three (potentially competing) dimensions of agency. We establish what role the three dimensions of agency – the iterational, the practical-evaluative and the projective – play in teachers' exercise of agency in this situation of uncertainty. First we analyse cases of teachers who are at the locus of autonomy (upper row in Figure 2). Then, we proceed to cases that shed light on the agency of teachers outside of the locus of autonomy (lower row in Figure 2) in their collective (school or team level).

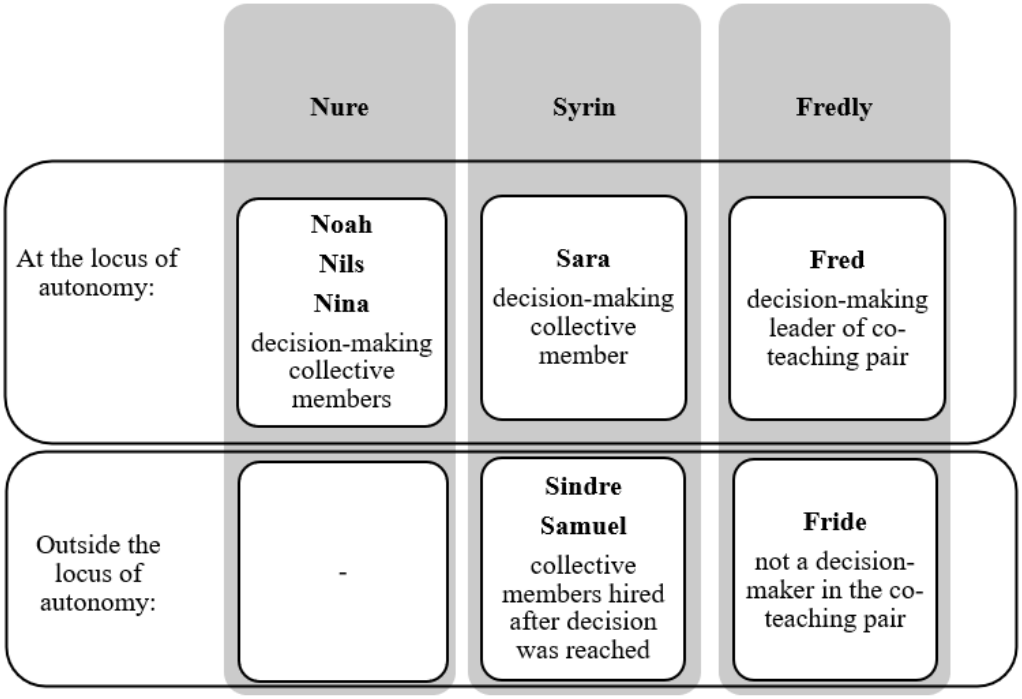

Figure 2: Different decision-making situations of teachers in three schools

Weighing up the alternatives: at the locus of autonomy

In this section, we will see that teachers who had been actively involved in decision-making collectively (e.g. at Nure) or individually (e.g. Fred) often described complex considerations, drawing on a range of experiences and discourses, and balancing between long-term aims, immediate priorities and the specifics of a shifting context. Their dilemmas illustrated the interplay of the iterational, projective and practical-evaluative dimensions in their uncertainty, but also the nuances that they saw and built on as they made decisions about grouping practice.

The Nure collective – Nina, Nils and Noah. At Nure, the teacher collective forms a tightly knit group: Nina, Nils and Noah each refer to the others' experiences, indicating how much they discuss their teaching. In this rural lower-secondary with results below the national average, the teachers are determined to hold on to mixed attainment classes, rejecting extensive attainment grouping on the basis of earlier experimentation (iterational dimension)

and concern for weaker students' self-concepts (projective dimension). However, they note that nurture groups had served a purpose in an experiment the previous year where 'a lot' of students with predicted grades of 1 (on a scale of 1 to 6 in end-of-school examinations) had been 'lifted to 2 and even 3' (Nils, iterational); this strategy is also seen as helping those who currently struggle (practical evaluative). Continuing to talk in terms of the practical evaluative dimension, the three teachers see low achievers as primarily hampered not by ability but by issues around motivation – Nils suggests that a cultural issue in Norway ('mathematics has a sort of negative status, [...] the level of ambition is pretty low, in society in general, among parents, among siblings') prevents students from doing well ('in maths, the distance between effort and results is very short! And this should be motivating'). This focus on motivation underpins their ongoing debate on how to achieve their aim of preparing students for life (projective dimension), as framed by Noah:

> It's about motivation. [...] They are in grade 10, right? They move on to upper secondary and they have to pass maths. If you [don't], you're stuck. It's a reality that will hit them in some years.

Recognising that their strategy does not always lead to similar results ('[Last year's nurture group] were "Go!" and had such momentum. [...] This year's don't', Noah), they debate how to maximise positive outcomes (practical-evaluative dimension). For Nina, this means insisting that other teachers select students for her nurture group carefully:

> I requested students who *want to* do well [...] It's a dilemma. I [...] insist on a group that functions, or else [...] they might as well stay in their classrooms as there'll be no added-value.

While all three agree that attainment grouping could help the lowest attainers, Nina and Noah's accounts of their own groups reveal very different justifications of how each nurture group does so. Noah's rationale concerns an aspiration for collaborative mathematics

(projective dimension):

> [We invite more students] to create some dynamic exchanges. [...] so when you have a discussion about mathematics there are more to contribute.

Nina's rationale for nurture groups rests on building motivation (projective) through robust relationships (practical-evaluative) between teacher and students ('it's very much about getting the chemistry right, getting to know them [...] It's about identity'). Questioning the ideal of collaborative classrooms (Noah's projective perspective), she draws on students' emotional responses (practical-evaluative dimension) to argue that the choice she gives them to collaborate or not ('I don't force anyone to sit together or to sit alone, [...][or] to present in front of the class') contributes to their willingness to participate.

The three teachers' accounts illustrate the extensive nature of their deliberation about their practice, and how their analysis of student needs varies even though they all pinpoint motivation as a key issue. Decisions on grouping are deliberate, made on the basis of a deep knowledge of their students considering not just attainment but also other variables which are harder to pinpoint and reconcile.

The Syrin collective - Sara. At Syrin, a high-achieving urban lower-secondary school, Sara comments on challenges and dilemmas connected to a collective decision to teach exclusively in mixed-attainment classes during regular school time. She reports that the collective (including her, but not Sindre and Samuel at the time) had discussed how this left them struggling to meet all needs in a diverse classroom (practical-evaluative dimension), as required by the policy of 'adapted education'. They had partially resolved this concern by introducing after-school sessions for grade 10 students in their final semester at Syrin, intended to work as self-selected groups (Table 1) with different levels of challenge. This student choice element was also present in the regular mixed classes where students could

choose homework at different levels of difficulty, and sometimes tasks in the lesson itself. However, Sara worries about the conflicts resulting from these decisions as she reflects on how her strategies in mixed attainment classes might be inequitable:

> The idea is to choose tasks where everyone can contribute. At their own level. I don't always manage that. They are encouraged to find slightly different methods, put them up [on the board] and talk, tell each other how they think. [...] And to feel safe asking questions – [but] it's actually mostly the best students who ask questions about the homework, rather than the weakest.

Sara reluctantly resigns herself to her sense that in her mixed attainment classes she neglects the weakest, 'but it's the reality in every Norwegian classroom, I imagine?'. She offsets this inevitability against the projected disadvantages of attainment grouping because these students 'don't have anything to aspire towards, don't get the explanations [from more knowledgeable classmates], don't get the help they would otherwise get'. In any event, she says, there is a logistic problem (five classes and only four teachers), and she is unsure about whether her (current) colleagues would want attainment grouping ('not all of us would be interested in this'). She seals this dismissal of the possibility by returning to her argument that inclusive (i.e. mixed) classrooms are needed to avoid losing student motivation (projective dimension) – '[the students] will easily slide into "oh well, this is where we are"'. But ultimately the decision appears to rest on what she feels she knows about her colleagues' teaching: even though she thinks she does adapted education 'poorly' because of high teacher-student ratios, she appears to lack confidence in how they would manage her students (practical-evaluative dimension) 'I am a bit afraid to give my students to someone else [...] [I wouldn't support grouping by attainment] as a general thing'.

Sara's reasoned justification of the decision on grouping practice at Syrin shows that, as in the case of Nure, the three dimensions cut across the dynamics of collective decision-

making. This complex interplay is also visible within the individual deliberations of Fred at Fredly.

Fred. An experienced teacher, Fred co-teaches with newly qualified Fride at Fredly, an inner-city primary school with a high proportion of students with a first language other than Norwegian. As his initial interview was with Fride (interview I1), we distinguish between it and two subsequent individual ones (interviews I2/I3). Whole-class mixed attainment teaching was Fred's (projective) ideal, while grouping via an after-school special interest group and nurture groups during the ordinary school day provided added value in the contextual setting (practical-evaluative dimension). Fred's aspiration is for all students to participate in collective mathematical activity (projective dimension) in mixed classrooms, despite the difficulties in a recent lesson:

> Everyone had a go and everyone contributed. And they got to talk mathematics with their learning pair – most of them at least. And they shared strategies. [...] We have a goal of dialogic teaching. We can't just discard that because we think that they aren't good at raising their hand and so on… You have to just stand your ground and be a bit stubborn. [...] Pick your battles. Otherwise everyone loses out. (I3)

Fred explains that he nevertheless needs nurture groups for his projective aim of addressing the needs of all students ('Having 28 students with enormous differences is an almost hopeless task. I appreciate the opportunity of a small group of weak students enormously.' I1). He reflects on the conflict between his observations from the classroom (practical-evaluative dimension) and his ideal of mixed classrooms based on rich tasks and dialogue (projective dimension):

> Even [with] a low threshold task, a good task that invites everyone in, you know [some] still won't be able to get in. It's often an issue of lacking language competencies. (I1)

To address these issues, Fred decided to pull out two nurture groups. One is taught for one

hour a week by Fride, with the brief of improving students' mathematical language so that they may participate more fully in regular classes (projective dimension). We discuss Fride's account of these lessons in the following section. In the other, Fred follows a type of 'Steiner pedagogy' with the weaker students, aiming to connect mathematical content to physical representations (practical-evaluative dimension).

Fred also runs a mixed-grade after-school special interest group that, like his regular classes, highlights mathematical discussions ('it is very dialogical', I1). Student enjoyment (projective dimension) is part of the overall rationale for providing this opportunity for those who are 'motivated, enthusiastic … with a certain mathematical depth' (I1). His inclusive aspirations (projective dimension) are apparent here too: membership is in principle limited to one semester to give more students the opportunity to participate, and teachers try to look for potential to benefit rather than prior achievement as a criterion for selection:

> Many wanted to join. And we had some students with behavioural [problems], that were a bit fed up with school but were given the chance and did very well. So that was great. A good way to end [primary school] for some of them. (I1)

Overall, though, Fred struggles to reconcile the discourse of adapted education – meeting the needs of each student – with the discourse of inclusion, which more closely reflects his professional (projective) vision of the classroom community. He frames this tension in terms of a clash between his overall aim for mathematics teaching and short-term accountability:

> Even if you are [...] anti testing regime [...], you have all these computational skills, they will be measured, parents will be informed [...]. And I think [...] our main goal is for the students to complete each year liking the subject, thinking it's fun. [...] But even that's not so easy when you have the tests [...] and that pressure. (...) But now the tests are over, and we can work on building [a community]. (I1)

Fred stands by his decision to use various forms of attainment grouping: although he realises this does not reflect his long-term perspective, he considers the groups to be highly

contextual and therefore subject to continuous evaluation. In the next section we turn to teachers who are not decision-makers, including Fride, the novice teacher with whom Fred co-teaches, to understand her interpretation of the shared context, informed by her experiences and aspirations.

Weighing up the alternatives: proximity to discussion

In the previous section we teased out the tensions voiced by the teachers who were decision-makers for the practices they enacted. Similar issues surfaced for teachers who stood outside the locus of autonomy when decisions were reached, but proximity to the discussion and experience appears to impact the richness of their arguments. In this section we explore the cases of three teachers who were not part of the decision-making process for the grouping practices they enacted (see Figure 2) in order to illustrate this observation.

The Syrin collective – Samuel and Sindre. At Syrin, Sindre and Samuel were hired after the teacher collective (which included Sara) had ruled out attainment grouping, Sindre having moved from another school, and Samuel being a new graduate teacher. Novice Samuel views the decision as final and a statement of principle. He rationalises it in terms of the overall policy goals of the Unitary school and adapted education, explaining that the teachers at Syrin 'seem to agree that [attainment grouping] is not a road we want to take' (a vicarious projective dimension in which his 'we' aligns him with the others' decisions). He connects this with practical-evaluative aspects both for and against the limitations of the law ('first of all, we are not allowed to do it over time') and his struggle with adapted education:

> Those who aren't so good in maths tend to get a bit more of my time (...) while stronger students are left to work on their own, although they should get just as much of my time. I find it very challenging.

Seeking some kind of resolution within the scope of his autonomy, he considers a particular

(limited) context for attainment grouping:

> Grouping by attainment at the end of a topic could challenge those who need it, while those who find it hard can revise. [...] I don't think it's right to do it for the whole of 8th, 9th or 10th grade [...]. It should be OK to struggle and be in the same group as successful students. It's about inclusion, as well.

His lack of experience and his distance from the discussions around attainment grouping at Syrin result in Samuel's arguments being quite limited, while – perhaps because of his junior position – he appears uneasy as he considers attainment grouping at all, even in such a constrained form. The issue of letting down the strongest students (practical-evaluative dimension) motivates him to look for a solution, but he recognises that it runs contrary to the original argument of inclusion (projective dimension).

By contrast, Sindre sees the discussion on attainment grouping as ongoing at Syrin, and in search of 'the optimal solution'. He exemplifies organisational pitfalls by reflecting on his experience from attainment grouping in another school (iterational dimension) and the inequitable impact of uneven group sizes where weaker students vastly outnumbered stronger but still had only one teacher. He believes that the detrimental impact of attainment grouping on weaker students' self-image and focus can be counteracted by providing them with greater individual support (projective dimension):

> Maybe the highest attainers got most out of it [...]. [The weakest group] easily identified themselves as stupid… they didn't manage to focus on what they were supposed to learn, there was a lot of chat and inefficiency. [...] When you group weak students together, you need more teacher resources.

In contradiction to his focus on individual learning and a high teacher-student ratio at least for the weakest, he puts forward a theory of collaborative learning without teacher guidance in attainment groups: 'a lecture model, [...] then split them in groups, they can go anywhere to solve a task together, then return and present a bit for each other'. However, this imagined

solution which he says results from recent discussions with some colleagues is limited to practical details – rather than educational aims – and it is constrained in the practical-evaluative dimensions:

> We have the resources we have [...] and it won't be optimal. And with the students we have now – I don't think they are ready for it. Maybe next year. We played around with the idea but put it on ice.

Unlike Samuel, Sindre imagines himself shaping future decisions on grouping practice at Syrin. Despite his conviction, not being party to the initial debate and missing out on confronting tensions and disagreements within the collective seems to detract from his exercise of agency in terms of articulating the projective dimensions at play.

Fride. Just three months into her first year of teaching, Fride co-teaches with Fred. She enacts his decisions on grouping, made before she joined the team: the two are together in all grade 5 mixed-attainment classes for many hours each week, and she is alone with the weekly language-focused nurture group. We distinguish here between statements in the joint interview with Fred (I1) and in her individual interview (I2).

Fride is focused on the discourse of adapted education (practical-evaluative dimension), voicing concerns about struggling students and the importance of collaboration in mixed attainment classes (projective dimension): 'if they manage to work well [with those sitting nearby], I think it would benefit the weakest, too.' (I1). She echoes here a set of shared principles for teaching (projective dimension) which the two jointly formulated, voiced here by Fred with Fride occasionally interjecting agreement:

> We want to focus on using learning pairs, on talking in whole-class segments – dialogic teaching [Fride: Mm] and a bit on type of tasks [Fride: Mm] but it's not a strict regime [Fride: No, no!]. (I1)

In her individual interview, Fride notes how Fred's teaching approaches support inclusion (projective dimension):

> I learn a lot from [teaching with Fred]. Because, in my own [school experience] there were a lot of algorithms and the like. And all these [informal methods], the rectangle method for multiplication, splitting up [factors] are new to me, we've never once met them during my teacher education! [...] The way [Fred teaches] is great because, as a student, you get a chance to engage in inquiry and [...] do it your own way. (I2)

However, although she is appreciative of Fred's teaching methods and critiques her teacher training, she goes on to say that struggling students need something else (practical-evaluative dimension):

> Often Fred is very fond of big problem-solving tasks, but these might leave the weakest out. [...] They have no strategies. [...] They don't even know where to start. (I2)

Consequently, her short-term aim for such students is fluency in basic skills as the gateway to inquiry (projective dimension), and this is in fact her focus in the nurture group:

> Many don't know [the multiplication tables]. So they should really be practising that. [...] In the [nurture] group we talked about needing to focus on the multiplication tables and try to make it a bit fun. [...] If you master it like this [snaps fingers] – then you feel more secure trying other things. (I2)

Despite her positive assessment of what nurture groups do for the students, Fride's personal discomfort in the mixed-attainment classes where Fred decides on the collaborative learning approach (practical-evaluative dimension) leads her to envisage an alternative organisational solution with her in charge of her own class:

> We could just divide the [mixed-attainment] class in two, and take half each. [...] Because, to be honest, when they collaborate there is a lot of noise – positive noise, but a lot of noise, I get a headache. (I2)

Fred and Fride clearly share the same concerns about enacting adapted education in large, mixed-attainment classes (practical-evaluative dimension). While Fred's decisions determine the organisational structure and suitability of nurture group goals and pathways to achieving them (projective dimension), Fride's experience of the inevitable tensions in the system seem to go unexplored, and she makes a bid for increased autonomy imagining alternative grouping solutions where she would be a decision-maker. Although she was able to articulate the differences in the projective dimension drawing on discussions with Fred, her inexperience (iterational dimension) seems to leave her unable to capitalise on this opportunity.

Discussion and implications

In this paper, we have explored issues of teacher autonomy and agency in relation to the issue of grouping practices in mathematics in Norway. Internationally, little is known about teachers' involvement in decisions on grouping practices, although some teacher autonomy is at least implicit in studies from elsewhere (Hunter, Hunter, and Anthony 2020; Taylor et al. 2017; Taylor et al. 2022). The Norwegian setting is to some degree unique, due to the emphasis on equality in its legal, political and cultural history (Welle-Strand and Tjeldvoll 2002) and the consequent legal limits on the use of attainment grouping together with the policy of adapted education which lays down a curriculum but is otherwise silent on how teachers should put this into practice. While the default practice for teachers in England is some version of grouping by attainment (Taylor et al. 2017; Taylor et al. 2022), for the participants in our study it was mixed attainment teaching. Even for those schools in Taylor et al.'s (2022) survey which fell towards the 'soft' end of the grouping spectrum with large numbers of students in mixed attainment groups supplemented by nurture or high attainment groups, grouping is the prevalent practice in the sector as a whole, particularly in

mathematics.

This very different history and circumstance enables new insights into teacher decision-making about grouping, particularly the role of collective expression, but also of different experiences. Hence our first research question asked 'How does autonomy feature in teachers' accounts of grouping practices?'. We found that teachers consistently placed themselves as the perceived locus of autonomy in their accounts of decision-making about grouping, even when under pressure from school leaders; they referred to both collective autonomy and individual autonomy, recognising the right of other teachers to argue for an alternative solution. That they consider alternatives to the traditional practice of exclusively mixed-attainment classes is particularly interesting given the evidence that teachers can feel burdened by - and reject - high-stakes decisions delegated to them if they do not feel suitably prepared to deal with these (Cribb and Gewirtz 2007; Mausethagen and Mølstad 2015).

As Larsen, Møller, and Jensen (2022) point out, policy documents in Norway do not support teacher professionalism as a deliberate practice, raising the question of how these teachers resource their decisions. Our second research question drew on Biesta et al.'s (2015) ecological notion of agency to expand on our understanding of these processes: 'How do teachers draw on the iterational (e.g. histories), projective (e.g. perspectives) and practical-evaluative (present discourses/relationships/resources) dimensions in explaining, justifying or challenging attainment grouping?'. Our findings indicate that, for many teachers, Norwegian tradition and policy translates into a perpetual uncertainty, as inclusive education runs counter to the idea of grouping by attainment as a principle while the goal of adapted education prevents attainment grouping from being ruled out entirely. Their accounts expressed ongoing dilemmas as they weighed up arguments for and against mixed attainment classes and attainment grouping in various forms. As we have seen, this was, for them, a highly sensitive arena in which they exercised agency in a complex interplay of experience,

long- and short-term perspectives, discourses of teaching and learning, and practical assessment of their context. Considering these debates about grouping practices provides an opportunity to explore the complicated relationship between the individual's autonomy and that of the individual within a collective (Helgøy and Homme 2007): within collectives, some teachers (more junior or recently hired) had less opportunity to shape decisions. We explored these distinctions and identified three main issues.

Firstly, there are qualitative differences in how teachers draw on various experiences, short- and long-term perspectives and the specifics of the shifting context, including a range of discourses and awareness of local practical constraints. For teachers who stand outside the locus of autonomy when collective decisions are reached, proximity to the discussion and experience appears to impact the richness and connectedness of their argument, and they appear less sensitive to the contradictions in their arguments than the decision-makers.

Secondly, across the board, teachers' arguments include contradictions and conflicts (e.g. between the pedagogical practices they want to enact and what is possible, between the potential for achievement and students' motivation), with those closest to decision-making articulating the struggle to reconcile these, and those farthest not noticing. Being conflicted meant that, even after reaching a decision, they continued to engage with a range of arguments as they responded to the particular circumstances they faced. In one sense, however, it appears that teachers were unable to live with the contradictions, or resolve them: they frequently reported that students were invited to choose after-school groups, the level they would work at, and whether or not to join nurture or groups and special interest groups.

Thirdly, our data from schools where the locus of teacher autonomy is collective indicates that agreement on grouping practices need not reflect similar reasoning. Differences between teachers who supported a collective decision stemmed not only from personal experiences and aims, but also from personal interpretation of the shared context (e.g. student

needs, potential teaching approaches, the school's educational goals). As arguments for or against certain grouping practices cumulated or diverged, they gave more depth to the discussion and anchored it in the specific context. These findings perhaps enlarge on Taylor et al.'s (2022) observation that some schools in their study grouped 'tactically' in response to perceived cohort needs. While they see the temporary year-by-year nature of such arrangements as negative, 'potentially removing the opportunity for teachers to adapt and improve their pedagogy appropriately' (p. 215), in the context of this study they indicated learning and considered decision-making.

These observations suggest several implications for practice and research. Our findings identify in Norwegian teachers' discourses the value they attach to diversity, evident both in their determination to preserve mixed attainment classes as the main grouping practice, and in their intention to implement pedagogical practices that Askew (2015) associates with such values: open tasks and opportunities for mathematical discussion. While this suggests that Norwegian teachers may be closer to the goal of inclusivity than teachers in countries where attainment grouping has been traditionally employed, such as England (Taylor et al. 2017) and New Zealand (Hunter, Hunter, and Anthony 2020), we observe that they need support moving forward. Specifically, there are big differences in how teachers articulate the value of such practices, ranging from what appears to be inclusivity in the sense of allowing for varied individual approaches, to inclusivity in the collective sense where these individual contributions come together into a whole, in the sense of learning communities (Askew 2015; Davis and Simmt 2003).

As these pedagogical practices feature in nearly every teacher's account, they speak to the partial success of teacher education programmes and professional development initiatives that promote such ideas; however, the next step in the development of inclusive classroom practices needs to attend to how teachers can bring diverse student contributions together.

Our use of Biesta et al.'s (2015) model reveals how making time for collective decision-making and for sustained discussion of the evidence including research and practical-evaluative assessment of their context as in Priestley and Drew's (2019) work on critical collaborative professional enquiry might enhance the value of teacher autonomy, enabling reflective engagement with ideas connected to each dimension (e.g. the educational aims of different colleagues, their interpretation of the context, their narratives of past experiences). In particular, we note that in our data, although when seen from the outside tensions appeared productive, they created some discomfort for the teachers involved and resulted in some strategies for avoidance, which would constrain teacher collaboration. While our findings support Hunter et al.'s (2020) argument for the importance of discussing tensions, we argue that critical collaborative inquiry enables ongoing assessment of pedagogical choices, particularly when resolution is not possible or compromise is uncomfortable, or where conflict and contradiction persists.

Finally, this study indicates the value of Biesta et al.'s (2015) model as a research tool for working with and among teachers and exploring the underlying mechanisms of what as Taylor et al. (2022) note is a more complex scenario than the dichotomy (attainment grouping or mixed attainment) many studies have assumed. It emphasises the value of the collective, and highlights the particular importance of smaller communities which allow participating teachers to be close to discussion and to engage with the concrete setting rather than decontextualized principles. As Priestley and Drew's (2019) professional development initiative demonstrated, it provides tools for exploring and understanding the collaborative process and informs the design of specific support for developing agency and capitalising on teacher autonomy. We argue here for the value of reporting in greater detail on teachers' decision-making as part of a more nuanced understanding of attainment grouping practices.

Declaration of Interest

The authors report there are no competing interests to declare.

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