Teacher professional learning and collaboration in secondary schools

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Chapter 4:
Different Learning Opportunities in School-based Teacher Collaboration

Abstract

Teacher collaboration in secondary schools can form a fruitful context for teacher professional learning. The aim of this study is to understand collaboration in teacher groups given their teacher characteristics and school context. Using a cross case design, we study different teacher groups in multiple contexts. The findings confirm results of other studies on teacher collaboration, which argue that short-term collaboration initiatives are depending on the prior existence of collaborative cultures. Deprivatization of practice provides opportunities to support professional learning in teacher groups, although more support is needed, especially when this is new to teachers.

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4.1 Introduction

Teacher collaboration is an important aspect of teachers' professional lives, as a means to continuously reflect on and improve the practice of teaching. In collaboration, teachers can, for example, share knowledge, critically reflect on teaching practices, provide collegial support or peer feedback, and collectively design teaching methods (Kelchtermans, 2006; Vangrieken et al., 2015). In current research, a clear picture of the learning potential of different forms of teacher collaboration is however lacking. According to Hargreaves and O'Connor (2017), existing forms of teacher collaboration in education mainly focus on conversation and exchange of ideas among teachers. The authors suggest that future forms of teacher collaboration should concentrate on teachers' joint work and collective sense of responsibility in order to improve their teaching practice. Moreover, Meirink et al. (2010) show that teacher teams typified by a strong link to teaching practice, were more effective in terms of changing their individual beliefs about teaching and learning compared to teacher teams typified by less intense forms of collaboration. Yet, other scholars (e.g. Doppenberg et al., 2012; van Gasse et al. 2016; van Gasse et al., 2017; van Waes et al., 2016) question whether forms of collaboration that are typified as joint work (Little, 1990) are more valuable to teachers' professional development and their teaching practice than less intense forms of collaboration, such as storytelling and aid and assistance. Possibly, the power of sharing experiences and ideas is underestimated, especially for teachers who have little experience with collegial collaboration or for teachers who lack particular pedagogical knowledge and skills. Hence, what works for one teacher in fostering his or her professional learning, might not work for another teacher. It could be argued that in recent research on teacher collaboration, teachers' context is not adequately addressed, an issue that already has been raised by several scholars (e.g. Horn, 2005; Opfer et al., 2011a; Runhaar et al., 2010). In order to meet this knowledge gap, we explore in this study how a short-term collaboration initiative, aimed at teacher professional learning, unfolds in different teacher groups, and how this collaboration can be understood from the characteristics of the teachers and the

school context the teachers work in. We do so by investigating multiple teacher groups from different schools.

4.2 Theoretical Framework

4.2.1 Teacher Professional Learning and Influencing Factors

Teacher learning is considered any ongoing work-related process that leads to a change of cognition or behavior (Zwart et al., 2008). From a situative perspective, the contexts and activities in which people learn become a fundamental part of what they learn (Borko, 2004, p. 7, quoting Greeno et al., 1996). Teacher learning is a dynamic, continuous process throughout teachers' careers, and is embedded in a range of contexts and activities, such as the classroom, professional development courses and workshops, conversations with students and parents, and in collaboration with colleagues (Pedder & Opfer, 2013). For teacher learning to be effective in the sense that it leads to improved teacher instructional practices and student learning, Opfer and Pedder (2011) distinguish three important features of learning activities in which teachers can participate. Learning activities should be: (1) intense and sustained; (2) embedded in teaching practice; and (3) collaborative and collective. Although learning activities that meet these features are potentially effective for teacher learning, focusing on specific activities in isolation from the teachers' context will provide us with an incomplete picture of teacher learning. Therefore, Opfer and Pedder (2011) propose a reconceptualization of teacher professional learning to expand the understanding of why and how teachers learn. In this conceptualization, the authors incorporate three reciprocal systems: the learning activity; the individual teachers; and the school. For teacher learning to occur and change in teaching practice to be sustainable, the activity should be aligned with the characteristics of individual teachers and the school (Opfer & Pedder, 2011).

School features relevant for teacher learning refer to cultural and structural supports that exist at the school level (Opfer & Pedder, 2011). In a recent study, Admiraal et al. (2016a) point to several school-level supports, such as an

open and collaborative culture, supportive leadership, and time and facilities to learn. Teacher characteristics entail prior knowledge, practices, experiences, and beliefs that they bring to their learning. The intersection of experiences and beliefs determines what teachers are willing to learn. When teachers engage in learning activities, their knowledge, experiences, and beliefs can change which subsequently determines their future participation in learning activities (Opfer & Pedder, 2011).

4.2.2 School-based Teacher Collaboration

Teacher collaboration in secondary schools can form a fruitful context for teacher professional learning. Several conceptions of teacher collaboration exist which relate to the content of teachers' conversations (e.g. Horn et al., 2017), the division of roles and responsibilities they adopt (e.g. Runhaar et al., 2014), community features that typify the teacher group (e.g. Sjoer & Meirink, 2016), and the extent to which teacher interactions are interdependent (Little, 1990). In this study, the latter operationalization is adopted which involves a continuum that varies from teachers being more independent to teachers being more interdependent. Within this continuum, four types of teacher collaboration are described: 1) storytelling and scanning for ideas; 2) aid and assistance; 3) sharing methods and materials; and 4) joint work. The first type, with weak levels of interdependence, is labelled *storytelling and scanning for ideas* which is recognized by occasional exchanges of experiences among colleagues. This type of interaction mostly takes place in the hallway or in the staff room with the aim of providing informational and social support. The second type is teacher interaction with the ready availability of mutual aid or help, named *aid and assistance*. In this type, teachers share ideas and give each other advice, mostly on specific teaching situations. Moderate levels of interdependence can be found in *sharing*. This third conception of teacher collaboration highlights sharing of materials and methods in which colleagues expose whole pattern choices with regard to the curriculum and instruction to each other. Teacher interaction with a high level of interdependence is labelled *joint work*. In this fourth type of collaboration, teachers feel a collective responsibility for the work of teaching.

Several studies investigated how teacher collaboration with different levels of interdependence is associated with teachers' learning opportunities (Doppenberg, et al., 2012; van Gasse et al., 2016; Imants, 2003; Meirink et al., 2010; van Waes et al., 2016). The results of the studies are however ambiguous. In other words, it remains unclear what the learning potential in different forms of collaboration consists of. The way teacher collaboration is adopted in recent studies might explain the ambiguous results. In developing the continuum of interdependence, Little (1990) was informed by collaborative cultures in schools. Yet, previous studies that adopted this framework did not do justice to its original meaning because they typified teachers' collaborative activities in terms of interdependence, in isolation from teachers' collaborative contexts in school (e.g. van Gasse et al., 2016; Meirink et al., 2010; van Waes et al., 2016). The continuum of interdependence is not meant to make judgements about teachers' competence or performance, but rather to examine the degree to which teachers influence each other's practice (Little, 1990). In other words, as van Waes et al. (2016) explain, there is no intended hierarchy among the different levels of interdependence. Interactions with low interdependence are similarly important for teacher development as highly interdependent interactions.

4.2.3 This Study

The context of the current study refers to pre-vocational teachers who meet in school to further develop their practice of differentiated teaching. Teachers who differentiate, design opportunities for each student to develop essential skills and knowledge, by adapting content (what students are expected to learn), process (how students are learning), and product (how student learning is assessed) to students' readiness, interest, and learning profile (Tomlinson, 2014; Tomlinson & Jarvis, 2009). Although differentiated teaching is a frequently studied topic and promising approaches have been developed, teachers struggle to implement these in daily teaching practices. Previous research has shown that teacher collaboration supports teachers' practice of differentiated teaching (de Neve & Devos, 2017; Hartwig & Schwabe, 2018).

In the present study, we aim to understand collaboration in teacher groups, given their teacher characteristics and the school context the teachers work in. Previous research has pointed to teacher characteristics regarding the content (e.g. Oude Grote Beverborg et al., 2015; Stanton et al., 2018) and the form (e.g. Opfer et al., 2011b; Tam, 2015b) of learning activities. For example, teachers have beliefs regarding teaching (content) and teacher learning activities (form). Because content and form characteristics are relevant for teachers´ engagement in learning activities, both are taken into account in this study. Yet, to understand learning, we must not only take into account characteristics of the individual teachers. Also, the social system in which teachers are participant is important, because the context in which teachers learn is a fundamental part of what they learn (Borko, 2004). In other words, the school context in which the learning takes place must be recognized. Using a cross case design, in which we study teacher groups from different schools, enables us to explore teacher learning across contexts. The main research question is: How is collaboration in teacher groups, as part of a short-term collaboration initiative, related to the teacher characteristics and school context of the groups? The following sub questions are formulated:

- How can teacher groups be characterized, in terms of teacher characteristics and school context?
- In what way does teacher collaboration in a short-term initiative, aimed at teacher professional learning, take place in teacher groups?

4.3 Methods

4.3.1 Sample

In this multiple case study, five teacher groups with a total of 20 teachers were examined. The teachers met to develop their differentiated teaching. The groups were situated in three pre-vocational secondary education schools in the Netherlands (Westside School, Panorama School, and Liberty School[9]). Dutch

[9] All school names are pseudonyms to maintain confidentiality.

secondary education is organized in three levels and pre-vocational education represents the lowest track and includes students between the ages of 12 and 16. The teachers were grouped by teaching discipline, distinguishing between Language Arts, Science, and Social Studies. At Westside School, teachers taught the same school subject as their group members. At Panorama School and Liberty School, teachers taught within the same discipline as their group members, but did not all teach the same school subject. The teachers of the five groups agreed to participate voluntarily in the research, for which they signed informed consent forms. Table 4.1 gives an overview of the demographic details of the teachers.

4.3.2 Procedure

Initial contact was made via email using existing school contacts of the university, and new, online available, school contacts. We opted for homogenous teacher groups in terms of school subject, aiming to support mutual understanding and involvement in the groups. Because school subjects were often represented by only one teacher per school, Panorama School and Liberty School informed us that they grouped the participating teachers based on teaching discipline, which aligned with formal structures in the schools.

A total of 90 teachers from six pre-vocational secondary education schools attended an introductory meeting where they completed a questionnaire on differentiated teaching, attended an expert presentation on differentiated teaching, and received information on the project guidelines. After this meeting, three schools were willing to participate in the project. By that time, the researchers were not yet involved with the schools in any form.

Six school-based group meetings of about two hours each were scheduled roughly once per month by the schools. In the end, groups A, B, and E met six times, group C met four times, and group D met five times. In line with Opfer and Pedder's (2011) recommendations on teacher professional learning, the following guidelines were provided:

- *Intense and sustained learning activities.* Teachers meet on a frequent basis to participate in learning activities such as peer-feedback and lesson design. The

Table 4.1
Teacher Demographics

Teacher	Age (in Years)	Gender	School Subject	Teaching Experience (in Years)	Working at School (in Years)	Amount of Meetings Present
			Westside School			
Group A						
Teacher A1	53	M	T and O	26	18	5
Teacher A2	49	F	T and O	17	16	6
Teacher A3	28	M	T and O	8	8	6
Group B						
Teacher B1	26	M	T and N	1	2	5
Teacher B2	29	M	T and N	5	5	6
Teacher B3	36	F	T and N	12	10	6
Teacher B4	48	M	T and N	17	12	5
			Panorama School			
Group C						
Teacher C1	39	F	French	17	16	4
Teacher C2	35	F	Dutch	9	6	3
Teacher C3	53	F	German	30	19	4
Teacher C4	31	F	English	1	1	3
Teacher C5	60	F	Dutch	14	14	4
Group D						
Teacher D1	41	F	Math	16	15	5
Teacher D2	24	M	Math	4	1	5
Teacher D3	31	M	Biology	3	3	5
Teacher D4	58	M	Math	30	29	5
			Liberty School			
Group E						
Teacher E1	52	F	Dutch	1	1	5
Teacher E2	61	M	German	33	1	6
Teacher E3	21	F	Dutch	5	0	5
Teacher E4	25	F	English	0	1	6

Note. T and O = Talent and Orientation; T and N = Talent and Nature.

teachers have access to an online data base on differentiated teaching, including hands-on tools and theoretical background information. Furthermore, expert input on differentiated teaching from the research team is available upon request.

- *Embedded in teaching practice*. Central to each meeting is the teaching practice of the teachers. The teachers determine the learning goal of the meetings themselves.
- *Collaborative and collective*. Teachers work on a collective learning goal and collaborate by for example sharing experiences and materials, discussing educational/pedagogical literature, and collegial observation. To support shared responsibility in the group, the role of moderator is rotated.

Opfer and Pedder (2011) furthermore stress that, in order to support teacher learning, the activity should be aligned with the characteristics of the teachers and the school context. To meet the diverse learning needs and school contexts of the teacher groups, and to support a sense of autonomy in the teacher groups, teachers were in control of which activities to undertake, which sources in the data base to consult, and what type of input regarding differentiated teaching to request from the research team.

4.3.3 Data Sources

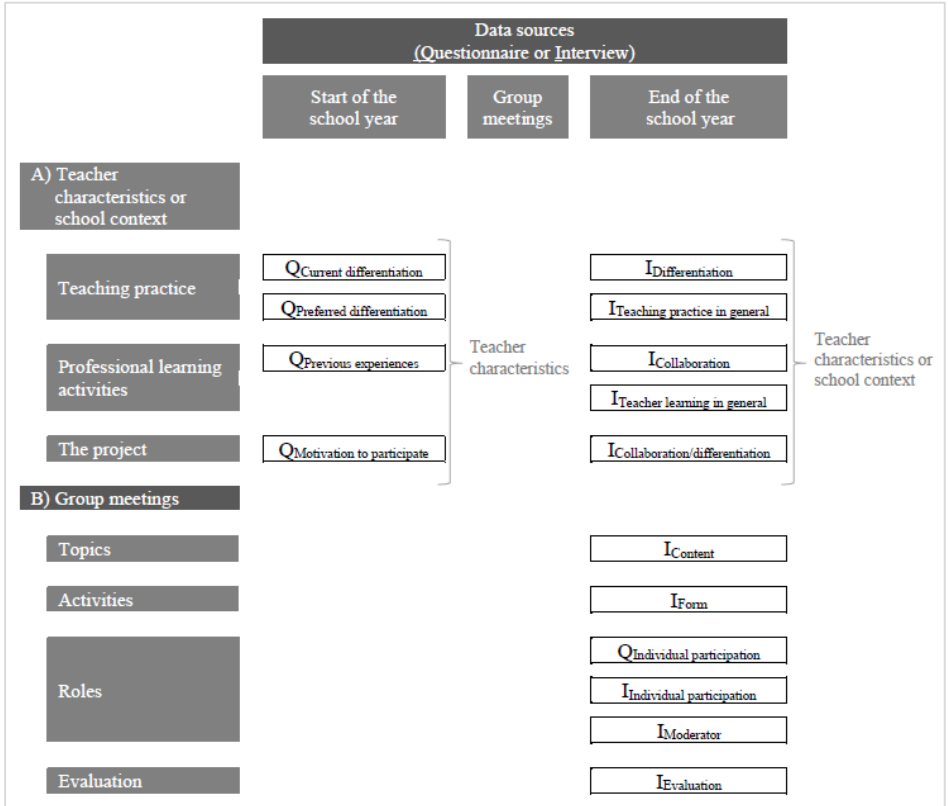
Teacher characteristics, school context, and the collaboration in the groups were measured using questionnaires and interviews. Based on previous research, characteristics relating to content (i.e. differentiated teaching) and form (i.e. professional learning) were both taken into account (e.g. Oude Grote Beverborg, et al., 2015; Tam, 2015b). An overview of the data sources and measured concepts is shown in Figure 4.1.

Prior to the Meetings

Hard-copy and online questionnaires were filled in by the teachers (N = 19) before the first teacher group meeting took place. Teacher B4 did not complete the questionnaire.

Current and preferred differentiated teaching. Current and preferred differentiated teaching were measured using a hard-copy questionnaire. This questionnaire, developed for the purpose of this study, was based on original scales from de Neve et al. (2015), and Roy et al. (2013). Teachers were asked to indicate to what extent a) each item was applicable to their current teaching practice, and b) whether they preferred to improve the particular item. Items were rated by the teachers using a five-point Likert scale ranging from *strongly disagree* that a/b (1) to *strongly agree* that a/b (5). The questionnaire consisted of three scales: differentiation in content (four items with Cronbach's α = 0.71 for current, and α = 0.85 for preferred); process (six items with α = 0.75 for current, and α = 0.87 for preferred); and product (five items with α = 0.78 for current, and

Figure 4.1
Visual Representation of the Data Sources and Measured Concepts



α = 0.83 for preferred). Example items are 'During my lessons, students work on assignments that vary in difficulty' (content), 'During my lessons, students work in their own pace' (process), and 'During my lessons, the assessment method varies between students' (product). Using all questionnaires filled in by teachers that attended the introductory meeting (N = 90), including data from the 20 teachers under study, the three-factor model was validated with the use of exploratory and confirmatory factor analysis in Mplus (CFI = .91; TLI = .89; RMSEA = .08).

Previous experiences with professional learning. Teachers' experiences with professional learning were measured using an adapted form of the TPD@Work survey (Evers et al., 2016) which is based on international literature and validated in the Dutch context. The TPD@Work survey measures secondary teachers' participation in professional development activities with six scales: 1) reflecting and asking for feedback; 2) keeping up-to-date: reading; 3) collaborating with colleagues with the aim of improving school development; 4) keeping up-to-date: participation in training related to work; 5) experimenting; and 6) collaborating with colleagues with the aim of improving lessons. For the purpose of this study one item from each scale was selected and reformulated to accurately represent the scale. For two scales we selected two items each because these items reflect different levels of teacher interdependence, and thus have distinctive contextual meaning, which is particularly relevant to this study. The original scale 'reflecting and asking for feedback' was split into 'reflecting on strengths and weaknesses' and 'inviting colleagues for lesson observation (in real life or and/or on video)'. The original scale 'collaborating with colleagues with the aim of improving lessons' was split into 'sharing teaching experiences with colleagues' and 'preparing lessons with colleagues'. In sum, our final measurement of teachers' previous experiences with professional learning resulted in eight items, including: 1) reflecting on strengths and weaknesses; 2) reading educational/pedagogical literature; 3) sharing teaching experiences with colleagues; 4) discussing educational improvement and innovation with colleagues; 5) attending teaching workshops with colleagues; 6) inviting colleagues for lesson observation (in real life or and/or on video); 7)

experimenting with teaching methods; and 8) preparing lessons with colleagues. Teachers were asked to indicate for each item how often they engaged in the particular learning activity using a five-point Likert scale ranging from *hardly ever* (1) to *very often* (5).

Motivation to participate. Motivation to participate was particularly important to this study due to the context in which it takes place. In the Netherlands, professional development is perceived as a professional duty, but not as a mandatory one (de Vries et al., 2013; Scheerens, 2010). Recent studies from the Netherlands show that teachers' reasons to engage in professional learning relate to autonomous motivation (Louws et al., 2017; Jansen in de Wal et al., 2014). In other words, teachers participate in learning activities because they find it interesting or important to learn themselves. Motivation to participate in the teacher group meetings was measured using an adapted form of the Academic Self-Regulation Scale (Vansteenkiste et al., 2009). The original questionnaire focuses on student learning and has been adapted by Jansen in de Wal et al. (2014), to measure teacher motivation regarding professional development in general. For the purpose of this study, the questionnaire of Jansen in de Wal et al. (2014) was slightly adapted to focus on the group meetings in particular. The questionnaire consisted of four scales: 1) external regulation; 2) introjected regulation; 3) identified regulation; and 4) intrinsic motivation. The questionnaire started with a general question 'Why do you participate in the meetings?' Example items following this general question are 'Because others (principal, colleagues, etcetera) force me to do it' (external regulation, $\alpha = 0.95$), 'Because I would feel guilty if I did not do it' (introjected regulation, $\alpha = 0.59$), 'Because that is an important choice for me personally' (identified regulation, $\alpha = 0.81$), and 'Because I like it' (intrinsic motivation, $\alpha = 0.85$). Items were rated by the teachers using a five-point Likert scale ranging from strongly disagree (1) to strongly agree (5). All scales consisted of four items each. Factor analysis was not conducted because factorial validity has been established in a previous study (Jansen in de Wal et al., 2014).

After the Meetings

Data on the group meetings were collected by means of a questionnaire (N = 20) that measured teachers' individual participation in the group meetings, and an individual interview (N = 16) in which the teachers reflected on the group meetings and shared self-perceptions, and perceptions of their group and/or school. Teachers A2, B3, B4, and E2 were not available for the interview due to scheduling restrictions, or because they did not respond to the researcher´s invitation.

Teachers' participation in the group meetings. In the questionnaire, the teachers indicated what kind of activities they undertook, including: 1) sharing teaching experiences; 2) sharing educational/pedagogical ideas; 3) advising each other; 4) sharing teaching materials; 5) visiting lessons; and 6) observing lessons on video. For each activity, two questions were answered, resulting in 12 questions. The first question concerned the teaching practice of the responding teacher. An example question is 'To what extent did you share experiences?' The second question concerned the teaching practice of the colleagues of the responding teacher, for example: 'To what extent did you listen to colleagues sharing experiences?' Questions were answered using a five-point Likert scale ranging from hardly ever (1) to very often (5).

Individual interviews. After the last group meeting, the teachers were invited for individual semi-structured interviews that lasted about 20 minutes. During the first part of the interview, the teachers shared with the interviewer what topics (i.e. content) were discussed, in what way (i.e. form) they collaborated during the meetings, and who moderated the meetings. During the second part of the interview, the teachers evaluated the group meetings and shared self-perceptions, and perceptions of their group and/or school, for which three prompts were used, including 'How did you experience the meetings', 'What did you learn from the meetings', and 'How do you collaborate as a group in general?' Follow-up questions were asked to further elicit answers to the questions. The interviews with teachers C3 and D1 were not recorded due to the teachers' objection. Therefore, notes were made by the interviewer during and immediately after the interviews, which were as detailed as possible.

4.3.4 Initial Data Analysis

The first stage of the analysis of the data included two steps. First, mean teacher scores from the questionnaire data (i.e. current differentiated teaching, preferred differentiated teaching, previous experiences with professional learning, motivation to participate, and participation in the group meetings) were computed. Second, the interviews were transcribed. The fragments were first assigned to the categories of a) teacher characteristics or school context, or b) group meetings (cf. Figure 4.1). Subsequently, the fragments were coded for which we used a data-driven approach. Thus, the concepts shown in Figure 4.1 emerged during the coding process.

The category of teacher characteristics or school context included five codes: 1) *collaboration* (e.g. a teacher explains that prior to the meetings, he/she only shared thoughts with colleagues when necessary; 2) *differentiation* (e.g. a teacher explains that differentiation is part of the school´s vision); 3) *teaching practice in general* (e.g. a teacher reports that he/she values teacher control); 4) *teacher learning in general* (e.g. a teacher points to a lack of school support for teacher learning); and 5) *collaboration/differentiation* (i.e. fragments relating to the project in general such as a teacher who explains that he/she had high expectations of the meetings). Fragments belonging to this category concern either a teacher characteristic or the school context, not both at the same time.

The category of group meetings included five codes: 1) *content* (what topic the teacher group elaborated on in the group meetings, such as experiences with student grouping or vision on differentiated assessment); 2) *form* (activities in the meetings, such as giving each other advice or designing teaching materials); 3) *evaluation* (how the teacher valued the meetings, such as instructive or uninformative); 4) *moderator* (who moderated the meetings, such as one group member or all group members); and 5) *individual participation* (what kind of role the teachers had in the meetings, such as a passive or active role).

4.3.5 Analyses Across Teacher Groups and Schools

In the second stage of the analysis, school descriptions and case descriptions of each teacher group were constructed. For the school descriptions, a summary

of interview fragments, relating to the teacher characteristics and school context of participating teacher groups within one school, was provided. For the case descriptions, first, a description of the *teacher characteristics* was provided, based on the data from the pre-questionnaires. Second, the *group meetings* were described using the interview fragments about the content, form and moderator of the group meetings, and the data from the post questionnaire about teachers' participation in the group meetings. Third, *reflections* were reported, which were based on interview fragments about the group meetings, individual participation, teacher characteristics and school context. For example, teachers reported to value the structured nature of the meetings and explained that previous meetings were less structured because they did not use an agenda.

To guarantee a valid interpretation of the data, an audit procedure (Akkerman et al., 2008) for the data of one school was conducted. In this procedure, the auditor (in our case the third author) assessed the quality of the analysis conducted, written results, and conclusions of the auditee (in this case the first author) in terms of three generic criteria: visibility, comprehensibly, and acceptability. In order to perform the audit, the auditee provided the auditor with the following audit trail: the original data, the processed data (e.g. coded interviews), a process document (i.e. a systematic report on the data analysis), and the written results. This audit procedure confirmed the quality of the analysis and did not lead to changes in the manuscript.

4.4 Results

An overview of teachers' current and preferred differentiated teaching, previous experiences with professional learning, and motivation to participate can be found in Table 4.2. Teachers' participation in the group meetings is shown in Table 4.3. Four typologies of participation are distinguished. Because the teachers generally scored low on the activities 'visiting lessons' and 'observing lessons on video', merely the activities of sharing experiences, sharing ideas, advising, and sharing materials were taken into account in the participation typologies.

Table 4.2

Current and Preferred Differentiated Teaching, Previous Experiences with Teacher Learning, and Motivation to Participate

	Differentiation						Previous Experiences with Teacher Learning								Motivation to Participate			
	Current			Preferred														
	CON	PROC	PROD	CON	PROC	PROD	REF	READ	SH	DIS	WORK	LO	EXP	PREP	ER	ITR	IDR	IM
Westside School																		
Group A																		
A1	**3.8**	**3.5**	3.2	**4.3**	**4.3**	**4**	**4**	3	**4**	**4**	**4**	**4**	3	3	*2*	*2*	3	**3.5**
A2	*2.5*	3	*1.6*	**4**	**4.3**	*1.8*	3	*2*	3	3	*2*	*2*	**4**	3	*2.3*	*1.3*	2.8	*2.5*
A3	3.3	**3.7**	**3.8**	**5**	**4.7**	**4.4**	**4**	*2*	**5**	**5**	**4**	**4**	**4**	**4**	*1*	*1*	**4.8**	2.8
Group B																		
B1	3	*2.3*	*2.2*	**4.5**	**4**	2.8	**5**	*2*	**4**	**4**	**5**	**4**	**4**	3	**3.5**	*1*	*2*	*1.3*
B2	*2*	**3.8**	**3.4**	**3.8**	**4.3**	**4.4**	3	**5**	**5**	**5**	**5**	3	**5**	**4**	*1*	*1*	**4**	**4.5**
B3	3	3.2	3.2	**4**	**4**	**4.5**	**4**	**4**	**5**	**4**	3	**4**	3	**4**	*2.5*	*1.5*	3.3	2.8
B4																		
Panorama School																		
Group C																		
C1	*1.8*	**3.5**	*1.8*	**4**	**4.2**	**3.6**	**4**	**4**	**4**	**4**	**4**	3	**4**	*2*	*1.3*	*2.3*	**4**	**3.8**
C2	**3.8**	2.8	*2.2*	*2.3*	2.7	*2*	**4**	3	**4**	**4**	**4**	*1*	3	*1*	**5**	*1.5*	2.8	*2.5*
C3	*1*	*1.7*	*2.2*	*1.5*	*2.3*	2.6	**4**	**4**	**4**	*2*	3	3	*2*	*2*	**4**	*2.5*	*2.3*	*2.5*
C4	**3.8**	**4.3**	*2.3*	**5**	**4**	3	**5**	**4**	**5**	**4**	3	**4**	**5**	*2*	**4.5**	*2.3*	2.8	2.8
C5	*1.7*	**3.5**	*2.2*	*1.8*	**3.7**	*2.2*	**4**	3	**4**	3	**4**	**4**	3	3	*2.5*	*1.5*	*2*	3
Group D																		
D1	*2.3*	*2*	*2.2*	2.8	*2.5*	*2.2*	3	3	3	3	**4**	*2*	*2*	*2*	**4.8**	*1*	3.3	*2.0*
D2	*2*	*1.3*	*1.8*	3	*2.3*	*2.2*	**4**	**4**	**5**	3	*2*	*2*	*2*	*1*	**3.5**	*1.5*	*2.3*	3
D3	*1.8*	2.8	*1.8*	2.8	**3.7**	*2*	**4**	**4**	3	3	3	3	**4**	*1*	3	*2.3*	**3.5**	*2.5*
D4	*1*	*2.3*	*2.6*	*1*	*1.7*	*1*	**4**	*1*	3	*1*	*2*	*1*	*1*	*1*	**5**	*1*	*1.3*	*1.5*
Liberty School																		
Group E																		
E1	*1.3*	*2.2*	*1.4*	**4.8**	**4.3**	**4**	**5**	3	**4**	3	**4**	3	**4**	*2*	**4**	*2.3*	3	**3.5**
E2	2.8	2.7	2.8	**3.8**	**4**	**3.8**	3	3	**4**	**4**	**4**	3	3	*1*	*1*	*1.5*	**3.5**	**3.8**
E3	*1.3*	*2.2*	*2*	**4**	3.3	2.8	**4**	*2*	**4**	*2*	*2*	**4**	**4**	*2*	*2.5*	*1.3*	3.3	*2.5*
E4	**4**	**4.3**	**3.4**	3.3	3.2	**3.6**	**5**	*1*	**4**	3	*2*	**4**	**4**	3	**5**	*1.5*	**3.5**	2.8

Note. CON = Content, PROC = Process, PROD = Product, REF = Reflecting on strengths and weaknesses, READ = Reading educational/pedagogical literature, SH = Sharing teaching experiences with colleagues, DIS = Discussing educational improvement and innovation with colleagues, WORK = Attending teaching workshops with colleagues, LO = Lesson observation (in real life and/or on video), EXP = Experimenting with teaching methods, PREP = Preparing lessons with colleagues, ER = External regulation, ITR = Introjected regulation, IDR = Identified regulation, IM = Intrinsic motivation. Items were rated by the teachers using a five-point Likert scale ranging from *strongly disagree/hardly ever* (1) to *strongly agree/very often* (5). Values below 2.5 and above 3.5 are reported in italics and bold, respectively. Data for teacher B4 is missing.

Table 4.3
Participation in Collaborative Activities and Participation Typology

Teacher	Sharing Experiences	Sharing Ideas	Advising	Sharing Materials	Participation Typology
			Westside School		
Group A					
Teacher A1	3–3	3–4	3–2	3–4	Fairly active
Teacher A2	3–3	2–4	2–2	4–3	Fairly active
Teacher A3	5–3	5–5	4–5	5–5	Active
Group B					
Teacher B1	5–4	4–4	5–4	5–2	Active
Teacher B2	3–4	4–4	4–3	4–3	Active
Teacher B3	4–4	3–3	4–3	3–2	Active except materials
Teacher B4	2–2	2–1.5	2–1.5	2–2	Passive
			Panorama School		
Group C					
Teacher C1	2–1	1–1	1–1	1–1	Passive
Teacher C2	3–4	4–4	4–3	2–1	Active except materials
Teacher C3	3–3	3–3	3–3	3–3	Fairly active
Teacher C4	4–3	4–4	4–4	1–1	Active except materials
Teacher C5	3–4	3–3	3–3	3–2	Fairly active
Group D					
Teacher D1	3–3	3–4	2–2	3–2	Fairly active
Teacher D2	4–5	4–5	3–3	3–1	Active
Teacher D3	4–4	4–4	3–3	2–3	Active
Teacher D4	2–4	5–5	4–2	2–1	Active except materials
			Liberty School		
Group E					
Teacher E1	2–3	1–3	2–2	2–1	Passive
Teacher E2	2–3	3–4	3–3	3–2	Fairly active
Teacher E3	4–4	4–4	4–4	2–4	Active
Teacher E4	5–4	4–4	2–4	3–3	Active

Note. The number preceding the dash ('–') refers to teachers' activities that concerned their own teaching practice. The number after the dash refers to teachers' activities that concerned their colleagues' teaching practice. Items were rated by the teachers using a five-point Likert scale ranging from *hardly ever* (1) to *very often* (5).

'Active' refers to teachers who perceived that they actively participated. 'Active, except materials' are teachers who perceived that they actively participated but did not share teaching materials. 'Fairly active' entails teachers who scored 4 or 5 on less than half of the items. 'Passive' entails teachers who perceived that they passively participated. A summary of the interview data about the group meetings can be found in Table 4.4.

4.4.1 Westside School

Westside School is a large school with 1750-2000 students that offers three levels of secondary education: pre-vocational, senior general, and pre-university. The teachers from Westside School describe a need to come together due to joint responsibilities, which originated from a drastic change in curriculum five years ago. Since then, students are offered the opportunity to take classes of a specific school subject at a higher level based on their ability, which can vary from subject to subject. Also, the formerly individual school subjects were combined into three disciplines (e.g. Talent and Nature). Within the teacher groups, the teachers teach the same school subject. Currently, the renewed curriculum is implemented and can be regarded as 'under construction', because some materials still need to be developed. The teachers explain that they often get together to discuss and collectively design the materials. Following Little's (1990) framework of interdependence, both teacher groups of Westside School suit the label 'sharing methods and materials', prior to the first meeting.

In the preliminary phase of the project the authors visited the school twice. The first exploratory meeting took place with the team leader. During the second meeting, involving the team leader and teacher A3, the aims and procedure of the project were further discussed. After the second meeting, the team leader and teacher A3 jointly agreed to participate in the project. The team leader assured us that all teachers were interested in participating in the short-term collaboration project.

Teacher Group A

Prior to the meetings. Teacher A1 and A3 reported overall moderate to

Table 4.4
Summarized Interview Data on Group Meetings per Teacher Group

Group	Content	Form	Moderator	Input	Reflections
			Westside School		
Group A	• Student autonomy • Assessment	• Planning • Advising • Developing vision and materials	All teachers	No input	• Positive reflections • Preference for continuation
Group B	• Teaching materials • Assessment	• Sharing knowledge • Redeveloping materials	Teacher B1	Once	• Positive reflections • Preference for continuation
			Panorama School		
Group C	• Teacher instruction	• Sharing experiences • Advising • Defining differentiated teaching	Teacher C1	Once	• Positive reflections • Continuation of collaboration is unclear • Need for more practical tools
Group D	• Teaching methods • Student differences	• Sharing experiences • Exploring visions • Experimenting	No teacher	Three times	• Negative reflections • No desire for continuation
			Liberty School		
Group E	• Teaching methods • Student differences	• Sharing experiences and knowledge • Brainstorming on lesson design	All teachers	No input	• Positive reflections • Continuation of collaboration is unclear • Need for more practical tools

high levels of current and preferred differentiation, engagement in various collaborative activities, and identified regulation. Compared to her group members, teacher A2 reported lower levels on these scales (see Table 4.2).

Group meetings. The teachers were mainly engaged in developing their vision of differentiated teaching and deciding on what teaching materials needed to be (re)developed. Also, but to a lesser extent, they provided each other with advice and redeveloped teaching materials. Frequently discussed topics related to student autonomy and assessment. The teacher groups alternated the role of moderator. No input on differentiated teaching was requested from the research team. The results from the post-questionnaire (see Table 4.3) show that the teachers participated in a (fairly) active manner.

Reflections. Teachers A1 and A3 explained that the meetings, as part of the short-term collaboration initiative, were in line with prior collaboration in the group. Yet, the teachers addressed three aspects which were different. First, a structured nature of the meetings was appointed. Previously, meetings were less structured, they lacked regularity and the use of an agenda. Second, the teachers from group A notified that they invested more time in substantive matters. Because they decided on their focus in the first meeting, they did not 'get bogged down into practical issues' (teacher A3)[10]. The teachers furthermore explained that the role of moderator, which was mentioned as a third aspect, contributed to shared leadership. Teacher A1 shared that he enjoyed 'summarizing things' for a change. Teacher A3 valued that 'for once, someone else is taking the lead,' as he normally takes the role of informal leader. Overall, the teachers shared positive reflections in the interview. In addition, teacher A3 shared his desire to continue this new type of collaboration.

Teacher Group B

Prior to the meetings. The teachers reported moderate to high levels of preferred differentiated teaching and teacher learning experiences. Regarding motivation, teacher B1 scored highest on external regulation, teacher B2 scored

[10] Quotations have been translated from Dutch and edited for length and legibility where applicable.

highest on identified regulation and intrinsic motivation, and teacher B3 scored highest on the identified regulation, although moderate (see Table 4.2).

Group meetings. This teacher group shared their knowledge, experiences, and teaching ideals, and (re)developed teaching materials. Central to the meetings were topics relating to assessment and teaching materials. Input on differentiated teaching was requested once, which was provided by email. Within this group, teachers' participation varied with teacher B1, B2, and B3 participating actively (except sharing materials), and teacher B4 participating in a passive manner (see Table 4.3). Teacher B1 moderated the meetings.

Reflections. Teachers B1 and B2 were positive about the meetings and teacher B2 described that 'It [the meetings] was not unusual, because normally we get together on a weekly basis'. One difference, however, related to the content of the meetings. Instead of focusing on organizational issues, the teachers adopted a meta-view by discussing future actions. Teacher B1 explained that 'because we participated in this project, we forced ourselves to make ideological choices, choices about what direction to take'. Teacher B2 shared future ideals for the group and stressed that lesson visits should take place more often, so that 'we are aware of what we actually do in class'.

4.4.2 Panorama School

Panorama School is a small school that provides pre-vocational secondary education to 300-350 students. The curriculum of Panorama School consists of individual school subjects which are taught on one level of secondary education. Teachers from the school describe their education as ´traditional´ or even ´old-fashioned´. Furthermore, they experience a lack of support (in time and facilities) to improve their teaching practice. At Panorama School, the teachers teach within the same discipline as their group members, but do not all teach the same school subject. The teachers explain that they do not necessarily get together on a regular basis. Following Little's (1990) framework of interdependence, the teacher groups suit the label 'storytelling and scanning for ideas'.

The research team met with the school leader twice to explore whether the project aims and procedures matched the school leader's needs and expectations. After these explorative meetings the school leader agreed to participate. At that moment, teachers' interest in participating in the short-term collaboration project was not yet verified by the school leader.

Teacher Group C

Prior to the meetings. The teachers reported, overall, to be frequently engaged in the learning activities reflection and sharing experiences (see Table 4.2). Regarding motivation, teacher C1 scored highest on identified regulation and intrinsic motivation, teachers C2, C3, and C4 scored highest on external regulation, and teacher C5 scored highest on intrinsic motivation, although moderate. Self-perceived current and preferred differentiated teaching show a variety between the teachers with teachers C2 and C3 having no desire for change.

Group meetings. The group meetings were dominated by sharing experiences and providing each other with advice. Furthermore, this teacher group took time to define differentiated teaching. Central to the meetings was the topic of teacher instruction. Input on differentiated teaching was requested once, which was provided by email. Teacher C1 moderated the meetings. The results from the post questionnaire (see Table 4.3) show a variety between teachers' participation with teacher C1 participating passively, teachers C2 and C4 participating in an active manner except sharing materials, and teachers C3 and C5 participating fairly active.

Reflections. Even though some teachers expressed their dissatisfaction since the meetings were 'implemented from top down' (teacher C4), all teachers were in general positive about the collaboration. In sum, the meetings supported collegial involvement, addressed their need to collaborate on 'other topics than just issues with students which is something that is lacking in education' (teacher C5), and contributed to their awareness:

> It is funny. Those people who were being stubborn at the beginning, who do not like change, they actually do a lot. [...] Some people, if they only hear the word [differentiation]. [. . .] While, when you share your experiences with them, it turns out they differentiate quite a lot. (teacher C1)

Teachers C2 and C5 explained to value the active role of beginning teacher C4, because she asked for clarification, explicit examples, and practical implications, from which the other teachers also profited. At the same time, teacher C5 pointed to the challenge that newcomers face when entering Panorama School:

> It is a closed community. I come from a work field that is open. Everything that was new was considered to be new knowledge, initially open and transparent. Here, you must fight your way into the school. There is always this mechanism present of proving yourself. (teacher C5)

Teachers' expectations of future collaboration were not straightforward. Teachers C1, C4, and C5 doubted whether the meetings would be continued, unless time would be facilitated by the schools and teachers 'really want it' (teacher C1) or 'more practical tools are made available' (teacher C4).

Teacher Group D

Prior to the meetings. Teacher group D was characterized by low levels of current differentiated teaching and low to moderate levels of preferred differentiated teaching, low to moderate levels of intrinsic motivation, and moderate to high levels of external regulation. The group reported infrequent engagement in the learning activities discussing educational issues, lesson observation, and experimenting. In contrast to his group members, teacher D3 reported high levels of preferred process differentiation and identified regulation (see Table 4.2).

Group meetings. This group shared experiences, explored each other's vision of differentiated teaching, set a learning goal, and went through a short cycle of experimentation, characterized by the topics related to teaching methods and student differences. Input on differentiated teaching was requested three times, which was provided by email and ranged from information on 'flipping the

classroom', to underachievement, to student motivation. In this teacher group, no teacher fulfilled the role of moderator, and teachers' participation varied between fairly active to active (see Table 4.3).

Reflections. No teacher fulfilled the role of moderator because this 'does not suit the way we are as a group' (teacher D3). During the post interviews, all teachers shared that they enjoyed the conversations but that the meetings did not add much for them and that their brief experiment with flipping the classroom confirmed their low expectations. During the interviews, the teachers gave comparable explanations. Teacher D4, for example, referred to the norms of practice in their school:

> Our school teaches in a traditional manner. If you want to try to [differentiate], soon you will end up... Look, our students should get used to it, differentiated teaching. They must get used to it, it is a culture. So, if your ideals are too high, if that is what you want, that is unrealistic. You should take small steps. (teacher D4)

Teacher D2 explained that they discussed 'whether it [differentiated teaching] suits our school, whether it suits us, and we concluded, no, it does not'. Also, teacher D3 shared this vision, stating that all the knowledge on differentiated teaching he gained during teacher training 'does not match the group'. In the future, they would probably not continue this form of collaboration, 'unless the others want it' (teacher D3).

4.4.3 Liberty School

Liberty School is a large school with 1750-2000 students that offers three levels of secondary education: pre-vocational, senior general, and pre-university. The curriculum of Liberty School consists of individual school subjects, which are taught on one level. Teachers from this school describe their teaching practices as ´traditional´. Furthermore, they explain experiencing a lack of support (in time and facilities) to improve their teaching practice. At Liberty School, the teachers teach within the same discipline as their group members, but do not all teach the same school subject. The teachers do not necessarily get together on a regular basis. Following Little's (1990) framework of interdependence, the teacher group suits the label 'storytelling and scanning for ideas'.

In the recruitment phase of the project, the research team visited the school twice to discuss mutual expectations; First with the department leader, team leader, and one (not participating) teacher, and second with all teachers. After that, the department leader assured us that all teachers were interested in participating in the project.

Teacher Group E

Prior to the meetings. The teachers reported moderate to high levels of preferred differentiated teaching. Also, they reported frequent engagement in the learning activities of reflecting, sharing experiences, lesson observation and experimenting. In contrast to the teacher group's interdependence described above, these results do not solely relate to their collaboration in the group, but refer to teachers' (individual) participation in professional development activities in general, both in and out of school, and can thus differ from the interdependence findings. The motivation types show a large variety between the teachers. Identified regulation was moderate to high for all teachers.

Group meetings. The meetings were dominated by sharing knowledge and experiences. Teacher E1 for example explained that they 'exchanged how everyone deals with it [differentiated teaching]'. This group also formulated learning goals and brainstormed on a lesson design. However, they did not experiment with the design in practice. Central to the meetings were topics relating to teaching methods and student differences. No input on differentiated teaching was requested from the research team. The teachers rotated the role of moderator. The results from the post questionnaire (see Table 4.3) show a variety between teachers' participation, varying from passive (teacher E1) to (fairly) active (teachers E2, E3, and E4).

Reflections. Teachers E1, E3, and E4 explained that the meetings supported collegial involvement and contributed to their awareness concerning their practice of differentiated teaching. Yet, teacher E4 also expressed her remaining confusion on what can or cannot be labelled differentiation. The teachers doubted whether the meetings would be continued. Teacher E1 mentioned a need for more practical tools to develop her practice of differentiated teaching. At the same, she pointed to a lack of time 'which hampers this learning anyway'.

4.4.4 Cross-case Analysis

Prior to the meetings, the collaboration in the teacher groups from Westside School was characterized by higher levels of interdependence than the collaboration in the teacher groups from Panorama School and Liberty School. Furthermore, teachers from Westside School and Liberty School were, overall, more willing to enhance their level of differentiated teaching than teachers from Panorama School. The teachers from group D (Panorama School) stand out because of their high level of external regulation and absence of willingness to change their teaching. The school context in which the teachers work may offer an explanation for these observed differences in interdependence, motivation to participate, and willingness to change. Teachers from Westside School pointed to their school's vision to develop new teaching materials due to recent educational innovations, in which differentiation became embedded in the curriculum and group members started teaching the same school subject. For this purpose, they collaborated regularly and shared a need to develop teaching materials, prior to the meetings. At Panorama School and Liberty School, on the other hand, teachers questioned the feasibility of differentiation, because they experienced a mismatch with their teacher centered education in school. Furthermore, these teachers were less familiar with collective lesson design in the group, and a common focus was less obvious because, in the groups, the teachers did not all teach the same school subject, compared to teachers from Westside School. In addition, teachers from Panorama School pointed to the top-down implementation of the project by their school leader which created some sense of reluctance, especially in teacher group D.

The group meetings, that took place in context of the short-term collaboration initiative, were in line with prior collaborative experiences in the groups. At Westside School, the group meetings were characterized with high levels of interdependence while teacher groups C, D, and E mostly shared experiences. Yet, there are no differences observed between teacher groups regarding teachers´ participation in the meetings, as teachers' participation varied in all groups. Overall, reflections of teacher groups A, B, C, and E were positive. Teachers from Westside School shared aspirations for follow-up while teachers

from groups C and E were in doubt regarding continuation and expressed a need for more practical tools. The reflections of teacher group D were, overall, negative, and aspirations for follow-up were not shared.

4.5 Discussion

Previous research has shown that a one-size-fits-all approach towards teacher professional development does not meet the variety in teachers' learning needs in schools, and above all it is inappropriate considering the fact that teachers value autonomy in their professional development and usually engage in learning activities when there is a strong motivation or interest to do so (Admiraal et al., 2016; Jansen in de Wal et al., 2014; Louws et al., 2017; Strong & Yoshida, 2014; Wermke & Höstfält, 2014). We assumed that teacher learning might work out differently for teacher groups, even for teacher groups from the same school. The present study therefore explored how collaboration in a teacher group, as part of a short-term collaboration initiative aimed at teacher learning, unfolds given their teacher characteristics and the school context the teachers work in.

4.5.1 Interdependence and Learning Potential

The findings indicate that both more and less intensive forms of collaboration can have learning potential for teachers, depending on participating teachers' needs and school context. The conversations held in groups A and B involved collective interpretations into the why of differentiated teaching such as developing a shared vision. The conversations held in the other groups (C, D, and E) involved what and how issues of differentiated teaching such as defining differentiation and exchanging experiences. Possibly, collaborative learning activities with higher levels of interdependence might enable (or force) 'deeper level' conversations. According to Horn et al. (2017), deeper level conversations support learning opportunities for teachers, which is not necessarily the case for what and how conversations, that dominate teachers' typical discourse in schools. Yet, our findings also show that deeper level conversations are not always accessible to

teachers or meet teachers' learning needs. For example, teachers from groups C and E benefited from thinking about what differentiation even looks like, in relation to what they and others are already doing. Thus, openness towards colleagues can be present in conversations held in groups with high levels of interdependence as well as in conversations held in groups with lower levels of interdependence. Openness in conversations, also referred to as 'deprivatization of practice' (Stoll et al., 2006), has been pointed as an underlying affordance for teacher professional learning (e.g. Admiraal et al., 2016). In line with van Waes et al. (2016), interactions with low interdependence can be similarly important for teacher learning as highly interdependent interactions.

4.5.2 School Context

Our study furthermore shows that teachers' school context is consequential for the type of collaborative activities that teachers engage in. Due to a shared vision towards differentiation, an educational structure in which teachers share responsibilities, and experiences with collaboration, the meetings in Westside School resulted in more interdependence than in Panorama School and Liberty School. These results confirm findings from Hargreaves and O'Connor (2017), that short-term collaboration initiatives are dependent on the prior existence of collaborative structures and cultures. At the same time, collaboration served as a tool to reflect on teaching practice in all groups, which is important to promote innovative practices into everyday school practices (Ioannidou-Koutselini & Patsalidou, 2015; Lomos et al., 2011; Vangrieken et al., 2015; Westheimer, 2008). Yet, in some cases teacher collaboration might enforce traditional views about teaching and student learning (Akiba et al., 2019; McLaughlin & Talbert, 2001). Despite their active participation and multiple requests for input, teacher group D did not prefer to enhance their differentiation and felt obliged to participate due to the top-down implementation of the project. Presumably, the high level of external regulation of the teachers inclined them to make multiple requests for input on various aspects of differentiated teaching and thus, in their opinion, meet others' (e.g. school leader, colleagues) expectations. In the end, they perceived the meetings as useless, their original views were enforced,

and the teachers did not share aspirations for continuation. Our study implies that in schools without a supportive culture, it is not the degree of teachers' active participation but teachers' perception of the short-term initiative and their willingness to participate that determines the initiative's impact on teacher learning and its sustainability.

At Westside School, differentiated teaching is advocated, teachers have joint teaching responsibilities, and norms of interaction are reflected by professional collaboration. Hence, the teachers have full insight in the subject matter of colleagues and experience autonomy, in the sense that change is within their power. This might explain why they do engage in the 'why conversations' and follow-up is rather self-evident. Teachers from Panorama School and Liberty School share different norms, that make follow-up unlikely. One teacher from Panorama School characterized her school as 'a closed community where you have to fight your way into' (teacher C5) and another Panorama teacher explains how 'differentiated teaching does not suit the school' (teacher D3). Staessens (1993) and Kelchtermans (2006) call this the notion of a 'family school', characterized by a pleasant informal culture, but that at the same time buffers attempts to change. The present study shows that both top-down implementation and too much autonomy with only limited support within a collaboration initiative can hamper teacher learning, or enforce teachers' existing views on education, which might limit teachers' openness to future professionalization. Especially in those cases where teachers are inexperienced collaborators and lack a supportive school environment (e.g. school leaders' supportive activities, a shared vision on teaching and learning), collaboration interventions have less chance to succeed when little (external) side-based support is available and the teachers rely heavily on the teacher groups' ability to innovate their practices from within.

4.6 Limitations and Recommendations for Future Research

The main limitation of this study is the use of pre and post measures only. Teachers bring past experiences and beliefs to the meetings. By participating in the meetings these experiences and beliefs change. Future research on teacher learning would benefit from situation-specific (e.g. meeting-bound) data that also includes teachers' context. Teacher learning logs for example would provide us with insight into how and why teachers develop over time, given a certain context. Another example of situation-specific data is observational data. Video recordings for example can be very suitable to shed light on learning opportunities in teacher groups by identifying how teaching concepts are communicated and what their implications for teachers' future action are (Horn et al., 2017).

In addition to situation-specific data, it would be worthwhile to further investigate support for teacher learning at the level of the school, for example by including the school leader's perspective on teacher learning. Teachers in our study mentioned the school leader's vision and the lack of facilities as hindering factors in their professional learning. It is critical to consider the role of the school leader, to have a more complete picture of how teacher collaboration stimulates teacher learning (Withworth & Chiu, 2015).

A third recommendation relates to the context in which the study is conducted. The most intensive form of collaboration that took place in the teacher groups was collective design of teaching materials. More intense forms of collaboration such as collegial observation require activities outside the planned meetings such as visiting colleagues' lessons or recording and preparing video clips to share within a meeting. This can be challenging, due to teachers' full work schedules. Furthermore, teachers should feel safe in a group to be able to share visible records of activity in their own classroom. Combining these factors creates a threshold that teachers in this study could not or did not want to cross. In future research it would be worthwhile to investigate whether our findings hold in a context where even more intense forms of collaboration take place, such as collegial observation. To make this possible,

teachers need both organizational (e.g. flexible scheduling or co-teaching) and emotional (e.g. creating trust) support. For example, school leaders can exert (indirect) influence through Human Resource Management (HRM) policies and governance strategies (e.g. work scheduling, arranging rooms, facilitating – virtual – interaction between teachers), which can offer teachers opportunities to share and collaborate (Admiraal et al., 2016).

Another limitation is the missing data of 4 teachers, for which reasons were not always clear. In some cases, missing data were due to scheduling restrictions that inhibited teachers' participation in the interviews. In other cases, teachers did not respond to the researcher's invitation.

4.7 Implications for Practice

Given that teacher groups are situated in different school contexts, and that they are heterogeneous in terms of teacher characteristics, such as motivation and preferences for improvement, implications point to effective alignment between teacher characteristics, school context, and intended learning activities. One general implication for teacher groups is to discuss teacher characteristics. In schools, teachers possess more knowledge and experiences than often known by teacher colleagues or is made use of. Furthermore, attention should be paid to teachers' motivation. Recognizing the diversity in teachers' learning goals by school leaders and other facilitators of teacher learning can help to motivate teachers to continuously develop their teaching practice (Louws et al., 2018). A way to arouse teachers' interest is to commence teacher meetings with an orientation phase in which the central concept is collaboratively explored, without imposing any demands for teacher change immediately.

Implications also point to stimulating collegial observation in teacher groups. Our findings show that the teacher groups did not, or hardly ever, engage in this type of collaborative activity. As pointed out by Little (2003), collegial observations are essential to teacher learning because they reflect specificity and completeness in what teachers share with their colleagues. Our findings imply

that, in schools where a collaborative culture already exists, collegial observations may serve as a window into colleagues' implementation of a collectively developed curriculum, as this step was not incorporated in the teachers' learning process in our sample. The exchange of artefacts of practice such as lesson plans or materials does not do justice to the complex nature of classroom interactions (Little, 2003). Yet, this does not imply that teachers do not learn from sharing experiences or that forcing teachers to engage in collegial observation is the way to go; depending on the context of teachers both learning activities are equally important and can co-exist, although this does not happen spontaneously. At schools where a culture of professional collaboration is not already unfolding, short-term collaboration initiatives should be implemented carefully because it can actually complicate the process of teacher learning. Among other things, ensuring safety and creating trust within teacher groups is important. A possible route for teacher groups that are relatively new to professional collaboration is collective reflection on the teaching practice of others, before teachers share observations of their own teaching practice (e.g. Borko et al., 2008). Also, our study stresses the need for (hands-on) support in the process of reflection and to take small steps. Namely, teachers found it difficult to assess whether their teaching practice could be typified as differentiated and how this practice could be improved.

In sum, our study shows that creating valuable learning opportunities is neither simply a matter of providing the right form of learning activities nor stimulating bottom-up teacher learning initiatives. Besides teacher support in reflecting on teaching practices, we also recommend teacher support in reflecting on the process of collaboration. This matches previous research from Sjoer & Meirink (2016) who suggest that it is necessary to educate teachers in how to collaborate with colleagues, and how this can contribute to their own learning.