Teacher professional learning through Lesson Study
Schipper, Tijmen Michiel

DOI:
10.33612/diss.98636764

IMPORTANT NOTE: You are advised to consult the publisher's version (publisher's PDF) if you wish to cite from it. Please check the document version below.

Document Version
Publisher's PDF, also known as Version of record

Publication date:
2019

Link to publication in University of Groningen/UMCG research database

Citation for published version (APA):

Copyright
Other than for strictly personal use, it is not permitted to download or to forward/distribute the text or part of it without the consent of the author(s) and/or copyright holder(s), unless the work is under an open content license (like Creative Commons).

Take-down policy
If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

Downloaded from the University of Groningen/UMCG research database (Pure): http://www.rug.nl/research/portal. For technical reasons the number of authors shown on this cover page is limited to 10 maximum.
GENERAL CONCLUSION AND DISCUSSION

“It directs attention away from simplistic thinking about solutions in terms of ‘What works?’ toward a more realistic appraisal of ‘What works, for whom, and under what set of conditions?’”

(Bryk, Gomez, Grunow, & LeMahieu, 2015, p. 13-14)
Chapter 6
1. Introduction

The empirical studies in this dissertation were based on the premise that teachers often struggle with addressing students’ diverse educational needs (Suprayogi, Valcke, & Godwin, 2017), partly as a result of the increasingly diverse student population in mainstream secondary education (Roy, Guay, & Valois, 2013; UNESCO, 2017). These struggles of teachers often seem to be associated with feelings of incompetence (Dixon, Yssel, McConnell, & Hardin, 2014; Tschannen-Moran & Woolfolk Hoy, 2007). To counteract this, the professional development approach Lesson Study (LS) is believed to address both these struggles and feelings of incompetence (Puchner & Taylor, 2006; Xu & Pedder, 2015) due to the incorporation of effective features such as being collaborative and classroom-based (Desimone, 2009), as well as having an explicit focus on student learning (Dudley, 2013). As this form of professional development is situated in the school context comprising a certain school culture (Avalos, 2011) and a variable set of school conditions (Tynjälä, 2008; Van Driel, Meirink, Van Veen, & Zwart, 2012), this context is believed to be essential as it may influence the quality of teacher learning (Louws, Meirink, Van Veen, & Van Driel, 2017). Reciprocally, implementing LS practices may influence the school context in turn (Hadfield & Jopling, 2016; Lee Bae, Hayes, Seitz, O’Connor, & DiStefano, 2016) as these practices may strengthen professional (learning) communities (Chichibu & Kihara, 2013; Lewis, Perry, & Hurd, 2009). This line of reasoning led to the following central research question guiding this dissertation:

To what extent does participation in Lesson Study influence teachers’ adaptive teaching competence, their self-efficacy beliefs, and the professional school culture, and, which school organizational conditions affect participation in Lesson Study?

In order to answer this research question, this concluding chapter provides the main findings of each separate study followed by the general, overarching conclusions. It subsequently presents a critical reflection addressing the limitations and methodological considerations, and concludes with the scientific contribution of this dissertation as well as practical implications for various stakeholders.

2. Summary of the main findings

2.1. First study (chapter 2)

The first qualitative, explorative study of this dissertation focused on two elements of the general research question. First, it examined to what extent participation in LS
enhanced teachers’ adaptive teaching competence in terms of their knowledge, beliefs and attitudes about students’ educational needs, and how teachers addressed (or tried to address) these needs in daily practice as a result of LS. Secondly, it examined which structural and cultural elements in the school context played a role in promoting or hindering teachers’ professional growth. The findings reveal that participation in LS did impact teachers’ professional growth. Teachers reported increased awareness of their students’ educational needs and argued that their beliefs and attitudes about adaptive teaching practices had changed. They also reported that, as a result of LS, they began to adapt their teaching to students’ educational needs more intentionally, either incidentally or structurally. Three key contributors in LS were distinguished that particularly enhanced teachers’ professional growth in terms of adaptive teaching competence: (1) the explicit focus on student learning, (2) the ample opportunities for collaborative professional experimentation, and (3) the guiding role of the LS facilitator.

This study also confirmed the importance of the school context in carrying out LS. Various cultural and structural school conditions were distinguished that could either promote or hinder teacher professional learning. Particularly the support of school leaders, learning from each other and shared feelings of responsibility (cultural conditions), as well the allocated time teachers received to participate in LS (structural condition), were reported as essential in promoting LS practices.

2.2. Second study (chapter 3)
The second study focused on the influence of participating in LS on teachers’ self-efficacy beliefs, their adaptive teaching behavior (as an element of adaptive teaching competence), and the relationship between these constructs. A quasi-experimental mixed methods design was used to determine this. The results show that teachers’ efficacy beliefs in student engagement increased as a result of participating in LS. Based on these results it can be argued that teachers who participate in LS feel more capable to engage a diverse group of students in their lessons. In addition, teachers who participated in LS also felt more capable to use various strategies in their instruction after their engagement in LS.

Focusing on teachers’ observed behavior, it turns out that teachers who participated in LS did not seem to become more adaptive in their teaching. However, participation in LS did affect teachers’ efficient classroom management behavior and their clarity of instruction. The results of the stimulated recall interviews, on the other hand, indicate that teachers who participated in LS expressed that they had become more aware of differences in students’ educational needs. These teachers’ also argued that LS enabled them to experiment with adaptive teaching material and instructional strategies to make their lessons more meaningful to all their students.
This study also showed that teachers’ self-efficacy beliefs seem to be associated with adaptive teaching behavior. Without having information about causality, this would imply that if teachers feel more capable to execute certain teaching behavior, they also tend to show more adaptive teaching behavior and vice versa.

2.3. Third study (chapter 4)
Where the previous study used a more broad and explorative scope, the third study in this dissertation focused on adaptive teaching competence in more detail. Specifically, this study examined teachers’ intentions and perceptions toward their adaptive teaching practices as well as their adaptive teaching behavior. Consistent with the study in the previous chapter, a quasi-experimental mixed methods design was deployed to address this. The results showed that teachers who participated in LS pointed to the important role LS played in influencing their perceptions in terms of becoming more aware of students’ educational needs and how they subsequently addressed (or tried to address) these needs. They highly valued the explicit focus on students’ educational needs, mostly through working with ‘case pupils’ and the ample opportunities to experiment with new teaching elements. Moreover, these teachers reported structural changes in their critical stance and their adaptive teaching behavior.

Despite differences in teachers’ perceptions toward their adaptive teaching practices, participation in LS did not seem to influence teachers’ observed adaptive teaching behavior. This is remarkable given the changes in teachers’ perceptions toward their adaptive teaching practices as a result of participating in LS. This may be explained by the fact that teachers in both groups defined and described adaptive teaching in a variety of ways, giving notion of the complexity of this construct. Another reason could be that teachers who did not participate in LS showed more adaptive teaching behavior after the intervention period. It is unclear what caused this.

2.4. Fourth study (chapter 5)
The last empirical study in this dissertation focused on two elements of the general research question. Firstly, it examined to what extent participation in LS influenced the professional school culture and its school conditions. Secondly, it examined the influence of participating in LS on teachers’ self-efficacy beliefs, consistent with the second empirical study in chapter 3. Given a potential link between these beliefs and perceptions of the school context, the relationship between these constructs was also examined. A quasi-experimental design including 60 teachers was deployed to answer these questions.

The findings revealed that participation in LS did not affect the professional school culture after one year of participation in LS. It was argued that more time was needed to
establish changes in the professional school culture. However, teachers who participated in LS did report increased levels of teacher autonomy and support from the school department leader. It was argued that LS may enable feelings of autonomy due to the experienced freedom in LS to formulate research questions that are closely related to teachers’ daily practice. School department leaders seem to become more involved in LS practices, possibly because of their close proximity to the teachers participating in LS.

Consistent with the second empirical study in this dissertation (chapter 3), this study also showed that participation in LS influenced teachers’ self-efficacy beliefs, in particular efficacy beliefs in terms of student engagement. However, this study did not reveal any relationship between teachers’ self-efficacy beliefs and their perceptions of the professional school culture. Therefore, this study confirms earlier notions in literature showing that changing the school culture is difficult and may need more time (Cochran-Smith & Lytle, 2001).

3. General conclusion

The results of the four empirical studies presented in this dissertation allow for answering the general research question. The various perspectives used in the studies provide evidence to assert that participating in LS enables teachers to become (more) aware of students’ educational needs and (more) capable in how to address these needs. Moreover, clear evidence was found that participation in LS improves teachers’ self-efficacy beliefs. However, it remains unclear whether being engaged in LS results in structural changes in adaptive teaching behavior and perceptions of the school context. This may be caused by the complexity of how to define and measure adaptive teaching as well as the duration of the intervention (Desimone & Stuckey, 2014). The main conclusions can be organized around the three concepts that are central in the general research question.

3.1. Adaptive teaching competence

A central focus in this dissertation was concerned with how participating in LS could support teachers in increasingly diverse, and hence complex, classroom environments. In terms of adaptive teaching competence, a distinction was made between beliefs and knowledge about students’ educational needs and how to address these needs, as well as adaptive teaching behavior in the classroom context. In all four studies, clear evidence is presented showing that LS has the potential to change teachers’ beliefs, either self-efficacy beliefs or more general beliefs about student’s educational needs and how to address these needs. A consistent picture arose in the interviews that took
place in the first three empirical studies. Teachers who participated in LS became more aware of differences between students’ educational needs (learning needs in particular) as a result of the explicit focus on student learning in the LS meetings (pre- and post-lesson discussions), and the classroom observations as part of the research lessons they conducted. Moreover, teachers also reported notions of gaining an adaptive mindset (Corno, 2008) as they began to perceive differences between students as an opportunity instead of an obstacle.

Evidence of gained knowledge about students and their learning was also found in the interviews with teachers. Some teachers gave clear examples of what they learned about students’ different learning preferences, abilities, motivation, and backgrounds as a result of participating in LS. In some instances this led to a self-reported increase in pedagogical content knowledge (Shulman, 1986) in terms of what content teachers would use to address all these differences and how they would subsequently teach it.

In terms of analyzing teachers’ adaptive teaching competence, Clarke and Hollingsworth’s (2002) model proved useful in capturing teacher professional growth. However, in the context of LS it was argued that, due to the interchangeability of activities in the External Domain and the Domain of Practice, LS should not be perceived as an external professional development activity. As a result, an adapted conceptual framework was proposed combining these two domains into a LS domain.

Furthermore, much attention was paid to examining the influence of participating in LS on teachers’ adaptive teaching behavior. This question was addressed in the first three empirical studies of this dissertation, both with self-report measures as well as observation instruments. The findings revealed that teachers who participated in LS reported clear examples of structural changes in their teaching behavior, mostly related to their instructional practices in the classroom, but also in their pre-planning efforts. However, despite these convincing self-reported changes as well as clear intervention effects in terms of other observed domains of teacher behavior, no significant intervention effects were found in terms of observed adaptive teaching behavior. This discrepancy between teachers’ perceptions about their own adaptive teaching behavior and the observed adaptive teaching behavior might be due to how adaptive teaching behavior is defined and perceived by teachers as opposed to how adaptive teaching is validated in the observation instruments. Moreover, the observation studies did not include teachers’ pre-planning activities and what they knew about students’ educational needs, which might be essential in order to understand how adaptive teaching behavior unfolds in classroom practice. Another potential reason that was noted was the relatively high starting value of observed adaptive teaching behavior in the comparison group. Although the samples in these studies were partly overlapping, it is remarkable that the comparison group teachers show a significant increase. Several potential reasons were
reported that relate to teachers’ professional development activities or ‘regression to the mean’ effects (Barnett, Van der Pols, & Dobson, 2005), but this remains unclear in this dissertation.

What did become clear in the observation studies is that there is reason to believe that LS might influence teachers’ efficient classroom management behavior. This was found as a clear intervention effect in the second empirical study and as a significant within-group increase in the intervention group in the third empirical study. This leads to the assumption that LS fosters pedagogical awareness and an explicit rethinking of one’s own lesson organization and classroom management. It also raises questions on how LS influences the significant relationship between efficient classroom management behavior and teachers’ classroom management efficacy beliefs (as found in chapter 3), not only in terms of the causal direction of this relationship, but also in terms of what features in LS play a role in enabling this.

3.2. Teacher self-efficacy

The influence of participating in LS on teachers’ self-efficacy beliefs, in particular efficacy beliefs in student engagement, turned out to be the most evident in this dissertation. Clearly, the LS features, such as the clear focus on student learning and collaborative experimentation, enable teachers to feel more confident in their abilities to engage all students in their classrooms. This finding is consistent with other TSE studies which report that participation in professional development programs increased TSE levels (Zee & Koomen, 2016), but has not been a central topic of research in empirical LS studies yet (Chong & Kong, 2012; Puchner & Taylor, 2006; Sibbald, 2009). Previous studies also found that there are indications that self-efficacious teachers frequently try out new teaching approaches to improve their practices paying more attention to “differentiated instructional strategies supporting inclusive education” (Zee & Koomen, 2016, p. 990).

The studies in this dissertation also found evidence for a clear link between teachers’ self-efficacy beliefs and (adaptive) teaching behavior. In particular, teachers’ beliefs of efficacy in student engagement and efficacy in classroom management were significantly related to adaptive teaching behavior. As the causal direction between these constructs was not determined, it may be that higher efficacy beliefs in engaging students in the classroom and managing classroom processes influenced increased adaptive teaching behavior, but the opposite may also be applicable. Based on previous research, one might argue that the self-efficacy beliefs led to higher levels of adaptive teaching behavior as efficacious teachers seem to “have more positive attitudes toward inclusive education” (Zee & Koomen, 2016, p. 994).
General conclusion and discussion

However, despite evidence in literature for a potential link between self-efficacy beliefs and organizational factors in the school (e.g., Geijsel, Sleegers, Stoel, & Krüger, 2009; Skaalvik & Skaalvik, 2010), the studies in this dissertation found no significant relationship between changes in teachers' self-efficacy beliefs and changes in how teachers perceived the school context in terms of the school culture and school conditions that promote or hinder teacher professional learning.

3.3. The school context

This dissertation stresses the importance of taking the school context, and specifically facilitating conditions that may promote a professional school culture, into account in LS practices (Hadfield & Jopling, 2016; Lee Bae et al., 2016). Teachers experienced learning from each other and support from LS team members as well as receiving support from the school management as particularly facilitating cultural conditions in the LS process. However, teachers’ struggles with the amount of facilitated time they received to participate in LS, experienced time pressure in relation to other teaching and extra-curricular activities, and issues around collaboratively planning the research lesson in relation to their teaching schedules, were reported as particularly hindering structural conditions. Despite these reported time struggles, the majority of teachers in the first empirical study argued that the facilitated time they received to participate in LS was sufficient. Finding the right balance seems to be key in organizing LS in schools and could determine whether these school contextual elements are perceived as hindering or facilitating. This is also extensively reported in previous research (Louws et al., 2017; Schaap et al., 2018).

Conversely, participating in LS also seems to influence how teachers perceive the role of school department leaders and teachers' autonomy in their school. These two conditions, school leadership and teacher autonomy, were also found to be critically important elements in previous research on professional learning communities (Valckx, Vanderlinde, & Devos, 2019), and in LS research this relates particularly to school leadership arguing that “one consensus seems to be that in order to sustain LS practices in schools and classrooms, well developed systems of leadership and organisational support are necessary” (Xu & Pedder, 2015, p. 47).

However, the professional school culture, in this dissertation defined as a culture that enables opportunities to exchange knowledge and experiences, to develop classroom material collaboratively, and which consist of teachers who take an inquiry stance (Cochran-Smith & Lytle, 1999; Hargreaves, 2000), was not perceived significantly different by teachers who participated in LS. It was argued that more time may be needed in order to change teachers’ perceptions of the school culture in line with earlier research (Cochran-Smith & Lytle, 2001; Hiebert & Stigler, 2017). Also, schools often
implemented LS in just one LS team prior to expanding it to other teams of teachers. Therefore, teachers could perceive changes in a subculture of the school (LS team) but in order to change perceptions of the school culture as a whole, more teachers should arguably be involved.

4. Scientific contribution

The scientific contribution of this dissertation is threefold. Firstly, it empirically explored and determined the influence of participating in LS on teachers’ (adaptive) teaching competence, their beliefs of self-efficacy, and how participating in LS is influenced by the school context and, in turn, how participating in LS can influence the school context. Through this focus this dissertation contributes to knowledge that is relatively scarce in the LS literature and, as such, presents an area of LS research that is not available yet in the context of mainstream secondary education. As noted, despite very informative research on promoting inclusive practices, particularly focusing on teaching students with (moderate) learning difficulties (Norwich, Dudley, & Ylonen, 2014; Norwich et al., 2018; Norwich & Ylonen, 2013), there is hardly any research available that focuses on addressing students’ educational needs in the mainstream secondary classroom contexts (Goei, Norwich, & Dudley, in press). In addition, only very few published studies examined the influence of LS on teachers’ beliefs of self-efficacy (Chong & Kong, 2012; Puchner & Taylor, 2006; Sibbald, 2009). The school context, both in terms of promoting and hindering conditions as well as the school culture, has been a topic of interest in LS research as shown by two extensive LS reviews (Huang & Shimizu, 2016; Xu & Pedder, 2015). However, available research in this regard has mainly adopted a focus on the implementation and sustainability of LS, examining essential factors in building (district-wide) LS networks (Perry & Lewis, 2009), or focusing predominantly on the school leaders’ perspectives (Lim, Lee, Saito, & Haron, 2011), whereas this dissertation focused on examining teachers’ perspectives of the school conditions and cultures in their school contexts throughout their engagement in LS. What adds to the scientific value of this dissertation, is the fact that the empirical studies examined the relationship between these constructs (teachers’ adaptive teaching competence, their beliefs of self-efficacy, and the school conditions and culture) in the context of LS, which has not been done before.

Secondly, in addition to filling this knowledge gap in the LS literature, this dissertation provides both theoretical models as well as practical observation tools. From a theoretical perspective, the first empirical study of this dissertation adapted the extensively used Interconnected Model of Professional Growth (Clarke & Hollingsworth, 2002) to suit the
General conclusion and discussion

LS context. This adapted conceptual framework could be useful in analyzing learning processes of teachers who are involved in LS. As this adapted framework integrates the ‘domain of practice’ and the ‘external domain’ into one ‘LS domain’, it also encourages a theoretical debate about the extent to which LS allows for the ‘decomposition of practice’ (Grossman, Wineburg, & Woolworth, 2001). After all, in the first empirical study of this dissertation it was argued that a certain amount of external practice or rehearsal could in particular benefit teachers in training before full participating in LS. This may prove to be difficult in LS given its authentic and classroom-based nature, although these opportunities are also available in LS (Cajkler, Wood, Norton, & Pedder, 2013).

This dissertation also contributes to knowledge about how to measure adaptive teaching behavior, in particular as a result of the construction and validation of a Narrative Running Record (NRR) observation instrument (chapter 4). This NRR observation instrument is one of the first that measures adaptive teaching behavior in response to students’ educational needs in mainstream secondary education, regardless of subject content (Prast, Van de Weijer-Bergsma, Kroesbergen, & Van Luit, 2018).

Thirdly, while “Most of the research carried out into LS has adopted a small-scale, qualitative, exploratory and inductive mode of inquiry” (Xu & Pedder, 2015, p. 49-50), this dissertation aimed to answer calls for larger-scale and replicable research in the context of LS (Lewis & Perry, 2017; Vermunt, Vrikki, Van Halem, Warwick, & Mercer, 2019). Following an explorative, qualitative study (chapter 2) aiming to obtain more knowledge about adaptive teaching competence in the context of LS, the three consecutive studies (chapters 3 to 5) deployed quasi-experimental designs to address these calls. Moreover, two of these quasi-experimental studies (chapters 3 and 4) used a combination of quantitative and qualitative measures to detect intervention effects as well as to gain insight about teachers’ learning processes. The use of these designs allowed for drawing conclusions about the effectiveness of LS in terms of differences between teachers who participated in LS and teachers who were not involved in LS practices, but also allowed for making assumptions about what might have caused these differences (or a lack of differences) based on the available qualitative data.

5. **A critical reflection: limitations and methodological considerations**

Despite the added value of this dissertation in terms of the theoretical relevance and its practical implications, the included studies have their limitations as well. The first limitation relates to the focus of the presented studies as they were mainly concerned with what teachers learned as a result of participating in LS and to what extent this
becomes visible in practice, but only to a limited extent with how teachers actually learned in their LS engagement. In that sense, this dissertation focused on measuring the influence of LS on outcome variables such as teachers’ beliefs and (adaptive teaching) competences and does not explicitly address calls for studies that describe and explain how teacher learning takes place in LS processes (Vermunt et al., 2019; Xu & Pedder, 2015). Such studies, for example, examined how teachers learn through professional and reflective dialogue (Horn & Little, 2010) in LS meetings aiming “to understand the processes by which teachers exchange information and build professional knowledge in collaborative groups” (Vrikki, Warwick, Vermunt, Mercer, & Van Halem, 2017, p. 214). Although there are instances in this dissertation that address LS processes, particularly in the first qualitative study (chapter 2) where three key contributors to teachers’ professional growth were distinguished (i.e., the intensive focus on student learning, collaborative professional experimentation, and the role of the LS facilitator), the main focus throughout this dissertation was on measuring the effects of participating in LS.

A second limitation relates to the samples included in this dissertation in terms of their sizes as well as their compositions. As LS in Dutch secondary education is still in its infancy (Coenders & Verhoef, 2019; De Vries, Verhoef, & Goei, 2016; Van Halem, Goei, & Akkerman, 2016; Verhoef, Tall, Coenders, & Van Smaalen, 2013), it was only possible to draw on a relatively limited group of available teachers who participated or were about to participate in LS. Hence, the included studies largely depend on convenience sampling. Besides the first qualitative study with 22 teachers, the consecutive three quasi-experimental studies contain between 48 and 63 participants which is relatively small for examining intervention effects. Moreover, these sample sizes did not allow for conducting additional analyses to look for differences between schools (e.g., demographic factors, an inclusive school climate (Roy et al., 2013), and the role of the school leader), LS teams (e.g., time allocation to participate in LS, the use of ‘case pupils’ (Dudley, 2013), the role of the LS facilitator, and the LS team’s focus in terms of addressing a content specific or a multidisciplinary issue), as well as teachers’ background characteristics (e.g., teaching experience, age, educational background). Although two of these quasi-experimental studies used a combination of quantitative and qualitative measures to gain deeper insight in how teachers’ professional growth unfolded, the statistical analyses only allowed for making statements about differences between teachers who participated in LS and teachers who did not. Teaching experience, for example, seems to be an essential characteristic in terms of the effects of professional development (Desimone & Stuckey, 2014) on TSE and adaptive teaching, which is illustrated by the following quote synthesizing 40 years of TSE research: “more experienced educators with high self-efficacy may have become more sensitized to students’ signals, needs, and expectations, and are thereby better able to provide them with adequate supports in
A third limitation relates to the research designs and intervention that were part of the empirical studies in this dissertation. Despite the use of various research instruments to examine the influence of participating in LS on different variables, allowing for triangulation to increase confidence in the results (Schoenfeld, 2013), these measures were all focused on the teacher and did not take the perspectives of students and school leaders into account. Though LS is an approach to teacher learning and teachers are central in this regard, students, LS facilitators and school leaders could potentially have offered a rich perspective on teachers' professional growth, its impact on student learning, and the impact on the school culture. Also, despite the fact that all LS teams followed the LS intervention as intended, LS is a flexible professional development approach and practical modifications to LS can be made to suit “the local institutional settings” (Xu & Pedder, 2015, p. 36). Hence, the focus of LS teams and how they organized their meetings could vary based on their research lesson objectives and other school contextual matters. Although the qualitative data provided insight in the focus of LS teams and how the LS process was organized, it is not fully clear how these practical adaptations may have differed between LS teams and how this influenced the intervention. On the other hand, the comparison group was not static either as they reported a variety of professional development activities in the three quasi-experimental studies. Since secondary school teachers in the Netherlands have a lot of autonomy in how they organize their professional development activities (Nusche, Braun, Halász, & Santiago, 2014), the question is whether the comparison group should have been subdivided into thematic clusters of professional development activities. However, the relatively small sample would not have allowed for this. A more fundamental question would be whether a LS setting makes “it unfeasible to apply an experimental design with a control group” (Vermunt et al., 2019, p. 72). Other important studies, however, have proved that this would not necessarily be the case (Lewis & Perry, 2017). Furthermore, in terms of the duration of the intervention as part of the research designs in the quasi-experimental studies, it was argued that one academic year was relatively short to see structural changes in teachers' behavior which is consistent with literature (Desimone & Stuckey, 2014). Especially influencing adaptive teaching behavior through LS, which is described as a complex teaching skill (Van der Lans, Van de Grift, & Van Veen, 2018), would arguably need more time.

A final limitation relates to the outcomes, and more specifically, to the disparities between the self-reported data and the lesson observations in the various studies in this dissertation. The fact that no significant intervention effects were found in terms of observed adaptive teaching behavior, whereas ample examples of professional growth
in terms of awareness and changes in adaptive teaching behavior were reported by teachers, evokes some essential questions. One might argue that this conflicting situation could be related to teachers’ tendency to overestimate their growth after having been intensively involved in LS activities focusing on adaptive teaching (Woolfolk Hoy & Spero, 2005), or to the variety of ways in which adaptive teaching was defined and described by teachers in the various samples. From another perspective one could argue that the observation instruments did not fully capture all elements that are part of adaptive teaching (e.g., the pre-lesson activities and teachers’ knowledge about different students), or may be difficult to observe by independent observers who do not contain information about the context (e.g., teacher-student relationships). The third study in this dissertation (chapter 4) explicitly addressed the latter question.

6. Directions for future research

Following the limitations presented in the previous section, several directions for future research can be suggested. The first area of suggested future research relates to the overarching focus of this dissertation, which was mainly concerned with determining the potential effects of participating in LS on teachers’ adaptive teaching competence, their self-efficacy beliefs, and the professional school culture. Consequently, the actual learning processes that take place in LS were only partly addressed in the first empirical study and were beyond the scope of the consecutive three empirical studies. Although this dissertation proved valuable given the important scientific contributions and practical implications, future research could increasingly focus on integrating data that aim to describe and explain how teacher learning processes take place in LS (Vermunt et al., 2019; Xu & Pedder, 2015), as well as the conditions under which professional learning takes place (Hadfield & Jopling, 2016), and could relate this directly to its impact on teachers’ professional growth. Improvement science might offer a useful lens to examine this as this perspective “directs attention away from simplistic thinking about solutions in terms of ‘What works?’ toward a more realistic appraisal of ‘What works, for whom, and under what set of conditions?’” (Bryk, Gomez, Grunow, & LeMahieu, 2015, p. 13-14).

The ‘for whom’ question in this context is also relevant for future research. The personal factors teachers bring to the LS arena do not often seem to be included in LS research (Xu & Pedder, 2015). Following the theoretical LS model by De Vries, Roorda, and Van Veen (2017), it would be worthwhile to examine teachers’ attitudes, motivations and intentions prior to being involved in LS. Also, as teachers have different interpretations of the LS process (Wolthuis, De Vries, & Van Veen, 2018), it would be worthwhile to examine whether LS offers a specific solution for a specific problem, or
whether multiple issues and questions of individual teachers can be addressed at once in a LS cycle. Linked to this, the important role of the school leader in implementing and sustaining LS processes was repeatedly stressed in this dissertation. Future research could examine what school leaders can do to enhance these processes and what type of school leadership would benefit these processes most.

The limitation that referred to the included sample sizes in this dissertation could be addressed by simply including larger sample sizes that allow researchers to conduct additional analyses in order to examine the variance in and between schools, LS teams and background characteristics of teachers. However, as LS is still a relatively new approach to teacher learning in Dutch secondary education, it might take a while before LS is being increasingly implemented on a larger scale, yielding a larger LS population from which potentially larger samples could be drawn. An interesting direction, however, would be to conduct more cross-national studies comparing LS in Dutch education with LS in other national contexts.

Another direction for future research refers to the limitation in terms of the adopted research designs. The mixed-methods approach used in two of the four empirical studies offers an interesting, yet relatively unexplored (Xu & Pedder, 2015) starting point. Considering such approaches, it may be worthwhile to examine how students’ and school leaders’ perspectives can be integrated to examine the impact of teachers’ participation in LS on student learning and the school context. Additionally, throughout this dissertation it was repeatedly argued that longitudinal designs would be appropriate to measure longer-term effects of participating in LS on different outcome variables. Future research could address this by following participating teachers for more than one academic year. As a potential consequence, structural effects on teachers’ professional growth as well as student learning would be more likely to become salient.

In terms of dealing with the variety of practical LS adaptations to suit the aims of the LS teams and the local school contexts, without jeopardizing the essential LS features, an interesting perspective is offered by Bryk and colleagues (2015). They argue that in order to achieve improvements at scale, “understanding the sources of variation in outcomes, and responding effectively to them, lies at the heart of quality improvement” (Bryk et al., 2015, p. 35). This approach is referred to as improvement science and within this paradigm, LS should not be seen as a static intervention but as a flexible learning approach with iterative plan-do-study-act-cycles that are adaptive to different school and LS contexts (Bryk et al., 2015). Understanding the variation between these contexts is what could arguably bring our knowledge about LS forward which, in turn, could support upscaling and sustaining LS practices. Despite encouragements to examine LS practices from an improvement science perspective (Lewis, 2015), this perspective has not been widely adopted in LS research yet.
Chapter 6

The limitation that addressed the disparities between the self-report and observation outcomes in terms of adaptive teaching behavior, would also be worthwhile to further examine as it was argued that the way adaptive teaching is defined and measured has proven to be a challenge and still leaves ample room for discussion and confusion. Combining observation data with data about teachers’ pedagogical content knowledge, teachers’ knowledge about their students and their learning, information about prior teacher-student interactions, as well as students’ background characteristics, would provide a richer context for researchers and, in turn, potentially more accurate measures of adaptive teaching behavior (Parsons et al., 2018; Suprayogi et al., 2017). One might also consider to examine the school context in terms of their inclusive climate (Roy et al., 2013).

Lastly, this dissertation focused on teachers in Dutch secondary education, but as LS practices expand to other educational settings where it is still relatively underexamined (De Vries, Roorda, & Van Veen, 2017; De Vries et al., 2016), this might constitute an important research context as well. In particular two contexts are highlighted for future research. The first context where LS is gradually being introduced is Dutch initial teacher education (De Vries et al., 2016; Van Joolingen, Goei, Willeme, & Schipper, 2018). Since this context is responsible for educating a new generation of teachers in which they can get used to this way of continuous collaborative professional learning, this context is highly relevant to increasingly examine in future research. A second important context for future research is LS in Dutch vocational education, which is not only characterized by a diverse student population, but also by a highly differentiated qualification structure focused on a whole array of professional contexts (Aalsma, Van den Berg, & De Bruijn, 2014). Adaptive teaching seems particularly relevant in this context (De Bruijn, 2006). In accordance with the presented findings in the context of Dutch secondary education, the LS facilitator may play a pivotal role in guiding LS forward in these contexts and could therefore also be important to include in future research.

7. Implications for policy and practice

Several implications for policy and practice can be derived from this dissertation, which can be categorized at different levels. Ordered from macro- to micro-level, the following sections present implications for policymakers, school leaders, teacher educators, teachers, and students in secondary education.

7.1. Implications for policymakers

As the presented studies in this dissertation provide evidence that participation in LS may enable teachers to become more aware of students’ educational needs and
to address these needs accordingly, several implications for policy can be derived from this. First of all, on a more general level, this dissertation emphasizes previous recommendations for educational policy that in order to attract and retain a high-quality teaching force, collaborative continuous professional development opportunities, such as LS, are essential (OECD, 2018). Various influential institutions that examined the educational systems in high-performing countries argued that teachers in these countries are promoted to be “lifelong learners and inquisitive professionals” (OECD, 2018, p. 31) and are encouraged to learn from each other (Barber & Mourshed, 2007; Mourshed, Chijioke, & Barber, 2010). Perhaps not surprisingly that Japan, where LS “is like air, part of everyday school life” for Japanese educators (Fujii, 2016, p. 411), is generally placed among these high-performing countries (OECD, 2018). The influential McKinsey & Company report ‘How the world’s best-performing school systems come out on top’ explicitly refers to LS as the driving force of the learning culture in Japanese schools and argues that (Barber & Mourshed, 2007, p. 28):

“In a number of the top systems, particularly those in Japan and Finland, teachers work together, plan their lessons jointly, observe each other’s lessons, and help each other improve. These systems create a culture in their schools in which collaborative planning, reflection on instruction, and peer coaching are the norm and constant features of school life. This enables teachers to develop continuously.”

Especially in the Dutch context, where LS is a relatively new approach to teacher learning (De Vries et al., 2016; Verhoef et al., 2013), it might be worthwhile for Dutch policymakers to further examine this approach and to assess how educational policy can promote the implementation of LS practices in Dutch schools, without compromising the high degree of autonomy Dutch schools have to organize the professional development activities for their teachers (Nusche et al., 2014). Promoting LS practices in Dutch schools would also address the OECD’s observation that Dutch schools “vary widely regarding the support they provide teachers to facilitate their professional development and [that] training is often too discretionary and lacking in focus on the actual teaching and learning process” (Nusche et al., 2014, p. 199). One way of promoting this is by increasing funding opportunities to allow schools to experiment with LS and conduct research to assess its impact at the same time. Luckily, positive signs of increased attention for collaborative teacher professional development activities in Dutch schools have recently been observed, which arguably leads to more positive teacher experiences and enjoyment in their profession (Dutch Inspectorate of Education, 2018). If collaborative professional development becomes the norm in Dutch schools, this could ultimately increase the attractiveness of the Dutch teaching profession (Barber & Mourshed, 2007) which would
align with one of the conclusions in a recent report by the Dutch Research Centre for Education and the Labour Market (Cörvers, Mommers, Van der Ploeg, & Sapulete, 2017).

A second, more specific, policy implication relates to calls for the inclusion of an increasingly diverse student population in mainstream education (UNESCO, 2009). While teachers are expected to respond to a broad variety of students’ educational needs (Corno, 2008), a majority of secondary education teachers in the Netherlands appear to lack the necessary skills to address these needs (Dutch Inspectorate of Education, 2018; OECD, 2016). The studies in this dissertation provide evidence that LS can counteract this as teachers tend to get more aware of students’ different educational needs and more willing and able to address these needs. This could guide policymakers in their quest for ways to improve teachers’ adaptive teaching competencies (Dutch Inspectorate of Education, 2018). An obvious first step could be to focus on clarifying the concept of adaptive teaching, often referred to with a variety of labels (Parsons et al., 2018; Suprayogi et al., 2017). This seems particularly helpful as many teachers often wonder what this concept actually entails (Dutch Inspectorate of Education, 2018). This dissertation provides clear suggestions for this, stressing that adaptive teaching includes intentional and planned teacher activities. A second step could be to focus on increasing the subsidy calls for research on promoting adaptive teaching practices through collaborative professional development, encouraging educational researchers to further clarify this concept and systematically examine adaptive teaching practices that could support teachers in addressing their students’ educational needs.

7.2. Implications for school leaders
School leaders play an essential role in implementing, sustaining, and scaling-up professional development activities for teachers in their schools, in particular if these professional development activities are integrated in the school context (Huang & Shimizu, 2016; Sperandio & Kong, 2018). However, Seleznyov (2019) argues that “without a nuanced understanding of the implications for school structures and cultures, school leaders beyond Japan should rightly be wary of introducing lesson study” (p. 9). The author encourages to explore how LS impacts the school cultures and structures in countries contrasting with Japan in terms of their neo-liberal traditions, such as the UK and the US, which are known for their “high-stakes performance-based accountability which drives the desire for quick wins and short-term gains in learning outcomes” (p. 9). This accountability orientation and focus on high-stakes testing is also observed in the Netherlands, although there seems to be attention for development-oriented elements as well (Nusche et al., 2014). The presented findings in this dissertation underline the crucial role school leaders have to take initiative for implementing LS and drive these activities forward (Lim et al., 2011; O’Shea, Teague, Jordan, Lang, & Dudley, 2015).
It can be argued that school leaders should not only pay attention to the structural and organizational side of implementing LS (i.e., facilitating teachers with sufficient time, making planning arrangements for the research lessons, and providing the right resources), but should also focus on being involved in the LS process by means of paying interest in teachers’ experiences with LS, knowing what LS entails, and creating a safe climate to experiment with new teaching elements and stimulate teachers’ professional learning (Xu & Pedder, 2015). The findings showed that the support of school leaders in the actual LS process is highly valued by teachers. Perhaps this is the reason that some researchers even suggest that school leaders should be engaged in LS themselves in order to successfully lead it (O’Shea et al., 2015).

In terms of a type of leadership that would best suit the challenging task to implement and sustain LS practices, the last empirical study in this dissertation argued for distributed leadership, consistent with previous research (Perry & Lewis, 2009). This leadership style assumes that the responsibility for the LS practice is distributed among people from the organization where it is implemented. Such a leadership style would not only focus on distributing the responsibilities and workload, but would also aim to create a shared vision through discussing ideas and voicing different opinions (Perry & Lewis, 2009, p. 386).

Others argue that supportive school leadership is part of a transformational leadership style, focusing on a clear vision, individual support, building a collaborative culture, and intellectual stimulation (Louws et al., 2017; Valckx et al., 2019). Regardless of the preferred leadership style, school leaders obviously have an important role when it comes to supporting teachers in feeling responsible for their own and other’s learning as LS depends to a large extent on teachers’ decisions and ideas. This can be promoted by “giving struggling teachers the feeling that change is actually and practically possible” (Vermunt et al., 2019, p. 71) through observing each other’s lessons and perceive the impact on student learning. Therefore, paying attention to teachers’ feelings of ownership, sense-making and agency (Ketelaar, Beijaard, Boshuizen, & Den Brok, 2012) may be relevant for school leaders prior to implementing, sustaining and up-scaling LS practices in their schools.

### 7.3. Implications for teacher educators

Although LS in teacher education was beyond the scope of this dissertation, several implications for teacher educators could be derived from the studies in this dissertation. After all, teacher educators are responsible for educating a new generation of teachers and could prepare future teachers for lifelong learning as “it is during this stage that they develop their personalised pattern of teacher learning” (De Vries, Jansen, Helms-Lorenz, & Van de Grift, 2015, p. 461).
The utility of LS in initial teacher training has been evaluated in various contexts showing its potential for prospective teachers as well as their mentors (Bjuland & Helgevold, 2018; Bjuland & Mosvold, 2015; Cajkler et al., 2013; Wood & Cajkler, 2018). Following the notion that “LS has the potential to bridge gaps between theory and practice and between trainee and experienced teachers” (Cajkler et al., 2013, p. 552), the implications for introducing LS to Dutch teacher training programs could be twofold: firstly, and consistent with the earlier notion that future teachers develop their pattern of teacher learning, bringing LS to teacher education programs allows prospective teachers to get used to a form of collaborative continuous professional development which increasingly receives attention in Dutch education (Dutch Inspectorate of Education, 2018). LS could enable prospective teachers to develop a certain mindset in which continuous learning is perceived as the norm in education and where collaboratively discussing classroom material and students, and observing each other’s lessons are common practice. This may reduce feelings of anxiety or resistance to become involved in LS for (experienced) teachers who are not familiar with this type of professional learning (Puchner & Taylor, 2006).

Secondly, it may deepen prospective teachers’ pedagogical content knowledge through learning and experimenting in authentic classroom settings, learning directly from each other and experienced teacher educators. It could further stimulate the development of prospective teachers’ awareness of students’ different educational needs, as was found by Bjuland and Mosvold (2015). This would also address the concern that Dutch teachers who are new to the profession appear to lack the necessary skills to “systematically assess students and differentiate their teaching” (OECD, 2016, p. 100).

Implementing LS in teacher education would arguably have two main implications. Firstly, the curriculum of teacher training programs should allow prospective teachers to have ample opportunities to experiment with LS. Situating LS in authentic classroom settings might yield complex planning and coordination issues given the situation that Dutch teachers in training are often conducting their placements in different schools as agreed in school partnerships. Implementing LS in the curriculum of teacher training programs may also stir up the debate on how we lecture and assess in initial teacher education. Should LS be a replacement in the already full Dutch teacher training curricula (Romkes, 2017), or should it be integrated in certain courses, and if so, how can this be done?

Secondly, implementing LS in Dutch teacher training curricula would imply that teacher educators are familiar with supporting LS practices. This may have an impact on how teacher educators are traditionally used to prepare their teachers in training for their future careers. The mindset that is expected from prospective teachers would also apply to teacher educators. In that sense, teacher educators should be role models of the kind of teaching and professional learning they are trying to promote (Swennen,
General conclusion and discussion

Lunenberg, & Korthagen, 2008). If these conditions are met, implementing LS in teacher training curricula would not only stimulate the learning of prospective teachers, but also those of teacher educators (Cajkler et al., 2013).

7.4. Implication for teachers considering to participate in LS

Throughout this dissertation the focus has predominantly been on teachers and their professional learning. As the findings have been reported extensively in earlier chapters, this section will not address the implications for teachers who participated in LS, but will instead highlight several implications for teachers who are about to embark on being involved in LS practices. Following the theoretical LS model by De Vries, Roorda, and Van Veen (2017), specific attention is drawn to the personal factors that have not been explicitly addressed in earlier chapters of this dissertation. This refers to teachers’ attitude and intentions as they enter the LS activities. These conditional factors may impact teachers’ participation in LS and their professional learning in turn (Lieberman, 2009).

Teachers who are exposed to educational innovations, including new professional development activities such as LS, may experience their professional identities as being reinforced or threatened by the proposed changes (Ketelaar et al., 2012; Van Veen & Sleegers, 2006). As teachers’ professional identity relates to how they perceive themselves, i.e., their professional self-image (Beijaard, Verloop, & Vermunt, 2000), this will arguably impact their attitudes and intentions (Lieberman, 2009). In their theoretical LS model, De Vries, Roorda, and Van Veen (2017) argue that, based on the reasoned action theory (Ajzen & Fishbein, 1980) and the theory of planned behavior (Ajzen, 1991), teachers’ intentions are the best predictor of one’s behavior and, thus, how a teacher will participate in LS. These intentions, in turn, are determined by teachers’ attitudes toward LS, the social influence (their peers’ perceptions of LS) and teachers’ self-efficacy beliefs. This dissertation could possibly promote positive intentions and beliefs toward participation in LS.

As teachers’ personal conditions are believed to promote or hinder the actual LS process, and teachers’ professional learning in turn, it seems important that prospective participants have a say in whether and to what extent they participate in LS. School leaders or LS facilitators can obviously support teachers in making this decision and show the benefits of LS, but when resistance to participate in LS presents itself as a clear obstacle, it is recommended to work on overcoming these obstacles first. This is especially an issue in the context of LS where teachers are to a large extent responsible for how they organize the LS process as this requires ownership, sense-making and agency (Ketelaar et al., 2012).
7.5. Implications for students

How teacher professional learning through LS affects students and their learning, is beyond the scope of this dissertation. This is also illustrated by the following notion: “LS is an andragogical intervention designed to enhance teacher (adult) learning. Obviously one would expect that teacher professional learning should ultimately impact on the progress of the children they are teaching – though perhaps not instantaneously” (Dudley, 2018, July 24). However, two potential implications for students can be derived based on the findings in this dissertation.

Firstly, as the studies provide evidence that teachers become more aware of students’ educational needs and get to know their students (even) better as a result of LS, this may impact student-teacher relationships and might ultimately increase student learning. Additionally, the student interviews that take place after the observed research lesson as part of the UK and Dutch LS model (De Vries et al., 2016; Dudley, 2013), enable students to have a clear say in how the lesson should be organized. As such, their experiences are increasingly taken into account.

Secondly, as students become (more) familiar with (public) research lessons (Takahashi & McDougal, 2016) where teachers are physically present in the classroom, sometimes accompanied by school leaders, administrators, specialists and parents (Takahashi, 2014a), students get to know other teachers as well (Burghes & Robinson, 2009) and experience being part of a professional learning community (Lieberman, 2009). This may also be an important element in students’ own learning process as they may start to realize that, even for adults, learning is not an isolated activity but also implies learning from and with each other.
General conclusion and discussion