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Chapter 32

Dealing with the Complexity of Adaptive Teaching through Collaborative Teacher Professional Development



Tijmen M. Schipper, Sui Lin Goei, and Siebrich de Vries

Abstract This chapter focuses on the challenges that teachers face in today’s heterogeneous classrooms when it comes to addressing students’ educational needs. By means of a conceptual discussion about this topic, relating to recent empirical studies in this field, we discuss whether teachers’ adaptive teaching behavior could be promoted through professional development approaches – such as Lesson Study – that focus explicitly on students’ learning. Taking students’ learning as a starting point in collaborative and classroom-based professional development approaches, one could expect that teachers gain more awareness of the variety of their students’ educational needs which, in turn, may lead to teachers better addressing these needs in classroom settings. It is argued that through such a cyclical and inquiry-based way of working, teachers may start to feel more competent and able to address the learning needs of students, leading to increasingly adaptive teaching practices. However, despite promising results in the literature, there is still much debate on the evidence of how Lesson Study influences adaptive teaching behavior in favor of *all students* and how this, in turn, impacts student learning. A “local proof route” to testing the effectiveness of Lesson Study might offer suitable directions.

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1 Introduction

Teachers in mainstream education are increasingly expected to develop their classroom practices to an increasingly diverse set of students' individual backgrounds and educational needs (Ainscow et al., 2019; Corno, 2008; Mills et al., 2014; Schleicher, 2016). On the one hand, this is a result of a trend toward more learner-centered, constructivist approaches in education, calling for teacher adaptability (Parsons et al., 2018) which is about meeting the needs of students at every level (Dosch & Zidon, 2014; Jager et al., 2021). On the other hand, this is a result of global developments in the context of inclusive and special education, fueled by the *Salamanca Statement and Framework for Action on Special Needs Education* (UNESCO, 1994). Although this was arguably “the most significant international document that has ever appeared in the field of special education” (Ainscow et al., 2019, p. 671), it urged for major reforms of mainstream schools in order to develop inclusive education systems. As such, its influence has also become increasingly apparent where a gradual trend toward more inclusive practices has been witnessed internationally which resulted in various inclusive education policies (UNESCO, 2017).

Although teachers who adapt their teaching to their students' needs can expect broad support in education and society (Schleicher, 2016), and there is evidence supporting the claim that the most effective teachers are adaptive teachers (Kyriakides et al., 2009; Parsons et al., 2018), addressing students' individual needs turns out to be highly complicated, especially in increasingly heterogeneous classrooms (Parsons et al., 2018; Suprayogi et al., 2017; Van der Lans et al., 2018). This complexity stems from the assumption that adaptive teaching requires pedagogical content knowledge, skills, diagnosis of student learning, and an adaptive mindset and competencies (Corno, 2008; Van Geel et al., 2019; Vogt & Rogalla, 2009).

Due to this complexity and the specific competencies adaptive teaching requires, teachers often feel unprepared to adjust their curriculum and instruction to meet students' individual learning needs (Dixon et al., 2014). To address this, effective teacher professional development (PD) that specifically focuses on adaptive teaching strategies and how teacher adaptability can be supported, seems essential (Parsons et al., 2018).

We commence this chapter with a theoretical discussion about adaptive teaching and related “fuzzy constructs” (Deunk et al., 2018, p. 32). Next, we provide a brief overview of what counts as effective teacher PD according to contemporary educational research literature. Subsequently, we introduce one particular form of collaborative and classroom-based teacher PD, namely Lesson Study, that has the potential to enhance teachers' adaptive teaching competencies due to its explicit focus on students' learning (Dudley, 2013), and we show how Lesson Study can

promote adaptive teaching behavior and substantiate this by recent empirical studies in different educational and national contexts. We conclude this chapter with the most important theoretical and practical implications.

2 Theoretical Framework

2.1 *Adaptive Teaching*

Various concepts are used to refer to addressing the needs of different students in classroom contexts, such as adaptive teaching, differentiated instruction, and differentiation. As a result, various researchers argue that these concepts are often overlapping labels that lack clarity and clear operationalizations (Deunk et al., 2018; Prast et al., 2018; Suprayogi et al., 2017). As such, “The lack of definition and shared terminology in research on differentiation and associated strategies could be contributing to confusion, both within and outside academia” (Graham et al., 2020, p. 31). Due to this confusion, capturing adaptive teaching behavior by systematically measuring it might also be problematic and so far has not provided “much insight into the acting and reasoning of teachers who differentiate instruction well” (Van Geel et al., 2019, p. 53).

Despite the ambiguous use of labels for addressing students’ educational needs, Corno (2008) distinguishes adaptive teaching from other related constructs by placing it in the social and dynamic context of classroom situations. This, on the one hand, requires flexible, spontaneous, and responsive interventions from teachers, and, on the other hand, requires careful lesson planning and diagnosing of students’ progress and needs. In this definition, adaptive teaching is not only concerned with actual differentiated teaching activities prior to, during and after the lesson (Smale-Jacobse et al., 2019), but also involves having an ‘adaptive mindset’ in which a teacher “views student differences as assistive, affording, and enabling for teaching as well as student learning” (Corno, 2008, p. 171). Therefore, adaptive teaching is concerned with teachers’ careful and proactive planning of the curriculum, teaching materials and learning activities, as well as how they think about and anticipate to students’ learning needs in the social context of the classroom in order to reach the desired lesson objectives (Beltramo, 2017; Corno, 2008).

2.2 *Effective Teacher Professional Development*

The literature on teacher PD is abundant and there seems to be consensus that effective forms of teacher PD consist of ongoing, active and collaborative learning of teachers that is situated in practice, focused on students’ learning, and coherent with teachers’ beliefs (e.g., Borko et al., 2010; Desimone, 2009; Desimone & Stuckey, 2014; Schleicher, 2016; Webster-Wright, 2009). This contrasts with ‘traditional’ forms of teacher PD in which teacher learning was generally seen as “an in-service

training model, where teachers are expected to learn a clearly defined body of skills through a well-specified process, often delivered in one-shot workshops or courses taught away from the school premises” (Borko et al., 2010, p. 548).

In the current view on teacher PD, which started to develop about three decades ago (Vangrieken et al., 2017), teacher learning ideally occurs through participating in professional learning communities (PLCs) in which the former characteristics of effective PD (i.e., ongoing, active, collaborative, focused on student learning, and coherent with beliefs) are embedded. Participating in PLC’s that address these effective features of teacher PD, may have a positive impact on both teaching practice and student learning (Vangrieken et al., 2017; Vescio et al., 2008). The concept of a PLC “rests on the premise of improving student learning by improving teaching practice”, situating teacher learning in their day-to-day experiences (Vescio et al., 2008, p. 82).

There is a great variety of PLCs ranging from school-wide to department-based PLCs (Valckx et al., 2020) as well as formal, member-oriented, or formative PLCs (Vangrieken et al., 2017). A specific form of a PLC that is known for its explicit focus on how students learning (Dudley, 2013), and, as such, may contribute to supporting teachers’ adaptive teaching behavior (Norwich et al., 2020), is Lesson Study. A Lesson Study-team of teachers can be seen as a PLC (Desforges, 2015), but it is also argued that Lesson Study can create a culture for a school-wide PLC (Chichibu & Kihara, 2013). For PLCs to be effective, at least two conditions need to be in place: participants in PLCs need to be supported in processing “new understandings and their implications for teaching” and the focus of participants need to be on analyzing the impact of teaching on student learning (Timperley et al., 2007). Both conditions are generally taken into account in Lesson Study.

2.3 *Lesson Study*

The teacher PD approach Lesson Study originated in Japan over a century ago and spread rapidly around the globe since the late 1990s after the publication of ‘the Teaching Gap’ (Stigler & Hiebert, 1999). It is now perceived as one of the world’s fastest growing forms of teacher PD (Dudley, 2015) which may be a result of the fact that Lesson Study includes many of the features that are supposed to contribute to effective teacher PD (Lewis & Perry, 2014), as mentioned above. In Lesson Study, a small team of teachers collaboratively conduct ‘inquiry cycles’ (Lewis et al., 2012) of studying, designing, teaching, observing, and evaluating research lessons (Dudley, 2013). A research lesson is an actual classroom lesson which is generally designed to study and improve the teaching of a particular subject topic by focusing on student learning, (Lewis et al., 2012), but may also be focused on other aspects such as behavioral support (Nilvius, 2020).

At a glance, Lesson Study is a “deceptively simple” form of teacher PD (Dudley, 2015, p. 5) and has been manifested in various variations suiting different cultural contexts (Stigler & Hiebert, 2016). Despite these cultural variations, the core

elements ('big ideas') of Lesson Study entail that teachers (1) collaboratively perform research on their lessons, (2) combine practical knowledge and external knowledge, (3) learn from students, (4) make a collaborative effort through engaging in intensive professional dialogue, and (5) follow repeated cycles of research lessons (Goei et al., 2021b).

More specifically, a Lesson Study cycle consists of defining a clear research purpose, studying the curriculum and classroom material, planning the research lesson in detail, teaching the research lesson by one teacher while the other members of the Lesson Study team observe the research lesson and collect (pre-defined) data, evaluating the research lesson in a post-lesson discussion based on student data, ideally guided by a facilitator or 'knowledgeable other' (Takahashi & McDougal, 2016), and reflecting on the learning experiences (Lewis et al., 2006).

A widely-used extra dimension to Lesson Study, embedded in the UK Lesson Study model (Dudley, 2013), is the application of 'case pupils' who represent certain learner groups (attainment groupings) in the classroom. All Lesson Study phases are organized around these 'case students'. In the UK model, revising and re-teaching the research lesson are also essential parts of the Lesson Study cycle. The Dutch Lesson Study model (De Vries et al., 2016) draws on the UK variant. In this model, the Lesson Study facilitator has a pivotal role and the model "allows more room for selecting 'case students' based on behavior or other criteria" (Schipper et al., 2020b, p. 353), in addition to solely learning aspects. In a variant of this model (Goei et al., 2021a), the three-tier prevention logic (Kratochwill et al., 2007) is used to select case students, focusing on case students from tier 1 (general provision), tier 2 (targeted provision), and tier 3 (specialized provision).

Various international review studies conclude that Lesson Study is a powerful PD approach. These reviews report studies in which it becomes clear that participating in Lesson Study influences teachers' knowledge, behavior and attitudes, and that teachers become more focused on the learning of their students, and also describe the impact on the school context (De Vries et al., 2017; Huang & Shimizu, 2016; Xu & Pedder, 2015). However, these reviews mainly draw on small-scale qualitative studies and only a few large effect studies are available in this context. The What Works Clearinghouse (WWC) body in the United States, found that, out of 643 PD studies related to K-12 Mathematics education in the US, only two studies met their evidence standards and reported significant positive effects on student math proficiency (Gersten et al., 2014), of which one reported a randomized controlled trial experiment in the context of Lesson Study (Lewis & Perry, 2017). A similar effect study on Lesson Study in the United Kingdom, conducted by the Education Endowment Foundation, did not report positive effects of participating in Lesson Study on students' mathematic and reading attainment on Key Stage 2 level (Murphy et al., 2017). However, this evaluation study did show that teachers felt that Lesson Study was a powerful PD approach and reported changes to their teaching practices. Moreover, the authors stated that "There is evidence that some control schools implemented similar approaches to Lesson Study, such as teacher observation. This trial might, therefore, underestimate the impact of Lesson Study when introduced in schools with no similar activity" (p. 4).

Working with RCTs is in line with thinking about instructional improvement via the so-called general proof route (Lewis et al., 2006), while Lesson Study and working with it are more in line with the “local proof route, whereby locally initiated innovations can contribute to broad instructional improvement, with education researchers supporting the explication, development, and testing of such innovations” (Lewis et al., 2006, p. 10). In addition, we actually do not know enough yet about the nature and mechanisms of Lesson Study to test it summatively. Hence, “Controlled experimental research on immature versions of lesson study could lead us to conclude that it doesn’t work, and to move on to the next promising idea” (Lewis et al., 2006, p. 10). Moreover, other Lesson Study researchers argue for Lesson Study “to be treated holistically as a vehicle for development and improvement at classroom, school and system levels rather than as a curricular or pedagogical intervention” (Dudley et al., 2019, p. 202), and should therefore contain indicators of impact at both school and local system levels (Dudley et al., 2019).

3 Promoting Adaptive Teaching Through Lesson Study: What Do We Know?

3.1 Overview of the International Literature

Despite the growing knowledge base around Lesson Study, studies that focus on the role of Lesson Study in inclusive mainstream classroom settings, specifically addressing how the needs of all students could be addressed, are scarce. In this chapter, we present an overview of the international literature about Lesson Study in relation to adaptive teaching by clustering these studies around the contexts in which they took place. We start this chapter by presenting the studies conducted in primary education situated in different cultural, though European, contexts (Sect. 3.1.1). In the subsequent section (Sect. 3.1.2), we address the secondary education context. As we found that these studies are, so far, predominantly situated in the Dutch context, we refer to this section as ‘The Dutch case’. We conclude this chapter with a short section about Lesson Study in the special needs contexts in which focusing on students’ individual needs is generally more self-evident (Sect. 3.1.3).

3.1.1 Adaptive Teaching Through Lesson Study in Primary Education

We found four recently published studies in primary education with the topic of adaptive teaching in the context of Lesson Study research. In the Swedish context, two studies draw attention as they are specifically concerned with catering for all students and how Lesson Study could promote this. Nilvius (2020) described how the multi-tiered Response To Intervention model (RTI) can be used in Lesson Study to maximize the achievement of all students. In this pilot study, teachers claimed “that the RTI model gave them good control over all the students’ development in

basic skills and that monitoring all students' development was important to better understand their needs" (Nilvius, 2020, p. 284). A second study (Lundbäck & Egerhag, 2020), also in Swedish primary education, described how Lesson Study enhanced the mathematical learning of all students in two learning situations, including students with special needs.

In another Scandinavian country, Norway, Aas (2020) presents findings of a study in primary education where Lesson Study was used to examine teacher talk focusing specifically on inclusive and adaptive education for all students. The study shows how teachers talk about students' needs (in terms of academic needs, behavioral needs, and the learning environment) and what kind of beliefs they have about these needs. As a result of participating in Lesson Study, teachers in this study reported to have become more aware of students' needs and gained increased trust in students' abilities as well as trust in their own ability to influence students' learning and development. Moreover, the study shows how teachers changed their classroom behavior in more inclusive ways.

In the Austrian context, Mewald and Mürwald-Scheifinger (2019) describe a train-the-trainer program that emphasizes the role of knowledgeable others, established to support implementing "educational change and further competence-oriented learning" (p. 219) in primary education. Their Lesson Study program was based on the "combination of a typical lesson study cycle with six design principles" including the principle to help teachers in "providing appropriate, relevant and adaptive learning experiences aligned with their students' interests, dispositions and needs" (p. 220). In presenting the experiences of knowledgeable others in this program, one of them described that this program "changed our attitude towards pupils' learning" (p. 227). In addition, teachers reported a focus on including all students and make particular reference to students from a migrant background stating that "It was very exciting to discover that using a lesson study approach created a much greater learning growth in children with migrant backgrounds compared to those without. This finding led us to critically examine our lesson planning to find out if we are really reaching all or as many children as possible" (p. 227).

In sum, these studies in the context of primary education show that Lesson Study can impact teachers' adaptive mindset and knowledge, and this leads to differences in teachers' adaptive behavior. In the last case there is even evidence of changes in student learning. However, these studies rely predominantly on qualitative evidence and more evidence is needed from "repeated cycles that test key design features and create "actionable artifacts" to leverage learning at new sites" (Lewis et al., 2006, p.10).

3.1.2 Adaptive Teaching Through Lesson Study in Secondary Education: The Dutch Case

Following our literature search on studies about adaptive teaching through Lesson Study in the secondary education context, we only came across several studies that were conducted in the Netherlands. Moreover, these studies were closely related to

each other as they were part of the same overarching research project. Prior to presenting the findings of the studies conducted in the Netherlands, we start with providing a description of the Dutch educational context in order to better understand and interpret the findings.

Secondary schools in the Netherlands have a relatively high degree of autonomy, no national curriculum, and a highly ‘tracked’ educational system in which students are divided over various cognitive tracks based on their standardized test scores in the last grade of primary education (OECD, 2016). These tracks include practical training, pre-vocational secondary education, senior general secondary education, and pre-university education. Despite the merits of this tracked system and the opportunities to move easily from one track to another, “Tracked systems tend to deprive low-performing students of the positive peer effects from stronger students” (OECD, 2016, p. 64). In line with the earlier described trend toward more inclusive practices, the Netherlands also aims to promote inclusive policies and classroom practices through, for example, the introduction of the *Appropriate Education Act* in 2014. This act obliges school leaders in collaboration with regional partners (other schools, including special education schools) to make sure that every child is offered appropriate education suited to his or her capabilities (OECD, 2016). Despite these introduced policies, teachers in the Netherlands struggle to assess and address the increasingly diverse needs of students (Dutch Inspectorate of Education, 2020) and this applies in particular to teachers who are new to the profession (OECD, 2016). The Dutch Inspectorate of Education (2020) concludes that, despite initiatives to promote adaptive teaching through the appropriate Education Act, not all schools feel the collective responsibility in their regional partnerships to cater for all students, which may have severe consequences for individual students. Following this context description, it is not surprising that effective teacher PD, particularly focused on adaptive teaching skills, is an increasingly important way of preparing teachers to address their students’ needs (OECD, 2016). Hence, Lesson Study receives increasing attention in the Netherlands (De Vries et al., 2016), not only in the context of inclusive education.

In the presented studies below, the Lesson Study model was used in which case students were selected on the basis of the three-tier prevention logic (Goei et al., 2021a). Depending on the research theme and research questions of the Lesson Study teams – which could vary from a more content-specific focus to a more generic focus on, for example, students’ motivation – teachers studied classroom and student material and then designed the research lesson with an explicit focus on the selected case students. Subsequently, the research lesson was taught by one of the teachers and observed by the other members of the Lesson Study team, again focusing specifically on the case students’ behaviors using self-constructed observation forms. The research lesson was then discussed and evaluated based on the collected observation data and case student interviews which took place directly after the research lesson. Finally, the research lesson was revised and re-taught followed by a reflection on the complete Lesson Study cycle.

In a first qualitative and explorative study, Schipper and colleagues (2017) examined to what extent participation in at least two Lesson Study cycles during one

academic year 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. This study also examined the role of the school context in promoting or hindering this. The results show that teachers gave clear notions of how Lesson Study participation increased their awareness of their students' needs and how their beliefs and attitudes about adaptive teaching changed. Teachers also reported either incidental or structural changes in their adaptive teaching behavior. What contributed most to these changes were an explicit focus on student learning in Lesson Study, the ample opportunities in Lesson Study that allow to experiment with adaptive teaching strategies, and the guiding role of the Lesson Study facilitator. In terms of the school context, support of the school leader, learning from colleagues, and sufficient time were found essential in promoting these practices.

In a second study conducted by the same authors (Schipper et al., 2018), a quasi-experimental mixed-methods design was used to examine the influence of participating in Lesson Study on teachers' adaptive teaching behavior. As teacher self-efficacy, defined as "teachers' belief or conviction that they can influence how well students learn, even those who may be difficult or unmotivated" (Guskey & Passaro, 1994, p. 628), was related to more positive attitudes toward adaptive teaching practices (Suprayogi et al., 2017), the study also addressed the influence of participating in Lesson Study on teachers' self-efficacy beliefs and the relation between adaptive teaching and teacher self-efficacy. The results showed a significant intervention effect for the subscale 'efficacy in student engagement' and a positive within-group effect on the subscale 'efficacy in instructional strategies', indicating that teachers who participated in Lesson Study felt more capable to engage all students in their lessons and to use various strategies in their instruction. Teacher behavior was measured using the ICALT observation instrument (Van de Grift, 2007). Although intervention effects were found for the subscales 'efficient classroom management' and 'clarity of instruction' in favor of the Lesson Study group, no intervention effects were found for the adaptive teaching domain. With stimulated recall interviews, the researchers were able to learn more about teachers' thoughts and actions during their lessons. It was found that teachers who participated in Lesson Study, expressed more awareness of students' educational needs and these teachers claimed that Lesson Study allowed them to experiment with adaptive teaching strategies and material.

To determine whether the self-reported findings in the first two studies could be supported by classroom observation data, a third study by Schipper and colleagues (2020c) examined adaptive teaching in more detail, again using a quasi-experimental mixed-methods design. For the purpose of this study, an observation instrument was constructed for which the ICALT observation instrument "was used as an anchor to assess the validity" (p. 7). Although the observation instruments did not yield any significant intervention effects in terms of adaptive teaching behavior, the qualitative data showed that teachers who participated in Lesson Study indicated that Lesson Study played an important role in becoming more aware of students' needs and supported them in addressing (or trying to address) these needs accordingly.

They particularly valued the use of case students in this process. The fact that, overall, the observation instruments did not capture the growth in adaptive teaching behavior that was reported by teachers in the stimulated recall interviews was found to be remarkable. Several potential reasons for this conflicting difference in output were related to the complexity of adaptive teaching, both in terms of teachers' conceptualizations of this construct, which showed a great variety of how teachers' defined and perceived adaptive teaching, as well as how to measure this construct as observers did not have information about the students, their educational needs, students' previous experiences with the subject, and teacher-student relationships.

The studies in secondary education show how participating in Lesson Study can impact teachers' adaptive mindset and adaptive teaching competence, but the results are not conclusive as the self-report evidence is not supported by the observation data. In these studies, however, it was argued that more time would be needed to see actual changes in adaptive teacher behavior and observers would need more knowledge about teachers' decisions in terms of adaptive teaching and their teacher-student relationships. As a result, we can conclude that more evidence is needed about the actual impact of participating in Lesson Study on adaptive teaching behavior given the local context in which it takes place, and, more specifically, what mechanisms in Lesson Study influence adaptive teaching behavior.

3.1.3 Lesson Study in Special Needs Education

Based on a recent literature review about the use of Lesson Study in the context of inclusive and special needs education (Norwich et al., 2020), a recent special issue in the *International Journal for Lesson and Learning Studies* (IJLLS) about perspectives of PD in special didactics (2020, Volume 9, Issue 3), and the recently published book entitled 'Lesson Study in Inclusive Educational Settings' (Goei et al., 2021a), it becomes clear that inclusive education and special needs education receive increasing attention in Lesson Study research. Studies conducted in this context are primarily concerned with using Lesson Study as a means to enhance teachers' knowledge and skills so that they can adapt their teaching to students with special educational needs in inclusive settings. This, for example, refers to applying Lesson Study to address the needs of students with neurodevelopmental conditions (Leifler, 2020), mild-to-moderate intellectual disabilities (Klefbeck, 2020), and moderate learning difficulties (MLD) (Norwich & Ylonen, 2013). In the last case, Norwich and Ylonen (2013) followed a local proof route using a realist evaluation methodology to take contextual conditions into account and found that Lesson Study "enabled teachers to develop teaching approaches and a focus on the learning requirements of pupils with MLD, who then showed some gains in their learning" (p. 171). Students in this study were assessed using different measures on reasoning, literacy and motivation.

4 Conclusion and Discussion

Adaptive teaching receives increasing attention due to an international trend toward more inclusive practices and the notion that teacher adaptability is linked to effective teaching (Kyriakides et al., 2009; Parsons et al., 2018). This chapter presented an overview of the current literature on adaptive teaching and whether the collaborative and classroom-based PD approach Lesson Study could support teachers in the increasingly complex endeavor of adapting their behavior to their students' educational needs. Based on the available international literature, we argue that Lesson Study indeed has the potential to promote teachers' adaptive teaching behavior, but much is still unknown about its effectiveness. We believe that the local proof route can contribute to this in order to find out more about the working mechanisms in Lesson Study that impact teacher behavior and student learning in turn. We also believe that a variety of methodologies, including a cross-disciplinary and cross-cultural approach, would benefit the knowledge base around Lesson Study.

In the presented studies, conducted in different European contexts, teachers appeared to be (very) positive about the potential of Lesson Study in preparing teachers for inclusive teaching practices. In general, teachers seemed to gain more awareness of their students' educational needs and gained more knowledge and skills needed to address these needs as a result of participating in Lesson Study. Awareness was enhanced in different ways, for example by closely examining and discussing student behavior, by writing down expectations of student behavior prior to the research lesson, and by interviewing the case students (Schipper et al., 2017). This impacted the way they prepared and executed their lessons by focusing on what students actually need in order to meet the learning objectives. This is most likely the result of taking student learning as a starting point by organizing research lessons around case students (Dudley, 2013). The Response to Intervention model that was used in the Swedish (Nilvius, 2020) and Dutch context (Schipper et al., 2017), may be particularly supportive in selecting these case students and making sure that a representation of all students in the classroom are included in the Lesson Study process. Future studies in the context of Lesson Study in inclusive settings may further examine this.

Despite the added value of the various studies presented in this chapter, it also becomes clear that research on Lesson Study focusing specifically on adaptive teaching is still in its infancy. After all, studies generally focus on special needs students and tend to be situated in primary education. Therefore, clear evidence of how Lesson Study influences adaptive teaching behavior in favor of *all students* and how this, in turn, impacts student learning is still lacking. Capturing adaptive teaching behavior in the classroom using objective measures, proved to be extremely complex and we argue that this is a result of the diffuse conceptualizations of adaptive teaching and the way the concept is operationalized (Deunk et al., 2018).

Finally, in order to draw conclusions about the effectiveness of Lesson Study in terms of influencing adaptive teaching behavior, we argue that school contextual conditions should be taken into account in Lesson Study research. School leaders,

for example, play an essential role in the implementation and sustainability of Lesson Study practices in order to promote adaptive teaching behavior in schools. This essential role not only refers to providing the needed structural conditions (e.g., available time to participate in Lesson Study) and cultural conditions (e.g., a shared vision and collegial support) in the school (Schipper et al., 2020a), but also to having a thorough understanding of Lesson Study and the implications for the school structures and cultures (Seleznyov, 2019) in order for Lesson Study to become an organizational routine (Wolthuis et al., 2020). In addition, even if the school context is very supportive for implementing and sustaining Lesson Study practice, much relies on teachers' adaptive teaching competencies and their motivation, mindset and ideals when it comes to becoming more adaptive teachers. Therefore, we should "acknowledge the slow and incremental way in which teachers incorporate new ideas into their ongoing practices" (Kennedy, 2016, p. 973).

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