

# DEVELOPING COLLABORATIVE RELATIONSHIPS IN LESSON STUDY

*We discuss how collaborative relationships may develop in lesson study groups, paying attention to the critical incidents that may arise. This qualitative research study is based on two lesson studies with primary and middle school teachers. Data were collected through a researcher's journal, audio records of working sessions, video records of research lessons, post lesson reflections, and individual interviews. In the two cases, the collaborative relationships developed as common aims and ways of productive joint work emerged. In the development of these relationships, several critical incidents had a strong influence, in some cases positive and in other cases negative.*

**Key words:** Collaboration; Critical incidents; Lesson study; Primary teachers.

Desarrollo de relaciones de colaboración en estudio de clases

*Analizamos cómo pueden desarrollarse las relaciones de colaboración en grupos de estudio de clases, prestando atención a los incidentes críticos. Esta investigación cualitativa se basa en dos estudios de clases, con maestros de primaria inferior y superior. Los datos se recopilaron a través de un diario, registros de audio de sesiones de trabajo, registros de vídeo de lecciones de investigación, reflexiones sobre la lección y entrevistas individuales. En los dos casos, surgieron relaciones de colaboración con la emergencia de objetivos comunes y formas de trabajo conjunto productivo. En el desarrollo de estas relaciones, varios incidentes críticos tuvieron una fuerte influencia, en algunos casos positiva y en otros casos negativa.*

**Términos claves:** Colaboración; Estudio de clases; Incidentes críticos; Maestros de primaria.

## INTRODUCTION

Collaboration is a way of work often recommended to educational professionals to deal with the problems that they face in their practice and in school life and to improve the quality of teaching and learning (Boavida & Ponte, 2002; Hargreaves, 1994). However, collaboration is often regarded in an unproblematic way, paying no attention to its associated complexities and uncertainties. Recognizing the need of collaboration among teachers to deal with complex educational problems, it is important to understand how it may develop and what difficulties it may face, so that its potential is fulfilled.

Lesson study is a professional development process with collaboration as a main feature (Lewis, 2016; Takahashi & McDougal, 2016; Wood & Cajkler, 2018). However, the way collaboration takes place in a lesson study has been addressed only in few studies (Quaresma & Ponte, 2019; Richit & Ponte, 2019), focusing on the features of collaboration rather than on its processes of development. So, it will be interesting to consider questions such as: How do the participant teachers establish such collaborative relationships? What is the depth that such relationships may attain in the frame of a process of limited duration as a lesson study? What difficulties and problems arise in developing collaborative relationships in a lesson study? With these questions as starting points, the aim of this paper is to contribute to knowledge about how collaborative relationships are constituted in a lesson study and what problems may emerge in their development.

## ISSUES IN COLLABORATIVE PROCESSES

The educational literature offers several, quite distinct definitions of collaboration. For example, Vangrieken et al. (2015) define collaboration “as joint interaction in the group in all activities that are needed to perform a shared task” (p. 23). A more precise definition, put forward in the frame of collaboration among organizations, is provided by Wood and Gray (1991), who state that collaboration “occurs when a group of autonomous stakeholders of a problem domain engage in an interactive process, using shared rules, norms and structures, to act or decide on issues related to that domain” (p. 146). Several aspects are usually regarded as important in collaborative processes, including (a) the active involvement and effort of participants, mobilizing specific knowledge and skills; (b) the setting up of a structure of work in which the different participants have different and balanced roles concurring to the common aim; and (c) the establishment of caring, open and trustful relationships (Achinstein, 2002; Boavida & Ponte, 2002; Vangrieken et al., 2015). In this paper, we consider that a collaborative process unfolds from the identification of a set of aims assumed as common for the participants and also from adopting working processes agreed upon by all group members. In addition,

both the common aims as the working processes must be freely assumed by the participants and not imposed by an external entity. As Dooner, Mandzuk, and Clifton (2008) indicate, means and aims are critical aspects of collaboration and tend to evolve as this process unfolds. In the view of these authors, from diverse aims, common means emerge, leading to common aims, and finally to diverse means.

Vangrieken et al. (2015) suggest that collaboration is a dynamic and multifaceted process and that different types of collaboration may develop with varying depth. In their perspective, collaboration is a general term admitting a variety of possibilities. To overcome the lack of precision of the notion of collaboration, Cohen and Bailey (1997) define a team as “a collection of individuals who are interdependent in their tasks, who share responsibility for outcomes, who see themselves and who are seen by others as an intact social entity embedded in one or more larger social systems (for example, business unit or the corporation), and who manage their relationships across organizational boundaries” (p. 241). This leads Vangrieken et al. (2015) to consider a continuum of forms of collaboration which span from “a mere aggregate of individuals to high levels of collaboration in teams” (p. 26) and to designate “the degree to which a collection of individuals possesses the quality of being a team” (p. 26) by “team entitativity”.

Achinstein (2002), assuming a micro political perspective, considers that conflict constitutes an inherent part of collaborative groups. In her view, the forms and outcomes of organizational learning are related to the way these groups deal with their differences and conflicts: “Communities that can productively engage in conflict, rather than those with low levels of conflict or those that suppress their differences, have a greater potential for continual growth and renewal” (p. 448). She considers that a strong challenge for professional groups is to find a balance between handling controversies that emerge from the participants’ different opinions and beliefs and maintaining strong interpersonal ties and connectedness proper of a caring community. In this way, collaboration does not exclude conflict. On the contrary, intensive collaboration depends on the existence of some conflict, that is managed so that it remains a constructive generator of new ideas for the members of the group.

In this paper, differences and conflicts were analyzed seeking critical incidents (Estrela & Estrela, 1994), seen as situations or events that stand out by their features that make them critical, distinct and relevant for the understanding of a given phenomenon or process. These critical incidents may arise from conflicting expectations of the participants and features of the activities, reflection conflicting views among participants, as well as from surprises and opportunities for reflection provided.

## LESSON STUDY

Lesson study is a professional development process of originating in East Asia (Huang, Takahashi, & Ponte, 2019) and nowadays practiced around the world. In lesson study, teachers work collaboratively defining a learning issue related to curriculum topic and broader learning theme (Takahashi & McDougal, 2016), study curricular documents and teaching materials and, based on this, plan a lesson, which is held and becomes an object of in-depth reflection (Fujii, 2016; Lewis, 2016; Takahashi & McDougal, 2018). During the research lesson, taught by one of the teachers, the participants observe the events and, from there, all reflect on the students' learning that took place, students' difficulties, and possible alternatives to consider to framing the lesson. In lesson study, the discussions held by the participants highlight, challenge, and question their conceptions and practices (Cajkler et al., 2015; Fujii, 2016). This collaborative activity gives teachers the opportunity to, in a structured and sustained way, with a focus on students' learning, take risks in their practice and try out new ideas (Fujii, 2016).

In a study addressing teacher collaboration and reflection in a lesson study Quaresma and Ponte (2019) indicated that the primary and middle school teachers' involvement in moments of planning and analysis of the students' work, led them to reflect on practice and for practice, and helped to develop collaborative relationships, moving from storytelling and scanning to joint work. In another study, Richit and Ponte (2019), based on a lesson study that they conducted, indicated that collaboration among teachers took place in three domains –sharing tasks, materials, and ideas; cooperating in carrying joint work; and providing personal stimulus. They also indicated that such collaboration took place during the lesson study especially in planning and, in some cases, extended to teachers' daily professional activities. Such previous research provides significant results regarding how collaboration may take place in lesson study and, as such, supports the analysis made in this paper regarding the development of collaborative relationships.

## RESEARCH METHODOLOGY

This qualitative work is based on two lesson studies. These lesson studies arose from a demand of the director of a school in Lisbon, Portugal, that asked the authors to provide a professional development activity for its teachers in order to improve students' learning. The participating teachers were appointed by the director. The first case that we analyze is based on a lesson study with primary school teachers teaching grade 3. These teachers teach all school subjects, including mathematics. Initially, the group had more teachers but from some point on it was carried out with just three teachers. In this case, the three teachers and a teacher educator (the first author of this paper) constitute the collaborative group. One of these teachers (Irina) (all teachers' names are pseudonyms) had a strong

professional knowledge in mathematics and mathematics teaching and self-confidence as a teacher of this subject, whereas the other two teachers (Antónia and Manuela) had a much weaker professional knowledge and were quite insecure regarding mathematics teaching. All the three teachers had more than 10 years of teaching experience. The second case refers to a lesson study with five middle school mathematics teachers, teaching grades 5 and 6, and these teachers and the same teacher educator that led the whole process constitute the collaborative group. From the five teachers, three (Maria, Isabel, and Francisca) were tenured in the school and had more than 30 years of experience and two (Luísa and Teresa) had more than 10 years of experience and were on annual contracts. The role of the first author as teacher educator was to set the agenda for the sessions, propose activities for the group to undertake, and make suggestions regarding the division of labor. In both cases, three other teacher educators/researchers participated in several sessions, including the research lesson and the post-lesson discussion.

Lesson study sessions took place once or twice a month and had two phases. Phase one had eight sessions. Session one aimed to introduce the lesson study to all participating teachers. Sessions two to six intended to deepen their knowledge about the chosen topic and about diagnosing students' previous knowledge (including the realization of a diagnostic test) and to prepare a lesson on it. Session seven consisted in observing a lesson, and session eight was a reflection on the research lesson and about the work carried out up to that point. Phase two had four sessions. In sessions nine to twelve we asked the teachers to plan, carry out, and reflect about two lessons that aimed to use the ideas discussed in the previous work undertaken, especially regarding the tasks and the organization of the lesson, with attention to the moments of whole-class discussion. In session twelve there was also a global reflection about the whole work carried out.

Lesson study with grade 3 teachers considered the topic of adding rational numbers represented as fractions as juxtaposing collinear segments whereas lesson study at grade 5 considered the topic of comparing and ordering rational numbers represented as fractions. In sessions two to six dedicated to the preparation of the research lesson, a major feature of the work was solving mathematical tasks and discussing possible strategies that the students could use in solving them. For example, with the grade 5 group, the task indicated in Figure 1 originated a very lively discussion:

The following figure represents  $\frac{3}{4}$  of a paper strip.



Represent  $\frac{1}{2}$ ,  $\frac{2}{3}$ ,  $\frac{4}{3}$ , and  $\frac{3}{2}$  of that strip. Explain your reasoning.

*Figure 1.* Task analyzed by the middle school teachers in session 2

The teachers themselves sought to understand how the task could be solved. They considered that the task is very difficult because it requires a solution with several

steps, the first of which is the reconstruction of the unit, which their students were not used to doing. Wondering about the possible response of their students, they discussed the possible difficulties that their students might have, and indicated that the most common mistake would be to divide the strip into four pieces. They considered the task out of range for their students. However, we challenged them to propose this task in their classes. They accepted this challenge and verified with surprise that several students could represent the required fractions.

Data were collected through a research journal, audio recordings of working sessions and video recordings of the research lesson and post-lesson discussions. In addition, individual interviews were held with the participant teachers right after the research lessons. Data from sessions (Sx) and Interviews (I) were analyzed seeking to identify the aims and working processes during the lesson studies (Dooner, Mandzuk, & Clifton, 2008), the critical incidents that influenced these lesson studies in a positive or negative way (Estrela & Estrela, 1994), and the implications of the aims and working processes and critical incidents in the development of collaborative relationships during the lesson studies.

## A LESSON STUDY WITH PRIMARY TEACHERS

### **Aims and Working Processes**

This lesson study was framed by two distinct but interrelated aims. In a first phase of the work, the aim of the group was to plan and teach a research lesson on addition of rational numbers. In a second phase, the aim was to prepare and carry out new lessons about other topics related to rational numbers. Underlying these aims was the teachers' interest in deepening their mathematical and didactical preparation and in getting to know how to better teach these topics, taking into account a new curriculum that was being introduced. The teachers may have also been interested in corresponding to the invitation from the school principal to participate in this professional development process as well as in doing a certified teacher education process. The aims were proposed in both phases by the teacher educator and discussed by all participants that reshaped and detailed some aspects.

The first phase of the work included a study about the teaching of rational numbers, a survey of curriculum materials, and an analysis of students' difficulties. In this work, the proposals were mostly made by the teacher educator. There was a strong involvement of Irina, the teacher that had a good relationship with mathematics teaching and there was very little involvement of Antónia and Manuela, the two teachers who were not confident regarding it. These two teachers seemed quite lost in the working processes used in planning the research lesson. The second phase took place after the post-lesson reflection, during a follow-up in joint work, with work towards a new common aim, shared decisions, and an effective division of labor. In this second phase, all teachers knew the working processes and what they were expected to do, given their experience in the first

phase. That was apparent in the way the teachers got involved in selecting and adapting tasks for the new lesson.

Antónia and Manuela began their planning quite insecure. They opened the textbook and began scanning it. They seemed uncomfortable with the perspective of selecting tasks, perhaps thinking that would not be regarded as appropriate. Taking into account the struggle of the teachers, the teacher educator suggested that, instead of just selecting a task, they could adapt it. Manuela liked this idea:

*Manuela:* I think so, increasing the difficulty, isn't it? Because that one is very basic. But I think yes, mixing up tenths, hundredths, and thousandths, with different denominators (S10).

At that point, Antónia and Irina also began giving further suggestions to elaborate the task (Figure 2):

*Antónia:* ... Or A, B and C, in order to have two equivalent and one different ... For example, to have two equivalent fractions. They understand that ... [those] are equivalent fractions, albeit having different denominators.

*Manuela:* Why don't we give a hypothesis here... That is, why not give equivalent fractions?

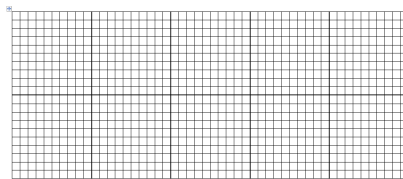
*Marisa:* Ah, one of these being as a fraction. Yes, instead of all being decimals...

*Manuela:* For example, here, there are four as decimals, aren't there? And one in words. Why don't we take out one that is a decimal and put it as a fraction?

*Irina:* Exactly.

*Marisa:* Maybe.

*Irina:* And then, during the discussion, we can ask them to write this also as a fraction. (S10)



In the grid, you should paint 0.4 green; 40/100 blue and four hundredths yellow.

*Figure 2.* Task prepared by the teachers in session 10.

The two teachers that had little participation in the first phase started to strongly participate in the second, making proposals for the group and assuming the responsibility for carrying out an important part of the tasks to undertake. The teachers became more confident in their knowledge and that seemed to help them to assume a joint responsibility for the results of the second phase in which the role of the teacher educator in leading the sessions became less prominent.

### **Critical Incidents along the Lesson Study**

A first critical incident experienced by the group was making the decision regarding who would teach the research lesson. Initially, none of the teachers volunteered. Irina thought that it should be one of her colleagues, who had much more to learn. The other two teachers, aware of their limitations, thought that Irina should teach the lesson. This issue created some discomfort in the group:

*Irina:* I think that the tension begun vanishing when I said “I do not mind being me”. Then, it calmed down a bit. Did it really calm down? No. It alleviated. I knew it would come to me. (S12).

When it became necessary to make a decision, the fears of Antónia and Manuela in being exposed to show their fragilities in teaching a mathematics lesson weighed much more than the incentive of Irina to the learning of her colleagues. Unsatisfied, she assumed to teach the lesson that she prepared with great care and detail.

A second critical incident was the research lesson. Antónia and Manuela, the teachers that had less participation so far, felt that the lesson taught by their colleague had an interesting dynamic and seemed to have appreciated the deep reflection that was made on the lesson:

*Manuela:* What happened in our group may not apply to other groups. I think that for me it was an added-value to observe Irina’s lesson, I have no doubt about that!

*Marisa:* Why?

*Manuela:* Because I think that the security and the way she looks at mathematics... I was listening to her... I think I always learn with Irina.

*Irina:* We always have much to learn with each other.

*Manuela:* ... I learned much more than if I was teaching the lesson, perhaps. (S12)

The third critical incident occurred just after the research lesson. We conducted individual interviews, in which we sought to know how the teachers regarded their experience so far in the lesson study. For Antónia and Manuela it was a moment in which they could voice their difficulties and insecurities. Both teachers indicated that they felt the detailed work of analysis of tasks and students’ solutions tiring, and Manuela referred that often she did not understand what was being discussed, given the limitations of her mathematics knowledge. These interviews assumed the role of *exorcising ghosts*, concerning their weaknesses and also concerning role of the teacher educator and the other participants as evaluators. These interviews contributed to the development of stance of security in the participation of these teachers in the lesson study activity and marked the development of close relationships within the group, including the teacher educator.



### **Collaborative Relationships**

In this lesson study, the collaborative relationships in the first phase developed only between two participants (Irina and the teacher educator), with the two other participants assuming a peripheral role. In the middle of the process, two critical incidents (the research lesson and the interviews) led the four participants to develop closer relationships and the group moved to working rather collaboratively. Within the group, the decision power began by being centered in the teacher educator, who made most of the working proposals, being shared by one of the teachers who assumed a strong involvement. In the second phase, the teacher educator maintained an important role in formulating the most general working proposals but the decisions about their enactment become distributed by all group members. In the first phase of the lesson study, the teachers did not know yet what was expected from them at each moment and that influenced their involvement. In the second phase, the teachers were more confident about their knowledge and knew the working processes. That led them to be able to adopt common aims and working processes. This enabled them to work in a more autonomous way regarding the teacher educator, sharing also the responsibility for the results of the work.

## **A LESSON STUDY WITH MIDDLE SCHOOL TEACHERS**

### **Aims and Working Processes**

This lesson study also had two phases, each one with its own aim. The first phase aimed to prepare and carry out a research lesson about comparing rational numbers; the second phase aimed to prepare and undertake new lessons about other topics related to rational numbers. These aims were developed in a similar way to the primary group. These teachers showed very similar interests as did the primary teachers yet also showed interest in making their lessons more dynamic, not only in this topic but also in other topics, in order to improve students' learning and to develop their own understanding of the new curriculum.

The structure of this lesson study is very similar to the primary group, following the usual model of defining the topic to address, study curriculum materials, as well as preparation, enactment, and reflection about a research lesson. There was also a follow-up phase with this group. In the first phase, the working proposals were mostly made by the teacher educator with a strong involvement of the teachers, albeit in different degrees, with many cases of joint work. In the second phase, the follow-up went on also in joint work, with decisions assumed in a shared way, with division of labor to reach a common aim.

### **Critical Incidents along the Lesson Study**

Despite their similar structure, the two lesson studies had quite different dynamics. At the very beginning of the second case, the participants questioned why they

were doing the lesson study. Its realization had been agreed upon in a meeting with the school principal and several teachers of different grade levels, including Maria, the coordinator of the middle school teachers. In this meeting, Maria did not show any concerns, but in the first lesson study session she raised many questions, showing high mistrust regarding this kind of work. She questioned why to focus all the attention on just one topic when there were so many problematic topics for students (“so much time to tackle just one topic!” S1). She also questioned if the presence of a high number of observers would not disturb the students and, with particular emphasis, indicated that she felt very uncomfortable by having a lesson observed, as she “did not want to be evaluated” (S1). The other teachers seemed to share these concerns. This reaction created a dilemma to the teacher educator team, between trying to persuade the teachers and dropping the lesson study. We presented several arguments indicating benefits that may arise from the deep study of a single topic, explaining that experience shows that students tend to not become disturbed in the research lesson, and reminding them that the focus of this lesson would be in the students’ learning and not in the work of the teacher. Finally, the teachers decided to accept to experiment, to see how it would go. This unforeseen beginning was the first critical incident in the lesson study.

A remarkable turnover took place in the beginning of the following session, providing a second critical incident. From a position of great reservation, the teachers moved to a position of active participation. Several mathematical tasks that were proposed made them feel challenged, enjoying the experience. The teachers also got involved in other activities such as the analysis of students’ solutions, the elaboration of a diagnostic of students’ knowledge, the preparation and undertaking of the research lesson, and the follow-up activities. Such involvement is noticeable, for example, as the teachers planned the whole class discussion with little support of the teacher educator, taking into account ideas already discussed, and calling on students to present and justify their strategies:

*Maria:* So, the idea was that Luísa would put the answers on the board...

*Marisa:* Some.

*Luísa:* Two or three.

*Maria:* And then to propose them for class discussion...

We could analyze one and say: “What is going on here? Who agrees?” Isn’t it?...

*Maria:* Who thinks this is correct? . . .

*Tânia:* To give the floor to who is at the board, because he/she then ends up arguing: “I liked this because I thought that...”

*Luísa:* Normally when they go the board they explain and then I ask: “and then, you agree? Ah! No? Why not?” Therefore, the one that is at the board explains and then if there is someone who does not agree... (S5).

A third critical incident arose, also in this group, with the decision of who would be the teacher for the research lesson. The structure of the group already indicated that the choice should be among one of the grade 5 teachers (Maria, Francisca and Luísa). Maria and Francisca refused to assume this role and the decision fell on Luísa, the teacher from this group with less professional status, since she had only an annual contract. Once the decision was made, without many protests from Luísa, the good climate returned to the group. This is a clear example how micro political power balance played an important role in how a decision was made.

A fourth critical incident, this time positive, occurred with the research lesson. Although it did not go as planned regarding the tasks proposed and regarding students' learning, it yielded good moments of students' work and originated an interesting and lively post-lesson discussion. In the final reflection, the teachers underlined that they enjoyed the experience of observing the research lesson:

*Francisca:* It was fruitful for all of us, because we verified that when we are in the classroom things do not go as well as we foresee. And other things, the kids surprise us with the solutions that they present . . . I thought it was a pretty lesson, different from usual... (S12).

### **Collaborative relationships**

In this lesson study, after its problematic beginning, the collaborative relationships among all members of the group developed in a very positive way. The mood of the sessions was enjoyable, the teachers showed willingness to carry out the tasks that were defined and the activities undertaken enabled the movement of the group towards its aim. The single exception to this pattern concerned the decision of the teacher for the research lesson. The refusal of the teachers in being observed has several explanations. It results, first, on the strong tradition of individualism and privacy in the work of the teacher that exists in Portugal as in many other countries. In addition, this reservation is also a consequence of previous attempts from the Ministry of Education to establish a system for teacher evaluation in which the observation of lessons was an essential feature. This reservation concerning the observation of lessons is a very strong cultural element in our country that requires special attention in the adaptation of lesson study to our educational context.

In the final reflection made in the last session of this lesson study, we asked the teachers what was the most salient feature of the work that was carried out. To our surprise, the teachers highlighted the collaborative work that they indicated to have expanded outside of the lesson study work:

*Marisa:* What was the most salient feature of the lesson study?

*Maria:* It was collaboration! It improved the relations among the five of us because we were three tenured teachers in the school for many years and we did no longer pay attention to each other, because we know the working methods of each other . . . And I find that this lesson study yielded this contact and also with the new colleagues . . . And yesterday when we

made that lesson planning . . . We were two old women with a young one, and I like this contact. I am frank.

*Francisca:* For me it was very positive... Because... We worked together, we shared information... And the work among teachers is absolutely important. Many times, we feel alone, don't we? . . . I find this the main issue. We opened ourselves to each other. We were not afraid of... Because sometimes there are people that have fear of showing their weak points, and I find sharing very productive, that is, working in group . . . (S12)

In fact, the collaborative work had never been an object of explicit discussion in the sessions. However, the teachers showed that they were aware of it and valued it strongly. The collaborative work carried out in the lesson study also influenced the daily relations of the five teachers that had good personal relations but had little professional interactions. There was very little communication among the tenured and the contracted teachers who were new at the school and the lesson study brought another dynamic to the group, providing moments of joint work that did not exist previously.

## CONCLUSION

The two lesson studies that we presented had several critical incidents that generated conflicts (Achistein, 2002). These critical incidents originated in the unfamiliarity of the teachers who faced a teacher education model very different from those that they knew and were used to participating in and, most especially, on their reservations of being observed by the whole group in a research lesson. Conflicts work in several ways: some are conflicts of participating teachers with teacher educators (e.g., the features of the professional development activity), others are conflicts of participating teachers among themselves (e.g., who teaches the research lesson?), and still others are inner conflicts of participants themselves (e.g., the insecurity regarding their professional competence). These conflicts and difficulties were dealt with high respect and diplomacy and the stimulating nature of the working proposals of the teacher educators during the sessions was the main factor to overcome them.

It must be noted, in addition, that there were critical incidents with a positive role, namely the research lesson (in both groups), the individual interviews (with the primary group), and the active involvement in doing challenging mathematical tasks and analyzing students' solutions (with the middle school group). The aims proposed in the lesson studies, in each phase, provided the necessary direction to the activities and the working processes that emerged, following a pattern of progressive development quite different from that indicated by Dooner et al. (2008). In both lesson study groups, these processes were particularly efficient in the last phase of the process, during the follow-up, in which all the teachers had opportunity to prepare tasks directly for their classes and share their experiences.

In this phase they worked as a team (Vangrieken et al., 2015). Therefore, both lesson studies involved the development of close relationships among participants and ended in a climate of productive and enjoyable working processes and aims achieved.

In these two lesson studies, the teacher educators were an integral part of the collaborative group, albeit with a very specific role. As the lesson study experts, they led the whole process, but did so in permanent negotiation with the other participants. Collaborative relations developed, supported by assumed common aims with enough strength and by establishing productive, joint ways of working associated first to the preparation and teaching of a research lesson and then later to other lessons. As our data indicates, especially with the middle school group, this may provide a strong collaborative experience. However, these relationships are ephemeral, unless new common aims emerge as well as new productive joint ways of working.

Collaboration is often seen as a process that develops in a natural and non-problematic way. In lesson study, as well as in many other activities involving teachers in joint activity, collaboration tends to be regarded as something inherent and not as something that has to be constructed by the participants by their joint activity, negotiating roles and relationships. This article shows that, as any other social process, lesson study unfolds in movements forward and backward with critical incidents (Estrela & Estrela, 1994) that sometimes favor the development of collaborative relationships and other times oppose them. Overcoming difficulties and differences among participants in a positive way may strengthen the relationships among participants. The cases presented show that, in the Portuguese context, lesson study framed by the preparation and teaching of lessons about a given topic, may sustain the development of these relationships, but these are not given at the beginning –they need to be constructed by the participants in their joint activity. In a similar way, in other professional development processes in which teachers' joint activity constitutes a main feature, collaborative relationships must be regarded as being constructed as the group faces difficulties and challenges, associated to differences and conflicts.

## REFERENCES

- Achinstein, B. (2002). Conflict amid community: The micropolitics of teacher collaboration. *Teachers College Record*, 104(3), 421-455. <https://doi.org/10.1111/1467-9620.00168>
- Boavida, A. M., & Ponte, J. P. (2002). Investigação colaborativa: Potencialidades e problemas. In GTI (Ed.), *Refletir e investigar sobre a prática profissional* (pp. 43-55). APM.
- Cajkler, W., Wood, P., Norton, J., Pedder, D., & Xu, H. (2015). Teacher perspectives about lesson study in secondary school departments: A

- collaborative vehicle for professional learning and practice development. *Research Papers in Education*, 30(2), 192-213. <https://doi.org/10.1080/02671522.2014.887139>
- Cohen, S. G., & Bailey, D. E. (1997). What makes teams work: Group effectiveness research from the shop floor to the executive suite. *Journal of Management*, 23(3), 239–290. <https://doi.org/10.1177/014920639702300303>
- Dooner, A.-M., Mandzuk, D., & Clifton, R. A. (2008). Stages of collaboration and the realities of professional learning communities. *Teaching and Teacher Education*, 24(3), 564-574. <https://doi.org/10.1016/j.tate.2007.09.009>
- Estrela, M. T., & Estrela, A. (1994). *A técnica dos incidentes críticos no ensino*. Estampa.
- Fujii, T. (2016). Designing and adapting tasks in lesson planning: a critical process of Lesson Study. *ZDM Mathematics Education*, 48(4), 411-423. <https://doi.org/10.1007/s11858-016-0770-3>
- Hargreaves, A. (1994). *Changing teaching, changing times: Teachers' work and culture in the postmodern age*. Cassel.
- Huang, R., Takahashi, A., & Ponte, J. P. (2019). Theory and practice of lesson study in mathematics around the world. In R. Huang, A. Takahashi & J. P. Ponte (Eds.), *Theory and practice of lesson study in mathematics* (pp. 3-10). Springer. [https://doi.org/10.1007/978-3-030-04031-4\\_1](https://doi.org/10.1007/978-3-030-04031-4_1)
- Lewis, C. (2016). How does lesson study improve mathematics instruction? *ZDM Mathematics Education*, 48(4), 571-580. <https://doi.org/10.1007/s11858-016-0792-x>
- Quaresma, M., & Ponte, J. P. (2019). Dinâmicas de reflexão e colaboração entre professores do 1.º ciclo num estudo de aula em Matemática. *BOLEMA*, 33(63), 368-388. <https://doi.org/10.1590/1980-4415v33n63a18>
- Richit, A., & Ponte, J. P. (2019). A colaboração profissional em estudos de aula na perspectiva de professores participantes. *BOLEMA*, 33(64), 937-962. <https://doi.org/10.1590/1980-4415v33n64a24>
- Takahashi, A., & McDougal, T. (2016). Collaborative lesson research: Maximizing the impact of lesson study. *ZDM Mathematics Education*, 48(4), 513-526. <https://doi.org/10.1007/s11858-015-0752-x>
- Vangrieken, K., Dochy, F., Raes, E., & Kyndt, E. (2015). Teacher collaboration: A systematic review. *Educational Research Review*, 15, 17-40. <https://doi.org/10.1016/j.edurev.2015.04.002>
- Wood, D. J., & Gray, B. (1991). Toward a comprehensive theory of collaboration. *Journal of Applied Behavioral Science*, 27(2), 139-162. <https://doi.org/10.1177/0021886391272001>
- Wood, P., & Cajkler, W. (2018). Lesson study: A collaborative approach to scholarship for teaching and learning in higher education. *Journal of Further and Higher Education*, 42(3), 313-326. <https://doi.org/10.1080/0309877X.2016.1261093>

Marisa Quaresma  
Instituto de Educação, Universidade  
de Lisboa  
[mq@campus.ul.pt](mailto:mq@campus.ul.pt)

João Pedro da Ponte  
Instituto de Educação, Universidade de  
Lisboa  
[jpponte@ie.ulisboa.pt](mailto:jpponte@ie.ulisboa.pt)

Recibido: 31 de octubre, 2020. Aceptado: 17 de marzo, 2021

doi: 10.30827/pna.v15i2.16487



ISSN: 1887-3987