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## TEACHER EDUCATION & DEVELOPMENT | RESEARCH ARTICLE

# The bumpy road to implementing cooperative learning: Towards sustained practice through collaborative action

Beathe Liebeck-Lien<sup>1\*</sup>

**Abstract:** Cooperative learning (CL) is a pedagogical model that is widely recognised to enhance students' academic and social learning. However, teachers experience difficulties implementing the method, which leads to CL being under-utilised in schools. This paper presents experiences from an exploratory research and development project in which teachers implemented CL through a context-driven professional development programme. The study explores the complexity of implementing CL by examining three critical stages in the professional development programme: a workshop, follow-up activities and proactive action research. Findings suggest that collaborative action research in teacher teams became a catalyst for teachers' learning and their implementation of CL.

**Subjects:** Educational Research; Teachers & Teacher Education; Teaching & Learning; Continuing Professional Development

**Keywords:** action research; cooperative learning; teacher collaboration; teachers' learning; professional development; research and development



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### ABOUT THE AUTHOR

Beathe Liebeck-Lien is a PhD candidate at Norwegian University of Science and Technology, NTNU, and a teacher in lower secondary school. She is an active teacher and researcher with experience using the pedagogical model Cooperative Learning in own teaching practice and from leading continuing professional development programmes for teachers with Cooperative Learning. She is a teacher and researcher with a special interest in Research and Development, Cooperative Learning, Teacher Learning and Professional Learning Communities.

### PUBLIC INTEREST STATEMENT

This research investigates how collaboration in teacher teams can support teachers' implementation of the pedagogical model Cooperative Learning (CL). CL has an extensive research base on its beneficial effect on students' academic and social learning and is considered an essential tool to develop skills needed in the social and work life of the 21st century. Nevertheless, CL is found to be challenging for teachers to implement after courses and training. This paper offers insights into the complexity of implementing CL by identifying three critical stages in a professional development programme during which teachers implemented CL. The key finding of the study is that a workshop alone does not support teachers' CL practice. However, continuous follow-up through collaboration in teacher teams with proactive action research did facilitate teachers' learning and implementation of CL. These findings can make an important contribution to practice that schools and education policy-makers should consider implementing CL.

## 1. Introduction

There is a growing need to enhance students' collaborative skills to prepare them for a complex and rapidly changing society and work life of the 21<sup>st</sup> century. Many industries require employees to collaborate, as the basic work structure is team focused rather than the individual (Deepa & Seth, 2013). Team-work and collaboration skills are found to be one of the most important skills employees look for in future employees (Burrus et al., 2013; Dixon et al., 2010). Further, the nature of collaboration is shifting to a need for a more sophisticated skillset with an increasingly globalised world and with mediated interactions (Dede, 2010).

It has been emphasised that the ability to collaborate is only mastered through sustained practice beginning in the early school years and continuing throughout a student's education (Kuhn, 2015). Despite the evident need to teach students how to collaborate, research indicates that students are often in educational situations that do not facilitate collaboration with peers. Whole class lecturing followed by individual tasks is still the prominent teaching method (Gillies & Boyle, 2010; Klette et al., 2008; Kutnick et al., 2005).

The pedagogical model of cooperative learning (CL) is an important tool for enhancing students' ability to collaborate and to learn through collaboration. Cooperative learning refers to teaching strategies where students work in small groups structured by the teacher to help each other learn academic content (Slavin, 2014). The central idea of CL is that students learn more together than on their own, which maximises the learning outcomes for all participants in the group (Johnson & Johnson, 1999). In addition to supporting teachers in their teaching of their own subjects, CL entails working on social skills, which are relevant throughout the school curriculum (Schul, 2011).

Although CL has significant potential for enhancing students' academic and social learning, teachers experience difficulties implementing the pedagogical model in their teaching (Sharan, 2010). This article presents and discusses findings from a 9-months professional development (PD) programme. In this PD-programme the teachers explored and implemented CL through site-based learning and action research in interdisciplinary teams. The study aims to give insight into teachers' implementation of CL to contribute to the discussion and knowledge of how teacher learning can facilitate the implementation of CL.

### 1.1. Implementation of cooperative learning

Over the last four decades, CL has been the subject of extensive research and has been associated with increased academic achievements and social skills (Kyndt et al., 2013). The large body of research on the effects of the method suggests that CL should be a widely used teaching strategy. However, research points to challenges for teachers in implementing the method in their classrooms after training (Buchs et al., 2017). Sharan (2010) argues that there is a gap between the idea of CL and its practical implementation as the method is often abandoned or its practice notably reduced after training courses. This is confirmed in a recent study by Buchs et al. (2017), which explored 207 elementary school teachers' beliefs and use of CL. The study found that the method was not widely used and that the teachers experienced challenges embedding CL with the curriculum, freeing up time for CL-activities and assessing students when using the method.

Cooperative learning is a complex pedagogy, and the teacher's role is pivotal if the method is to be properly implemented. The teacher's role in CL is under-explored as much of the research on CL addresses its effect on students' learning (Ruys et al., 2011). However, the literature on teachers' implementation of CL is growing, and several studies identify a number of challenges faced by teachers implementing CL that constrain its practice. Hennessey and Dionigi (2013) found that teachers had limited knowledge of CL, which was a barrier to its successful implementation. They point out that although the method is well-theorised, it is not sufficiently integrated into teachers' education or supported in schools. Other difficulties encountered by teachers in implementing CL that are identified in the research literature are group management and challenges related to time, organisation, curriculum and assessment (Buchs et al., 2017; Dyson et al., 2016; Ghaith, 2018; Gillies & Boyle, 2010).

## 1.2. Teacher learning through cooperative learning

To address the challenges of implementing CL, it is important to support teachers' learning of the method. Cooperative learning is characterised by an active learning environment. This may present challenges for teachers and students who are used to more traditional learning situations. Sharan (2014) claims that implementing CL requires new skills for teachers, such as taking on the role of facilitator, designing learning activities structured for CL and teaching collaboration skills.

Timperley et al. (2007) emphasise that changing teaching practice in substantive ways is difficult. To develop new understanding and skills, teachers need to engage with new knowledge through multiple learning opportunities involving a range of activities. Such teacher learning must have clear aims and alignment between content and activities. Moreover, teacher collaboration is increasingly seen as a key element of teacher learning and important for improving practice (Darling-Hammond et al., 2017). The literature indicates how participation in professional learning communities influences teacher practice and student learning (Bolam et al., 2005; Vescio et al., 2008). Interest in how professional learning communities and teacher collaboration can support the implementation of CL is growing. Dyson et al.'s (2016) study of primary physical education teachers found that ongoing embedded support in implementing CL in a school-based professional learning group helped teachers learn to use the method in their teaching. Jolliffe's (2015) case study of a network of schools in England that implemented CL with support from a university also identifies the positive impact of ongoing support for teachers working together on the implementation of CL. The study highlights the fact that CL requires a sustained and collaborative process to be implemented effectively in schools and teaching practice.

More research on the implementation of CL is needed to develop knowledge that will lead to sustainable implementation of the method (Sharan, 2010). Much of the existing research on professional learning communities and teacher collaboration in the implementation of CL is based on large-scale project or networks (see Jolliffe, 2015; Saborit et al., 2016). There is a lack of small-scale research projects with exploratory designs aimed at understanding the complexity of CL implementation from a practitioner perspective. Baines et al. (2015) argue that much of the research on the implementation of CL consists of experimental short-term studies and that there is little research on how teachers develop and implement CL in their own teaching practice. Therefore, more research is necessary on teachers' integration of CL into day-to-day school practice.

This article describes and discusses the findings from a PD programme in a lower secondary school in which teachers explored and implemented CL by collaborating in interdisciplinary teacher teams. Throughout the school day, students meet different teachers and subjects, and since CL is a subject-independent teaching method, the potential exists for teacher collaboration in the implementation of CL across subjects. Teachers who teach the same students can support each other in implementing CL, and this can also benefit students by enabling them to participate in CL in different subjects at the same time. By investigating ongoing teacher learning and collaboration with regard to CL throughout the PD programme, this article seeks to provide an understanding of how the implementation of CL can be supported.

The following research question guides this article: How can collaboration in teacher teams facilitate teachers' implementation of CL?

Cooperate and collaborate are often used interchangeably as the terminology associated with group learning has become intricate and it is difficult to distinguish between them (Davidson & Major, 2014). However, collaboration is often distinguished from CL in that cooperation is accomplished through a division of labour, such as the students having their own specific sub-tasks to meet the common goal (Ferguson-Patrick & Jolliffe, 2018). In this paper, when talking about collaboration, this generally refers to working together. When referring to CL, it relates to the specific educational model that structures students' collaboration for academic and social learning.

### 1.3. A conceptual approach to cooperative learning

Cooperative learning is an umbrella term for a variety of educational approaches that are structured to enable students to learn by working together and to learn to collaborate (Sharan, 2010). It is an instructional technique planned by the teacher with the aim that, in time, students will learn to collaborate without this scaffolding (Ferguson-Patrick & Jolliffe, 2018). There are several researcher-developed CL-procedures and models ranging from concrete and prescribed to more conceptual and flexible, that can be used in the classroom (see Johnson et al., 2000). The method is anchored with the underlying theory of social interdependence adapted to the educational setting (Baloche & Brody, 2017; Johnson & Johnson, 2008). Johnson and Johnson (2017) highlight that the basic premise of social interdependence theory is “that the way in which interdependence is structured determines how individuals interact, and the interaction pattern determines the outcome of the situation” (p. 286). By structuring for positive interdependence between students as it is done in CL, leads to promotive interaction beneficial for learning.

This study is informed by the conceptual approach to CL “Learning Together” and covers three types of CL: informal CL, formal CL and base groups. Informal CL consists of students working together in temporary ad-hoc groups that last from a few minutes up to one class period. In formal CL, students work together in groups for one class period and up to several weeks. Base groups are long-term heterogeneous groups with stable membership, and the aim is that the students provide each other with academic and social support (see Johnson & Johnson, 2002). The three types of CL were supported by the teachers’ learning and use of CL-structures. CL-structures are specific ready-made strategies that the teacher can use to organise the interaction between the students. The main feature of the structures is that they are content free and can be adjusted to suit any lesson and year level (Ferguson-Patrick & Jolliffe, 2018). There are multiple structures for teachers to use.

The five key elements of CL (see Table 1) were used as a guiding framework for all levels in the PD programme. These five elements are the mediating variables for facilitating effective collaboration (Johnson & Johnson, 2017).

## 2. Methodology and methods

### 2.1. Context

This paper reports on a research and development project that explored the implementation of CL in a lower secondary school. The research question stated above is addressed using data from a nine months implementation of CL. The perspectives of both the teachers and the researcher are considered.

**Table 1. Key elements of CL and explanations based on Johnson and Johnson (2002)**

Positive interdependence	Students perceive that they are linked with others in such a way that they cannot succeed unless their group members succeed.
Individual accountability	Students are held responsible for their share of the work in the group.
Face-to-face promotive interaction	The teacher maximises the students’ opportunities to promote each other’s success and learning through group work.
Social skills	Students learn the social skills required to function in a group through training in interpersonal and small group skills.
Group processing	Group members periodically reflect on the group’s functioning and learning.

The study was carried out at a suburban lower secondary school in Norway, which has around 500 students in years 8–10. The students' ages range from 13–16. The teachers work in interdisciplinary teacher teams who teach the same students from year 8 to year 10. The teacher teams are made up of three teachers who together are responsible for a form group of about 50 students. Each teacher in the team specialises in and is usually responsible for teaching one to three subjects to the form group. Organising teachers in teams is a common practice in lower secondary schools in Norway.

The research and development project was initiated by the author in her own school. As a teacher, the author had used CL extensively in her own teaching and had past experiences facilitating a school-based implementation of a structured approach to CL. The teachers who participated in this study had limited previous knowledge and experience of CL but were interested and motivated to learn about the method.

When initiating the project, the author had two predetermined criteria: (1) the teachers should work with and explore a conceptual approach to CL, based on the five elements presented above (Johnson & Johnson, 2002), and (2) learning and working with CL should mainly take place in interdisciplinary teacher teams.

After initiating the PD programme for implementing CL, further planning was conducted in close collaboration with the school and the teachers involved. The aim was to make this a contextually driven programme that would be responsive to the school's suggestions and ideas and that would support the teachers' needs.

The initial plan was that only one teacher team would participate in the PD programme. However, the school wanted all teachers teaching in year 8 to participate. This amounted to three teacher teams. The author also facilitated sessions on CL for the whole school during the study, with the intention of providing all teachers in the school with a basic understanding and experience of CL.

The aim of the study was to explore the implementation of CL through teacher collaboration in interdisciplinary teacher teams and to gain insight into how teachers' implement and develop CL in their own day-to-day teaching practice. By initiating the PD project in the school, the author also wanted to initiate a change in teaching practice to include CL. It is hoped that the research will generate new knowledge about the implementation of CL.

The author had a dual role in this project: (1) to support and facilitate the teachers' CL practice and (2) to collect data about the implementation of teachers' learning with the method for research purposes. The author was a full staff member and facilitator and also undertook the specific role of researcher.

## **2.2. Outline of the PD programme**

The PD programme included a range of activities to facilitate teacher learning of CL during a nine months period, including whole school sessions, sessions for year 8 only and implementing CL through interdisciplinary teacher teams. A more detailed description of three stages of the intervention is provided below.

### **2.3. First stage**

The first stage of the PD programme, was a three-day workshop in CL which included all teachers in year 8 and was facilitated by the author, took place at a conference centre where the teachers also stayed overnight. This created a space to focus solely on CL. The workshop incorporated a variety of interactive activities, such as team building and CL structures. During the workshop, the teachers gained first-hand experience of CL by working together in teams and, at the same time, explored and reflected on the theoretical principles of CL. Throughout the workshop, teachers were encouraged to reflect on their own opinions about learning, teaching practice and classroom context with regard to CL. Time was allocated for teachers to plan how to use CL in their upcoming lessons, both in their own

subjects and in an interdisciplinary teacher team. The workshop was designed around the five elements of CL (see Table 1) and based on the literature on supporting teachers' use of CL.

#### **2.4. Second stage**

During the second stage, the importance of sustaining teachers' CL practice and supporting continuous learning after the workshop was emphasised. The workshop was conducted at the end of April, a busy time for teachers due to obligations such as mid-terms assessments. Therefore, this time was not deemed the best time to initiate further exploration of CL in interdisciplinary teacher teams. Instead, a 90-minute session on informal CL structures was scheduled a couple of weeks after the workshop to maintain motivation and work further on the teachers' experiences during the workshop. This was followed by teachers experimenting with these structures in their own classes for a couple of weeks. Thereafter, teachers gathered to share and reflect on their experiences with CL up to that point.

#### **2.5. Third stage**

In the third stage, interdisciplinary teacher teams with responsibility for the same students developed their own action research projects aimed at implementing CL in their classes. This phase was inspired by an initiative taken by three mathematics teachers who, after the workshop, had conducted their own exploration of CL, changing the midterm test to include collaboration. In a student survey about the midterm test, students gave positive feedback on the inclusion of CL. This provided the teachers with knowledge of the students' perspective. Furthermore, the test results showed that CL had positively affected the students' learning. This led to agreement among participants of the PD programme to focus on action and data collection followed by reflection and sharing of experiences as the next step in exploring CL. The author developed a working model for an action research process and presented it to the teachers. This working model was inspired by Schmuck's (2006) proactive action research.

In proactive action research, practitioners act first and then study the effects of the actions taken. This was a suitable method for this PD programme, as the teachers were inspired to try out the new CL practices they had experienced during the workshop. The teacher teams decided how they were going to implement CL and collaboratively planned its implementation using the model as a support. Each teacher team conducted their own proactive action research cycle and implemented CL customised for their own classroom context and needs. At the end of the action research cycle, each team shared their processes with the other teams, creating a communicative space to learn and reflect on each other's experience with CL.

The model presented (Table 2) shows an overall picture of the proactive action research process, which may appear to be a straightforward process with clear steps throughout. However, it should be noted that, in practice, the larger cycle included various smaller cycles as a result of the teachers' action research process. Action and reflection became enmeshed in the teachers' everyday practice collaborating and working on the implementation of CL. These cycles of action and reflection can be seen as iterations that emerged from the main investigation (McNiff et al., 1996).

#### **2.6. Participants**

This paper focusses on one of the teacher teams and their implementation of CL. The school management proposed that this particular teacher team participate in the study. The three teachers in the team, Sara, Daniel and Robert, were all early career teachers with between three and six years' experience. Prior to this study, none of them had previously used CL based on the five elements outlined above.

#### **2.7. Data collection**

The study is practice-based, and the researcher is a practitioner in the organisation studied (Coghlan & Brannick, 2014). Wells (2009) highlights that to attain a more complex understanding

**Table 2. Proactive action research model inspired by Schmuck (2006) and carried out from June to December 2017 in the PD programme**

Steps in the process	Explanation
(1) List hopes and concerns	The teacher team reflect together on their hopes and concerns with regard to implementing CL in their teaching practice.
(2) Plan how to try out the new practice in teaching	The teacher team plan how they want to try out CL in their classroom and devise a common action plan for implementation.
(3) Collect information on how the implementation of the method worked	The teacher team agree on how they want to document and collect information about the action taken.
(4) Check what the data mean	The teacher team reflect on the implementation of CL based on the data collected.
(5) Share their experiences with other teacher teams, focussing on how they want to further fine-tune their practice	A communicative space is created for teacher teams to sharing their learning and experiences of implementing CL.
(6) Fine-tune practice	The proactive learning cycle restarts.

of the phenomena studied, you need to become, to some extent, a participating member of the practice field. Prolonged time in the field being a researcher in own organisation and experiences as a teacher supported the understanding and insights created in the study. During the study, data were generated through various means including interviews, three audio-recorded planning and reflection meetings in the teacher team, field notes and documents. Integrating and triangulating the different source of data provided a confirmation of patterns and themes, but also found inconsistency that led to further reflections and critical investigations of the implementation of CL. This triangulation was found important to enhance the understanding of the data and to enhance the trustworthiness (Patton, 2015).

Individual interviews with the teachers in the team were conducted before the PD programme and one year later. The interviews were semi-structured (Merriam & Tisdell, 2016) and consisted of open-ended questions. The three teachers were interviewed according to the same interview guides. The interview guide for the first interview focused on the teachers' practice and on student learning, with a particular focus on student collaboration in the classroom. Interviews conducted prior to the intervention were also used pragmatically to facilitate the intervention (Brinkmann & Kvale, 2015). The interview guide for the interview after the first year focused on the teachers' knowledge of CL and their experiences implementing CL during the PD programme. Each interview lasted 60–90 minutes and was audiotaped.

During the PD-programme field notes were written daily in a researcher journal. This ensured documentation of what happened in the project, but the researcher journal was also a tool of thinking where questions, reflections and developing insights on the implementation of CL were written. The field notes were gathered by doing observations when the researcher facilitated the PD-programme, this can be described as participant observations (Creswell, 2014). The researcher strived to write the comprehensive field notes as soon as possible, as it is easy to forget what you noticed and thought retrospectively (O'Reilly, 2012).

### 2.8. Data analysis

The interviews and four recorded meetings with the team were imported and transcribed verbatim using NVIVO. Field notes and documents from the intervention were imported in NVIVO and organised together with the transcribed material. To understand how the implementation of CL developed during the first year of the PD programme, a holistic rereading of the data was carried out. In order to gain insight into the teachers' experiences of the PD programme, conventional



qualitative content analysis of the second interview was conducted (Hsieh & Shannon, 2005). Conventional qualitative content analysis is a method for interpretation of the content of an interview, through a systematic process of coding and of identifying themes and patterns in the material. The analysis focused on condensed meaning units and open coding of each interview. Subsequently interviews were recoded based on the main codes from the first cycle and further organised into categories (Saldaña, 2016). The three stages of the project were further treated as critical incidents. Critical incident analysis is effective for exploring material in depth (see Halquist & Musanti, 2010). Tripp's (1993) view of critical incidents was used as inspiration for analysing the material.

Critical incidents are not “things” that exist independently of an observer and are awaiting discovery like gold nuggets or desert islands, but like all data, critical incidents are created. Incidents happen, but critical incidents are produced by the way we look at a situation. (Tripp, 1993, p. 8)

Regarding the three stages as critical incidents enabled the author to probe the material and interrogate the meaning of each stage of the implementation of CL. This connected the critical incidents to reflection (Angelides, 2001) and advanced the author's thinking regarding the different stages. As a researcher immersed in practice, the author used critical incidents to create space to step back from the action and theorise the PD programme and the implementation of CL.

As part of the analysis, the author presented the three critical stages to the participating teachers and invited them to reflect and discuss the implementation of CL from their perspectives. These conversations created opportunities for a participatory process, involving learning and reflection for both the researcher and the participants (Halquist & Musanti, 2010). Angelides (2001) claims that using critical incident analysis as a tool for reflection can extend understanding within a particular context, which, in this case, may lead to improvement of the school. The analysis was presented to the whole school and used to reflect on how the implementation of CL in the organisation might be supported.

The use of critical incidents created an opportunity for the author to step back from the action but also to step back into the action through participatory reflection on the PD programme with the teachers.

The researcher's interconnection between the identity of the researcher and a practitioner in this study requires increased sensitivity in data collection and analysis to ensure trustworthiness. In addition, the presentation of the preliminary analysis to the teachers and the school as an approach to analytical triangulation, the analysis of the three critical stages were discussed in round-table discussion within the academic community on CL at a conference. This specialist collaboration provided peer review and support to ensure a rigorous analysis (Patton, 2015).

### **2.9. Ethical considerations**

Ethical approval for this research was obtained from the Norwegian Social Science Data Service (NSD). Participation in this study was voluntary, and written and verbal informed consent was obtained from the teachers prior to the start of the research project. The teachers are referred to by pseudonyms to protect their anonymity.

### **3. Results**

When analysing the material, it became apparent how the different stages of the project had influenced the teachers' learning and implementation of CL. In this section, the three critical stages of the first year of implementation are described and the central findings of the teacher interviews with Daniel, Robert and Sara and the researcher's field notes regarding these stages are presented. Then, the relations between the various stages in the PD programme and the

implementation of CL will be discussed. The first stage depicts CL as a method that was easily learned and embraced by the teachers in the workshop. However, coming back to school to implement CL proved more difficult than expected.

### **3.1. Workshop: the cooperative learning bubble**

The workshop emerged as a recurrent theme in the interviews with the teachers after the first year of the PD programme. The teachers described the workshop as important for their knowledge about CL. Robert, explained, “It did, in a sense, lay a foundation, a fundamental understanding of the content, in terms of the methodology and principles. Like what this is all about”. Sara described how the workshop gave her confidence in using CL:

I feel very confident about the theory because of the workshop, because there was such a huge and intense focus on it, and we got to work so thoroughly with it. And I feel it sticks, and this is, of course, safe that I feel professionally confident in what I’m doing.

As well as indicating that the workshop provided the teachers with knowledge and an understanding of the method, they also noted that the workshop for all year 8 teachers was important for creating a common understanding of CL and that experiencing the method themselves convinced them that it “worked”. It also fostered collegiality and collaboration. Daniel reported that the workshop facilitated both social and professional collaboration. This was also noted by Sara:

I experienced this as very positive with so many things positive things, for example, the social experience ... you get closer to each other and do something bigger together, and to experience that was very unifying for us (Sara).

The workshop was also considered by the teachers to give inspiration to further try CL in their own practice and to make plans together. In reference to the workshop, Robert reported “it gave a kick-start in a way” for the implementation. Daniel described the workshop as a starting point:

We got lots of ideas ... you can do this, and you can do that, every lesson .... Because there is something about being able to make plans that we could try out together, and we had the opportunity to set the ambition level together.

Sara explained that the teachers found the workshop to be a common source of inspiration and that it provided a boost for the teachers:

After the workshop, I came back with lots of motivation to get started and thoughts about what I wanted to try out, and ... I found that the rest of the teachers felt the same way, a kind of motivational boost. And it was great fun.

As the facilitator of the workshop, the author saw how the teachers united through their first-hand experience of CL structures when working in groups. The field notes indicate that using the structures to learn about the theory and methodology of CL enabled the teachers to be actively involved in learning about CL. Team-building activities were included throughout the workshop, starting with the teachers creating group names and slogans. The team-building activities generated friendly competitions between the teams and enabled them to get to know each other better. During the workshop, the teams also used group names and slogans without being prompted to do so. The field notes demonstrate the energy felt in the room and reflect how those 3 days became a “cooperative learning bubble”, almost too good to be true.

Working together in groups facilitated discussions about opinions and practice related to group work. The field notes show that several teachers that participated in the workshop commented that they often found group work challenging. There seemed to be a shared hope, already on the first day of the workshop, that CL as a tool would help them to structure effective group work for students’ learning.

Findings from the first stage show that the workshop provided teachers with knowledge of CL, first-hand experience trying out CL structures in groups and time to plan how to use CL in their own practice. The workshop also facilitated teacher collaboration and social learning.

### **3.2. Back to reality: the bursting of the bubble**

Field notes from the two follow-up sessions after the workshop show that it was difficult to sustain motivation. The author began the first session with a film shot during the 3-day workshop to take the teachers back to their experiences during the workshop. Reflections in the field notes indicate that it was more difficult to engage the teachers, the focus seemed to be on daily chores. Further, in the first session, the teachers were presented for four informal CL-structures and given the assignment to try out one or two of these structures in their classes two or more times before the next session. The teachers were asked to write down reflections on their experiences using these structures, and on their students' learning after trying them out to bring these notes to the next session. The designated informal CL-structures were Think-pair-share, Mingle-pair-share, Pair-Check and Coach and a version of Listen right (see Ferguson-Patrick & Jolliffe, 2018).

The field notes show that when the teachers shared their reflections on their use of informal CL and on student learning in the second follow-up session, not everybody had tried out the CL structures as agreed. Some teachers had chosen to try out other CL strategies or their own projects in their teaching. This session did not go according to plan. However, the teachers did sit together and share their experiences of CL and the workshop. Reflections from the field notes demonstrate the bursting of the "cooperative learning bubble", and the common ambition declared at the workshop to use CL seemed to be constrained when the teachers returned to their everyday practice. This resulted in only some teachers trying CL in their classes, while others did not. Sara, who chose to do her own CL project, reflected on this period:

It turned out that I focused on my own project, and then I didn't bother so much with the structures, the four small structures. I made my own choices ... . I just had to focus on it rather than including more things ... . But the session in which we talked about what we had done was rewarding ... . it was fun, and we got new tips, and that was useful.

When the other teachers were asked about the period after the workshop, they had little recollection of this phase or what they had done. Daniel reported that he had so much else to focus on during that period as he was also teaching other classes in another year.

The experiences during these two sessions after the workshop created a vacuum, and the question of what to do next in the PD programme to support the implementation of CL was raised as it seemed as if the common aspirations and the energy from the workshop had decreased.

The second stage of the PD programme was planned and structured so the teachers would learn more about CL, try out designated informal CL structures in their teaching and, afterwards, collaboratively discuss their experiences. The findings indicate that the teachers' learning became more individual and fragmented. Some of them tried out the structures as planned, and others did not.

### **3.3. Proactive action research in teacher teams: a tool for collaborative action to overcome the unexpected challenges of implementing CL**

The third critical stage for the teachers' CL practice was the proactive action research they conducted in their interdisciplinary teacher team. At the end of the school year, the teacher team was given time to start planning their proactive action research project. This began with a session to discuss their hopes and concerns with regard to using CL. The aim was to create room for the teachers to gain insights into each other's opinions about implementation and to create a common understanding within the team. This yielded a written list of hopes and concerns. The hopes were that CL would help establish a classroom culture of collaboration and equip the students with good routines to work collaboratively in the future. Their concerns related to issues

such as how to create groups and a collaborative culture that would help everyone to participate and benefit from collaboration. They were also concerned about finding the time to work with the students on social competence in subject-driven everyday school life.

The next step was to establish a common action plan for implementing CL in their classes. The field notes suggest that the teachers had a lot of ideas but that it was difficult to decide what action to take. Their ideas ranged from trying out and developing the jigsaw method (Aronson, Stephan, Sikes, Blaney & Snapp, 1978) to initiating larger CL projects, such as creating a newspaper within which groups and students had dedicated roles. The semester began, and they decided to organise their classrooms in base groups of four, with the idea that this would facilitate the use of informal and formal CL structures. When placing students in groups, the teachers faced challenges that led the team to amend the focus of their action plan for implementing CL. Sara described this in the interview after the first year of the project:

It was the fact that we had put them in base groups and that we saw that not all of the groups functioned as we expected. Instead of changing the groups, as we might have done earlier, we realized we had to focus on teaching them how to collaborate and not keep changing the groups (Sara).

The team's new action plan focused on enhancing the students' ability to collaborate by co-planning a designated CL day focused on CL structures and team building. When planning the CL day, they developed an interdisciplinary CL structure named the Quest, based on the five principles of CL. Each student in the group was given clear roles and responsibilities for learning materials in order to ensure individual accountability and positive interdependence. The activity was structured so that the students needed each other's expertise to succeed. The teachers' goal was to have the students experience what it meant to be in an interdependent group. They hoped that this would improve collaboration within the base groups and support the use of CL structures. It was through collaboration the teachers developed this CL structure, drawing on each other's disciplinary knowledge and theory on the CL principles. Robert described the Quest as "a method in a way, in which we have tried to apply the principles actively, the principles of CL, to get that kind of assignment, or mission, to be the best possible."

To explore how the CL day worked, they planned to use focused student logs with questions on their group process after each activity that day. Together with the teachers' own participating observations, this concluded the data collection on their proactive action research.

On the CL day, all the teachers were present, working side by side in class, introducing activities and facilitating the entire day together. Afterwards, the teachers came together, read the students' logs and discussed their experiences from the day. The teachers discussed how the CL day had worked, how the Quest had led to active involvement of the students and how all the students in the group had worked together. The students' logs showed that the students had valued this way of working and had thought their collaboration worked well that day. However, the students had not written in depth about their group process in the log.

Throughout the autumn, the teachers used the Quest several times and developed it further as they found it improved their students' ability to collaborate. At the end of the proactive action research period, they shared their experiences with the other teachers. Instead of just presenting their project, they decided to conduct the Quest with the other teachers working in groups. The aim was to give the other teachers first-hand experience of how the structure they had developed worked. This led to further discussion on the teachers' experience of the method and the teacher team explaining what they wanted to fine-tune and develop. The field notes show that the teachers emphasised that they wanted to continue their interdisciplinary teamwork with CL and explore how to proceed with more in-depth subject-specific work. The action research had laid a foundation for continued work on CL for the teachers both individually and together. Daniel

pointed out in the interview, “The structures are in place in the classroom; it is easier to plan things and carry out interdisciplinary activity”

In a reflection meeting with the teachers after the completion of the action research process, the author and the team examined the list of hopes and concerns implementing CL, that was made in the beginning of the action research. When the teachers reflected on their hopes and concerns, they said that they had accomplished most of their hopes for the methods during the semester. The teachers pointed out that they had succeeded quite well to create a collaborative classroom culture, including CL structures in their practice and getting the students to work well together. When reflecting on their concerns, they realised they still had some problems engaging all the students. Nevertheless, after further discussion, they pointed out that these students performed better through working in groups than they would have on their own. Furthermore, the teachers agreed that they still needed to work on how to structure CL to engage all students in the CL activities.

The collaborative proactive action research, the third critical stage in the implementation of CL, was a tool for translating the theory of CL into the teacher’s own practice. In addition, the proactive action model enabled the teacher team to evaluate and reflect on their implementation of CL and to discuss its continuous implementation.

#### **4. Discussion and lessons learned**

The potential and value of CL for students’ learning are evident in the extensive research on the effect CL has on students’ academic achievement and social skills (Kyndt et al., 2013; Roseth et al., 2008). In reality, however, releasing the potential of CL seems to be constrained by the challenges teachers’ face when trying to implement the method in their teaching practice. The current paper presents a teacher team’s learning and implementation of CL during a nine month contextually driven PD programme. It offers insight into the complexity of implementation from a practice perspective. By identifying three critical stages in the PD programme, this paper presents the factors that supported implementation but also the setbacks faced. Research into those factors that impede implementation and how they can be overcome can contribute to an awareness of the factors that schools and education policy-makers need to consider when implementing CL (Sharan, 2010).

The gap between the potential of CL and its implementation is often associated with challenges related to continuous use after training courses (Buchs et al., 2017; Sharan, 2010). The relation between the first and second critical stages identified in this PD programme indicates one such challenge. The teachers considered the first critical stage, the workshop, vital for their motivation, learning and implementation of CL. During the workshop, the teachers obtained first-hand knowledge of CL, including both the theory behind it and practical knowledge of structures and methods through group experimentation. The findings indicate that the teachers immediately recognised its potential value. Learning about CL together during the workshop provided them with common knowledge and experience. The workshop also facilitated social learning, bringing the teachers together through a combination of CL structures and team building. During CL structured sessions, personal, supportive relationships tend to develop between teachers (Johnson & Johnson, 1989). This suggests that the workshop was a shared foundation for both their continuing collaboration and their implementation of CL.

Notwithstanding the value of the workshop for the teachers learning and their motivation to use CL, something happened when they returned to school, which is here described as the critical stage “back to reality”. The author found that the common plans and ambitions established during the workshop seemed to be constrained by the teachers’ return to everyday practice. Timperley et al. (2007) claim that short-duration workshops rarely sufficiently changes teaching practice. During the analysis, it became clear that the workshop was a “cooperative learning bubble” constructed by the author using of the five elements of CL, which allowed the teachers to focus solely on CL for three days. Structuring the workshop with CL and including team building established positive interdependence among the teachers while also making them individually accountable, which created good

learning conditions for CL. When the teachers returned to school and everyday practice, “the bubble burst”. The support structures that had enabled the teachers to solely focus on CL were gone, and further practice of CL was incorporated into an already cramped teaching schedule.

In hindsight, the informal CL sessions back at school did not facilitate positive interdependence and individual accountability between the teachers working with CL to the same extent as the workshop. These informal CL sessions facilitated individual learning followed by teachers sharing their experiences. Little (1990) argued that the link between teachers’ collaboration and change is not necessarily present but depends on the type and content of the collaboration and how it is arranged. In this study, the informal CL session with individual experimentation and reflection resulted in some of the teachers trying out informal strategies as agreed and others not doing so or experimenting with their own CL structures. The learning of CL became individual, and the teachers had different aspirations regarding incorporating CL into their own practice. The workshop in which teachers learned the content of CL and experienced it at first hand in groups united the teachers in a community of practice (Johnson & Johnson, 2017; Wenger, 1998). On their return to school, this community of practice was weakened by everyday practice and the structure of the informal sessions. If the PD programme had ended with the workshop and the informal CL sessions, there is reason to believe that not all teachers would sustain their use of CL in practice. This finding can be seen in relation to Buchs et al.’s (2017) study that providing teachers with a workshop in CL is not sufficient for a sustained use of CL. This highlights the importance of a continuous and sustained follow-up to a workshop. On its own, a workshop does not support teacher learning.

Darling-Hammond et al.’s (2017) study of effective teacher professional development identified seven characteristics that result in a change of teaching practice and student learning. According to the study, content-focused professional development that focuses on teaching strategies associated with curriculum content is found effective. In addition, professional development that uses models for effective practice and engages teachers in active learning in the same style of learning they are designing for their student is found to promote change. Furthermore, high-quality professional development needs to create space for teachers to collaborate, provide expert support, incorporate feedback and reflection and have a sustained duration. Sustained learning is found to have the greatest impact on practice. In this study, the workshop and the follow up alone had not the sustained duration to support the implementation of CL. The other six characteristics were included, however, the quality of the elements such as how teachers’ collaboration was structured in the follow-up session, was found not to be adequate for a common implementation of CL.

Timperley et al. (2007) emphasise that changing teaching practice is difficult and that teachers need multiple opportunities to learn and translate their learning into practice. It was not until the third critical stage in the PD programme that the teachers united as a team in their learning of CL and adapted the theory to their classroom practice. The teachers found that placing the students in base groups was a turning point. This was done to facilitate the use of CL. However, the teachers found that the students did not work well together, which indicated that they did not have the necessary skills for effective collaboration. This could easily have become an impediment to the use of CL. Instead, it became a catalyst for the teachers’ learning.

With proactive action research as a development tool, the teachers amended their implementation of CL to focus more on developing collaborative skills and on giving the students a sense of positive interdependence and individual accountability, which the teachers themselves had experienced in the workshop. Facing the challenges of implementing CL together, the team became a community of practice. Johnson and Johnson (2017) claimed that one of the most important aspects of creating a community of practice is to move from self-interest to mutual interest. Mutual interest in learning and implementing CL was reinforced when the teachers’ experienced challenges to implementation due to the students’ lack of collaboration skills. This motivated the

teachers to actively implement the knowledge they had gained from the workshop. Using the elements of CL as a framework, they developed their own formal CL structure adapted to their classes. The power of action research lies in the fact that it can contribute to local solutions to local challenges through collective processes (Ulvik et al., 2018). In this study, using proactive action research as a tool for implementation facilitated collaborative action when faced with the challenges of CL. McNiff (2017) emphasised that the strength of action research lies in its capacity to bring people together. By using proactive action research as a tool for implementing CL, the private world of the classroom and individual teaching was replaced by collaborative action, co-planning and co-teaching. Because CL is a subject-independent method, this also opened up a space for interdisciplinary teaching and the development of the CL structure the Quest using the five elements of CL as a framework. The experience of working together in interdisciplinary teams led the teachers' to want to develop their cross-subject work with CL for deeper learning. Dimmock (2016) argues that professional learning that is grounded in participants' inquiry, questions and experimentation and is iterative, supported and extended over time, is central for bringing knowledge innovations to classrooms. This study suggests that the combination of workshop and inquiry and experimentation extended over time with the proactive action research, facilitated teachers' learning and implementation of CL. This combination incorporated and strengthened the seven characteristics of effective professional development (Darling-Hammond et al., 2017). The proactive action research was found to be a powerful tool that mediated teachers' collaboration and supported the implementation of CL customised to their classroom context and needs. As documented in a number of studies, action research in a community of practice is found to support teachers' learning and change (Manfra, 2019). This study adds to the growing research base that presents and discusses how teacher collaboration is found to support the implementation of CL (see Dyson et al., 2016; Jolliffe, 2015; Miquel & Duran, 2017; Weitze, 2017).

This study also emphasises certain pedagogical implications that should be considered when implementing CL in the classroom. Before initiating CL, it is important to prepare the students for collaboration. Collaborative groups often implode because of a lack of necessary interpersonal skills for working collaboratively (Gillies, 2016). In this study, the teachers faced challenges in implementing CL because the students did not work well together. This could easily have restricted the use of CL and prevented further implementation of the method. The ability to collaborate in groups increases when students are taught the necessary interpersonal and small group skills for managing group interactions (Gillies, 2014). Therefore, it is important to create a collaborative classroom culture to support the implementation of CL.

## 5. Concluding remarks

This paper proposes that teacher collaboration in interdisciplinary teams with proactive action research to support teachers' continuous CL after workshops and training is promising for supporting a sustainable implementation of CL. Through collaborating, the teachers can also be important CL role models for their students.

This paper asks how collaboration in teacher teams can facilitate teachers learning with regard to implementing CL. The findings show that a workshop alone does not support teachers' CL practice. However, continuous follow-up with collaborative proactive action research in the teacher team facilitated and supported teacher learning and their implementation of CL. The teacher team observed in this study experienced challenges with implementation that could have constrained the use of CL. However, using proactive action research as a collaborative tool, the teachers as a team actively engaged with and retained the knowledge they had learned during the workshop. This empowered the teachers to take collaborative action, create local solutions and adapt CL to their own classroom context using the five elements of CL (see Table 1) as a guiding framework. This resulted in the teachers developing their own formal CL structure, which supported their use of CL in class and made CL a shared practice. The teacher team in this study can be seen as architects and constructors of CL who went beyond merely applying prewritten techniques and structures. The creation of their own formal CL structure based on the five elements of CL suggests

that the teachers were on the way to developing a conceptual understanding of CL. The inclusion of proactive action research in the PD programme led to a bottom-up approach to the implementation of CL, whereby the teacher themselves brought the theory and practice of CL together. This empowered them to change and improve their teaching practice. By implementing CL through collaborative proactive action research, the teachers felt that they had achieved a collaborative culture in class and that the CL structures worked.

This study has a potential limitation. The double role of the author as both a colleague and a researcher examining her peers may have affected the feedback on the PD programme and led to more cautious interview questions and to more cautious answers. Researching one's own organisation requires the researcher to balance an organisational role with the demands of research. The researcher must be able to make appropriate choices regarding when to step in and out of these roles. The author was aware of how this dual role can complicate the research and used critical incident analysis as a way to ensure sensitivity in working with the analysis and to reflect on her roles. Presenting the preliminary critical analysis both to the participating teachers and school and to the academic community, was found important to sustain the sensitivity and support a rigorous analysis throughout the study. Critical incident analysis also allowed the author to step in and out of action and to balance the role of facilitator of the PD programme with the role of researcher. The double role of the author may have influenced how she was perceived by the participants, which may have influenced their feedback.

Although this study followed the teachers' implementation of CL for an extended period (nine months), the period of time is also a limitation of the current study. A conceptual understanding of CL takes time to develop. More research over an extended period of time is required to learn more about how the implementation of CL develops and whether its practice is sustained through interdisciplinary teamwork.

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#### Correction

This article has been republished with minor changes. These changes do not impact the academic content of the article.

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