

Students' experiences of a teacher-led implementation of cooperative learning: A longitudinal study

Beathe Liebech-Lien

Norwegian University of Science and Technology, Norway

An extensive research base has developed exploring the effects of the pedagogical model of cooperative learning (CL) on students' academic and social learning. However, it has also been found that teachers face challenges when implementing the method after training. This paper presents a teacher team's longitudinal implementation of CL and investigates the relationships between teachers' learning during a professional development (PD) program, their changes of teaching practice, and students' learning, by exploring the students' experiences. The findings indicate that the PD program supported the teachers' learning and implementation of CL, which led to a change in practices to incorporate CL. Their students experienced social gains, such as the development of social skills, after the implementation of CL. However, the implementation of CL was not sustained when final exams approached. The empirical findings also indicate a need to emphasise group processing as part of the implementation of CL to develop and support students' reflection on their cooperative learning.

Introduction

There is an ongoing debate in the education field about how schools can best prepare students for their future social and work lives. The ability to collaborate is seen as one of the core skills that students will require, and a growing number of countries have reviewed their curricula and included an explicit focus on collaboration (Binkley et al., 2012; Lamb, Maire & Doecke, 2017). The ability to collaborate is increasingly seen as an educational outcome in its own right rather than only a tool to develop or assess knowledge (Kuhn, 2015).

The pedagogical model *cooperative learning* (CL) is regarded as an essential tool for developing students' ability to collaborate and for providing students with essential skills to face 21st-century challenges (Johnson & Johnson, 2014). Cooperative learning is a methodology that teachers can use to design and structure their lessons to enable students to learn from each other and gain social skills. An extensive research base has developed exploring the effects of CL on students' academic and social learning. Research clearly indicates that CL is beneficial in improving students' achievement, attitudes, motivation, peer relationships, and well-being (Johnson, Johnson, Roseth & Shin, 2014; Kyndt et al., 2013; Roseth, Johnson & Johnson, 2008). A recent study of secondary students' experiences with CL found increased classmate relations and motivation after implementation. Moreover, the students found CL to create enjoyable and interesting lessons (Fernandez-Rio, Sanz, Fernandez-Cando & Santos, 2017). Cooperative learning is considered to have the potential to become the primary teaching method for achieving both traditional and innovative learning goals (Slavin, 2014).

In spite of the extensive research on the benefits and potential of CL, its implementation remains challenging. Sharan (2010) identified a gap between the promise of CL and its practice in the classroom, referring to it as a valued pedagogy but a problematic practice. Teachers struggle to implement the method in their teaching after completing CL training courses, which leads to the method being abandoned or its practice notably reduced. This was recently found in a study based on self-report data collected from 207 teachers about their use of CL in the canton of Geneva where continuing education offered up to 2 days of professional development (PD) training in the method. The study found that teachers do not consider CL as easy to implement and few use it routinely. (Buchs, Filippou, Pulfrey & Volpé, 2017). The implementation of CL can also be experienced as challenging for students and is found to lead to disappointment when CL-groups do not work as planned (Fernandez-Rio et al., 2017).

More research on the implementation of CL is needed to develop knowledge that can support sustainable implementation of the practice (Sharan, 2010). The growing research base on the implementation of CL reveals several challenges, including limited knowledge of CL among teachers and lack of support in the form of teacher education and other school supports (Hennessey & Dionigi, 2013). Other challenges that have been identified relate to group management, organisation, time management, curriculum design, and assessment (Buchs et al., 2017; Dyson, Colby & Barratt, 2016; Ghaith, 2018; Gillies & Boyle, 2010).

To minimise the challenges faced in implementing CL, researchers have emphasised the importance of providing teachers with training and ongoing support (Hennessey & Dionigi, 2013). Having teachers work together in professional learning communities is increasingly gaining attention and is seen as a means of enhancing teacher learning and practice and improving student learning (Hairon, Goh, Chua & Wang, 2017; Stoll, Bolam, McMahon, Wallace & Thomas, 2006).

Having teachers work together to learn and implement CL has been found to support the use of the method. Dyson et al.'s (2016) study of primary physical education teachers' implementation of CL found that ongoing embedded support through a school-based professional learning group supported the teachers' implementation. The positive impact of teachers working together on CL is also identified in Jolliffe's (2015) study of the implementation of CL in a network of schools in England.

More attention is being paid to developing students' ability to collaborate, and CL seems to have the potential to be the primary teaching method for achieving this. Therefore, it is important to develop more research on how CL is implemented in the classroom and how teacher learning in professional learning communities can support the sustainable implementation of CL and students' learning. This paper aims to investigate the relationships between teachers' own collaborative learning and working with CL in teacher teams, their change of practice, and students' learning.

The relationship between teachers' learning and students' learning is explored by examining the students' perspective on their teachers' implementation of CL and how this

affects their learning. While interviewing teachers about their own learning and practice may lead to socially desirable responses about their use of CL, enquiring into their students' experiences of the implementation can provide insights into actual changes in practice. Students' perceptions of CL are also important for identifying features of the implementation that teachers and policymakers may not see (Sharan, 2010). Baines, Blatchford and Webster (2015) argued that much of the research on the implementation of CL consists of experimental, short-term studies and that little research has been conducted on how teachers develop and implement CL in their own practice. This longitudinal study aims to contribute to discussions on the implementation of CL by providing knowledge of how teachers adapt CL to their own practice and how this affects their students' learning.

The research question guiding this article is as follows:

In what ways does teachers' learning about CL transfer to changes in teaching practice and students' learning?

Teacher learning for student learning

Timperley, Wilson, Barrar, and Fung (2007) emphasised that changing teaching practice in substantive ways is difficult and that teachers need to engage with new knowledge through multiple learning opportunities. They argued that teachers' professional learning opportunities are not directly connected to student outcomes. First, how teachers' learning affects their practice depends on how teachers interpret their learning and utilise their skills. Second, how students interpret and participate in the change in practice influences the students' learning outcomes. As illustrated in Figure 1 (Timperley et al., 2007, p. 7), how teachers and students interpret and utilise skills are considered black boxes between teachers' learning opportunities and student outcomes.

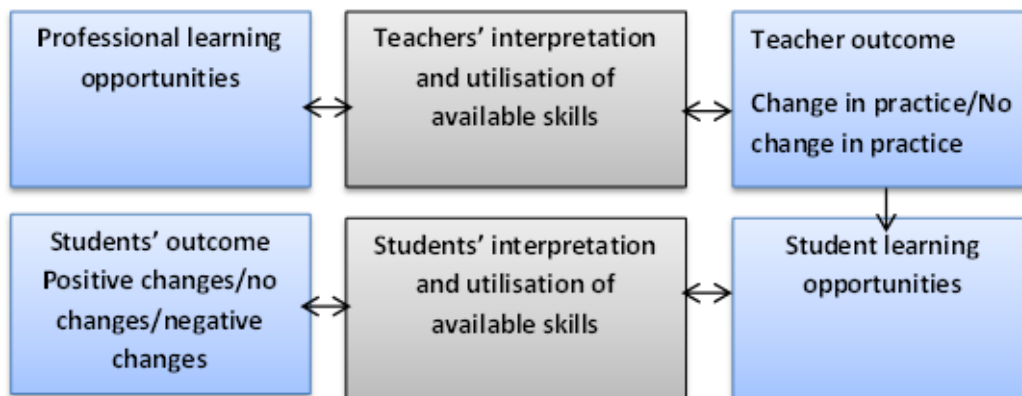


Figure 1: The black boxes of teacher and student learning (Timperley et al., 2007, p. 7).

With this model in mind, students' experiences with CL are used to explore the relationship between teachers' learning opportunities and students' learning outcomes.

Methods

The study

This study was conducted in a suburban lower secondary school in central Norway. The school has around 500 students in Years 8 to 10 who range in age from 13 to 16. The students are organised in form groups of around 50 students, each of which is divided into two classes during lessons. Each form group has the same teacher team from Year 8 to Year 10. The teacher teams generally consist of three teachers and are multidisciplinary. Each teacher in the team specialises in and is responsible for teaching one to three subjects. Organising teachers into teams is a widespread practice in lower secondary schools in Norway.

The professional development program

This study explores students' experiences of a 2-year implementation of CL. The implementation of CL was proposed to the school by the author as a research and development project. The objectives of this intervention were twofold: (1) to initiate a change in teaching practice to include CL, and (2) to explore and develop knowledge of how teachers implement and develop CL in their teaching practice when working together in teacher teams. The implementation of CL began with a context-driven PD program facilitated by the author and planned in close collaboration with the school and the teachers involved. The PD program ran from April 2017 to December 2017. From January 2018, the school leaders continued to support the teachers' learning and exploration of CL. During this later period, the author had a more distanced role, functioning as an adviser when invited to do so by the school leaders.

Table 1: Outline of the three stages of the PD program from April 2017 to Dec 2017

Stages	PD activity	Description
Stage 1 April 2017	Three-day workshop in CL facilitated by the author	The workshop was designed to provide the teachers with theoretical knowledge of CL and incorporated interactive activities that facilitated teachers' first-hand experience of CL structures in groups. Time was allocated for planning how to use CL in upcoming lessons, both in the teachers' own subjects and in multidisciplinary teacher teams.
Stage 2 May 2017	Two sessions on informal CL strategies	The first session included revision of the content of the workshop, followed by a presentation of a selection of informal CL strategies to experiment with in upcoming lessons. The second session enabled teachers to share and reflect on their team's experiments.
Stage 3 June-Dec 2017	Proactive action research in teacher teams	Teacher teams developed collaborative proactive action research projects aimed at implementing CL in their classes. In proactive action research, practitioners act first and then study the effects of the actions taken (Schmuck, 2006).

A conceptual approach to CL

The PD program was inspired and based on a conceptual model of CL, exploring and using the five elements of CL as a guiding framework (Johnson & Johnson, 2002). These five elements are positive interdependence, individual accountability, interpersonal and small group skills, promotive interaction, and group processing. According to Johnson and Johnson (2009), these five elements must be present for effective cooperation. The PD program also covered three general ways to structure CL: informal CL, formal CL, and base groups. In informal CL, students work in temporary, ad-hoc groups for periods ranging from a few minutes to one class period, whereas formal CL involves students working together in groups for periods ranging from one class period to several weeks. Cooperative learning is also facilitated through base groups. Base groups are long-term heterogeneous groups within which students provide each other with academic and social support (see Johnson & Johnson, 2002).

Participants and data collection

Altogether 11 students participated in the research, which included six boys and five girls. The students were chosen from the form group of one teacher team that participated in the PD program presented above. The students who were asked to participate were chosen by the teacher team based on criteria provided by the author, to form a heterogeneous focus group with respect to gender, achievement level, and personality.

The participating students were divided into two focus groups, and data was gathered during six focus group interviews. Each group of students was interviewed three times over two years. Due to unexpected circumstances, not all students were present at the first interview, and some of the participants changed in the period between the first focus group session and the second focus group session.

Table 2: Overview of focus group interviews

Focus group interviews	Interview prior to implementation March 2017	Interview February 2018	Interview March 2019
Group A	Four students: 2 boys and 2 girls	Five students: 3 boys and 2 girls	Five students: 3 boys and 2 girls
Group B	Four students: 2 boys and 2 girls	Five students: 2 boys and 3 girls	Five students: 2 boys and 3 girls

The focus group interviews followed a semi-structured interview guide using open-ended questions (Brinkmann & Kvale, 2015). The same interview guide was used for focus groups A and B and was altered and adapted each year. The interview questions focused on the students' experiences of teaching practice, collaboration and the implementation of CL. Focus group interviews conducted before, during and after a program are useful for evaluation as they enable researchers to gather perceptions about the program's outcome (Patton, 1990). In this study, the use of focus groups enabled the author to elicit the students' perspectives on their experiences with the implementation of CL and their own learning.

The interviews lasted for 40-70 minutes. Interviews were audio-recorded and subsequently transcribed verbatim in full and organised in *Nvivo* for further analysis.

Analysis

Conventional qualitative content analysis (Hsieh & Shannon, 2005) was used to analyse and interpret the interview transcripts. This method allows codes and categories to be developed and defined through analysis and permits the identification of themes or patterns rather than an initial imposition of preconceived categories. This was considered appropriate for obtaining insights into students' experiences. Through the work of coding and categorisation, the author constantly questioned the material by posing certain recurring questions: What cooperative activities do the students talk about? And what are their perceptions about working with CL and about their own learning? This led to the emergence of patterns throughout the analyses. Some of these patterns illuminated changes in practice and learning between the different years of the study. Other patterns, such as the students' limited reflection on their cooperation, showed no change. The categories developed from the analysis were abstracted into four themes, which are used to present the findings.

Ethical considerations

Ethical approval for this research was obtained from the Norwegian Social Science Data Service (NSD). The study follows NSD's ethical guidelines, which include securing the confidentiality and anonymity of participants. Verbal information was given in person to the students and written information was provided for their parents. Written consent to participate was attained from the students and their parents before the interviews.

Findings

The findings provide an in-depth picture of the students' experiences of the implementation of CL and their own learning, with four important themes related to the implementation of CL identified. The themes are (1) from group work to the routine use of CL; (2) learning from peers and social gains; (3) a language for cooperation; and (4) CL and exam preparation. These findings are then discussed in relation to how the teachers' engagement with CL affected the students' learning.

From group work to the routine use of CL

When students in both focus groups talked about cooperative activities in the classroom prior to the PD program, the most common form of cooperation was working together with the student next to them during traditional lessons. These lessons generally began with an introduction from the teacher followed by seatwork assignments. Seatwork assignments were mainly described as independent work on the learning task that the students worked on individually at their desks, such as questions from the textbook or tasks given by the teacher. Student cooperation in these lessons involved discussing issues with a student sitting adjacent when working on these assignments, discussing homework,

and discussing questions asked by the teachers. This cooperation was reported to be initiated by the students and structured to some extent by the teachers. The teacher could instruct the students to share their homework or to discuss questions before whole-class discussions.

The students also reported engaging in group work and projects. They explained that the projects often ended with a final presentation, which was graded. For such projects, the students reported being assigned a group and given an assignment or theme to research. The descriptions provided by the students indicate that these projects were focused on academic content and involved little structured cooperation between students. This finding is based on comments such as “We just get an assignment and then we have to figure out how to solve it” and “I think most often we just start in the group and decide ourselves what to do”. One of the students described how a recently finished group project on the Sami people was structured:

In my group, I suggested how we should divide the labour. One found out about their culture, another found out about the oppression of the Sami and so on [...] We got much more done and quicker when we divided the work between us.

Another student in the focus group replied, “That's how it was on my group as well, we just each decided on a theme within Sami music and afterwards put it together in a *PowerPoint*”.

When discussing the instructions given by the teachers in relation to cooperating during group work, the students said that they were not given directions on how to work together other than general guidelines. Students reported in both focus groups with comments such as, “The teachers often say that we have to distribute tasks so that it is not just one person doing everything” and “They say we have to talk with each other [...] or that we have to choose how to work together”. The students’ description of the cooperative activities they engaged in prior to the PD program indicated that the teachers had not structured the cooperation process.

However, the students reported that in science, they regularly cooperated in a structured way to conduct experiments in groups. These groups were stable and long term. In their science groups, the students had designated roles, such as leader, secretary, and equipment manager, and a common goal to conduct the experiments, after which they wrote individual reports on their experiment.

An analysis of the interviews conducted in 2018 and 2019 revealed a change in the cooperative activities of the students entering Year 9. At this point, their teachers were in stage 3 in the PD program and were implementing CL through proactive action research (see Table 1). The students reported that the teachers facilitated more cooperation and cooperative activities in their lessons. The main change discussed in both focus groups was an alteration of their seating arrangements from pairs to base groups of four. The students highlighted the fact that base groups created more opportunities to cooperate. In the base groups, they discussed and completed assignments together. The students’

description of their cooperation in base groups reflects the use of informal CL strategies. Comments such as

There were a lot more discussions in the base groups, and, in the end, each group gave an answer to the whole class that they had developed together and agreed on.
and
... often it is like we are talking together first in pairs at a table of four... often then afterwards all four of us talk together, and, after that, one of the group shares what's been discussed.

These comments show that the teachers structured the cooperation using informal CL strategies and base groups.

The students talked about a designated CL day facilitated by the teachers in September 2017, which focused on various team-building activities, including creating group slogans and contracts for cooperation in base groups. The students described a formal CL structure called the CL quest, which was part of the CL Day. This structure involved the students working in groups, with each student having a designated role and material. The groups were sent on a quest to find a specific destination. To get to the destination they had to complete various assignments, which required different forms of expertise and material from each student in the group. When the students talked about the activity they described it as a structure in which “you are kind of dependent on each other because only one person has the thing that will find the answer” and “After all, we had to rely on each other”. The students also described CL quest as a structure that forced them to cooperate effectively. From the discussion in the focus groups the designated CL-day and the formal CL structure were considered as a highly regarded method for working effectively together by all of the students. The students' descriptions of this cooperative activity indicated that the teachers had structured it so that the students had to be interdependent with each other and individually accountable. The teachers' structuring facilitated promotive interaction and the use of social skills. It should be noted that this formal CL strategy was developed by the teacher team as part of their collaborative action research project in stage 3 of the PD program. The CL quest was conducted at least seven times during this study.

The students also described other formal CL structures implemented by teachers from September 2017 on, such as the jigsaw technique. The science experiment groups were also continued.

However, group work, such as projects focused on academic content, which was not as structured as CL activities was still conducted after the PD program. For such projects, the students reported that the group divided the task between themselves and decided how to cooperate.

The students' descriptions of their cooperative activities in the interviews prior to and after the PD program revealed a change in practice, from mostly unstructured cooperative activities involving seatwork, group work and projects focused mainly on academic content, to more CL activities in which the cooperation was structured by the teachers.

Their teachers implemented CL and incorporated base groups and informal and formal CL structures into their teaching. Table 3 illustrates the cooperative activities described by the students in the interviews before and after the PD program.

Table 3: Students' descriptions of cooperative activities

Prior to the PD program	After the PD program (September 2017–December 2018)
Year 8	Year 9–10
Seating arrangements: Rows of pairs.	Seating arrangements: Base groups of four
Cooperation by talking and working with a partner.	Informal CL: Discussion and tasks in base groups structured by the teachers
Science experiment groups (structured cooperation with roles)	Formal CL activities: The jigsaw puzzle; science experiment groups; a designated CL day; the teachers developed their own CL structure and other structured CL activities
Project work focused on academic content (unstructured cooperation)	Projects work focused on academic content (unstructured cooperation)

Learning from peers and social gains

Prior to the implementation of CL, the students perceived working with others as a way of learning academic content. They identified the benefits of cooperative activities as learning from each other and having opportunities to learn more than they would have done on their own. One of the students reported,

By cooperating or working on projects, you get to the substance. You get to know even more about it than you know before, and then when you share it with others, you also learn from what the others have done.

They reported another benefit of cooperative activities as obtaining new ideas and insights into different ways of doing and thinking. The benefits described by all the students were mainly related to academic learning, except for the fact that they found cooperative activities, such as discussing material with the student next to them, made them feel safer participating in whole-class discussions.

In the interviews after the PD program, the value of cooperation as a way of learning academic content from each other was still noted by the students. Most of the students said that they learnt more by cooperating than by working alone and that they learnt more effectively. However, an interesting development in the interviews conducted after the PD program was that all the students reported that they had experienced social gains after the implementation of CL. This was not included in the students' descriptions of their experiences of cooperative activities before the PD program, except for their reports that cooperating made them feel safer. The social gains they described related to experiencing increased activity and student participation in the lessons, a sense of achievement, development of their social skills, increased security, confirmation, and that CL supported the relationships between students, and a sense of class unity.

The development of social skills was the most frequently reported social gain. One student said,

I feel that I cooperate much better. I don't always know what to say, but you learn to be interdependent of others. And you become better at listening to others and trying to understand and see them [...] so you don't just think of your own work.

A feeling of being interdependent of each other was reported by several students, and it was this experience during structured cooperative activities that made them feel they were gaining knowledge of how to cooperate. This was particularly the case when the students had different roles and materials, which led to them needing and trusting each other. One of the students described his experience working with the formal CL quest structure:

You learn that you have to trust each other. You have to trust that the other person can do his part and that the leader of the group can motivate the others. You have to learn to trust each other and know that everybody manages to do their part.

One of the students reported that she had previously struggled with group assignments because she believed that the other students' work did not meet her standards and that she would rather do assignments alone:

I have seen that I can learn from others and that I don't have to do everything myself. [...] I feel that I have learned to trust that others can do the job [...]. Although it still is not my strongest side.

The implementation of CL also taught the students to cooperate within diverse student groups. One student reported, "We learned to cooperate with other students that we probably wouldn't have chosen if we could have decided ourselves".

The analysis revealed a change in students' learning after the PD program and the implementation of CL. While the students felt that cooperation benefitted their academic learning both before and after the implementation of CL, the students reported increased social gains when the teachers implemented CL. This finding indicates that the CL activities provided the students with knowledge and experience of how to work together, which led to social gains, such as their development of social skills.

A language for cooperation

Both before and after the implementation of CL, the students reported limited experience of reflecting on their cooperation and learning after group activities. Before the implementation, the students reported that they did not discuss how they had cooperated. One student said, "Maybe after class, you can say if you think someone has done a good job, but I do not think that, we sit down to talk about what we did and how we did it".

However, the students reported that they wrote individual logs for the teacher after some group projects. In these logs, which the students described as individual and confidentially addressed to the teacher, the students wrote about their cooperation. In both focus

groups there was an agreement that the log helped the teacher to see who has done what and what may influence their grades. One student said, “if the others think you have been working poorly, it will show in what they have written about you in their log”.

Group processing, whereby students reflect together on their learning and co-operation, is regarded as one of the main elements of effective CL. After the implementation of CL, the students reported limited experience of group processing. One student reported, “We do not talk to each other about what we could have done better and such. That’s more what the teacher says”.

One of the focus groups recalled one experience with group processing using a CL structure called “meeting in the middle. The students in the focus group discussed that they did not see the point of group processing. One student described how they talked: “Well it worked out like [...] okay [...] today we have worked fine, we managed to do the task really well (laughs)”. The students’ descriptions of their group processing indicate that they talked in a superficial way about their cooperation. They also mentioned having difficulties reflecting together when somebody had not contributed. For example, one student described how they reflected when someone in the group had not done their share: “We might just say ‘Okay, we could have worked a little better’. When really most of the group had cooperated as well as they could have and only one hadn’t contributed”.

In response, another student highlighted that it would have been better to write this in an individual log instead: “If we wrote a confidential log to hand in to the teacher, we could have written that the student didn’t work well”. Some of the students found that telling their peers directly that they had not done a good job was difficult as they did not want to hurt their peers’ feelings.

An analysis of this theme shows that the students had little experience discussing and reflecting together on their learning and cooperation after cooperative activities. This indicates that the teachers did not incorporate the fifth element of CL, group processing, into their implementation.

CL and exam preparation

In the last interviews, which took place in 2019, 15 months after the teachers’ PD program ended, the students described a surprising change in the teachers’ uses of CL. This was the students’ final semester at lower secondary before transferring to high school and the semester in which they have exams before graduating.

The students described a change from working in base groups as the teachers had altered the seating arrangements so that the students were back to sitting in pairs, as they had been in Year 8. One student expressed the following concern about the change of seating:

I feel that there is less cooperation now than before. We sit differently now. Before we were in groups of four, but now we are two and two or three and three in rows. And I feel that we work more on individual tasks.

All the students indicate a reduced use of CL in the classroom, especially in the last semester, and that this had led to them engaging in more individual work. The students reflected that this change of practice was related to their final exams. One of the students offered this response, which is representative of the students' general view:

We have had less CL lately. Because it's a little more difficult to do that now that we are going to have exams soon. And difficult to cooperate, because exams are individual, and we need to prepare for that.

Another student reflected that the change may be related to the transition to high school, where they would be required to work individually.

The students also reported that they were given the freedom to choose their working methods and whom to work with during that semester. One student said,

We are now allowed to choose if we want to work in groups or if we want to work individually. Often the choice is to work individually, even though many still choose to work in groups.

Another student commented that the freedom to choose may have resulted in the change to more individual work: "Mostly you just work alone or with the one sitting next to you".

The students reported that their cooperation had been more structured before and that this structure was important for them to learn how to cooperate. In the focus group discussions, the students expressed mixed opinions on the change of CL practice. Some students reported that they preferred to work with CL, especially in base groups. Others liked the freedom that they were later given regarding the structure of their cooperation and their methods.

This finding suggests that there was a reduction in the use of CL in the last semester of lower secondary in preparation for exams and the transition to high school. The students' descriptions depicted a shift from structured cooperation using CL to more unstructured or student-structured cooperation with more freedom to choose their methods of working, which resulted in more individual work.

Discussion

This study sought to investigate teachers' transfer of their learning about CL to their students' learning, with the aim of contributing knowledge to support the sustainable implementation of CL. This paper adds to the literature on the subject as it reports on a longitudinal study of students' perspectives on teachers' implementation of CL, covering the entire lower secondary period (Years 8 to 10).

To support their own learning and their implementation of new teaching practice, teachers need to engage with new knowledge through multiple learning opportunities (Timperley et al., 2007). The PD program presented in this study offered the teachers multiple learning opportunities, including a workshop, follow-up sessions, and proactive

action research in teacher teams over a period of 9 months to support their implementation. The students described a notable change when they entered Year 9 from the mainly unstructured group work they had engaged in prior to the implementation of CL. The change in teaching practice indicates that the teachers' engagement with CL in the PD program supported the implementation. The students' experience of a prominent change when they entered Year 9 indicates that the collaborative proactive action research may have been a catalyst for the teachers' implementation of CL. This is in line with studies that conclude that teacher collaboration is beneficial for the implementation of CL (Dyson et al., 2016; Joliffe, 2015).

The study finds that the change in practice to include CL altered students' learning opportunities. Through the teachers' implementation of CL, their students became positively interdependent and individually accountable in promotive learning interactions. These learning experiences are found to have affected students learning strategies. Students no longer saw working together as merely a tool for academic learning but also as a way of experiencing social gains. The students described a more active learning environment with increased student participation and a greater sense of community after the implementation of CL. The students found that they developed social skills such as the ability to cooperate, which is increasingly seen as an educational outcome in its own right and an essential preparation for students' future social and work lives (Kuhn, 2015). This study reveals the potential of CL as an important tool for developing students' ability to cooperate. Students' achievement of social gains is in line with other research that has found CL beneficial for students' social learning (Jordan & Le Métais, 1997; Roseth et al., 2008). Sharan (2002) divided different CL models into subgroups, one of which, the "learning together model", inspired the PD program in this study. This model emphasises social skills and interpersonal learning. In this study, the students reported that the implementation of CL promoted their social learning.

Cooperative learning has been found to be most effective when it is structured to include all five elements (Johnson & Johnson, 2005). Group processing - the fifth element of CL - was accentuated in the PD program provided for the teachers in this study. However, the use of group processing in the teachers' interpretation and implementation of CL seems to have been limited. This indicates that the teachers focused on activities and did not allocate time or establish a structure for the students to reflect together. Sutherland, Stuhr, Ressler, Smith and Wiggin (2019) noted that group processing is often forfeited because of a lack of time and the misguided idea that students reflect by purely engaging in CL activities. Group processing enables students to step back from their learning experience and reflect together on how to enhance further cooperation and learning, which is an integral part of the learning process. According to Dewey (1938, p. 87), "to reflect is to look back over what has been done so as to extract the net meanings which are the capital stock for intelligent dealing with further experiences". Reflecting on experiences creates opportunities for insights and complex learning (Costa & Kallick, 2008).

The CL literature specifies that including group processing as a tool for reflection is critical for successful group learning (Johnson, Johnson & Holubec, 1998). Studies on the

use of CL have found that group processing has a positive effect on academic achievement (Bertucci, Johnson, Johnson & Conte, 2012). Group processing has also been found to contribute to the satisfaction of students' need for self-worth and belonging (Strahm, 2007). When the teachers in this study did not facilitate group processing, they neglected a powerful learning tool. A lack of group processing deprives students of learning opportunities that foster reflection and that enable them to develop a meta-language for their learning and cooperation. This study found that students discussed their cooperation only superficially and preferred to share it with the teacher through individual logs. Students who are inexperienced in reflection often offer simple or superficial answers and need to be taught strategies for effective reflection (Costa & Kallick, 2008). The inclusion of group processing during the implementation of CL would have provided the students with such strategies. This study highlights the need to support teachers to incorporate group processing when implementing CL so that students can reap the benefits of learning by reflecting together.

Hargreaves and Fink (2006, p. 1) noted that "change in education is easy to propose, hard to implement, and extraordinarily difficult to sustain". Despite the learning opportunities provided for teachers during the PD program and the school's continued focus on CL, there was a shift towards more individual work and unstructured cooperation during the final semester when the final exams were approaching. Ferguson-Patrick (2018) points out that teachers may be reluctant to experiment with pedagogies such as CL in an environment that is increasingly focused on high-stakes testing. The final semester of lower secondary is when students receive their final grades, and this entails a large amount of assessment work for the teachers. Assessment has been found to be one of the main challenges for teachers using CL (Surian & Damini, 2014; Buchs et al., 2017). In addition, the students have oral exams held locally and final written examinations with centrally set papers that are centrally graded in the final semester. Their final grades determine whether they qualify for their education program and upper secondary school of choice. A large body of research indicates that high-stakes testing can have unintended consequences that may narrow the curriculum focus and cause teachers to return to teacher-centred instruction (Thompson & Harbaugh, 2013). This may have been the case for the teachers in this study, who were preparing their students for final national examinations focused on a subject-centred curriculum.

The 9-month PD program and the school's continued support were not sufficient to sustain the implementation of CL and compete with traditional learning practices that foster competitive and individual learning goals. This underlines the need for prolonged support to sustain the change of teaching practice to CL, especially regarding meeting assessment demands. It can take 2–3 years of practising CL for teachers to be comfortable with the method (Putnam, 1993). The teachers in this study had to prepare students for final exams for the first time after learning about and implementing CL. The change in teaching practice towards freedom of choice and more individualistic learning when the exams approached, may indicate that the teachers perceive individual learning as more effective.

Conclusion

In sum, despite the difficulties of sustaining the implementation of CL, this study finds that the teachers' learning opportunities during the PD program led to a change in their teaching practice to include CL and initiated new student learning practices that fostered social gains. However, an important finding was the limited use of group processing as part of the teachers' implementation. This suggests that CL learning opportunities for teachers should emphasise group processing so that students can develop a meta-language for discussing their cooperation and learning.

The empirical results reported herein should be considered in the light of some limitations. The PD program was initiated, developed, and, thereafter, researched by the author. This provided the author with access to the field and rich data but may have influenced the interpretations. This study also represents a broad picture of a CL implementation from a longitudinal perspective in which depth of enquiry may have been compromised. Further research is required to examine in greater depth certain issues related to implementation, such as the teachers' neglect of group processing found in this study. In addition, longitudinal studies on the implementation of CL that include both teachers' and students' perspective are suggested to compare and further explore the practice of CL.

References

- Baines, E., Blatchford, P. & Webster, R. (2015). The challenges of implementing group work in primary school classrooms and including pupils with special educational needs. *Education 3-13*, 43(1), 15-29. <https://doi.org/10.1080/03004279.2015.961689>
- Bertucci, A., Johnson, D. W., Johnson, R. T. & Conte, S. (2012). Influence of group processing on achievement and perception of social and academic support in elementary inexperienced cooperative learning groups. *The Journal of Educational Research*, 105(5), 329-335. <https://doi.org/10.1080/00220671.2011.627396>
- Binkley, M., Erstad, O., Herman, J., Raizen, S., Ripley, M., Miller-Ricci, M. & Rumble, M. (2012). Defining twenty-first century skills. In P. Griffin, B. McGaw & E. Care (Eds.), *Assessment and teaching of 21st century skills*. (pp. 17-66). Dordrecht: Springer. https://doi.org/10.1007/978-94-007-2324-5_2
- Brinkmann, S. & Kvale, S. (2015). *InterViews: Learning the craft of qualitative research interviewing* (3rd ed.). Thousand Oaks, California: SAGE. <https://au.sagepub.com/en-gb/oce/interviews/book239402>
- Buchs, C., Filippou, D., Pulfrey, C. & Volpé, Y. (2017). Challenges for cooperative learning implementation: Reports from elementary school teachers. *Journal of Education for Teaching*, 43(3), 296-306. <https://doi.org/10.1080/02607476.2017.1321673>
- Costa, A. L. & Kallick, B. (2008). Learning through reflection. In A. L. Costa & B. Kallick (Eds.), *Learning and leading with habits of mind: 16 essential characteristics for success* (pp. 221-235). Alexandria, Virginia USA: Association for Supervision and Curriculum Development. <http://www.ascd.org/publications/books/108008.aspx>

- Dewey, J. (1938). *Experience and education*. New York: Macmillan.
- Dyson, B. P., Colby, R. & Barratt, M. (2016). The co-construction of cooperative learning in physical education with elementary classroom teachers. *Journal of Teaching in Physical Education*, 35(4), 370-380. <https://doi.org/10.1123/jtpe.2016-0119>
- Ferguson-Patrick, K. (2018). The importance of teacher role in cooperative learning: The effects of high-stakes testing on pedagogical approaches of early career teachers in primary schools. *Education 3-13*, 46(1), 89-101. <https://doi.org/10.1080/03004279.2016.1189946>
- Fernandez-Rio, J., Sanz, N., Fernandez-Cando, J. & Santos, L. (2017). Impact of a sustained cooperative learning intervention on student motivation. *Physical Education and Sport Pedagogy*, 22(1), 89-105. <https://doi.org/10.1080/17408989.2015.1123238>
- Ghaith, G. M. (2018). Teacher perceptions of the challenges of implementing concrete and conceptual cooperative learning. *Issues in Educational Research*, 28(2), 385-404. <http://www.iier.org.au/iier28/ghaith.pdf>
- Gillies, R. M. & Boyle, M. (2010). Teachers' reflections on cooperative learning: Issues of implementation. *Teaching and Teacher Education: An International Journal of Research and Studies*, 26(4), 933-940. <https://doi.org/10.1016/j.tate.2009.10.034>
- Hairon, S., Goh, J. W. P., Chua, C. S. K. & Wang, L. (2017). A research agenda for professional learning communities: Moving forward. *Professional Development in Education*, 43(1), 72-86. <https://doi.org/10.1080/19415257.2015.1055861>
- Hargreaves, A. & Fink, D. (2006). *Sustainable leadership*. San Francisco: Jossey Bass.
- Hennessey, A. & Dionigi, R. A. (2013). Implementing cooperative learning in Australian primary schools: Generalist teachers' perspectives. *Issues in Educational Research*, 23(1), 52-68. <http://www.iier.org.au/iier23/hennessey.html>
- Hsieh, H.-F. & Shannon, S. E. (2005). Three approaches to qualitative content analysis. *Qualitative Health Research*, 15(9), 1277-1288. <https://doi.org/10.1177/1049732305276687>
- Johnson, D. W. & Johnson, R. T. (2014). Cooperative learning in 21st century. *Anales de Psicología/ Annals of Psychology*, 30(3), 841-851. <https://doi.org/10.6018/analesps.30.3.201241>
- Johnson, D. W. & Johnson, R. T. (2009). An educational psychology success story: Social interdependence theory and cooperative learning. *Educational Researcher*, 38(5), 365-379. <https://doi.org/10.3102/0013189X09339057>
- Johnson, D. W. & Johnson, R. T. (2002). Learning together and alone: Overview and meta-analysis. *Asia Pacific Journal of Education*, 22(1), 95-105. <https://doi.org/10.1080/0218879020220110>
- Johnson, D. W. & Johnson, R. T. (2005). New developments in social interdependence theory. *Genetic, Social, and General Psychology Monographs*, 131(4), 285-358. <https://doi.org/10.3200/MONO.131.4.285-358>
- Johnson, D. W., Johnson, R. T. & Holubec, E. J. (1998). *Cooperation in the classroom* (6th ed.). Edina, MN: Interaction Book Company.
- Johnson, D. W., Johnson, R. T., Roseth, C., & Shin, T. S. (2014). The relationship between motivation and achievement in interdependent situations. *Journal of Applied Social Psychology*, 44(9), 622-633. <https://doi.org/10.1111/jasp.12280>

- Jolliffe, W. (2015). Bridging the gap: Teachers cooperating together to implement cooperative learning. *Education 3-13*, 43(1), 70-82.
<https://doi.org/10.1080/03004279.2015.961719>
- Jordan, D. W. & Le Métais, J. (1997). Social skilling through cooperative learning. *Educational Research*, 39(1), 3-21. <https://doi.org/10.1080/0013188970390101>
- Kuhn, D. (2015). Thinking together and alone. *Educational Researcher*, 44(1), 46-53.
<https://doi.org/10.3102/0013189X15569530>
- Kyndt, E., Raes, E., Lismont, B., Timmers, F., Cascallar, E. & Dochy, F. (2013). A meta-analysis of the effects of face-to-face cooperative learning. Do recent studies falsify or verify earlier findings? *Educational Research Review*, 10, 133-149.
<https://doi.org/10.1016/j.edurev.2013.02.002>
- Lamb, S., Maire, Q. & Doecke, E. (2017). *Key skills for the 21st century: An evidence-based review*. Education Future Frontiers Report. NSW Department of Education.
 [see conference version:
https://research.acer.edu.au/cgi/viewcontent.cgi?article=1358&context=research_conference]
- Patton, M. Q. (1990). *Qualitative evaluation and research methods* (2nd ed.). Newbury Park: SAGE.
- Roseth, C. J., Johnson, D. W. & Johnson, R. T. (2008). Promoting early adolescents' achievement and peer relationships: The effects of cooperative, competitive, and individualistic goal structures. *Psychological Bulletin*, 134(2), 223.
<https://doi.org/10.1037/0033-2909.134.2.223>
- Schmuck, R. A. (2006). *Practical action research for change* (2nd ed.). Thousand Oaks, California: Corwin Press. <https://us.corwin.com/en-us/nam/practical-action-research-for-change/book229146>
- Sharan, S. (2002). Differentiating methods of cooperative learning in research and practice. *Asia Pacific Journal of Education*, 22(1), 106-116.
<https://doi.org/10.1080/0218879020220111>
- Sharan, Y. (2010). Cooperative learning for academic and social gains: Valued pedagogy, problematic practice. *European Journal of Education*, 45(2), 300-313.
<https://doi.org/10.1111/j.1465-3435.2010.01430.x>
- Slavin, R. (2014). Cooperative learning and academic achievement: Why does groupwork work? *Anales de Psicología/ Annals of Psychology*, 30(3), 785-791.
<https://doi.org/10.6018/analesps.30.3.201201>
- Stoll, L., Bolam, R., McMahon, A., Wallace, M. & Thomas, S. (2006). Professional learning communities: A review of the literature. *Journal of Educational Change*, 7, 221-258.
<https://doi.org/10.1007/s10833-006-0001-8>
- Strahm, M. F. (2007). Cooperative learning: Group processing and students needs for self-worth and belonging. *Alberta Journal of Educational Research*, 53(1), 73-76.
<https://journalhosting.ucalgary.ca/index.php/ajer/article/view/55199>
- Surian, A. & Damini, M. (2014). "Becoming" a cooperative learner-teacher. *Anales de Psicología/ Annals of Psychology*, 30(3), 808-817.
<https://doi.org/10.6018/analesps.30.3.201521>
- Sutherland, S., Stuhr, P. T., Ressler, J., Smith, C., & Wiggin, A. (2019). A model for group processing in cooperative learning. *Journal of Physical Education, Recreation & Dance*, 90(3), 22-26. <https://doi.org/10.1080/07303084.2019.1559676>

- Thompson, G. & Harbaugh, A. G. (2013). A preliminary analysis of teacher perceptions of the effects of NAPLAN on pedagogy and curriculum. *The Australian Educational Researcher*, 40(3), 299-314. <https://doi.org/10.1007/s13384-013-0093-0>
- Timperley, H., Wilson, A., Barrar, H. & Fung, I. (2007). *Teacher professional learning and development: Best evidence synthesis iteration*. Wellington, New Zealand: Ministry of Education. <https://www.educationcounts.govt.nz/publications/series/2515/15341>

Beathe Liebech-Lien is a PhD candidate at Norwegian University of Science and Technology, Trondheim, Norway, and a teacher in lower secondary school. She is an active teacher and researcher with experience using the pedagogical model cooperative learning in her teaching practice and from leading professional development programs for teachers with cooperative learning.
Email: beathe.liebech-lien@ntnu.no

Please cite as: Liebech-Lien, B. (2020). Students' experiences of a teacher-led implementation of cooperative learning: A longitudinal study. *Issues in Educational Research*, 30(2), 555-572. <http://www.iier.org.au/iier30/liebech-lien.pdf>