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Peer Learning Network: implementing and sustaining cooperative learning by teacher collaboration

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ABSTRACT

This article describes an in-service teachers' staff-development model *Peer Learning Network* and presents results about its efficiency. *Peer Learning Network* promotes three levels of peer learning simultaneously (among pupils, teachers, and schools). It supports pairs of teachers from several schools, who are linked through a network, to use cooperative learning in their classrooms by implementing an adjustable peer-tutoring programme. The programme offers evidence of the progress of the pupils, and tries to guarantee the sustainability through a three-year, staff-development sequence that replaces the teacher pairs each year. After describing the peer-tutoring programme, results from 20 schools from one network in Spain are presented. These results show the effects on teacher learning on both concepts and attitudes, the decisions that pairs of teachers make to adjust the programme to their context, and the supports needed for success. This programme has been shown to be an effective and efficient way to help teachers introduce and use, in a sustained way, a method of cooperative learning in their classrooms.

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Peer learning; peer tutoring; cooperative learning; teacher collaboration; teacher professional development

Introduction

After many years of offering staff development through coursework, and seeing the difficulties involved in implementing cooperative learning in a sustained way, a decade ago a group of educators in Spain began to explore an alternative model of teacher professional development for cooperative learning, called *Peer Learning Network*. This model combines the coherent promotion of peer learning in three levels (students, teachers, and schools) within a three-year cycle of staff development, in order to help students, teachers and schools learn, put into practice and sustain a cooperative-learning project (Duran and Utset 2014).

Peer learning among students, teachers, and schools

Peer learning is defined as building knowledge and skills through interaction between people who share similar characteristics or status, and where nobody acts as a professional teacher of others (Topping 2005).

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Interactions with others, properly structured, are an important engine for learning (Wells 1999). The effectiveness of learning among students is amply documented and extensive research demonstrates the benefits from cognitive, social and emotional perspectives (Gillies 2008, 2014; Kyndt et al. 2013; Plante 2012). Specifically, the effectiveness of the cooperative-learning method of peer tutoring has been extensively researched (Bowman-Perrott et al. 2013; Topping, Duran, and Van Keer 2015). Furthermore, the content, skills and strategies that cooperative learning promotes are viewed as essential to face the great challenges of the twenty-first century (Johnson and Johnson 2014).

Despite considerable evidence for its effectiveness, the actual use of cooperative learning in the classroom has not been consolidated (Gillies and Boyle 2010; Ruys, Van Keer, and Aelterman 2014). In fact, efforts to implement and sustain cooperative learning are often met with considerable resistance and practitioners experience multiple difficulties despite the wealth of practical knowledge and resources available (Cohen, Brody, and Sapon-Shevin 2004; Kagan 2005; Sharan 2010). Hargreaves and Fink (2006) note that it is essential for teachers to work together and learn from each other in order to develop practices that respond to the challenges of today's educational environments. It is widely recognised that collaboration among teachers is directly linked to the improvement of practices in innovative educational situations because of the learning processes it promotes in the participants. Professional Learning Communities are a good example of such collaborative practices (Little and Horn 2007).

Meirink et al. (2010) explain that peer learning among teachers is characterised by exchanging ideas, discussing experiences with alternative teaching methods and solving instructional problems. But this alone is not sufficient for teachers to learn. Teachers must also be supported in the creation of concrete artefacts, such as lesson plans, and be encouraged to be responsible in the way these artefacts are used. Moreover, teachers, with their school leaders, must make decisions about what topics they consider important for their collaboration. Both autonomy in the *process* and autonomy in the *topics* are important to promote a high level of learning.

Peer learning can also take place among schools, and this supports the development of school networks (Katz and Earl 2010; Sliwka 2003). Katz and Earl describe Networked Learning Communities as learning spaces that enhance learning for students, teachers, management teams and schools. Connections among schools provide encouragement and support to meet new challenges that lead to new knowledge (Jackson and Temperley 2007). These collaborative connections can be developed in both face-to-face and virtual environments (Owston et al. 2008).

Sustainability of cooperative learning in classrooms and schools

Ishler, Johnson, and Johnson (1998) designed a programme of professional development and put it into practice to support the implementation of cooperative learning and its use in the long term. The results showed that the key factor in determining which schools continued making use of cooperative learning after three years was the collaborative work among the staff. Krol et al. (2008) designed a two-year, staff-development plan. During the first year, each teacher implemented cooperative learning and a staff-development specialist gave regular feedback. In the second year, situations of mutual support between teachers were organised and a clear leadership team, that included the teachers, the

school-management team and the staff development specialist, was established. Krol et al. suggest that a good staff-development programme should focus both on those teachers who work directly in the classroom and on the development of a teacher leadership team. They noted that (a) the teacher participation in a leadership team was important to support changes in teachers' attitudes and practices and (b) the degree of implementation of cooperative learning among schools was related to the support teachers received from the team. This team became what Geijsel et al. (2003) described as 'the transformer'.

Jolliffe (2015) also suggests that schools working together, with a community of facilitators providing support, demonstrate a greater ability to use cooperative learning. She notes that collaborative cultures in the school are the key for sustainability, however these are built up slowly. Jolliffe focused implementation of cooperative learning in three phases: (a) preparation, to examine the theoretical perspectives and beliefs about learning; (b) staff development, which should be accompanied by practised and tested cooperative-learning methods; and (c) support to ensure long-term success, through a networked learning community.

Research context: introduction and sustainability of the educational programme *Reading in Pairs*

The in-service staff-development model this research is based on started in multiple territories in Spain in 2006 and is currently distributed in six different networks of schools, called *Peer Learning Networks*. By 2015–2016 academic year, 300 schools have been, or still are, in one of these networks. The model for *Peer Learning Network* and the educational programme *Reading in Pairs* have been created and promoted by the Research Group on Peer Learning (GRAI), affiliated to the Universitat Autònoma de Barcelona. Some group members are lecturers at the University, others are teachers in schools; some members serve as staff developers in the networks. The aim of the group has been to introduce and implement the peer-tutoring programme *Reading in Pairs* (Duran et al. 2016), with family involvement, in order to improve reading skills. Essentially, the programme provides a framework for a structured interaction between two students (tutor and tutee) which is guided by an activity sheet. Tutor and tutee make a fitting and more flexible use of this interaction as they become familiar with it.

When schools join *Peer Learning Network*, they commit to a three-year plan. Every school decides in which classrooms and under what conditions they will develop *Reading in Pairs*. Each year two different teachers participate, implementing the programme in their classrooms. While planning and implementing *Reading in Pairs*, the teacher pairs collaborate with pairs of colleagues from other schools in the network. Previously trained teachers are encouraged to participate in the school leadership team to implement and make the programme sustainable as a regular practice.

Peer Learning Network uses a blended form of faculty development, with three face-to-face sessions and a virtual space. Documentation on *Reading in Pairs* is supplied to teachers at the beginning of the academic year. Throughout the year, support is provided by the staff developers during the group sessions and in the virtual space. Support and collaboration with colleagues focus on both implementing the programme in the classroom and adapting it to the needs and characteristics of each school. With two new teachers participating in each school each year, a continuity of staff development and participation is embedded. Parallel to this process and the implementation in schools, GRAI carries out research in

collaboration with the teachers. Data about students' reading comprehension are collected, analysed and returned to teachers so they can evaluate the improvement in student learning and make new data-driven decisions.

Teacher collaboration is the central axis of the Peer Learning Network. Situations in which teachers collaborate to build new learning include: (a) within school collaboration among currently participating teachers and with previous teacher participants; (b) in the virtual space, where all currently participating teachers, ranging from 20 to 60 teachers, depending on the network, collaborate; and (c) three face-to-face staff-development sessions during which all currently participating teachers within the network collaborate, with a maximum of 20 participants per session. Table 1 summarises the stages implemented during the first year of Reading in Pairs.

The actions outlined in the table are based on four characteristics: *Coherence*, the simultaneity of three levels of peer learning: students, teachers and schools. *Classroom innovation*, the process of learning cooperative learning and learning to adjust through repeated use. *Evidence*, the process of gathering and reviewing data related to effects on student learning. *Sustainability* within a three-year continuous cycle.

Researching the effects of Peer Learning Network to introduce Reading in Pairs: objectives and method

The purpose of this research was to identify possibilities and limitations of Peer Learning Network to generate an innovative practice based on cooperative learning that can become a sustainable practice in schools. This research was based on an evaluation model of professional development involving four levels: (a) impact on pupil learning, (b) teachers' new knowledge, (c) expanded support for each school and (d) changes generated in the school as the result of staff development (Guskey 2002).

Obviously, the effectiveness of any project should be evaluated in terms of the impact on the students' learning (Guskey and Sparks 2002). When teachers learn to use cooperative learning, it has to affect positively the learning of their students. The effectiveness of Reading in Pairs in improving reading comprehension has already been demonstrated (Flores and Duran 2015; Valdebenito and Duran 2015). In current research, the data of the improvement in pupils' learning serve as a control value, to ensure that the teaching activity and the professional development have been effective. Detailed results will not be discussed here, but it is important to note that progress in reading comprehension levels of pupils at the beginning of the course ($M = 56.86$) and at the end ($M = 65.61$) is statistically significant in all the groups of all the schools in the network ($p = 0.000$).

Three research questions were formulated:

- (1) To what extent do teachers involved in Peer Learning Network acquire the basic conceptual knowledge of the programme Reading in Pairs and have appropriate attitudes and conceptions about peer learning?
- (2) What decisions do teachers involved in Peer Learning Network make when developing Reading in Pairs in their schools, and what elements help them to make them?
- (3) What are the indicators that suggest continued use in the school after the three-year-cycle of staff development?

Table 1. Peer Learning Network: the stages to implement ‘Reading in pairs’ (an academic year).

Stages	Teacher collaboration (TC)
(1) Before starting faculty-development sessions (using the virtual space)	Management team of each school and teacher participants sign an authorisation and commitment document with GRA
(2) First faculty-development session	Participants receive information about Peer Learning Network
(3) The period between the first faculty-development session and the second (planning for ‘Reading in pairs’ implementation)	<p>Participants receive information about ‘Reading in pairs’</p> <p>Clarifying information: Conversations between teachers and staff-development specialist</p> <p>Distributing tasks</p> <p>Making initial adjustments and customisations based on the needs of each school</p> <p>TC in each school</p> <p>Deciding in which classrooms the programme will be implemented (decisions include grades, specific teachers and whether cross or same-age pairs will be used)</p> <p>Collaborating to develop activity sheets</p> <p>Conducting initial reading comprehension assessments of students, creating pairs (tutor–tutee)</p> <p>Teaching pupils their roles and other characteristics of Peer Tutoring</p> <p>Teaching a member of the family how to work with the activity sheets</p> <p>Sharing activity sheets; giving and receiving feedback to improve them</p> <p>Asking questions to clarify conceptual knowledge of the programme</p> <p>Asking questions about how to fit the programme into one’s school; making suggestions to others</p>
(4) Second faculty-development session	Checking the implementation planning
(5) From second faculty-development session to third (implementing/experiencing)	<p>Deciding on the final design of implementation in each school: (Conversations amongst teachers and staff-development specialist)</p> <p>Implementation of ‘Reading in pairs’ (Two sessions of 30 minutes per week for twelve weeks in the classroom. One session of 30 minutes per week at home)</p> <p>Helping tutors and tutees make a fitting and flexible use of the programme</p> <p>Analysing classroom observations and making decisions to adapt the implementation to their context: Co-teaching</p> <p>Visiting other schools and exchanging experience</p> <p>Each school explaining how implementation is working</p> <p>Staff development specialist and teachers working together in an open forum where everyone can ask questions and make suggestions</p> <p>Exchanging activity sheets and other materials</p> <p>Continuing to give feedback to improve activity sheets and other kinds of classroom materials</p>
(6) Third faculty-development session	Evaluating the implementation of the programme and the working processes in the network; making proposals for improvement
(7) From third faculty-development session to the conclusion of the year (process of closing the annual cycle/planning to continue)	<p>TC in each school</p> <p>Planning the next year; taking into account all data collected throughout the implementation process. Final assessment is used to identify pupils’ improvement in reading comprehension and opinions about the experience from both pupils and families</p> <p>Presenting to all school staff the developed experience in the Peer Learning Network and identifying two teachers who will represent the school next year</p> <p>Sharing final decisions of each school</p>
TC in virtual space	TC in virtual space

The study was conducted in 20 primary and secondary schools. A total of 40 teachers and 817 pupils participated in Peer Learning Network, during the 2014–2015 academic year, in 1 of the 6 networks in Spain. Four of these schools completed a three-year cycle.

Data-collection tools

The 'Cooperative Learning Implementation Questionnaire, CLIQ' (Abrami, Poulsen, and Chambers 2004) examines concepts about and attitudes towards the implementation and sustainability of cooperative learning. It takes into account three dimensions: (a) value (benefits for teachers and students); (b) expectancy of success (perceptions of use and expected results); and (c) cost of innovation (time, effort, and special materials). The questionnaire consists of 48 items answered on a scale from 1 to 5. Results were analysed through calculated means for each item. For items related to value and expectancy of success, means above three suggest that teachers place a high *value* on cooperative learning and have a high *expectancy of success*. Conversely, a mean above three for items related to cost suggests that teachers have negative perceptions of the *cost* of using cooperative learning as high.

The 'Assessment Questionnaire of the Knowledge of Fundamental Components of the Programme', consists of 12 multiple-choice statements; these examine (a) Reading in Pairs goals, (b) peer tutoring, (c) reading comprehension, (d) teacher collaboration, (e) the teacher's role, (f) pupils' pairs, (g) activity sheets and (h) programme implementation. The percentage of correct answers for each teacher was calculated, from a maximum of 12 points.

At the end of the year, each participating teacher wrote a report, detailing the decisions made to adapt the programme to the individual needs of each classroom. The staff developers reviewed the reports, with the teachers, in the virtual space. Semi-structured interviews of teachers and school-management teams were conducted from the four schools that completed the three-year cycle. Results were analysed using an *ad hoc* category system validated using interjudge reliability. Atlas-ti software was used to calculate frequency.

Results

In this section, results are presented related to each of the three research questions.

Teacher learning

At the beginning of the first faculty-development session, teachers completed the 'Assessment Questionnaire of the Knowledge of Fundamental Components of the Programme' to determine what teachers already knew about the programme. At the conclusion of the third faculty-development session, teachers completed this assessment again. The percentage of correct responses increased from 80 to 90% from pre to post-faculty-development, indicating a consolidation of knowledge. Relatively high accuracy rates of initial responses suggest that preparation for the first face-to-face session, which provided teachers with information about Reading in Pairs in a networked virtual space, was effective.

During the first faculty-development session, faculty also completed the Cooperative Learning Implementation Questionnaire (CLIQ) to gather data about their conceptions of, and attitudes towards, the use of cooperative learning. Results, reported on a 1 to 5 scale, indicate that teachers recognise that, although implementation of cooperative learning

involves a cost ($m = 2.80$), they have a relatively high expectancy of success ($m = 3.77$) and value ($m = 4.21$) the use of cooperative learning methods in the classroom. These results suggest that teachers' attitudes were appropriate to begin the project, possibly because of the schools' demonstrated commitment.

Implementation of reading in pairs in schools

All teachers from all schools in the network implemented the programme in their classrooms. Each school made concrete decisions based on their needs, resulting in a high level of specificity with multiple configurations of the programme. Table 2 shows the range of options that the 40 teachers from the 20 schools adopted in order to adapt the programme to the realities of their particular schools. Data in Table 2 were derived from the end-of-year report each teacher wrote.

Schools made decisions by combining different elements with different options, but always ensuring that the essential components of the programme were preserved. Often decisions were made to adapt the activity sheets to the reality of a particular classroom and each school developed its own activity sheets for both classroom and home use. These were shared among colleagues and the staff developer for feedback and exchange of ideas.

Data in Table 3 are based on interviews conducted in the four network schools that were completing a three-year cycle of faculty development. In each school, the six teachers who participated during the three-year project participated in a culminating group interview. These 24 teachers were asked to describe their perceptions of support for their decision-making during the implementation and development of the project. Researchers analysed the interviews to determine categories and subcategories or responses. Data show how often teachers mentioned each subcategory throughout their interviews and the percentage of teachers who mentioned a particular category.

The researchers coded responses to examine teachers' perceptions of collaboration within pairs of teachers, with school colleagues who had previously participated in the programme, and with colleagues from other schools within the network. Colleagues from the school, who had participated in previous years in the Peer Learning Network, were highly regarded; 33.4% of coded comments were viewed as expressing the value of support in two ways: by providing information related to their own experiences and through collaborating with year-one teachers to make implementation decisions and adaptations. Year-one teachers reported that they felt support from the teacher they were paired with in their school (26.7%) and specifically mentioned the usefulness of discussions related to implementation decisions being maintained. They also identified collaborative support from participating colleagues who not in their school (20%) as being individuals with whom they could exchange ideas and solve problems. They reported that this was more useful during face-to-face staff development sessions or inter-school visits than in the virtual space.

Incorporation of reading in pairs in schools: sustainability and regular practice

Interviews of the teachers and school management teams, from the four schools that had completed the three-year cycle, were analysed using four broad categories through, as above, an ad hoc category system validated using inter-rater reliability.

As Table 4 shows, all four schools agreed that the sustainability of the programme was due to the (a) learning and skills that the teachers had acquired, (b) decisions adapted to

Table 2. Decisions made by teachers in the Network.

Differential elements	Distribution among teachers				Total teachers (%)
	Year 1 & 2	Year 3 & 4	Year 5 & 6	Year 7 & 8	
Age groups	Possibilities N teachers (%)	Year 3 & 4 17 (42.5)	Year 5 & 6 10 (25)	Year 7 & 8 12 (30)	40 (100)
Number of pupils per class	Possibilities N teachers (%)	From 10 to 15 8 (20)	From 16 to 20 10 (25)	From 21 to 24 10 (25)	40 (100)
Type of Peer Tutoring	Possibilities N teachers (%)	Fixed same-age 12 (30)	Reciprocal same-age 24 (60)	Fixed cross-age 4 (10)	40 (100)
Use of Co-teaching	Possibilities N teachers (%)	Co-teaching 14 (35)	No co-teaching 24 (60)	Half sessions co-teaching 2 (5)	40 (100)
Number of class sessions	Possibilities N teachers (%)	From 12 to 15 21 (52.5)	From 16 to 20 3 (7.5)	From 21 to 24 16 (40)	40 (100)
Number of home sessions	Possibilities N teachers (%)	From 0 to 5 11 (27.5)	From 6 to 10 12 (30)	From 11 to 15 13 (32.5)	40 (100)
				More than 15 4 (10)	40 (100)

Table 3. Support elements for decision-making in the implementation and development of the programme.

Categories	Subcategories	Frequency	Total /%
School colleagues who had previously participated in the programme	They share information on their previous experiences	7	15/33.4%
School colleagues who are currently participating in the staff-development programme	Decisions are made together	8	
	Team works together to discuss planning and development of the programme	10	12/26.7%
Network colleagues	Colleague understands the classroom reality and contributes ideas	2	
	Face-to-face situations: exchanging ideas and solving problems	7	9/20%
	Virtual classroom: exchanging ideas and solving problems	2	
School Management Team	Depending on their degree of commitment (they offer support and encouragement)	4	4/8.9%
Staff Developer	At a faculty-development session level	1	2/4.4%
	In the virtual classroom	1	
Programme-related materials	Published on the web	0	2/4.4%
	From the virtual classroom	2	
Pupils in the classroom	They express (either directly or indirectly) their needs and interests	1	1/2.2%
Total comments		45	45/100%

Table 4. Sustainability of the programme, means to carry it out and transference of the methodology.

Categories	Subcategories	N schools
Learning skills acquired by the teachers	Teachers who have completed the staff-development and have continued in the programme	4 (100%)
Adaptation of the programme to the characteristics of the school	The group of teachers involved in the programme in the school understand how to continue developing it	4 (100%)
School management team's commitment to maintaining the programme	There is a clear policy on which age groups will participate and how they will do it	4 (100%)
Teachers involved in the programme apply the acquired knowledge in other areas	Although adjustments have been made they are not useful, it depends on the teachers	1 (25%)
	The commitment has been made public	4 (100%)
	The measures required to carry it out have been made available	3 (75%)
	Teachers progressively start using the peer tutoring in other situations	4 (100%)
	The school management team accept using peer tutoring in other situations and create the mechanisms to make it possible	2 (50%)
	The school management team accept it but do not commit to any extra help	2 (50%)

the individual context of each school, (c) commitment of the school management team and (d) transfer of the use of peer tutoring into other content areas, both in the same classroom and to others inside the school.

Conclusion

The coherent promotion of peer learning at three levels simultaneously (students, teachers, and schools), as in the model presented here demonstrates, can have a positive impact on the predisposition to use cooperative learning because, at all three levels, cooperation is the key factor for learning. Although it has been suggested that when promoting cooperative learning among pupils, it is important that they see teachers cooperating, teachers are equally encouraged to cooperate when they see their pupils cooperating effectively. Perhaps even more so when, as in Reading in Pairs, teachers have available to them specific reading-comprehension data that indicates the positive effects on their own pupils.

Within their schools, teachers work with their partners and with those teachers who are previous participants in the programme. Over the three-year implementation period, as links with previous participants are developed an ad hoc and dynamic teacher-leadership team develops. Teachers also collaborate with teachers from other schools, during faculty-development sessions, in the virtual space, and during inter-school visits; each supports learning amongst schools. These various collaborative interactions help consolidate the decisions made by individual teachers, as they promote discussions on how to implement the programme and encourage conversations about difficulties which may arise. Collaboration initiates an exchange of views that facilitates the flexibility of mental structures and allows participants to advance their knowledge (Katz and Earl 2010).

Information and materials supplied during initial phases of the programme have (a) proven effective in helping teachers plan how to introduce the programme, (b) provided solid conceptual knowledge and (c) helped to create a positive attitude towards the use of cooperative learning. As Gillies and Boyle (2010) have pointed out, it is necessary to develop and provide specific materials for teachers to use. However, it is also important that teachers learn, and have support, to adapt materials according to their needs.

A critical finding is that Reading in Pairs implementation can be, and is, adapted to the needs and possibilities of each school. Teachers make adjustments guided by their professional and content knowledge, and with the support of their peers. Their ability to adapt and adjust contributes to making them 'engineers' of cooperative learning rather than merely technicians who apply prewritten techniques (Johnson and Johnson 1994). Some indicators that ensure the programme is sustainable have been identified previously (Jolliffe 2015; Katz and Earl 2010). These include the high level of knowledge teachers achieve and are able to apply in a variety of educational situations, and the explicit commitment of the school-management team to introduce support measures, especially time to plan with peers. This commitment supports the creation of an internal team of teachers, all of whom have participated in Peer Learning Network, who then support its continued development. Specific characteristics and challenges of the education system (for instance, in this study, issues of teacher mobility) can always hinder the implementation of any transformative model.

The Reading in Pairs programme, nested within Peer Learning Network, provides a 'slow' and continuous three-year cycle. It seems to dissociate the programme from a particular teacher, pair of teachers or grade level. In doing so, it progressively becomes a project for

the school and the network itself. Eventually it loses its initial status of *innovation* and become a regular, dynamic and adaptable practice grounded in, and supported by, collaboration.

Disclosure statement

No potential conflict of interest was reported by the authors.

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