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Article

Improving Literacy Competence and Social and Emotional Competencies in Primary Education Through Cooperative Project-Based Learning

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Abstract

Background: Cooperative learning and Project-Based Learning are methodologies that can promote learning environments and improve learning, school achievement, and social and emotional competencies. **Method:** A mixed combination of these two methodologies called Cooperative Project-Based Learning was designed, and a quasi-experimental evaluation study with a pre-test and a post-test was conducted with a sample of 156 students from Primary Education. Literacy competence and social and emotional competencies, including empathy, were analyzed and compared between experimental and control groups. **Results:** The intervention effectively increased scores on literacy competence, social and emotional competencies, and empathy in the experimental group, significantly more than in the control group. The girls in the experimental group exhibited greater improvement than the controls in literacy competence, social and emotional competencies and empathy. However, the boys in the experimental group were only different from the boys in the control group in literacy competence, but not in the other two variables. **Conclusions:** These results have implications for school practice and curriculum planning in Primary Education. New lines of future research are also being opened based on the impact of Cooperative Project-Based Learning on other key competencies and on the prevention of antisocial behaviors.

Keywords: Cooperative learning, Project-Based Learning, literacy competence, social and emotional competencies, empathy.

Resumen

Mejora de las Competencias Socioemocionales y de Comunicación Lingüística en Educación Primaria a través del Aprendizaje Basado en Proyectos Cooperativos. **Antecedentes:** el aprendizaje cooperativo y el Aprendizaje Basado en Proyectos son metodologías que pueden mejorar el aprendizaje, el éxito académico y las competencias sociales y emocionales. **Método:** se diseñó una combinación mixta de estas dos metodologías llamado Aprendizaje Basado en Proyectos Cooperativos. Se realizó un estudio cuasi-experimental con pre-test y post-test, con una muestra de 156 estudiantes de Educación Primaria. **Resultados:** se analizaron y compararon las competencias en comunicación lingüística y las competencias socioemocionales (incluyendo empatía) entre los grupos experimentales y control. La intervención aumentó las puntuaciones en las tres variables de estudio en el grupo experimental, significativamente más que en el grupo de control. Las chicas del grupo experimental mostraron puntuaciones mayores en comparación con las chicas del grupo control en la competencia en comunicación lingüística, las competencias socioemocionales y la empatía. Sin embargo, los chicos del grupo experimental solo mostraron diferencias con los chicos del control en la competencia en comunicación lingüística. **Conclusiones:** estos resultados tienen implicaciones para la práctica escolar y la planificación curricular en Educación Primaria. También abren nuevas líneas de investigación futuras basadas en el impacto del Aprendizaje Basado en Proyectos Cooperativos en otras competencias clave y en la prevención de comportamientos antisociales.

Palabras clave: aprendizaje cooperativo, Aprendizaje Basado en Proyectos, competencia en comunicación lingüística, competencias socioemocionales, empatía, Educación Primaria.

Competency-based education contributes to lifelong learning by promoting desirable social interaction and improving the way in which people overcome difficulties (Unesco, 2017). A desirable social interaction requires an adequate communication with other people and establishing relationships in different contexts (Council of Europe, 2018). An adequate communication process requires appropriate literacy competence in four dimensions (Council of the European Union, 2018): listening, reading, speaking and writing. Moreover, social interaction is conditioned by the emotional content used in interpersonal interactions (Saarni, 2000). Within this content, social and emotional competencies such as self-awareness, self-management and motivation, social awareness and prosocial behaviour and decision making (CASEL, 2012) are crucial for building successful relationships. Social and emotional competencies are usually accompanied by a key factor in the recognition and understanding of others, such as empathy (Allemand et al., 2015), which is made up of two dimensions

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(Jolliffe & Farrington, 2006): affective empathy and cognitive empathy. Thus, literacy competence and social and emotional competencies are important competencies for ensuring desirable social interaction. For this reason, it is necessary to develop these competencies as early as Primary Education.

Cooperative learning (CL) has been one of the most recommended teaching methods since the 1980s (Ghaith, 2018; Surian & Damini, 2014); because it has the potential to positively affect academic achievement and social interactions (Keramati & Gillies, 2021). CL is based on working in pairs or small groups (usually heterogeneous), where students join efforts and share resources to improve their own learning and also the learning of other team members (Johnson et al., 2008). Each member of a cooperative base-group is assigned a role to ensure that interaction and skill development (leadership, decision making, trust-building, communication, and conflict management) actually happens (Johnson & Johnson, 2006).

Many cooperative programmes have been carried out to improve literacy competence. A reading program, called Cooperative Integrated Reading and Composition, showed that a cooperative peer support programme improved reading and vocabulary acquisition in primary (Stevens & Slavin, 1995), secondary (Nwosu et al., 2021) and university (Olaya & González-González, 2020) students. Moreover, Rivera-Pérez et al. (2021a) have found positive and significant associations between CL and emotional intelligence in primary and secondary education. A cooperative programme carried out in Primary Education (Rivera-Pérez et al., 2021b) improved students' self-approach goals, their emotional control and regulation, and empathy.

Project-Based Learning (PBL) is another didactic method that promotes content learning (Holm, 2011) through the joint creation of materials or final products by the students (Dado & Bodemer, 2017). The final product focuses on one of the contents established in the curriculum and must be linked to a problem in society (Thomas, 2000). The participation of students in the project includes a series of questions posed by the teacher, which aim to promote a search for solutions to the problem posed (Blumenfeld et al., 1991). A recent meta-analysis (Chen & Yang, 2019) showed that PBL improves academic achievement when compared to traditional instruction. However, a systematic review by Ferrero et al. (2021) showed that studies about PBL in Primary Education had important methodological flaws, and reported insufficient information about important aspects, such as materials, procedures and key requirements to guarantee the success of PBL.

The effect of PBL on literacy competence has been studied by Duke et al. (2017) in grade 2, where writing improved significantly. A PBL focused on different values carried out in pre-service teachers (Seçgi, 2020) showed an improvement in skills in communication, research, recognition of prejudice and stereotypes, empathy, group work, taking task responsibility or developing a sense of self-confidence, among other skills. Nevertheless, more research is necessary about the effect of PBL on literacy competence, and social and emotional competencies specifically in Primary Education.

The current study analyzed the combination of CL and PBL, that could be an effective technique to improve literacy competence, and social and emotional competencies. De Ojeda et al. (2020) combined CL and PBL in a Sports Education programme in Primary Education students and obtained significant and positive development in planning and self-monitoring. Another study (Siew & Ambo, 2020) obtained a positive impact on the cientific creativity of grade 5 students of a programme that used a PBL with CL. Cooperative base-groups improved social skills and academic achievement of university students (Mando-Lázaro et al., 2018).

Previous studies have shown promising results of PBL and CL on different aspects of youth development. Nevertheless, these approaches have rarely been combined, and their effect on literacy competence and social and emotional competencies in Primary Education still needs to be evaluated. Thus, the aim of this study was to analyze to what extent literacy competence and social and emotional competencies improved in an experimental group that received a Cooperative Project-Based Learning (CPBL) intervention taking into account the sex and the grade of the students.

Methods

Participants

The sample was selected by convenience sampling in Cordoba and Jaen, and it was composed of 145 participants (47.6% boys and 52,4% girls), aged 8 to 12 years (M_{age} = 10.03 years, SD = 0.92), enrolled in two classes of Grades 4, 5 and 6 during the 2017/2018 school year. Taking into account the ethnic-cultural diversity, two students identified themselves as members of the Gipsy community (1.4%), three students identified themselves as immigrants (2.1%), and the rest as the Spanish majority group (96.5%).

The sample was divided into two groups: 49% control group (n = 71) and 51% experimental group (n = 74). The control group (M_{age} = 10.04 years, SD = 0.89, 48.6% boys and 51.4% girls) was formed by classes of Grade 4 (n = 24), 5 (n = 21) and 6 (n = 26) and the experimental group (M_{age} = 10.01 years, SD = 0.96, 46.5% boys and 53.5% girls) was drawn from other classes of Grade 4 (n = 27), 5 (n = 21) and 6 (n = 26).

Instruments

Data were collected using a survey that consisted of four parts: socio-educational data (sex and grade), *the literacy proficiency test* (Llorent & González-Gómez, 2020), *the Social and Emotional Questionnaire* (Zych et al., 2018), and *the Basic Empathy Scale* (Jolliffe & Farrington, 2006).

The literacy proficiency test assessed *listening*, *reading* and *writing*. This test was based on the PIRLS test (Mullis et al., 2017), which has been used to assess literacy proficiency in 4th-grade primary school students from various countries since 2001. The test used in this study was composed by three parts: reading, listening and writing. The reading part focused on literacy experience and the acquisition and use of information. In the reading part, children answered questions about a text that they had previously read. The listening part began with the teacher reading a story, and the children answered various questions about the story. In writing, students wrote a story based on an image. These tests were assessed using two scales: the first scale measured comprehension (*listening* and *reading*), and the second scale measured expression (*writing*). Both scales were divided into six levels, including A1 (the most basic/introductory level), A2, B1, B2, C1 and C2 (mastery of proficiency level) based on the criteria established by the Council of Europe (2018). Each one of six levels had two items in each level and the final scale was composed by 12 items. The items described an observable behaviour carried out by

the students. For example, *writing* A1.1 level is "He/she describes with difficulties some realities that he/she knows or sees", and C2.2 level is "He/she rebuilds information and arguments from various sources, and presents them in a coherent and originally summarised way". Researchers evaluated the tests and selected a single item on the scale from each of the three factors. The selected item corresponded to the description of the test result carried out by each student. Cronbach's alpha is adequate (α = .81) for this study and it was calculated adding up the score of each of the three factors because it is a polytomous scale.

The Social and Emotional Competencies Questionnaire (Zych et al., 2018) is composed by 16 items grouped into four factors: *self-awareness* (four items), *self-management and motivation* (three items), *social-awareness and prosocial behaviour* (six items), and *responsible decision making* (three items). These items are answered on 5-point Likert scales ranging from 1 (Totally disagree) to 5 (Totally agree). Cronbach's alpha in this study indicated good reliability of the questionnaire (α = .70).

The Basic Empathy Scale, validated in Spanish (Villadangos et al., 2016), consists of 20 items. It measures two factors, including *affective empathy* (11 items) and *cognitive empathy* (nine items). The items are answered on a five-point Likert scale ranging from 1 (Totally disagree) to 5 (Totally agree). Cronbach's alpha in this study was also good (α = .77).

Procedure

This was a quasi-experimental study and it was carried out with a pre-post test design with an experimental and control group. The pre-test and post-test were carried out with the participating students at the beginning and at the end of the 2017/2018 school year. The researchers selected two schools that were interested in participating in the study and obtained the necessary authorizations. The pre-test questionnaire was answered by all the research participants.

A CPBL was implemented only in the experimental group throughout the 2017/2018 school year. This intervention was divided into two phases (see Table 1), which took place in the regular classroom during the school hours corresponding to the Literacy area.

Phase 1 included the curricular development lessons with explanations based on lectures and student tasks. This phase included 4 weekly one-hour sessions. In Phase 2, students were reorganized in small cooperative base-groups of 3-4 people for the development of cooperative project work. This phase included one weekly session of two hours. The sequence of creating a project consisted of four activities. In the first activity, each group had to create three characters of free choice, specifying their general data, their physical appearance and their character. In the second activity, each group had to describe a context (city, characteristics of the place for the story, etc.). In the third activity, a story that included the previous characters and context was created. The story had to contain the teaching of a value. The values included in the stories were: respect, forgiveness, friendship, generosity, tolerance, effort and peace. Finally, the fourth activity consisted of dividing the story in scenes and drawing a picture of each scene. All scenes are told to younger students through *kamishibai* (a Japanese-origin way to tell stories through drawings). When a group finished a story, the students began with the creation of another story following the same sequence.

Individually each student had to set a personal goal before each activity. At the end of each activity, a self-reflection exercise was performed focused on achieving each objective. These reflective objectives dealt with attitudes and behaviors performed with the rest of the classmates in each cooperative group during the interaction in the activities. Each cooperative base-group had four roles: spokeperson, evaluator, evaluator assistant, and material manager. These roles are exchanged among the members of each cooperative base-group. Thus, every student enjoys every role in the own base-group.

Researchers analysed the lesson plan of both groups at the beginning and during the academic year. The control group followed text book activities according to its grade, this group did not develop any cooperative activity or project-based methods during the school year.

At the end of the school year, the questionnaire was answered again by both groups. The questionnaires were completed individually by the students, as another class activity, during school hours. Data collections were carried out by a member of the research team, in the presence of the teachers responsible for each group. Teachers did not have access to individual questionnaires at any time. The researchers obtained the necessary permission and participants were informed about the purpose of the research, the expected duration and the procedures. Ethical standards of the Declaration of Helsinki Ethical and the Ethical Comittee of University of Cordoba were followed to conduct this study.

Data Analysis

First, the reliability coefficients of the questionnaires were calculated using Cronbach's alpha. Frequencies, means, standard deviations and percentages were also calculated. Second,

Table 1
Planning of the Cooperative Project-Based Learning

Phases (from October 2017 to May 2018)	Objective of each phase	Teaching methodology	Typology of didactic activities of each session	Student organization
Phase 1. 4 weekly sessions of 1 hour	Acquire knowledge related to literacy competence	Direct knowledge instruction	Session 1: comprehensive reading Session 2: parsing Session 3: spelling work Session 4: writing texts	Individual work of each student
Phase 2. 1 weekly session of 2 hours	Apply the knowledge acquired in the previous phase in cooperative interaction situations, which include social and emotional competencies and empathy	Cooperative project-based learning	Sessión 5: Carrying out a project: creating stories cooperatively that teach values. The task is divided into four activities that each group performs	Students were organized in cooperative base-groups of 3-4 members with rotating roles in each activity

differences and effect sizes between-groups in the pre-test were obtained using Cohen's d which was calculated with a web-based effect-size Campbell Collaboration Calculator (Wilson, 2021). The effectiveness of the intervention was studied through a repeated-measure ANOVA. The Mauchly sphericity test was performed to decide if corrections were necessary in the repeated measures ANOVA test, considering p <.05 to be significant. The Mauchly test was not significant and no corrections had to be made. These and the rest of analyses were run with SPSS 23.0 (IBM, 2018).

Results

Literacy competence, social and emotional competencies, and empathy in the pre- and post-tests of the control and experimental groups

Differences in the pre-test scores between control and experimental groups are not significant in the key variables of this study (see Table 2).

Regarding the effectiveness of the intervention, the increase in the scores of the experimental group was greater than the increase in the control group, and these differences were statistically significant for different variables (see figures 1, 2 and 3). The total score on *literacy competence* increased significantly after the intervention in the experimental group compared to the control group ($F_{1,143}$ = 96.74, p < .001, η^2_p = .404; see figure 1). Different *literacy competencies* also increased significantly in the experimental group compared to the control group including *listening* ($F_{1,143}$ = 44.13, p = .036, η^2_p < .001), *reading* ($F_{1,143}$ = 42.62, p <.001, η^2_p < .001) and *writing* ($F_{1,143}$ = 54.90, p <.001, η^2_p < .001).

The total score on *social and emotional competencies* in the experimental group increased significantly compared to the control group ($F_{1,114}$ = 4.50, p = .04, η^2_p = .038; see figure 2). In contrast, there were no significant differences (p > .05) in the different factors that make up this variable.

The total score on *empathy* increased significantly after the intervention in the experimental group compared to the control group ($F_{1,102}$ = 4.51, p =.04, η^2_p = .042; see figure 3). However, there were no significant differences (p >.05) in *affective* and *cognitive* factors.

Change in literacy competence, social and emotional competencies, and empathy by sex

No significant differences were found in the pre-test scores of boys and girls between the experimental and the control groups. Regarding the effectiveness of the intervention for boys, differences between the experimental and the control groups were found only in *literacy competence* ($F_{1,67}$ = 37.46, p <.01, η^2_p = .359); while the scores in *social and emotional competencies* ($F_{1,57}$ = .02, p =.89, η^2_p < .001) and *empathy* ($F_{1,46}$ = .01, p =.92, η^2_p < .001) showed no significant differences (see Table 3).

In contrast, for girls, the experimental group showed a greater improvement compared to the controls in *literacy competence* ($F_{1,50}$ = 63.68, p <.01, η^2_p = .463), *social and emotional competencies* ($F_{1,55}$ = 7.60, p < .01, η^2_p = .121) and *empathy* ($F_{1,54}$ = 9.01, p < .01, η^2_p =.143) (see Table 4).

Table 2
Differences in pre- and post-test scores in literacy competence, social and emotional competencies, and empathy in the control and experimental groups

	Control		Experimental			
	Pre-test M (SD)	Post-test M (SD)	Pre-test M (SD)	Post-test M (SD)	Differences between the pre-tests d (CI)	Differences between the pre- and post-tests F(p)
Literacy competence	15.80 (2.59)	19.25 (3.15)	15.42 (2.91)	21.97 (3.25)	-0.13 (-0.46, 0.19)	96.74 (<.001)
Social and emotional competencies	61.68 (8.43)	62.71 (7.56)	61.98 (6.32)	65.44 (7.42)	0..04 (-0.31, 0.39)	4.50 (.04)
Empathy	72.83 (11.77)	70.28 (9.35)	71.65 (10.84)	74.81 (9.77)	-0.10 (-0.45, 0,25)	4.51 (.04)

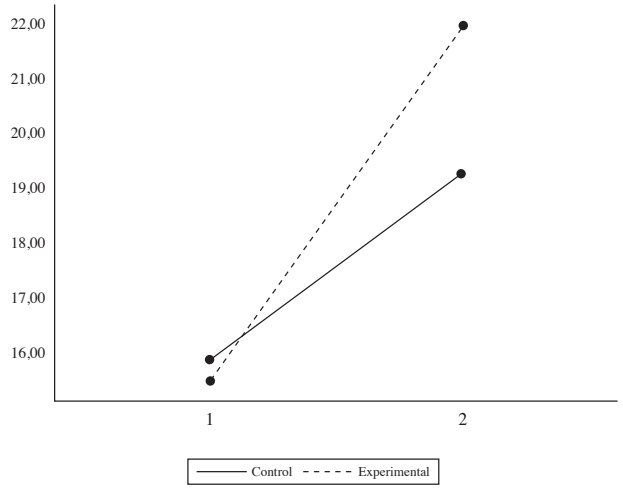

Figure 1. Literacy competence scores in the control and experimental groups including pre-test and post-test

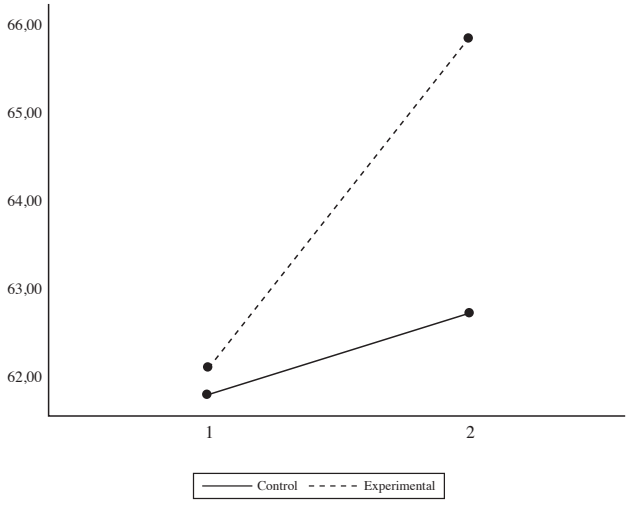

Figure 2. Social and emotional competencies scores in the control and experimental groups including pre-test and post-test

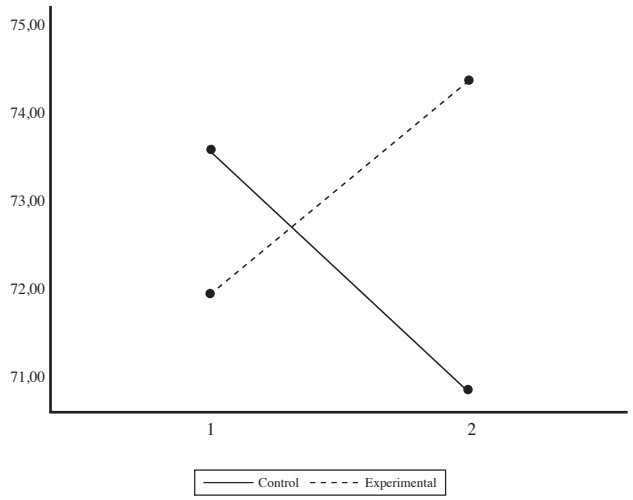

Figure 3. Empathy competence scores in the control and experimental groups including pre-test and post-test

Change in literacy competence, social and emotional competencies and empathy by grade

There were significant differences between the experimental and control group changes in *literacy competence* ($F_{1,49} = 86.91$, $p < .001$, $\eta^2_p = .639$) and *social and emotional competencies* ($F_{1,40} = 6.04$, $p = .02$, $\eta^2_p = .131$) in Grade 4; while the *empathy* scores ($F_{1,35} = .10$, $p = .33$, $\eta^2_p = .028$) did not show significant differences.

In Grade 5, *literacy competence* ($F_{1,40} = 34.15$, $p > .001$, $\eta^2_p = .461$) and *empathy* ($F_{1,25} = 5.71$, $p = 03$, $\eta^2_p = .186$) increased significantly more in the experimental group compared to the control group, while there were no significant differences in *social and emotional competencies* ($F_{1,27} = 1.62$, $p = .21$, $\eta^2_p = .057$).

In Grade 6, *literacy competence* scores ($F_{1,50} = 10.04$, $p = .003$, $\eta^2_p = .167$) showed significant differences. However, scores in *social and emotional competencies* ($F_{1,43} = .02$, $p = .90$, $\eta^2_p < .001$) and *empathy* ($F_{1,38} = .45$, $p = .51$, $\eta^2_p = .012$) showed no significant differences. See table 4 for more details.

Table 3
Change in literacy competence, social and emotional competencies, and empathy in boys

	Control		Experimental		Differences	
	Pre-test M (SD)	Post-test M (SD)	Pre-test M (SD)	Post-test M (SD)	Pre-tests d (CI)	Pre and post-tests F(p)
Literacy competence	15.72 (2.65)	18.97 (3.39)	15.33 (3.16)	21.47 (3.62)	-0.14 (-0.61, 0.34)	37.46 (<.01)
Social and emotional competencies	59.71 (7.93)	62.29 (7.18)	62.03 (6.41)	62.29 (7.18)	0.34 (-0.16, 0.83)	.02 (.89)
Empathy	74.04 (12.49)	71.56 (8.73)	73.64 (9.68)	71.56 (8.73)	-0.03 (-0.55, 0.50)	.01 (.92)

Table 4
Change in literacy competence, social and emotional competencies, and empathy in girls

	Control		Experimental		Differences	
	Pre-test M (SD)	Post-test M (SD)	Pre-test M (SD)	Post-test M (SD)	Pre-tests d (CI)	Pre and post-tests F(p)
Literacy competence	15.87 (2.57)	19.50 (2.96)	15.50 (2.68)	22.45 (2.83)	-0.14 (-0.59, 0.31)	63.68 (<.01)
Social and emotional competencies	63.76 (9.14)	62.69 (7.96)	62.14 (6.44)	66.46 (7.11)	-0.24 (-0.75, 0.27)	7.60 (<.01)
Empathy	73.20 (10.81)	70.23 (8.78)	70.31 (12.83)	77.11 (10.42)	-0.17 (-0.64, 0.31)	9.01 (<.01)

Table 5
Change in literacy competence, social and emotional competencies, and empathy by grade

	Control						Experimental						Differences between the pre-tests d (CI)			Differences between the pre- and post-tests F(p)		
	Pre-test M (SD)			Post-test M (SD)			Pre-test M (SD)			Post-test M (SD)								
	4th	5th	6th	4th	5th	6th	4th	5th	6th	4th	5th	6th	4th	5th	6th	4th	5th	6th
Literacy competence	13.54 (1.84)	16.48 (2.23)	17.36 (1.98)	17.00 (1.89)	19.91 (2.53)	20.81 (3.42)	12.67 (1.90)	15.86 (1.42)	17.92 (2.12)	20.56 (3.22)	21.62 (2.01)	23.73 (3.38)	-0.47 (-1.02, 0.09)	-0.33 (-0.94, 0.28)	0.28 (-0.27, 0.82)	86.91 (<.001)	34.15 (<.001)	10.04 (.003)
Social and emotional competencies	62.06 (7.46)	66.00 (6.96)	58.27 (9.68)	62.06 (7.08)	66.65 (6.54)	60.19 (7.79)	59.92 (5.70)	66.92 (6.54)	61.82 (5.80)	65.04 (5.86)	70.92 (4.48)	64.04 (8.32)	-0.32 (-0.90, 0.27)	0.14 (-0.59, 0.87)	0.48 (-0.10, 1.05)	6.04 (.02)	1.62 (.21)	02 (.90)
Empathy	72.44 (14.72)	76.06 (9.79)	72.52 (9.99)	70.31 (12.42)	72.81 (7.57)	69.71 (8.01)	70.71 (13.17)	70.64 (11.01)	74.05 (9.69)	73.10 (10.78)	77.72 (6.13)	73.90 (10.73)	-0.04 (-0.64, 0.56)	-0.50 (-1.17, 0.18)	0.13 (-0.44, 0.70)	.10 (.33)	5.71 (03)	.45 (.51)

Discussion

The objective of this research study was to analize the impact of a CPBL programme, which uses cooperative base-groups in a PBL, in Primary Education. Results showed that literacy competence, social and emotional competencies, and empathy improved significantly between the pre-test and post-test. The findings are important because CPBL could be promoting comprehensive education, which is a basic objective of the current school systems (OECD, 2015).

The results showed a significant and greater progress in literacy competence of the students in the experimental group. CL facilitates the development of literacy competence, specially reading (Nwosu et al., 2021; Olaya & González-González, 2020; Stevens & Slavin, 1995). The results showed that other skills such as listening and writing also improved too. Certainly, cooperative base-groups and their roles imply peer-assisted learning, that was found to provide benefits in achievement for involved students (Rohrbeck et al., 2003). Each cooperative base-group worked about different values and wrote different stories, so each one had complementary information. Complementary information on materials stimulates cooperative interdependence between partners and improved literacy competence in Primary Education students (Buchs et al., 2021).

The implementation of PBL in Early Childhood Education (Olivares-García et al., 2016) and in Grade 2 of Primary Education (Duke et al., 2017) has shown that this methodology contributes to the development of literacy competence at an early age. The results of this research study have shown that PBL also has a positive impact on the development of literacy competence in older ages too, such as Grade 4, 5 and 6 of Primary Education. Besides, social and emotional competencies knowledge have been added in this study. PBL Primary Education programmes was still scarce (Ferrero et al., 2021) but research (Seçgi, 2020) showed that learning values through PBL develops social skills.

This research incorporated social and emotional competencies and empathy in the curricular planning of the literacy subject in two ways: contents (focusing on values) and methods (through the social interdependency of cooperative base-group and the individual assessment of the role of each student in each activity). Previous studies (CASEL, 2012; Jones & Kahn, 2017; Jones et al., 2011; Jones et al., 2010) showed that social and emotional competencies could be developed when they were integrated into the curriculum planning related to language. CPBL could be an effective method to develop social and emotional competencies and empathy through curricular planning regarding literacy competence.

Detailed analyses showed that progress in literacy competence and social and emotional competencies differed by sex and grade. Girls in the experimental group showed a significantly greater development than the girls in the control group in literacy competence, social and emotional competencies and empathy. However, boys in the experimental group showed significant differences in literacy competencies, but not in social and emotional competencies and empathy. Previous studies indicated that social and emotional competencies (Llorent & González-Gómez, 2020) and empathy (Jolliffe & Farrington, 2006) differed between sex, with higher scores in girls. A two-year social and emotional intervention (Elias et al., 1991) showed that differences between girls and boys persisted even after the social and emotional intervention. Cooperative base-groups are formed by heterogeneous students. A recent research with 5th graders (Wyman & Watson, 2020) showed no significant differences in the academic achievement between heterogeneous and homogeneous cooperative base-groups. In relation to the grade, the intervention effectively increased literacy competence and social and emotional competencies in Grades 4 and 5. However, in Grade 6, no significant group differences were found. Social and emotional learning programs have shown that the development of social and emotional competencies in Primary Education is greater when they are embedded in the curriculum for extended periods of time that exceed one academic year (Catalano et al., 2003; Flay & Allred, 2003; Snyder et al., 2010). It is probable that the intervention needs more than one school year of implementation, so that the impact on the social and emotional competencies of the students becomes more significant. Roseth (2016) suggests that if a cooperative base team would be formed by people who were committed to the wellbeing of other partners, programmes were more successful. It's probably that these results depend on the personality skills of cooperative base team members. Results are contradictory according sex and grade and more researches are needed, especially including other personal factors.

Despite the fact that this study presents encouraging findings in improving the education of Primary School students, it has some limitations such as the sample size, especially small in the subgroups, which limits the possibility to generalizing the conclusions. For this reason, it is necessary to carry out future studies with bigger samples that include more schools and students. This intervention produced benefits at the cognitive level. It would be interesting to open new lines of research to verify the incidence of this type of method with other competencies, such as mathematical competence. In relation to social and emotional development, this research contributes to the knowledge of social and emotional competencies and empathy and could open new lines of research in relation to school-climate problems. Van Ryzin & Roseth's study (2018) showed that the use of the cooperative methodology reduced bullying and violence in the classroom, problems that are present and prevalent in schools (Nasaescu et al., 2020). Other studies showed that social and emotional competencies can protect children from bullying (Zych et al., 2018; Zych et al., 2017) For all these reasons, it would be interesting and pertinent to continue studying these types of designs of method, but including other study variables related to bullying. This would show whether this intervention can be used in the prevention or reduction of antisocial behaviours.

Taking into account the research findings, new studies are required that analyze possible causes of the differences between boys and girls, and tailored interventions should be designed to enhance the development of social and emotional competencies in boys. The results of future studies should provide evidence to introduce methodological or organizational changes that contribute to the further development of social and emotional competencies, especially in boys.

This study has clear implications for school practice. Consistent improvements in student learning were found in the intervention group of this study. Therefore, it is necessary to improve teacher training based on these types of curriculum innovations, the benefits of which are based on empirical evidence. In this way, the adequate training of teachers will be key in improving education and society, especially to promote attitudes towards cultural diversity (Llorent & Álamo, 2016) and positive social relationships (Baker-Henningham & Walker, 2018) among citizens. The promotion of cognitive and social competencies contributes to an inclusive education and thus guarantees the construction of a competent, inclusive, peaceful and democratic society.

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