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Changes in attitudes and willingness to use co-teaching through pre-service teacher training experiences

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ABSTRACT

Although the benefits of co-teaching are emphasised in the literature, implementing it is still problematic. Teacher training is necessary to change attitudes and encourage its use, but training alone is not enough. Opportunities to practice it must exist to appreciate the benefits for both pupils and teachers. This study focuses on pre-service training. Three groups of student teachers were created: one group received conceptual training only, another received conceptual training and the opportunity to co-teach, and a third group received initial conceptual training and explanations on its use from a member of the second group. An explicative sequential mixed design was chosen, which combines a quantitative study, conducted on a pre-post basis to compare test results on attitude and willingness to use co-teaching, with a qualitative study to analyse co-teaching student-teachers' perceptions in both their own learning experience and the learning experience of the pupils. The results show that those who received only conceptual train- ing modified their attitudes to a lesser degree and curiously, those in the group receiving explanations from a peer improved the most.

KEYWORDS

Attitude; collaboration; co-teaching; experiential

learning; teacher education

Introduction

In recent years, co-teaching – the practice of pairing teachers together in a classroom to share the responsibilities of planning, instructing, and assessing students- has become an increasingly interesting and more widely implemented instructional model (Villa *et al*. 2008, Rytivaara and Kershner 2012). The collaborative culture between teachers is key to developing active learning environments that meet the new educational demands of the 21st century (OECD 2017, Miquel and Duran 2017). Research has already shown the benefits of a co-teaching instructional model for better inclusive education, professional development and as an effective tool to promote educational innovation. Without doubt, it provides an innovative approach to teaching meth- odologies and the teacher's role (Hang and Rabren 2009, Nevin *et al*. 2009, Rytivaara and Kershner 2012, Pancsofar and Petroff 2016).

Co-teaching, as a cooperative method, requires teachers to display their interpersonal and team- work skills, in the three different stages of the teaching-learning process: 1) planning lessons, when both teachers exchange different points of view; 2) instructing in the classroom, when co-teachers offer and accept support mutually and share responsibility for the activities; 3) and assessing the process, when both the teachers' work and what pupils and teachers have learned is analyzed through constructive dialogue. However, research has repeatedly shown that many teachers and schools are ill prepared for collaboration and co-teaching (Scruggs *et al*. 2007, OECD 2014). There still exists a certain ignorance about co-teaching practices and their advantages for students, teachers and schools (Hamilton-Jones and Vail 2013). Moreover, the traditional individualistic one-teacher-per-classroom culture has helped forge strong resistance in teachers' attitudes toward co-teaching practices (Pancsofar and Petroff 2013).

Co-teaching training programmes must be implemented, especially in the pre-service stage, to overcome these barriers and support effective practices and positive attitudes towards co-teaching. We cannot expect teachers to develop positive attitudes and be

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skilled at teamwork without specific instruction (Bacharach *et al*. 2010, Guise *et al*. 2017). Recent studies have highlighted that training alone is not enough (Abrami *et al*. 2004) and there seems to be consensus on the need to use experiential learning (Sharan 2015) and the need for 'coordination between what the interns see and do at university and what they see and do in actual classrooms' (Cohen *et al*. 2004, p. 10).

Introducing co-teaching methodology in pre-service training can benefit future teachers in several ways:

(a) It may provide an opportunity to acquire teamwork skills and educate pre-service teachers in a collaborative model based on communities of practice (Cavanagh and McMaster 2015, Guise *et al*. 2017).

(b) It can increase the degree of dialogue, observation and critical reflection on teaching and

learning processes (Bullough *et al*. 2003, Bouck 2007).

(c) Working in pairs can provide more emotional and professional support and, because the teacher feels more secure, efficient and confident, it can have a positive impact on personal and professional development (Pancsofar and Petroff 2013, Miquel and Duran 2017).

(d) Collaborative environments have a positive impact on teacher efficacy and student perfor- mance (Johnson and Johnson 2014). Bacharach *et al*. (2010) noted that the co-teaching model of student teaching meant that both student-teachers and pupils learned more in schools where co-teaching was practiced. A greater increase in pupils' academic performance was observed, compared with classrooms where co-teaching was not practiced. Moreover, the data that Goodnough *et al*. (2009) provide on the perceptions of pre-service teachers in co-teaching experiments suggest that, besides improved learning in the pupils, the opportunity to learn from each other is one of the most important factors. This practical experience in co-teaching encouraged them to endorse this instructional approach.

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Pancsofar and Petroff (2013) explained that teachers who reported more pre-service learning opportunities in co-teaching had a more positive attitude towards co-teaching and felt more confident implementing it, than teachers without co-teaching experience. Offering situations where prospective teachers can see and also experience co-teaching, as a mechanism of peer learning (Pratt 2014), may therefore be a powerful way to improve attitudes and willingness to co-teach.

Although some empirical work has shown how education programmes prepare teachers for co- teaching through their pre-service training (e.g. Heck *et al*. 2008, Goodnough *et al*. 2009, Cavanagh and McMaster 2015), none of it, to our knowledge, has directly addressed what co- teaching training should be like, if it is to impact on the prospective teacher's attitudes and willingness to engage in it.

This study presents the innovations in the Degree in Education at the Universitat Autònoma de Barcelona (Catalonia). These innovations included; 1) Providing conceptual training of the bases of co-teaching. Student-teachers from three groups received co-teaching training in class; 2) Offering the possibility to experience co-teaching in primary school classrooms. In the course Practicum II, pairs (and one trio) of student-teachers from one group received support to plan, instruct and assess lessons together in the same classroom; 3) Offering the possibility to share their co-teaching experience through peer tutoring.

This innovative approach has enabled the creation of three student groups: Group 1: students who only receive conceptual training on co-teaching; group 2: students who received training, the opportunity to practice co-teaching and to share their experience; and group 3: students who receive training and one peer-tutorial session, in which a fellow student, who has co-taught in his practicum, shares his experience.

The aims of this study were to explore what co-teaching training should be like for pre-service teachers and to consider how such training might inspire pre-service teachers to develop a positive attitude towards using it. The following hypothesis and questions were formulated to guide the research.

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Hypothesis: Those students who receive conceptual training and the opportunity to co-teach (group 2) or receive explanations from a fellow student's experience (group 3) improve their attitudes and willingness to use co-teaching in a pre-post test measurement, more than students who only receive the training (group 1). This improvement is especially apparent in group 2, where they have both practiced co-teaching and shared their experiences.

Having established the positive relation between the perception of improvement in learning (in both student-teachers and pupils) as a mechanism to change their conceptions and attitudes towards co-teaching, the following two research questions were asked to explain the possible quantitative changes of the hypothesis more clearly:

(1) How do the student-teachers from group 2, who have co-taught in the practicum, interpret the repercussions it has had on their own learning during the different stages (the planning, the instructing and the assessing stage)?

(2) How do these group 2 student-teachers interpret the repercussion that co-teaching has had on the pupils' learning processes? What evidence do they have to support this?

Method

Design

This research has chosen an explanatory sequential mixed design (Creswell 2015), combining a quasi pre-post test experimental design to detect changes in attitudes and willingness to use co- teaching, with a qualitative study, based on analyzing what the students who co-taught perceived at the end of the process which allowed the changes identified quantitatively to be explained.

Sample

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The sample, 107 students in the third year of their degree in Education at the Universitat Autònoma de Barcelona, was divided into three groups: Group 1 (n = 54), received initial conceptual training on co-teaching; group 2 (n = 29), received this same training, but also experimented with it in the classroom; and group 3 (n = 24) received pre-service conceptual training and participated in a peer tutoring session with a classmate from group 2, who explained his experience to them.

Instruments

The following instruments were used for the purpose of the study:

- An adapted questionnaire on co-teaching (CTQ). We chose and adapted Huguet's (2006) proposal after discovering there was a lack of suitable questionnaires available. The adapted questionnaire has three parts: a) the student's previous experience in co-teaching; b) the

attitudes and conceptions they hold on co-teaching; and c) the benefits and difficulties detected in the development of co-teaching. The first part contains multi-choice questions and the third consists of opened-ended answers to questions on the benefits and difficulties of co-teaching with respect to three areas: students, teachers and the institution. The second part contains 36 statements, which are evaluated on a *Likert* scale of 1–5, where 1 means total disagreement and 5 total agreement, with an added no-opinion option for students who may not understand the statement. Huguet's questionnaire provided 20 statements and the remaining 16 were designed a*dhoc* and focused on the following topics: the relationship among teachers, the provisions made for the co-teachers and pupils, the attention to diversity, innovation and improvement and finally the institution's cultural ethos.

- Final written reports: The student-teachers reflected on the development of co-teaching in the practicum at the end of the course. This activity contained two direct questions to be answered freely on 1) the students' learning experience during the planning, instructing and assessment stages and 2) the repercussion of co-teaching on primary school pupils' learning, with evidence to support their answers.

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- Pupil satisfaction questionnaire: There were four questions in the quantitative section of the questionnaire, which used a *Likert* scale for the answers, where 1 represented least satisfied and 4 most satisfied. The questions focussed on whether they and their classmates had learned more and if they had a clearer understanding of what they had to do. The qualitative part contained two questions focussing on what they felt were the negative or positive effects of having two teachers in the classroom.

Collecting and analysing the data

At the beginning of the first term (before co-teaching began), the CTQ questionnaire was distributed to all students in a preformat and afterwards, conceptual co-teaching training was discussed in the subjects: *Learning Processes and Development II* and *Language and Learning* over two sessions, lasting six hours in total. Extra reading material was also provided.

At the beginning of the second term, in *Practicum II*, students from group 2 designed and co-taught in schools with another student-teacher. Learning guidelines were provided to help them, they were supervised by the teachers responsible for the subject and had the approval of the class teacher.

The data collected in the student-teachers' final written reports were transcribed and analysed qualitatively using the Grounded Theory and qualitatively, with Atlas-ti. Each student's report (*n*

= 29) was analysed using an adhoc category coded system, taking the frequency (*f*) of the answers

into account, that is to say, how many students mentioned each category/subcategory. The frequencies were complimented with percentual data and quotes to clarify the meanings of the categories and subcategories.

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The students' replies in the final reports were based on the evidence they collected while co- teaching. They used their personal experience and the work with their co-teaching partner to answer the first question, and used the pupil satisfaction questionnaire, distributed at the end of their sessions, to answer the second. In addition, assessment activities used in class and the information they had collected from daily observation and listening in the sessions were also taken into consideration.

At the end of the second term, students in groups 2 and 3 participated in a peer-tutorial at the University. The session was led by the university teachers, who provided them with material. Students in group 2 adopted the role of tutor and shared, with students in group 3, who were the tutees, what they had learned during the co-teaching practicum, the difficulties they had encoun- tered and the solutions they had found. Once they had completed all the sessions, the participants answered the CTQ questionnaire in post-test format.

SPSS Statistics v.22 software was used to analyse the data obtained in the questionnaires. For all the statistics tests, the nominal significance level applied was 5% ($p < 0,05$). The variables in the questionnaire were summarised using descriptors (mean and standard deviation, quantitative

variables). The ANOVA three-group comparison test was used to compare the differences in results obtained in the pre-post test of the questionnaire. The application conditions of this test were contrasted by using the Shapiro-Wilk Normality Test and the Levene Homogeneity Test. Results were statistically insignificant, thus corroborating the correct use of the ANOVA test. Finally, pairwise multiple comparisons using Bonferroni's multiple contrast corrections were performed.

Results

First, the results of the hypothesis based on the statistical analysis of the questionnaires were presented. The statistical descriptors of the difference between results (pre-post) obtained in the answers to the CTQ show that groups 2 and 3 score higher than group

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1 (see Table1). Likewise, the equality of variances are assumed according to the Levene test results (p = .31).

The results show the statistically significant differences between groups 1 and 2 and groups 1 and 3, but not between groups 2 and 3 (see Table 2). This confirms the first part of the hypothesis, which states that changes in attitude and willingness to use co-teaching is higher when students receive conceptual training on co-teaching and the opportunity to practice it, or benefit from explanations from a colleague, than if they merely receive conceptual training alone.

However, the results in the second part of the hypothesis were unexpected. While significant statistical differences between groups 2 and 3 were expected, it was assumed that group 2 would display greater changes in attitude and willingness to use co-teaching because of the nature of the group's involvement. The results reveal that the statistical descriptors (Table 1) and the differences between pre and post analysis (Table 2) display no significant statistical differences between both subgroups and therefore the second part of the hypothesis has been rejected.

The results obtained in the qualitative analysis are presented to explain group 2's changes in attitudes and their willingness to use co-teaching. Students based their replies to the first research question on their own learning experience. The reflection activity considers the three stages of co- teaching: planning (t1) instructing (t2) and assessment (t3).

The replies were based on the different reasoning related to what and why they had learned, as shown in categories and subcategories in Table 3. The number of students who made comments in each subcategory during the different stages of the co-teaching process was recorded, as was the percentage they represent over the total (n = 29).

The students indicated that by planning, instructing and assessing their intervention together they especially learned: a) how to work together, b) how to implement more elaborate lessons and

c) how to improve professionally.

Table 1. Statistical descriptors for the three groups.

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	Group 1 (n = 54)	Group 2 *(n = 29)*	Group 3 *(n = 24)*
M pre test	156.28 (11.15)	155.52 (13.05)	154.58 (12.62)
M post test	164.63 (9.82)	169.83 (7,98)	169.38 (11.84)
Difference in CTQ results	8.35 (9.27)	14.31 (10.31)	14.80 (10.19)

Mean (Standard Deviation)

Table 2. CTQ difference post pre-test (ANOVA test, Bonferroni correction).

	Group 1 (n = 54)	Group 2 *(n = 29)*	Group 3 *(n = 24)*
Group 1		−5.96 (2.24) *	−6.44 (2.40) *
Group 2	5.96 (2.24) *		−0.48 (2.69)
Group 3	6.44 (2.40) *	0.48 (2.69)	

*. The mean difference is significant at the 0.05 level.

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Table 3. Perception students have of their own learning.

SUB CATEGORY	CATEGORY	EXAMPLE	t1	%	t2	%	t3	%
More elaborate lessons	Constructive Dialogue Skills	'I've learned how to work together, agree with, listen and recognize the other person's ideas and proposals. Even so, we learn through debating'	8	27.6	6	20.7	19	65.6
	Coordination	'I've learned more from the fact that I could talk to my colleagues before and after each intervention'	7	24.1	3	10.3	4	13.8
	Mutual Support	'It has helped me to plan better and be more relaxed about planning and being in class'	6	20.7	10	34.5		
	Distribution of Roles	'I've learned how to share responsibility in the classroom and how to divide the tasks up better for the pupils'			10	34.5		
	New Techniques and Resources	'I've learned a lot of techniques, ideas and discovered materials and resources by sharing the experience with my colleague'	28	96.6	13	44.8	12	41.4
	Different styles of working	'Each teacher has her own teaching style, but if we are flexible and more aware, lessons are more fun and solid'	6	20.7	3	10.3		
	Attention to Pupils	'I think we were able to help the whole group much better, despite the difference in levels'			6	20.7		
	Continuous Assessment	'By really observing, we were able to see how the children learned'					6	20.7
Professional	Self- reflection	'It helps us become more objective and understand what we like and dislike and what we want to do in			3	10.3	4	13.8

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Teamwork skills Teachers' perspectives 'Above all, I've learned new points of view and different ways of facing challenges, because my colleague is very different in her approach'

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(a) The students claimed that co-teaching gave them the opportunity to learn how to work collaboratively throughout the three stages and highlighted the different teaching strategies they learned during the planning stage (*t*1, 65.6%); in equal measure, the mutual support and the distribution of roles in the classroom during the instruction stage (*t*2, 34.5%); and finally, the improvement in constructive dialogue skills during the assessment stage (*t*3, 65.6%). To a lesser extent, (24.1%) indicated that coordination was a source of learning, especially during the planning stage (*t*1).

(b) Students also mentioned that co-teaching improved their lesson planning skills, thanks to

new knowledge they had learned from their colleague. Especially worth mentioning is that most of the contributions refer to techniques they learned and resources they discovered during the three stages (*t*1, 96.6%; *t*2, 44.8%; *t*3, 41.4%). They gave equal value (20.7%) to: the diversity in the way of working in the planning stage (*t*1), the attention to pupils during instruction (*t*2) as something positive to learn how to plan lessons more effectively and finally they mentioned the possibility of carrying out continuous assessment (*t*3).

(c) Finally, though less explicitly, they indicated that by developing co-teaching techniques, they improved professionally, because it forced them to reflect on and appreciate the flexibility a competent teacher must have, especially in the instruction stage (*t*2, 10.3%) and the assessment stage afterwards (*t*3, 13.8%).

With respect to question two, those students in group 2 who co-taught during their practicum also mentioned that co-teaching had a positive impact on their pupils' learning (see Table 4). In this case the number of students who added comments in each subcategory over the total number of comments, was recorded (n = 73).

As Table 4 shows, students emphasized that, in lessons where co-teaching is practiced, the acceptance of help (60.3%), its frequency (30.1%), its immediacy (16.4%) and the fact it is more personalised (13.7%) is key to encouraging pupils' learning. Other less

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mentioned aspects relate to the work methodology in class (17.8%). Also, the pupils' implication in a co-teaching set up (13.7%) should be considered when assessing their learning.

As we have already mentioned, the student-teachers based their perceptions on which aspects of co-teaching had a greater impact on the pupils' learning on different sources of information (Table 5). The number of students who made comments in each source and the percentage each source represents over the total (n = 37) was recorded.

With reference to the pupils' replies in the satisfaction questionnaire, of particular relevance is that the average number of replies in the quantitative questionnaire of a total of pupils (N = 996) was 3.70 out of 4 *(Likert* scale from 1 to 4). In the qualitative section, an average of 93% of the pupils from each class stated that the best thing about having two teachers in the room was that they received more support. A 6th grade pupil said: 'They can keep a closer eye on us and, if there's something we don't understand, we can always ask the other teacher for a second explanation'. And a 3rd grade student: 'We get more help, so we don't get distracted as easily'. 3% however, though only in some classes, said that sometimes while the student-teachers were co-teaching they disagreed or chatted to each other and that made them uncomfortable.

Conclusions

The results show that, while students' attitudes and willingness towards co-teaching have improved in all three groups, those who improved the most were the students who either had the opportunity to co-teach in their practicum and also received theoretical training or received explanations from a colleague who had co-taught.

Changes in attitudes and a willingness to adopt co-teaching practices are greater in students who have co-taught, probably because they understand the advantages of this methodology. They remark that co-teaching has taught them skills, such as teamwork and the ability to implement

Table 4. Students' perceptions on the aspects of co-teaching which influenced pupils' learning.

Design

Different teachers' perspectives 'The pupils could see that because we are all different we can contribute in different ways and complement each other'

CATEGORY	SUBCATEGORY	EXAMPLE	F	%

Acceptance of Help	More frequent	'I think they liked having two teachers in the room because they felt they received more attention and were better supported'	22	30.1
	Immediate	'We could answer their needs, doubts and satisfy their curiosity more quickly and efficiently than if we had been alone'	12	16.4
	Personalised	'While one of us explained something, the other could help a particular group who had difficulties letting us continue the lesson'	10	13.7
	Category Total		44	60.3
Methodology	Improvements in Teaching Learning	– 'Co-teaching has allowed us to carry out more entertaining, elaborate and varied activities'	5	6.9
6	8.2			
Pupils' Implication				

Assessment ‘Being able to observe and analyse how the lesson develops and act accordingly is really positive’ 2 2.7 Category Total 13 17.8

Attitude ‘Many of the children took the sessions more seriously because two teachers were involved’ 6 8.2 Participation ‘Pupils participated more because the sessions were much more dynamic’ 2 2.7

Security ‘None of the pupils felt uncomfortable [. . .], in fact they felt better and more secure’ 2 2.7

Category Total 10 13.7

Type of learning Deep/significant ‘The pupils with greater learning difficulties have made a great effort’ 6 8.2 Category Total 6 8.2

Total 73 100

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Table 5. Sources which provide evidence on the pupils' learning.

SOURCE EXAMPLE Ƒ %

Pupil Satisfaction Questionnaire

Classroom Assessed Activities

'I've taken into account the questionnaire on individual reflection that we distributed at the end, where there were specific questions on co-teaching'

'The work produced was better because pupils, who felt unable to do the activity, managed to complete it in the end thanks to the help of the additional teacher'

13 35.1

12 32.4

Pupils' attitudes 'You only had to see how eager they were each time we gave a session, to understand that it works'

Pupils' Comments 'At the end of the session, some of our pupils said we had done a really good job and that they had learned a lot'

7 18.9

4 10.8

Class Teacher/Tutor's Comment

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‘The proof I have is the opinions the teacher gave me’ 1 2.7

Total 37 100

more elaborate lessons, which will serve them in their teaching career. One of the most salient aspects is the opportunity to learn by collaborative design, which corroborates studies that reinforce the idea that teacher involvement in the collaborative curriculum design is a form of professional development (Voogt *et al*. 2015). The student-teachers who co-taught also feel that pupils benefitted, because they could offer more help and could adapt it to the needs of the pupils. This idea is supported by the pupils’ answers in the questionnaire.

The results are especially relevant however, when student-teachers receive conceptual training and explanations from a fellow student who has co-taught, because their attitudes and willingness improve the most, even more than colleagues who have co-taught. This conclusion should be taken with caution because the sample size was small, but the result is in line with peer influence, which may be stronger than the influence adults, in this case the teacher, can exercise (Harris 2009) and the results on how effective cooperative learning situations are in changing attitudes (Kyndt *et al*. 2013).

Evidently, first-hand experience from a colleague who, with supervision and help, has co-taught, influences attitudes and encourages using this methodology. Further analysis of the data and an examination of the causes and their lasting effects are of course necessary, but the results do allow us to feel optimistic about co-teaching’s educational implications. Without doubt, above and beyond the conceptual training the University can offer students on co-teaching, the opportunity to practice it is limited, not only because individual pre-service teaching practice has to be offered, but also because supervising co-teaching is more complex. A further study focusing on how to implement co-teaching practice in the curriculum of pre-service teachers is suggested. The positive results from the student- teachers who chose the co-teaching option opens up a perspective, which can guarantee the sustain- able incorporation of this method into pre-service teacher training.

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