Article

Co-Teaching Implementation: How Do School Leaders Support Teachers?

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Abstract: School leaders play a pivotal role in fostering change and improvement, including via teacher-led interventions, such as co-teaching. Leaders' vision and support create the conditions for teachers to maximize the effectiveness of school interventions. However, there is limited understanding of how school leaders provide support for the intervention of co-teaching. This gap in knowledge is crucial because co-teaching has the potential to be transformative, but teachers must actively drive pedagogical changes. We conducted a mixed-methods study involving 150 Norwegian elementary schools participating in a multi-year co-teaching initiative for literacy instruction. We collected data through open and closed survey questions, inquiring about school leaders' beliefs and support practices regarding co-teaching. Our descriptive analysis examined school leaders' practices and explored potential associations with their epistemological perspectives. Our findings indicate that leaders who approach co-teaching with cautious optimism tend to provide more thoughtful support compared to those who are overly optimistic and may underestimate implementation challenges. Moreover, most leaders prioritize structural support elements while potentially overlooking psychological and emotional support practices aligned with self-determination theory (SDT). We conclude with practical recommendations for school leaders to offer support to teachers that are grounded in the principles of SDT and organized according to implementation phases.

Keywords: co-teaching; team-teaching; school leader; school administrator; teacher-support; self-determination theory

1. Introduction

The purpose of this paper is to identify and analyze forms of leader support offered to teachers during the critical implementation period of co-teaching. Furthermore, we consider how school leaders' beliefs toward the success of a co-teaching intervention (e.g., confidence in co-teaching and epistemology) may be associated with the forms of support chosen as well as the intensity of support. To date, although there is evidence that school leader support is instrumental in the implementation of educational interventions and inclusive education [1–3] and specifically for teachers' buy-in and engagement in co-teaching [4], the types of support offered are less clear. In our work, we studied 150 Norwegian schools that had recently implemented co-teaching as an intervention for literacy instruction in Grades 1 and 2.

Theoretically, we conceptualized the support that leaders extend to teachers through the lens of self-determination theory (SDT) [5], which posits that people have three core psychological needs to be fulfilled: competency, autonomy, and relatedness. It is important to consider the psychological needs of teachers during the implementation of educational interventions because teachers experience increased stress throughout the process, which can impact their well-being and the efficacy of implementation [6]. In co-teaching, these stressors specifically may include threats to their competence (e.g., trying new instructional

approaches) and autonomy (e.g., reduced pedagogical choices) [7]. Furthermore, with co-teaching specifically, there is an inherently related challenge of redefining roles when integrating a second professional into the instructional practices and building a cooperative teaching relationship [8]. Therefore, school leaders who anticipate and address these needs can be particularly beneficial for teachers newly engaged in co-teaching.

1.1. The Complexity of Co-Teaching Research

The research around co-teaching presents a conundrum, as it contains divergent findings that researchers are still untangling. On the one hand, co-teaching is a long-standing, commonly implemented intervention that teachers perceive to be highly effective [9], boasting a strong pragmatic and theoretical foundation [10]. On the other hand, the magnitude of the impact is unclear. For example, recent longitudinal work indicated that while co-teaching was associated with significant gains in learning for students with disabilities [11], these gains were smaller than anticipated. Further, identifying the "active ingredients" in co-taught classrooms that drive improvement in student learning remains unclear [12,13].

Taken together, these findings suggest that it is crucial to explore contextual factors within the school environment, including, we would argue—levels of leader support. Such contextual work may provide insights into why co-teaching is sometimes highly effective while, at other times, yielding less impressive outcomes. Interestingly, the role of school leaders in co-teaching has rarely been the focal point of the investigation despite their unique position to shape the conditions that increase the likelihood of success. One important exception is recent work by Rönn-Liljenfeldt and colleagues [14], whose in-depth interview work with nine school leaders found that, while teachers are the primary catalyst for co-teaching, school leaders play a crucial role as facilitators.

Finally, in this work, we are informed by the philosophical stance of pragmatism [15], as it emphasizes problem-solving and the application of knowledge in real-world contexts. Through the words of 150 school administrators and specific examples from their schools, we aim to bring clarity from an abstract notion of leader support for co-teachers to a more concrete set of practices that could be replicated. In our work, co-teaching served as a literacy intervention for grades one and two and represented a new type of intervention for these schools (i.e., teachers were inexperienced with co-teaching).

1.2. Literature Review

In the following literature review, we first define key constructs of interventions and co-teaching. Next, we document the benefits of co-teaching as an intervention. Finally, we introduce the relevant challenges of implementing co-teaching.

1.2.1. Educational Interventions as Context

Interventions, as defined by Fraser and Galinsky [16] (p. 459), refer to purposefully implemented change strategies. Consequently, when interventions take place, teachers find themselves expending additional energy as they are compelled to modify their pedagogical approaches, often acquiring new skills, strategies, and knowledge [17]. Thus, it becomes crucial for teachers to feel motivated that an intervention is valuable enough to justify the demands it places on them and to have efficacy that they can meet the demands put forth [6]. Not surprisingly, research has indicated that positive teacher attitudes significantly contribute to the success of interventions [18,19]. Conversely, it has been established that when initiatives are perceived as being imposed by school leaders, teachers often resist the change and persist in their previous practices [19].

Our work focused specifically on schools implementing a new co-teaching intervention in the early grades. In addition to teachers' initial attitudes toward an intervention, our focus extends to motivation throughout the implementation phase. This is a critical phase of an intervention, and in schools where teachers frequently engage in new interventions and curriculums, researchers have observed a phenomenon known as initiative

overload [20]. This overload can manifest in cynicism and a reluctance to invest efforts into new interventions [21], or, in other words, burnout.

1.2.2. Defining Co-Teaching

In our research, we focused on the specific intervention of co-teaching, also referred to as team teaching. Co-teaching involves collaboration, planning, and joint instruction among two or more educators [22]. While it is commonly assumed to be a partnership between a regular classroom teacher and a special education teacher [23], co-teaching arrangements include myriad other professional pairings. For instance, general educators may team up with speech–language pathologists [22], gifted education teachers [24], or even teachers across multiple grade levels [25]. In our study, we examined schools in which pairs of general education elementary teachers collaborated in co-teaching literacy instruction for first and second-grade students.

1.2.3. Why Co-Teaching Is a Unique Intervention

Co-teaching presents numerous potential benefits for students and teachers through both academic and professional pathways. One of the key advantages is the reduced student-to-teacher ratio, resulting in increased opportunities for teacher–student interactions and small group work, which are highly relevant for early literacy instruction [10]. For example, it is valuable for students to individually read aloud to teachers at this stage of literacy acquisition, but it is challenging to enact such a practice with one teacher. Furthermore, co-teaching facilitates differentiated instruction, particularly for students facing reading challenges, while allowing them to remain in their regular classroom setting. Collaborations between special education (SPED) and general education teachers in co-teaching settings have been found to benefit both students with learning disabilities and typically developing students [26,27].

Moreover, co-teaching offers multiple opportunities for professional growth and development for teachers themselves. Co-teaching provides a consistent colleague for reflection, problem-solving, and the shared construction of knowledge about their students [28]. Peer modeling and collaboration, integral components of co-teaching, have also been recognized as important for teachers' professional development [29]. Consequently, co-teachers often report experiencing professional growth, satisfaction, and personal support through this collaborative arrangement [9].

Nonetheless, it is important to exercise caution when considering the potential benefits of co-teaching, as there is often a lack of empirical documentation, as well as instances where co-teaching may not meet anticipated outcomes. As described earlier, educational researchers have long recognized inconsistency of effectiveness as a notable void [12,13,30]. In theorizing why co-teaching often underperforms, it is important to note that unlike many conventional educational interventions, such as implementing a new literacy program, co-teaching represents an opportunity for change. It is a structural intervention rather than solely pedagogical [31]. In other words, while co-teaching can disrupt the status quo and provide motivation for change, teachers must actively embrace their roles as change agents to bring about pedagogical transformations [31].

1.3. Theoretical Framework

In the following section, we introduce our theoretical frame, SDT, and apply it to school leadership. Specifically, we focus on how school leaders can support teachers' psychological needs during co-teaching.

1.3.1. Defining SDT

SDT, a psychological framework, connects one's motivation to three basic human needs: autonomy, relatedness, and competence. In short, only when one's core needs are met can one's performance and efficacy (belief in one's ability to accomplish tasks and achieve goals) be optimized [5]. Although SDT was not originally conceived as a

theory of leadership, this theory is highly applicable to workplaces because, at its essence, organizational leadership is about motivating others [32]. When we consider leadership through the lens of SDT, the key question is not only, How does this leader motivate others?, but also the more complex (and perhaps more important), How does this leader create conditions in which workers can tap into inner resources? [33]. Convergent empirical evidence supports the principles of SDT, for when a person's core needs are satisfied in their work environment, workers report higher job satisfaction, higher intrinsic motivation, and lower burnout [34,35].

1.3.2. SDT and Models of Leadership

Transformational leaders, one of the most studied forms of leadership [1], are often described as visionaries who can see new ways of doing old work [36]. Logically, when schools are implementing a new intervention, such as co-teaching, the focus of leadership is ideal for a transformational perspective because the status quo has been disrupted, and new possibilities can be imagined. Transformational leadership has been further defined with four key dimensions, often called the four Is:

- Idealized Influence: charismatic, serving as a role model;
- Inspirational Motivation: articulating a compelling vision, instilling a sense of meaning and purpose to others;
- Intellectual Stimulation: challenging conventional thinking, promoting intellectual growth;
- Individualized Consideration: showing concern for an individual's needs and aspirations and providing personalized support [37].

When SDT is overlaid onto other models of leadership, it can be connected to the style of transformational leaders, whereas the three dimensions of SDT can be readily mapped onto the four dimensions of transformational leadership [33]. Specifically, one's need for autonomy is addressed through a transformational leader providing "intellectual stimulation". Relatedness can be aptly addressed through leaders' "individual consideration and idealized influence" and one's need for competence through "inspirational motivation" [38]. In direct contrast to transformational leaders, transactional leaders focus on maintaining stability and achieving specific goals through traditional pathways, such as meeting predetermined targets and monitoring employee performance [37], which does not necessarily relate to SDT (or to the opportunities posed by co-teaching).

1.3.3. SDT Applied to Leadership in Schools

Furthermore, when compared to more traditional organizational behavior theories, we believe that SDT, due to the focus on satisfaction and intrinsic motivation [5], is particularly relevant for the teaching profession as teachers often possess high orientations towards intrinsic motivation and altruistic reasons [39,40]. Furthermore, the related concept of teacher efficacy is critical for educational success as it is connected to teacher enthusiasm, and its absence is connected to the opposite—teacher burnout [40].

Additionally, SDT can be applied at multiple levels in schools—most important to this work is the finding that how teachers experience their work and their needs being met not only predicts their own job satisfaction but also predicts the degree to which they will enact a classroom with autonomy-support for students [41], thus perpetuating a cycle—either positive or negative. Similarly, in our own research in schools [42], supervisory support was negatively associated with teacher burnout, and teacher burnout levels were associated with the quality of the classroom's emotional climate for children. Therefore, at the level of school leaders, when a leader is supporting their teachers' needs, they are not just supporting intrinsic motivation for teachers but also creating the conditions in which teachers can motivate children.

1.3.4. How Leaders Support SDT Needs in the Workplace

Next, we will consider each core need in more depth, present research regarding how leaders can support dimensions of SDT in the workplace generally, and then consider each need in reference to supporting co-teachers. Autonomy refers to the freedom individuals have to make decisions and act in alignment with their values, interests, and self-expression [5]. Supporting autonomy goes beyond merely granting employees independence in a hands-off manner; it involves actively fostering autonomy [43] and can be likened to participatory management [38]. Leaders who support autonomy strive to understand their employees' perspectives and goals while minimizing unnecessary rules and tasks [33]. Leader behaviors that promote autonomy include offering choices on how to achieve goals, providing rationales for specific tasks, and acknowledging emotions related to work [33]. Diefendorff and Chandler [44] highlighted how certain job characteristics are enacted (including goals, rewards, and policies) and influence employees' perceptions of their leaders as either controlling or supporting their autonomy. When it comes to supporting the autonomy of co-teachers, this would likely involve regular meetings, both collectively and individually to gain insight into their perspectives and attitudes, collaboratively developing plans, and engaging in joint problem-solving. For example, a leader can present multiple co-teaching approaches but give teachers the decision-making for which approach would best fit their needs.

Competence at work refers to one's need to feel proficiency and effectiveness at work. Appropriate challenges at work can lead to feelings of competence when workers are able to apply their unique skills and strengths to solve problems [5]. Accordingly, leaders can support feelings of competence by working to match tasks with an individual's skills [38]. Specifically, according to Baard [33], leaders can support competence by co-constructing goals, providing consistent feedback, arranging for appropriate training opportunities, and removing barriers to efficiency. In the co-teaching context, leaders can support competence by removing structural barriers to collaboration (e.g., creating common planning times), monitoring progress regularly, and providing professional developmental support as needed. Such steps can help the teachers improve their collaboration and adjust their teaching strategies as needed to ensure student success.

Finally, the concept of relatedness at work pertains to the sense of connection and belonging among individuals in a group, often linked to interdependencies with colleagues [38]. According to Baard et al. [35], among the three psychological needs of SDT, relatedness showed the strongest association with high performance. Leadership behaviors that foster relatedness include promoting teamwork, exemplifying mutual respect, and establishing shared group visions [38]. Furthermore, activities fostering communication and relatedness, such as holding regular discussions, sharing information frequently, and encouraging colleagues, are closely intertwined [35]. Yet, despite the importance of relatedness and communication, in Flujit, Bakker, and Struf's [45] review of professional development for co-teaching, they observed that establishing a shared vision between co-teachers was notably not included in definitions of co-teaching.

Therefore, in the context of co-teaching, leaders can play a crucial role in clarifying the roles and responsibilities of each teacher in the partnership and mitigating potential confusion and misunderstandings regarding task ownership, resulting in a more efficient and effective collaboration. For example, when studying more and less effective co-teaching dyads, less effective dyads often had a classroom teacher acting in a gatekeeper role for the second teacher, thus reducing equal responsibilities [8].

1.4. Current Study Informed by Recent Co-Teaching Research, Including Our Own Work

As noted earlier, this study is part of a large-scale randomized controlled trial (RCT) examining co-teaching and teacher professional development for literacy instruction in elementary grades, yet our previous research has primarily focused on the experiences of teachers and students. The main analysis from the RCT focused on student learning. Findings indicated that co-teaching alone had limited effects on students' overall liter-

acy learning [46]. However, when teacher professional development (TPD) for literacy instruction was added to the co-teaching arrangement, it proved to be effective in promoting student learning [47]. Specifically, students in two-teacher classrooms receiving TPD achieved higher scores in literacy measures and reader self-concept. Notably, these effects were more pronounced for boys and students with lower emergent literacy skills [46,47]. When connected to our theoretical frame of SDT, this finding provides encouragement for school leaders to consider teachers' competency needs as they engage in co-teaching.

A second pair of studies considered the experience of the teachers and aimed to understand how co-teachers conceptualized different dimensions of literacy instruction and how they organized their instruction. Gourvennec and colleagues studied extreme cases of co-teachers, specifically those whose classrooms exhibited exceptionally low or high student growth [8,48]. Gourvennec found that higher-achieving teacher dyads demonstrated high levels of efficacy and optimized the opportunities presented by having a second teacher, displaying a more empowered approach, for example, to experiment with new instructional approaches [8]. Furthermore, these high-achieving pairs demonstrated greater teamwork skills. Such findings have implications for school leaders in how they can support the autonomy and relatedness needs of co-teachers. Next, building on those findings, Gourvennec and colleagues [48] investigated the extent of shared responsibility between high- and low-achieving teacher pairs. They found that lower-performing teachers tended to engage in surface-level collaboration, whereas higher-achieving pairs reached a more meaningful level of collaboration characterized by higher levels of communication and greater parity within their partnerships. The researchers concluded that to foster genuine collaboration, school leaders should communicate a vision of meaningful collaboration and create opportunities for cycles of reflection, goal setting, and planning.

As noted earlier, limited co-teaching research has focused on school leaders, although recent work has connected leadership to teacher engagement. Specifically, in our own work, using quantitative methodologies, we found a positive association between leader support and teachers' buy-in for co-teaching (i.e., perceived usefulness). This, in turn, was linked to higher levels of teachers' work engagement [4]. Recently, Rönn-Liljenfeldt et al. [14], in interviews with nine school leaders, concluded that teacher engagement is critical to co-teaching success. Yet, they also observed a tendency to delegate responsibility to teachers, rather than collaborating closely and being fully aware of the daily practices.

In this study, by directly inquiring about school leaders, we aim to understand how school leaders offer support to teachers during co-teaching. However, prior to delving into the specifics of the support offered, we anticipate that the decision-making process of leaders regarding support may be influenced by their conceptualization of co-teaching. For instance, if leaders view the second teacher as primarily an extra resource, they may not perceive the need to provide support. Conversely, if leaders have a more nuanced perception of the co-teaching relationship, they may feel a stronger inclination to offer support. This leads to our research question:

During the implementation phase of a co-teaching intervention,

1.　How do school leaders perceive the likely success of the co-teaching intervention for student literacy success?
2.　What types and levels of support do school leaders offer to teachers?

2. Materials and Methods

This research adopted a "concurrent triangulation design" [49] utilizing two types of survey data gathered concurrently from 150 school leaders. In such designs, researchers collect and analyze quantitative and qualitative data and merge the two data sets into one overall interpretation, thus relating the quantitative results to the qualitative findings. The study commenced with the collection of quantitative data through closed-ended questions, which were subsequently supplemented by qualitative data obtained from open-ended questions for a more comprehensive interpretation. The goal of this investigation was to examine both the initial attitudes of school leaders regarding the effectiveness of a co-

teaching intervention and the subsequent types of support provided to co-teaching dyads. Our work complements recent quantitative work [4] by considering the specific experience of school leaders, and due to our relatively large sample size (n = 150), we bring breadth to previous qualitative work [14].

2.1. Context

The present study is connected to the intervention study, "XX", where the primary aim was to examine the effects of increased T-S ratio (in the form of co-teaching) on student outcomes. There were 150 schools in the project, which were located in 53 different municipalities in nine counties in the Southern part of Norway. Two classes at each school were randomly assigned to a treatment or a control condition. The treatment condition had a second teacher present during Norwegian lessons, 8×45 min per week. The study was approved by a third-party ethical agency in Norway, The Norwegian Social Science Data Service. Additionally, the study followed the Ethical Guidelines developed by the National Committee for Research Ethics in the Social Sciences and Humanities. For more detailed information about the Two Teachers study, see the study protocol [50].

2.2. Sample

In total, 150 school leaders participated (67.8% females) with a response rate of 99%. The final sample reported was 55% principals, 42% assistant principals, and 3% "other". The mean age among the school leaders was 52 years, and the mean years of school leader experience was 8 years. Sixty-two percent of the school leaders had participated in a national training for school administrators. All but one of the school leaders reported a background as a teacher, and the mean of teaching experience was 15 years. Although we have not systematically collected data on school leaders' experience with co-teaching through informal communication with school leaders, it became clear that co-teaching was a new practice for these 150 schools, and the majority of school leaders and teachers were not experienced with this approach. More specifically, co-teaching implemented in the manner of this study, in which two regular education teachers collaborated for reading instructions, was a novel arrangement for all 150 schools.

2.3. Measures

2.3.1. Beliefs about the Effectiveness of Co-Teaching for Students' Learning Outcomes

School leaders' belief was measured by a single item: "To what extent do you believe that the co-teaching arrangement leads to greater student learning?" The respondents answered on a 5-point scale from "to a very little extent" (1) to "to a very great extent" (5). The item was followed by an open-ended question where school leaders were asked to give a short description of why they believed (or not) that the co-teaching arrangement would lead to greater student learning.

2.3.2. Leader Support during the Implementation Process

Leader support was explored by two items: "To what extent do you provide support in order to promote the cooperation between the two teachers who work together as part of the Two Teachers project (This may be in the form of seminars, literature, presentations, extra time for common planning)?" and "To what extent do you monitor the nature and success of the co-teaching arrangement (This may be in the form of observations, interviews with teachers, informal check-ins)". Both items were answered on a 5-point scale ranging from "to a very little extent" (1) to "to a great extent" (5) and followed by open-ended questions asking the school leaders to give a short description of the forms of their support and monitoring.

2.4. Data Collection

Each participating school assigned an administrator the responsibility for conveying information between the research project leadership and participating teachers. This role

could be performed by either the principal or assistant principal. School leader data were collected via an e-mail-distributed survey at the end of the first year of the two-year intervention period (June 2015).

2.5. Analysis

2.5.1. School Leader Beliefs

To analyze the extent to which school leaders believed in the effectiveness of co-teaching for students' learning and provided the teachers with support, we first used descriptive statistics from the Likert scale survey item regarding their perceived beliefs about the success of the co-teaching intervention. To gain insight into the reasons for school leaders' perceived usefulness of the intervention for students' learning and how they supported the teachers, we conducted inductive, thematic coding on the open-ended question. This initial step was accomplished individually by two researchers (Authors 2 and 3). Then, inductive themes were discussed and adapted before collaboratively coding all remaining items to the revised categories. During this coding, each response was subject to open-ended coding to provide descriptive statistics. Items were allowed to be placed in more than one category. In parallel, we identified exemplary responses for each theme, as well as borderline responses that forced us to reconsider the existing thematic categories. In some cases, these borderline responses prompted us to merge two themes or add a new theme. Whenever we adjusted themes, the coding of all responses to the item in question was reconsidered.

2.5.2. School Leader Support

Mirroring the same process described above, the two quantitative items regarding support and ongoing monitoring of the co-teaching relationship were analyzed descriptively. Next, the open-ended questions were analyzed qualitatively by the same two researchers (Authors 2 and 3) following the same protocol.

2.5.3. Data Integration

Throughout the coding process, we employed a comprehensive approach to examine patterns across multiple sources, enabling us to effectively integrate the data. For instance, once we initially coded the support provided, we analyzed the relationship between levels of confidence in co-teaching (quantitative Likert scale data) and the quantity and nature of support offered (quantitative Likert scale data and qualitative data describing support types). Furthermore, we explored the interconnections between themes emerging from confidence in co-teaching and the specific forms of support provided. To illustrate, if a school leader attributed the potential success of co-teaching to the quality of the relationship between co-teachers, we examined whether they subsequently offered support in the domain of relatedness.

3. Results

RQ1: How do school leaders perceive the likely success of the co-teaching intervention for student literacy success?

3.1. School Leaders' Optimism Regarding the Success of the Intervention

When asked to what extent they believed that the co-teaching arrangement would result in greater student learning, many leaders were optimistic with approximately two out of three (64%), citing "to a great extent" or "to a very great extent" (see Table 1).

When asked why they believed the arrangement would result in greater learning (or not), the leader responses mainly fell into one of two categories: (a) two teachers can provide the student group with more adaptive/differentiated instruction (mentioned by 53%) or (b) any effect is dependent on how the resources are used (mentioned by 35%). Note that there was no overlap in school leaders' responses between these two categories.

Table 1. The extent that school leaders believed co-teaching would lead to student gains.

Descriptor	Percentage of School Leaders
To a very little extent	0
To little extent	2%
To some extent	34%
To great extent	52%
To a very great extent	12%

(N = 149).

Among leaders who believed that the co-teaching arrangement would lead to greater student learning to a "great" or "very great" extent, adaptive instruction was the most frequently reported reason for success. For example, 74% of respondents who believed in Two Teachers to a "great extent" attributed the predicted success to adaptive instruction. Representative statements included "Two teachers make it easier to carry out adapted instruction/follow up, especially for reading instruction" and "The teachers have more time to individualize instruction for each student". Responses in this category seemed to rely on the assumption that more available resources result in more targeted and individualized instruction. Or, said in another way, there is a balance between the resource input (time and personnel) and the resource output (instructional quality).

Among leaders who believed that the co-teaching arrangement would lead to better learning only "to some extent", the most frequent response (65%) was that any effect is dependent on one or several circumstances. In other words, there are moderators between the resource input and the resource output. When analyzing the answers in the "dependent on-category" more closely, we identified five sub-categories of reasons given by the leaders (not mutually exclusive), with the following distribution: Success will be dependent on (i) Cooperation between the co-teachers (29%), (ii) Teachers' competence (22%), (iii) Organization and use of resources (20%), (iv) Changes in teaching practice (18%), and (v) Personal characteristics (4%). These results are summarized in Table 2 by category and example quotes from school leaders.

Table 2. Themes in responses from school leaders, who felt confident that co-teaching intervention would result in greater student learning, regarding the attribution of success.

School Leaders' Predicted Moderators for Implementation Success	Example Quotes
1. Cooperation between co-teachers	"Two instructors who collaborate well will complement each other and may follow up the students better and more closely". "Teachers may collaborate to a too little extent while planning, carrying out and evaluating the instruction". "For the co-teaching arrangement to be effective teachers need to plan the pedagogy/pedagogical content together. [...] It is hard to change a culture where the second teacher only serves as an extra hand and where cooperation and planning of student learning isn't prioritized strongly enough".

Table 2. *Cont.*

School Leaders' Predicted Moderators for Implementation Success	Example Quotes
2. Teacher's competence	"Not automatically/by itself, but due to the teacher's good disciplinary competence, the teacher knowing how to individualize instruction, being good at collaborating and being able to develop herself, and being updated on research, engaging the parents, and being systematic in their reading instruction" "It will depend on the teacher quality, collaboration and the advantage taking of the competence in the classroom. 2 teachers in the classroom does not necessarily lead to better learning. A lot of things influence the effect!"
3. Organization and use of resources	"I have been in the profession for so long that I have seen that this is completely dependent on the organization and use of the resource"
4. Changes in teaching practices	"I believe that [the arrangement] will lead to better learning if teachers teach in another way, not if they are doing more of the same"
5. Dependency on the individual teacher/personal characteristics	"It depends on the person to what degree the co-teaching arrangement leads to better learning".

The "dependency on the individual teacher" category implicitly testifies that there is an awareness among the leaders about the complex relationship between teacher resource input and student learning output. However, we noted that the reasons for their concern were frequently tied to the individual teachers (his or her competence, personal characteristics, and ability to change their teaching practice) as well as the relationship between the two teachers (tendency to collaborate in successful ways). We noticed that no leaders explicitly attributed the role of good leadership to the success of the intervention, which may imply an expectation that teachers are more singularly responsible.

3.2. School Leaders Support to Encourage Cooperation between the Teachers

When asked to what extent school leaders provide support to promote cooperation between the two teachers in the intervention, most leaders reported that they provided it "to some extent" (48%), while few of them reported that they support either "to very little extent" (3.4%) or "to very great extent" (2%) (see Table 3).

Table 3. The degree to which leaders provide support to promote cooperation between co-teachers.

Descriptor	Percentage of School Leaders
To a very little extent	3%
To little extent	19%
To some extent	48%
To great extent	28%
To a very great extent	2%

(N = 149).

When analyzing the leaders' descriptions of their support, we identified two main categories: (a) responses that mention factors/actions that are associated with transactional leadership (69% of leaders) and (b) responses that mention factors/actions that are associated with transformational leadership (40% of leaders). Within the first category, the leaders focus on supporting teachers with resources in the form of time and structure. The majority of the leaders (60%) reported that they support their teachers by giving time—either

simply by mentioning "time" or "more time" (19%) or by specifying that the co-teachers have scheduled time for common planning (41%). Of a more structural nature, 16% of the leaders also reported that they have arranged for the co-teachers to have their main teaching responsibility at the same grade level, meaning that the co-teacher spent most of his or her workday at this grade level, even when co-teaching. This arrangement allowed for more shared meetings and planning times with all the colleagues at the target grade level. Some leaders (5%) also specified that the co-teacher have their workspace/desk in the same room. Yet, we assume that the low percentage of leaders who mentioned the two latter ways does not reflect the actual percentage of schools with these arrangements (grade level assignments and shared workspace) as, based on informal observations, the actual percentage was higher. Rather, it refers to the percentage of leaders ascribing these arrangements as specific support that they had provided to encourage teacher collaboration during the intervention.

Within the second category (transformational leadership), the most frequently mentioned forms of support are spoken communication (16%), formal meetings (14%), and external input (15%). The first form of support includes answers that are either explicitly described as informal (informal conversations), or answers where we cannot evaluate whether the conversations are of a more formal/structured/planned nature or not ("I talk with them about the project and ask them what they need and what kind of effects [of the project] they observe"). The second form of support (meetings) includes conversations within a more planned structure: "We have had several meetings during the year", "Meetings with the two involved teachers". The third form of support (courses/external input) includes different possibilities for professional development: "They are allowed to attend courses, either alone or together", "Possibility to attend courses, networks at municipality level. I sent one of them to your [referring to the researchers' university] seminars.". In addition, some (3%) of the leaders mentioned classroom observation as a form of support: "I walk the school and visit during instruction as frequently as I can during the regular workday". Taken together, the responses associated with transformational leadership focused on support that either takes place through the leaders' direct engagement in more or less formal conversations with the teachers, in observations of their instruction, or by promoting opportunities for professional development by means of external input.

3.3. Attention towards the Nature and Success of the Co-Teacher Arrangement

When school leaders were explicitly asked whether they monitored the nature and success of the co-teaching arrangement, most leaders (53%) reported that they did this "to some extent," about one quarter (24%) reported that they did this "to a great extent" whereas no leaders reported "to a very great extent" (see Table 4).

Table 4. The degree to which leaders monitored the nature and success of the co-teaching arrangement.

Descriptor	Percentage of School Leaders
To little extent	19.6%
To some extent	53.4%
To great extent	23.6%
To very great extent	0

(N = 149).

The most frequently reported way to monitor the co-teaching arrangement is different kinds of spoken communication with the teachers, such as informal conversations (71%), meetings (36%), and development discussions (9%), in addition to classroom observations (34%). Some leaders also reported that they ask the teachers to share their experiences in plenary sessions (2%), that they pay attention to and follow up on students' results (4%), or that attention is given when initiated by the teachers themselves (5%). This latter category includes both examples of rather structured arrangements, such as a "Standing

agreement that issues related to the collaboration from one week to the next is brought up continuously", and of what seems to be of a more unbinding nature: "Available for support if needed".

The most frequently mentioned actions, to a large degree, overlap with the actions that we associated with a more transformational leadership style, as described in the previous section. We noticed that informal conversations still dominate as the most frequently mentioned action, but formal or planned meetings and observations increase in frequency when the question explicitly draws attention to how they monitor the co-teaching arrangement. This can suggest whether the leaders perceive these actions as primarily supporting their teachers' development or rather as meeting their own need for accountability over their teachers.

4. Discussion

4.1. Summary of Findings

This study explored school leaders' perspectives and support for elementary teachers during the implementation phase of a co-teaching intervention for literacy. It revealed that many school leaders are optimistic about the success of co-teaching arrangements because of its potential for adaptive instruction and effective resource utilization. However, some leaders held more moderate and attenuated views, clarifying that success depends on factors such as teacher cooperation, competence, resource organization, changes in teaching practices, and personal characteristics. Regarding monitoring the co-teaching arrangement, school leaders employed a range of methods such as informal conversations, classroom observations, and attention to student outcomes. In terms of support, school leaders provided varying degrees of assistance to foster cooperation between co-teachers. This support included allocating time for planning, engaging in spoken communication and meetings, and offering professional development opportunities.

In the following sections, we discuss school leaders' perceived roles in the intervention and how such roles align with leadership styles. We also present their levels of optimism towards co-teaching and how the support offered may be influenced by their attitudes. Finally, returning to our theoretical frame of SDT [5], we present recommended support for co-teachers organized through SDT and the phase of the intervention.

4.2. School Leaders' Perceived Role in Interventions

In general, we noticed a significant absence among school leaders in explicitly acknowledging leaders (i.e., themselves) as contributing to the potential success of the intervention. This is surprising because, first, the respondents are in that role. Second, much empirical research confirms that school leaders are highly influential for school development in general [51,52], and of the many sources of influence, school leaders are second only to classroom teachers for impacting students' learning [53]. This rhetorical omission may suggest an expectation that teachers bear greater individual responsibility for the intervention's effectiveness, and/or it could reflect the adoption of a hands-off leadership style. School leaders occupying a smaller role in interventions is also consistent with survey results from both principals and teachers, indicating that both groups perceive that school leaders spend more time on management tasks than educational leadership tasks [54]. Rönn-Liljenfeldt and colleagues [14] described how school leaders delegated the majority portion of responsibility for co-teaching to classroom teachers rather than adopting a more shared leadership model.

However, this minimization of leaders' roles does not necessarily indicate a negative stance towards teachers. In fact, school leaders may consider a distancing of their role as a way to respect teachers' expertise and authority. They may even perceive this as a way of supporting teachers' autonomy, for, as described earlier, teachers can feel resistant to initiatives that are imposed in a top-down fashion by school leaders [19]. For example, school leaders of co-teaching dyads reported working to maintain a balance of expectations and freedom for action with freedom equated as respect for teachers' autonomy [14].

Yet, according to Bass's [36] classical research on leadership styles, school leaders taking a reduced role in intervention could result in styles of leadership determined to be less effective, which could ultimately lead to less intervention success. For example, such an attitude can align with a laissez-faire style of leadership in which a leader is not involved in an initiative and may even avoid decision-making responsibilities. Alternatively, this distancing could represent a management-by-exception style, which occurs when leaders intervene only in the face of problems. For example, one school leader described how they "have expected them [co-teachers] to come to me if they needed anything". Our research cannot draw clear conclusions about the styles of leadership employed, but this is an area worthy of future research in co-teaching.

Ideally, following models of transformational leadership [36] would mean that school leaders fully recognize their essential role in the process of enacting a complex intervention (as is co-teaching). Intervention implementations present a unique opportunity for school leaders to have a meaningful impact on student learning by providing support to teachers during periods of time when they are operating under increased stress. In fact, this is a time that calls for vision, where school leaders have the opportunity to inspire and motivate teachers to strive for more than originally thought possible [37].

So, how can leaders adopt a transformational style? We suggest that attending to SDT is a pragmatic approach to assist teachers in times of change and stress. Much empirical research [33,34] supports the idea that addressing employees' psychological needs for autonomy, relatedness, and competence leads to greater efficacy, engagement, and the evocation of internal motivations. During interventions, teacher efficacy plays a critical role in educational success, as it is closely linked to teacher enthusiasm, while its absence is associated with teacher burnout [39].

Additionally, in the context of co-teaching, it is important to recognize that co-teaching is not a traditional pedagogical intervention (i.e., a curriculum) but, instead, a structural one that opens up possibilities for pedagogical change but does not demand change [31]. In other words, while co-teaching has the potential to disrupt the status quo, teachers must efficaciously embrace their roles as change agents to facilitate pedagogical transformations. As described earlier, many school leaders predicted that the increased use of differentiated instruction would make co-teaching effective for student learning, thus connecting student improvement with intentional teacher change. As such, visionary leadership that can evoke intrinsic motivation becomes particularly valuable to shift pedagogical opportunity to reality.

However, we also recognize some obstacles and tensions may arise when working to adopt a transformational leadership style. In the following sections, we consider two tensions that we see in the data—optimism vs. realism and formal vs. informal support styles.

4.3. School Leaders' Optimism, Teacher Support, and Chances of Success

Regarding attitudes, our study aimed to enhance our understanding of school leaders' divergent perspectives on interventions, and we found differences in levels of optimism. Traditionally, optimism has been linked to motivational drives and success in business leaders as well as a predictor of teachers' efficacy [55]. Simply put, optimism is good. However, our analysis suggests that school leaders who exhibited more cautious or realistic optimism provided more effective and thoughtful support, thereby increasing the likelihood of success. In their comments about the perceptions of success, the more cautious leaders acknowledged the potential obstacles that may arise during the intervention, thus fostering a problem-solving mindset. In business literature, similar patterns have also been observed among successful entrepreneurs who simultaneously hold a mix of optimistic and realistic beliefs [56]. In Mackey et al.'s [57] interview study of co-teachers, teachers felt empowered when leadership championed and communicated a positive vision for co-teaching (i.e., reflecting optimism). However, they also identified that effective leaders could take on

positions that would critique and challenge existing beliefs, which is consistent with a more cautious optimism.

Conversely, leaders with solidly high levels of optimism about co-teaching tended to report providing less support, focusing more on structural measures such as common planning time. While structural supports are undoubtedly important, they alone cannot fully engage teachers nor meet their needs for relatedness, autonomy, and competence. Similar trends of overconfidence and unrealistic assessments of risk have been observed in business leaders, where optimism can lead to excessively high expectations and illusory beliefs [58,59]. Building on our previous analysis, which demonstrated the positive impact of support on teacher engagement during intervention implementation [4], our findings suggest that school administrators are more effective when they acknowledge the potential challenges and use that insight to proactively offer meaningful support to teachers.

Realistically optimistic school leaders appear to recognize that the success of an intervention relies not only on the availability of resources but also on how teachers utilize those resources. Returning to SDT, these leaders recognize the need for teacher efficacy to create change. For example, one leader expressed that "An additional teacher doesn't automatically lead to increased student outcomes if teachers continue with traditional teacher-led instruction and don't experiment with new forms of teaching". This perspective aligns with the notion that co-teaching is a fundamentally structural intervention, not solely a pedagogical one, and presents an opportunity for action [31]. These leaders view teachers as active and efficacious agents in the process rather than simply assuming an intervention will automatically succeed. As SDT predicts, efficacy is critical for educational success as it is connected to teacher engagement and enthusiasm [40].

So, what is the ideal relationship between school leaders' confidence and the success of co-teaching interventions? Perhaps agency is the crucial factor. Philosopher Bortolotti [60] recently proposed that optimistic beliefs contribute to goal success only when they support agency. In other words, when optimistic beliefs help leaders feel competent and effective, they are more likely to act with competence and effectiveness. On the other hand, when optimistic beliefs lead to complacency (i.e., laissez-faire leadership styles) or lack of preparedness (i.e., management by exception style), they can hinder a leader's agency [61].

4.4. Informal vs. Formal Support

When, in our analysis, we shifted to specific practices of support, we observed that informal conversation was the most frequently mentioned action in relation to leaders' involvement in co-teaching. On the one hand, the prominence of informal conversations suggests that leaders may prioritize building relationships and fostering open communication with their teachers. These informal conversations likely serve as opportunities for dialogue, collaboration, and the exchange of ideas, which can contribute to the overall success of co-teaching. On the other hand, the reliance on informal conversations may not provide systematic nor predictable support, as these conversations may occur sporadically and may not be planned for.

A recent report synthesizing the effects of school leaders' actions on student outcomes [62] found the largest effects occurred when school leaders promoted and participated actively in teachers' learning and development, including providing advice about solving teaching problems. Similarly, establishing goals and expectations with teachers also proved to have large effects on student learning. This type of support requires regular, planned communication of the more formal type. We conjecture that the informality may be related to the overall optimism bias towards co-teaching—school leaders' optimism that co-teaching will succeed may lead to assumptions that there does not need to be a formal support plan in place.

In contrast to the informal support for co-teaching we observed, Hackett and colleagues [63] propose that co-teaching should be approached proactively as an activity system. This system is not simply checklists but also includes activities related to values,

beliefs, psychological needs, and instructional practices. They present a series of tools that can proactively guide discussions and formalize support systems.

Interestingly, we noted an increase in the frequency of formal or planned meetings and observations when the focus shifted toward monitoring the co-teaching arrangement. This observation raises questions regarding the leaders' perception of these actions. It invites speculation as to whether leaders view these activities primarily as a means to support their teachers' professional development or if they perceive them as meeting their own need for teacher accountability. This shift may reflect leaders' desire to ensure accountability and compliance with co-teaching objectives and standards.

In total, we would recommend that informal support, while important, should not be the main structure of communication. Instead, it could provide a useful supplement to regular, intentional frameworks for communication that promote teacher learning and development.

4.5. Implications for School Leaders: How to Design an Environment to Support Co-Teaching?

According to Baard et al.'s [35] suggestion, when examining leadership from the perspective of SDT, it is essential to consider not only how school leaders motivate teachers to participate in co-teaching but also how leaders can help their workers activate their inner resources and intrinsic motivation. Therefore, as an overview, we first present forms of support in relation to the three key needs outlined in SDT (see Table 5).

Table 5. Form of Teacher Support Organized by Dimensions of SDT.

Autonomy	Relatedness	Competency
Shared Decision Making	Establish a Culture of Collaboration	Regular Feedback
Choice and Flexibility within Parameters	Shared and Team Reflection Opportunities	Professional Development Opportunities
Acknowledge Teacher Expertise	Celebrate Collective Achievements	Resources Allocation
Reflection Opportunities for learning	Addressing conflicts and challenges promptly	Growth Oriented Culture

Next, we elaborate on forms of support most appropriate for the three stages of implementing interventions: preparing for the intervention, active implementation, and maintenance. However, we acknowledge that many of these tasks or goals transcend one stage and may be present in multiple ones. Finally, it is important to highlight that although there are critical structural supports, the majority of support offered is more relational in nature.

4.5.1. Before/Beginning Phase

- Establish a supportive culture around collaboration and co-teaching.

To create a co-teaching culture that values professional learning, school leaders can lead reflection and discussions regarding the values underlying collaboration and co-teaching [53]. These shared values (e.g., a commitment to student success) are useful to revisit when making classroom decisions or when conflicts arise between co-teachers. Experienced school leaders of co-teachers even acknowledged the importance of developing common values and vision for co-teaching at the school level [14]. Furthermore, Härkki et al. [64] observed that partnerships with significant value differences were associated with imbalanced cooperation rather than parity.

- Acknowledge Teacher Expertise.

Teachers are empowered to act with efficacy when they are given the space to affect student learning by contributing to school improvement [65]. One way that leaders

can work to build a culture of respect and shared leadership is by acknowledging educators' expertise [66]. This acknowledgment can be explicit, such as naming observed skills and strengths of co-teachers during observations or classroom walk-throughs. This acknowledgment can also be implicit, for example, by including teachers in pedagogical decision-making or resource allocation connected to co-teaching.

- Establish a growth-oriented culture.

A growth-oriented culture in school settings is one that emphasizes learning and development and celebrates taking logical risks for the goal of continuous improvement [67,68]. This aligns intimately with the process of intervention implementation for co-teaching—co-teaching creates an opportunity space within which teachers can experiment with new pedagogical techniques. Some pedagogical attempts may fail, but in a growth-oriented culture, these failures can be reframed as a source of knowledge for future work and a source of reflection. To promote a growth-oriented culture, school leaders can use language feedback that mirrors a growth mindset and encourages teachers to evaluate their ongoing (or newly adopted) practices as well as revise their practices to further student growth.

- Choice and Flexibility within Parameters.

Extending the concept of shared leadership (or collective leadership) allows co-teachers the autonomy to make decisions collaboratively and take ownership of their classroom yet remain involved in the process [54]. For example, instead of leaders dividing the classroom workload between co-teachers, school leaders can request the co-teachers to co-develop a work distribution plan and share it with the leader. If the plan seems unbalanced, then the school leader can put forth options to equalize the roles and responsibilities.

- Promote shared decision-making and leadership within dyads.

Shared leadership reframes power as not power over people but the power to accomplish shared goals [69]. Beyond working to include co-teachers in decision-making at the school level (thus modeling shared leadership), promote shared leadership within co-teaching pairs. For example, encourage co-teachers to create and share an explicit joint vision of a successful classroom. Furthermore, recognize each co-teacher's contributions and individual teaching styles. Proactively address any "gatekeeping" behaviors that may limit a co-teacher's power in a dyad to influence decisions by maintaining adherence to the status quo [8].

- Resource allocation.

Through continual discussion with co-teaching dyads, ensure they have access to the necessary resources, such as common planning time, teaching materials, and technology tools to try out new pedagogical approaches. As reported by veteran co-teachers, a particularly important resource is that co-teachers have workspaces within the same classroom or adjoining offices [8], as this proximity will promote more regular and informal communication.

- Be proactive about sources of conflict.

Be aware and assist co-teaching pairs in addressing common logistical issues, which, if unsolved, can result in conflict. These issues can include conflicting classroom management approaches, classroom policies and procedures (e.g., parental communication), as well as scheduling conflicts. Check to see if pairs have discussed these issues and have aligned decisions with the co-teaching approach and shared values [7]. McTigue et al. [31] provide guidelines for facilitating such discussions.

4.5.2. During/Middle Phase

- Individual reflection opportunities for learning.

As Knowles [70] described in classic adult learning theory, individual reflection about how learning can be applied to an individual's life is key for adults to grow. Applying

this theory to teacher professional development, for development to result in meaningful change, it is essential to emphasize critical reflection [71]. School leaders can prompt reflection by initiating conversations with individual teachers. Furthermore, individual reflection guides are recommended by McTigue et al. [31].

- Shared and team reflection opportunities.

Although individual growth for teachers is important, shared reflection is also critical for co-teachers to reach their potential as a team. School leaders should encourage and support team reflection as part of the cycle of planning [45]. Allocate time for co-teaching pairs to engage in regular collaborative sessions. Create a structured framework for teachers to co-design lesson plans, set instructional goals, differentiate instruction, and assess student progress. Pratt et al. [72] provided a co-planning framework, and McTigue et al. [31] provided templates to frame and encourage shared reflection.

- Provide regularly scheduled feedback.

Regularly and proactively monitor and assess the implementation of co-teaching practices. In this role, teachers are encouraged to consider how classroom instructions have shifted/improved with the addition of teacher resources. School leaders may adopt the stance of an instructional coach and support teachers by using feedback and data to make informed decisions and pedagogical adjustments. Furthermore, school leaders can facilitate peer observations to help co-teachers refine their practices.

- Provide professional development opportunities.

Provide professional development on the process of co-teaching, as it requires a paradigm shift from solo teaching [73]. Then, in order to support pedagogical change within the opportunities provided, provide for professional development in the target content area. Forms of embedded professional development may be particularly powerful for co-teaching dyads as they emphasize teamwork and professional roles in addition to pedagogical content knowledge [74].

- Manage conflicts in a proactive manner.

A common perception about conflict in the workplace is that conflict is negative and destructive (and therefore often avoided). Yet, conflict is essentially neutral; it is how people engage and manage the conflict that will create experiences of negativity or positivity [75]. As such, managing conflicts is the ability to notice and address, not solve, conflicts in a constructive manner. In fact, research regarding conflict in educational institutions demonstrates that conflict is associated with change [75], so we can anticipate increased conflicts at times of growth.

4.5.3. After Co-Teaching

- Recognize and celebrate successes.

Acknowledge the successes and achievements of co-teaching pairs. In leadership studies, recognition has been identified as one of the most powerful tools that leaders have to keep employees motivated. Recognition can be personal, written thank you notes, or public acknowledgments and celebrations. However, the key for recognition to have the most impact is to be highly personalized, with a sincere thank you for a job well performed [76]. Furthermore, school leaders can also share effective co-teaching practices and success stories within the educational community.

5. Conclusions

Co-teaching represents a promising educational approach, although one that demands a significant allocation of resources, necessitating an intentional, proactive, and thoughtful approach from school administrators. The attainment of successful outcomes from co-teaching cannot be taken for granted, highlighting the importance of prioritizing robust support for teachers. However, such support should extend beyond mere structural

provisions and encompass measures that cater to the psychological needs of teachers. By addressing these needs, teachers can access their internal resources and intrinsic motivation, thereby fostering an environment conducive to optimal student outcomes.

Limitations and Future Directions

The singular use of survey methodology is an important limitation of this study. As a result of relying on survey data, the school leaders' behaviors need to be interpreted by the researchers. For example, further research could explore leaders' perspectives and intentions behind the preference for informal communication. Understanding leaders' underlying motivations can provide valuable insights into the dynamics of leadership within co-teaching interventions and inform strategies to optimize leadership practices. As a result, we recommend that future research includes multiple data sources, such as interview data and observation, which would add richness to the patterns suggested here.

A second limitation is that our focus in the present study considers only the viewpoints of school leaders. However, for a more comprehensive understanding of the support provided to teachers, it is crucial to incorporate the perspectives of both school leaders and teachers. By triangulating the descriptions of support from school leaders with the firsthand experiences of teachers and co-teaching dyads, a more robust understanding can be obtained.

The final and most important methodological limitation is that we cannot draw causal inferences between leader support and the effectiveness of the co-teaching intervention. Future research should take a systems approach and work to connect leader support with teacher-level variables, particularly teacher engagement, and then to student learning outcomes. Student growth is ultimately the goal of co-teaching interventions and must be a focal point of research.

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