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"If She Can Do It, So Can I": Self-Efficacy of University Professors Who Co-Teach

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Abstract

Background/purpose. Co-teaching has emerged as an innovative practice in Higher Education that offers positive experiences for both students and professors. The current study focused on professors who were involved in co-teaching practices and aimed to explore the effects of these partnerships on their teacher self-efficacy (TSE).

Materials/methods. Participating professors wrote reflective diaries and were interviewed at the end of their experiences. The resulting data was analyzed for mentions of TSE and categorized according to Bandura's (1997) information sources that allow for a judgment of self-efficacy.

Results. Co-teaching practices have been found to positively affect TSE, most often informed by enactive mastery experiences, probably due to the reflective nature of the experience. The second most common source of TSE was vicarious experiences. Evidence of negative effects of co-teaching on TSE was also found, mainly in first-time co-teachers, and often related to the use of ICT during the pandemic.

Conclusion. The study concludes that co-teaching at the university level has a generally positive effect on TSE. However, a negative impact can be noted, especially in the first year of co-teaching. To capitalize on the positive effects, it is essential to stress the use of reflective dialogue between partners and the continuation of co-teaching partnerships as they tend to gain strength in time.

1. Introduction

In an educational panorama where institutions rapidly embrace innovative methodologies, universities seek opportunities to improve their instruction quality. Among the diverse possibilities, collaborative teaching, or co-teaching, has emerged as a potential booster in the classroom. Offering students the possibility to be in contact with two different teaching profiles has been found to contribute to a richer learning experience (Bacharach et al., 2008; Honigsfeld & Dove, 2010; López-Hernández & Custodio-Espinar, 2024; Minett-Smith & Davis, 2019). Co-teachers may be experts in different content areas, have different teaching abilities, and complement each other in the delivery of subjects. Besides the benefits for students, studies have also shown that this methodology positively influences instructors' professional development (Buckingham et al., 2021; Holland et al., 2018).

The present piece of research stems from the institutional efforts of a Spanish private university to launch an innovation and research project based on the implementation of co-teaching as a teaching strategy. The study attempts to shed light on two areas that have yet to be answered by research. On the one hand, it explores the context of co-teaching at the university level in more depth. Until now, most studies have focused on lower educational stages, mainly special-needs education. On the other hand, connections are made between co-teaching practices and teacher self-efficacy (TSE), exploring one important aspect of professional development. Research has mainly focused on how co-teaching improves students' learning development; however, little has been said about how it affects instructors' feelings of self-agency, whether positively or negatively, despite the significant effect on job satisfaction, teacher performance, and student engagement. Considering the importance of this concept, the present study attempts to fill a gap in research concerning the effects of co-teaching on university instructors' professional development, specifically TSE.

The main results of this paper suggest that co-teaching positively influences the development of self-efficacy in participants, most often informed by enactive mastery experiences. Observation of the co-instructor also contributes to positive TSE through vicarious experiences, especially when the co-instructor is considered to be an equal. There are few instances of negative self-efficacy, often in new partnerships, suggesting that it takes time and effort to consolidate a co-teaching partnership.

2. Literature Review

2.1. Co-Teaching in Higher Education

Co-teaching, or collaborative teaching, can be defined as the close collaboration between two teaching professionals in the planning, instruction, and evaluating a course for a group of students. There are several models in which this might take place, some involving having both educators share the classroom simultaneously with varying roles, and some involving the rotation of instructors between groups of students (Cook & Friend, 1995). Most co-teaching has traditionally occurred between generalist and specialist teachers at the primary and secondary levels to support special needs students or recent immigrants, and much has been written about the results (Honigsfeld & Dove, 2010; Schwab et al., 2015). At the university level, despite the common practice of more than one instructor teaching different sections of the same course, little research examines any potential collaboration between those instructors. However, there has been a recent surge of more formal co-teaching in Higher Education, mainly in preservice teacher training through an effort to model collaboration among instructors (Custodio-Espinar et al., 2022; Ferguson & Wilson, 2011) and between teacher trainees and in-service teachers as part of the training of the former (Montgomery & Akerson, 2019; Simons et al., 2020), but also in other fields of study such as History, Veterinary Science or Translation and Interpretation (Lasagabaster et al., 2019; Peral Santamaría & Strotmann, 2019).

Studies have shown positive aspects in co-taught classes: a greater variety of instruction (Ferguson & Wilson, 2011; Graziano & Navarrete, 2012), a feeling of democracy and the sharing of more viewpoints (Bacharach et al., 2008; Ferguson & Wilson, 2011) and an increase in individual attention and scaffolding techniques (Buckingham et al., 2021; Graziano & Navarrete, 2012). Instructors who work closely together provide a model for collaboration (Dugan & Letterman, 2008) and a more negotiated and fairer form of student assessment (López-Hernández et al., 2023). Finally, co-teaching partnerships provide an opportunity for professional development for instructors as they learn from each other and the experience itself (Buckingham et al., 2021; Holland et al., 2018), which can include the use of new instructional practices and deeper reflection on one's own teaching (Kelly, 2018).

Despite these positive effects, as university instructors rarely receive initial teacher training (Mas Torelló, 2011), most have not been prepared to teach in a collaborative setting. Co-teaching involves several challenges, such as the need for institutional support (for creating compatible schedules or assigning credits to both instructors, among others) as well as a significant investment of time and effort by instructors when planning, collaborating, and evaluating (Graziano & Navarrete, 2012; Minett-Smith & Davis, 2019; Ricci & Fingon, 2017). There are also several considerations regarding personal and professional characteristics when pairing co-teachers to create effective dynamics (Morelock et al., 2017). Nevertheless, many studies have concluded that the benefits obtained outweigh the drawbacks (Bacharach et al., 2008; Honigsfeld & Dove, 2010; López-Hernández & Custodio-Espinar, 2024; Minett-Smith & Davis, 2019).

2.2. Self-efficacy

Grounded in social cognitive theory, the idea of self-efficacy is intrinsically related to human agency, the belief that people can make intentional changes in their lives and environment (Bandura, 1997). The same author contends that self-efficacy constitutes the belief that one is capable of making the necessary effort that will bring about the desired change. At the same time, self-efficacy is a personal trait that will vary according to the situation and activity domain (Bandura, 1997). Naturally, our beliefs about our abilities will influence which activities we pursue, how we perceive the related challenges and obstacles, and the amount of effort we put forth (Skaalvik & Skaalvik, 2010).

According to Bandura (1997), four primary sources of information contribute to our judgment of our personal capabilities: enactive mastery experiences, vicarious experiences, verbal persuasion, and physiological and affective states. Enactive mastery experiences are the most influential in the development of self-efficacy because they refer to personal successes, especially those gained due to perseverance in the face of obstacles. Vicarious experiences involve witnessing others attain similar goals, with the idea of "if they can do it, so can I." This type of experience is slightly weaker than mastery experiences in informing self-efficacy, though peer modeling and social comparison are still powerful stimuli. The third source of information on self-efficacy is verbal persuasion, when significant others express assurance of our abilities, as long as this appraisal seems realistic. When we receive feedback on our performance, whether negative or positive, it will influence our perception of our ability to achieve the pursued goal. Finally, our physiological and affective state will also alter self-efficacy, especially when facing a physical challenge, health problems, or stressors. Bandura notes that people can also arouse negative or positive emotions that will affect efficacy, though this varies among individuals.

2.3. Teacher self-efficacy

In this study, we are looking specifically at teacher self-efficacy (TSE), defined by Skaalvik and Skaalvik (2010) as "individual teachers' beliefs in their own ability to plan, organize, and carry out activities that are required to attain given educational goals'' (p. 1059). Other experts have further

stressed the idea that TSE is closely intertwined with student outcomes. Tschannen-Moran and Woolfolk Hoy (2001) wrote that TSE is "a [teacher's] judgment of his or her capabilities to bring about desired outcomes of student engagement and learning, even among those students who may be difficult or unmotivated" (p. 783). Indeed, TSE is essential to the teaching-learning process, given that this set of beliefs influences both teacher behavior and student motivation and performance (Bandura, 1997; Klassen & Chiu, 2010). Strong efficacious beliefs by teachers are often associated with greater job satisfaction (Krammer et al., 2018); well-being, commitment and productivity (Baroudi & Shaya, 2022); higher levels of planning and organizing educational goals (Allinder, 1994); more teaching-related innovation (Cousins & Walker, 2000; Deemer, 2004); and more time invested with students, especially those who experience more difficulties (Tschannen-Moran & Woolfolk Hoy, 2001). Moreover, teachers who experience a greater sense of responsibility for students' academic outcomes were found to be more engaged and satisfied with their own teaching techniques than those with a lower sense of responsibility (Matteucci et al., 2017, as cited in Sasson & Malkinson, 2021).

TSE will not only be influenced by individual beliefs and attributes but also by social connections, including school context and social networks. Siciliano (2016) found that teachers who sought advice from their colleagues, who had peers who were willing to share knowledge, and who worked in schools with dense advice networks had significantly higher TSE than those who did not experience each of these factors. Other school characteristics, such as socio-demographic variables, have also been found to influence TSE (Rubie-Davies et al., 2012). TSE has also been studied as Collective TSE, or the efficacy of the entire teaching faculty of a school. Skaalvik and Skaalvik (2010) found collective TSE to be even more dependent on the functioning of school leadership than individual TSE. Collective TSE is not to be confused with TSE in collaborative teaching, which is further described below.

2.4. Self-efficacy in co-teaching partnerships

Research on self-efficacy in co-teaching situations is limited (Colson et al., 2021), so much so that a review of the research on teacher efficacy does not mention co-teaching at all (Kleinsasser, 2014). What is written mainly focuses on partnerships between general and special educators at the primary and secondary levels, novice teachers, and trainee teachers in their teaching practice. When bringing together general educators and special educators in an inclusive setting, there are several studies that report positive effects on TSE. Colson et al. (2021) found that teachers who had co-teaching experience had significantly higher TSE in instructional practice. There was also a significant positive impact of the number of hours of professional development in co-teaching practices on TSE related to student engagement, instructional practice, and classroom management. In a similar context, Johnson et al. (2022) found that TSE was predictive of active involvement in classroom instruction for general educators, though not for special educators when co-teaching. Special educators seem to maintain a more secondary role in the classroom, and this is supported by King-Sears and Strogilos (2018), who found that the prevailing co-teaching model was One teaches, one observes or drifts. Furthermore, in a study comparing TSE when teaching alone or with a co-teacher, Pizana (2022) found that most teachers ranked their collective TSE higher than their individual TSE, especially related to student engagement.

When looking at novice and preservice teachers, co-teaching seems to have positive effects on their TSE. In a study that looked at preservice teachers' training in co-teaching between general and special educators, Bowlin et al. (2015) found that the vicarious experience of watching a video of a co-taught class also significantly improved TSE related to educating students with disabilities. This effect was higher than watching an in vivo co-taught class (which also had significant positive results) or an introductory course on special education (which was found ineffective). In more general terms unrelated to special education, Sasson and Malkinson (2021) looked at teachers in their first five years

of service and compared those who had completed a professional training program based on co-teaching to those who did not. They found that the program had contributed to a stronger TSE, more positive attitudes toward the teaching profession, and the development of pedagogical knowledge. The authors argued that co-teaching contributed to successful experiences in the classroom, which may have influenced novice teachers' SE and attitudes toward the profession through enactive mastery experiences (Bandura, 1997).

Further on in teachers' careers, co-teaching still seems to have a positive influence on TSE, especially collective TSE. Krammer et al. (2018) conducted a large-scale study of secondary-level general education teachers with varying amounts of experience involved in co-teaching partnerships in Austria. They found a positive correlation between teachers' views of their co-teaching skills and the use of external resources and their collective TSE (much more than with individual TSE). The authors related this correlation to the influence of enactive mastery experiences as described by Bandura (1997). Likewise, though to a slightly lesser effect, the pleasure teachers found in the co-teaching partnership positively correlated to collective TSE, which the authors related to the influence of the physiological and affective state (Bandura, 1997). Interestingly, general teaching experience had a negative effect on collective TSE, which the authors suggested may have resulted from the traditional socialization to teach alone (Krammer et al., 2018).

The authors have been unable to find any study that relates TSE with co-teaching experiences at the university level. The present article aims to fill a significant gap in the existing research, focusing on the potential effect of co-teaching on university lecturers' TSE.

3. Methods

This study is part of a larger project, which is further described below. The research has been exploratory and open to determining the effects of co-teaching at the university level from both the instructors' and students' perspectives over the years. This particular study has focused on the instructors' perspective through qualitative methods designed to collect data on various aspects of the experience. The scope and details of the study follow.

3.1. Research questions

The authors raised two research questions that aimed to determine the impact of co-teaching methodology on practitioners' self-efficacy. Below, we explore whether there is any connection between these variables and analyze whether this methodology exerts a positive or negative influence on teacher self-efficacy (TSE), searching for specific areas in which these connections might be found. Therefore, two research questions have been formulated:

R1: What, if any, is the influence of co-teaching on TSE?

R2: Does co-teaching have a positive or negative impact on TSE?

3.2. Context and participants

The study is part of a research project that brought two universities together, both located in Madrid, Spain. The first, University A, is a medium-sized private university; the other, University B, is a large state university. Traditionally, these universities often have more than one instructor teach the same course for various reasons, such as providing smaller class sizes, instruction in more than one language, or different timetables. This has generally resulted in varying degrees of coordination among the instructors involved. However, at University A, co-teaching has more recently become part of their innovative practices in different faculties.

This study focuses on the experiences within the Faculty of Humanities and Social Sciences, where a group of instructors launched an internally funded innovative teaching project on co-

teaching in 2018, stemming from their own interest in collaborative teaching as a way of unifying student experience among different sub-groups within the same courses. After the initial positive experience, the same instructors formalized a research project in 2021, also funded by the same university, to continue studying this practice's effects. Connections were made with instructors in University B, where there was no specific program in place to promote or support teacher collaboration. However, co-teaching sometimes occurred when instructors had to complete their minimum teaching hours by sharing subjects with another instructor or by simultaneously teaching the same subject to different groups.

In total, 29 class groups and 20 instructors participated in the study. Sampling was purposive as researchers asked instructors already involved in, or interested in, co-teaching their courses. Recruitment was repeated for five years, from 2019 to 2023. It is worth noting that, due to the longitudinal nature of this piece of research, some participants provided data in more than one year and reflected on various co-teaching experiences. Participants in the study were involved in teaching subjects offered in the degrees of Early Childhood Education, Primary Education, Translation and Interpretation, Global Communication, English Studies, Academic English, and the master's degree in Conference Interpretation. The most prevalent model of co-teaching was station teaching; however, two subjects were delivered in the team-teaching mode. The sample was composed mainly of instructors at University A and just three at University B.

3.3. Tools and procedures

The study employed two data-gathering tools designed by the research team. Researchers asked participants whether they would be willing to either write a diary throughout their co-teaching experience or have an interview at the end of the course. Participants who agreed to complete the teacher's diary (n=14) were asked to write 500 words each week on a list of topics related to co-teaching, such as planning or communication (see Appendix 1). The researchers collected the diaries once the co-teaching experience was finished, and they were available to answer any questions throughout the process.

Interviews were conducted once participants had finished their co-teaching experiences (n=19). The interviewers were members of the research group who did not teach together with the interviewees. Each interviewer used a list of questions to ask participants to reflect on their experiences. The research group created this guide, and interviewers were allowed to use more questions to help the respondents give more details about a specific topic. The interview guide can be found in Appendix 2.

Interviews were conducted online using the Microsoft Teams software, which allowed for automatic transcription from audio to text. Each interviewer was responsible for anonymizing and checking the transcript to correct any mistakes made by the automatic process. Interviews were conducted in English or Spanish, according to the language that the interviewee was most comfortable with. Where direct quotes are used below, those in Spanish have been translated into English for the purpose of this paper.

It is worth noting that participants were not directly asked to rate their self-efficacy but rather to share their experiences, perceptions, and opinions about co-teaching. It was the researchers' task to find instances where self-efficacy was present in their comments, either oral or written.

Two independent researchers were involved in data classification, categorization, and analysis. Information was entered into NVivo software in the form of text and transcripts. Researchers identified the fragments of the texts related to self-efficacy and labeled them accordingly. All diaries and interviews contained some reference to self-efficacy. Once found, data was categorized using Bandura's (1997) types of self-efficacy. When the comment included this trait, a value of 1 was given.

Then, they were further categorized into positive or negative features (when self-efficacy was negative). Each comment could be categorized into more than one feature.

a. Enactive mastery experiences

b. Vicarious experiences

c. Verbal persuasion from others

d. One's own physiological and emotional feedback during performance.

We aimed to have a deeper understanding of the types of self-efficacy co-teaching could trigger.

3.4. Research ethics

The research ethics committees of both universities involved in the study approved the research procedures. All participants were informed about the aims and procedures of the research, and all consented to share their responses while keeping their identities anonymous. To do so, each participant was assigned an identification code (i.e., Prof A), and this was substituted for all mentions of names in both diaries and interview transcripts. All data collected was uploaded to the institutional drive, to which only the two researchers had access. Researchers from the participating institutions were not involved in gathering information from their own colleagues participating in the study as a means to preserve objectivity in the data collection and analysis.

4. Results

Researchers found 87 comments related to self-efficacy in the comments provided by 20 participants over five years (2019 to 2023). The comments were distributed evenly during the five years of research (see Table 1). However, it is worth noting that there was a slight increase in the number of comments produced in 2020, most related to ICT skills developed during the pandemic lockdown.

Table 1. Number of comments and instructors per year

Year	Number of comments	Number of instructors
2019	14	3
2020	25	7
2021	10	5
2022	19	7
2023	11	5

Concerning their nature, 70 comments are related to positive self-efficacy, while 17 contain negative features regarding self-efficacy in co-teaching. Data was further classified using Bandura's classification of self-efficacy sources (1997). As shown in Figure 1, references to self-efficacy were most often concerning enactive mastery experiences and vicarious experiences. In contrast, those about verbal persuasion from others and one's own physiological and emotional performance were less frequent. Co-teaching seems to trigger a type of self-efficacy related to action, either one's performance or observing the co-teacher's performance.
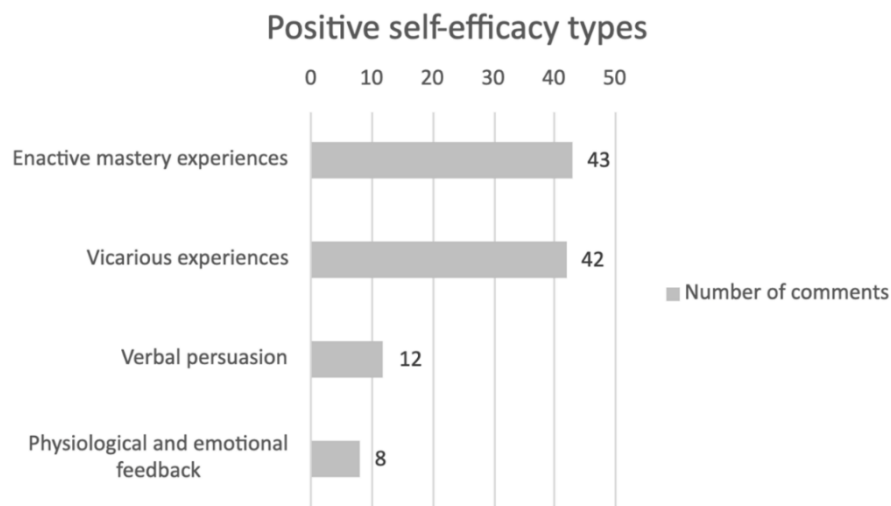
Figure 1. Positive self-efficacy types

Upon delving deeper into the data, we discovered that instructors attribute specific traits of co-teaching methodologies to the development of self-efficacy in enactive mastery experiences. The most cited area is the division of theoretical and practical instruction between co-teachers, thus facilitating a balanced curriculum for students. In some cases, instructors emphasized the benefits of having different professional and academic backgrounds for students' learning development. One example is seen in the following comment: "My knowledge of literature is much more complete, and she is more pedagogical, creative, and practical. In that sense, we have complemented each other and have adapted our strengths to our teaching practice" (Prof U).

Another area that instructors highlighted was that self-efficacy increased due to the ability to rely on each other's expertise and strengths. It is worth noting that two participants mentioned how co-teaching improved their self-efficacy while facing online teaching during the pandemic lockdown, primarily because co-teachers were more adept at using technology. The following comment illustrates this idea: "I learned from her, and she learned from me. (...) I am very good in technology (...), so I taught the other teacher" (Prof V).

Finally, participants highlighted that co-teaching has a positive impact on the assessment process, another example of enactive mastery experiences. Students receive a more comprehensive and balanced evaluation of their progress when multiple instructors are involved. Additionally, due to the instructors' diverse backgrounds and teaching styles, students get feedback based on multiple perspectives. "Our ways of providing feedback are completely different, but I believe this is an asset to students. As a learner, I always appreciated having different perspectives on my work, and I think this is the case here" (Prof T).

The concept of self-efficacy through vicarious experiences suggests that observing another person successfully perform a task can boost our own belief in our ability to do the same. In our study, participants reported an increase in vicarious self-efficacy when they learned good teaching practices from their co-teachers, sometimes applying them to their own teaching methods. These practices included effective organization of course content, innovative teaching techniques, clear communication with students, and constructive feedback. Additionally, participants found new teaching styles that made them reflect on their own approach, even if they had been in the field for many years. For example, one instructor says, "After seeing how [my colleagues] planned their sessions, I've copied them and applied what they do to my own teaching style" (Prof L).

One source of self-efficacy that has not been frequently found in the data is verbal persuasion. A few instructors shared that, when facing challenges or stress, they spoke with their co-teacher and

were able to solve problems together. In other words, they were positively influenced by the conversation and persuaded by the idea that working collaboratively can lead to more successful outcomes. In the words of Prof G, "It's difficult to deal with problems related to the online classes (...). Fortunately, we have a co-teacher who may share your experience and opinions and help you to improve your classes."

The last source of self-efficacy found in the sample is related to physiological or emotional responses to the co-teaching experiences. Some instructors acknowledged having felt comfortable and integrated in the experience. Also, feelings of becoming part of a group and being respected by peers have been highlighted as key in the co-teaching experience. For example, Prof T wrote, "This is fantastic because I feel that Prof U trusts my teaching abilities, and I also have the freedom to propose activities and ideas according to my teaching philosophy."

In the analysis of data, 17 instances of negative self-efficacy were found. Twelve comments are from first-time co-teachers, while five are from instructors in their second year of co-teaching. As for the type of self-efficacy found, they generally mirror the results obtained for the positive self-efficacy categorization, with a slightly higher prevalence of vicarious experiences over enactive mastery experiences (Figure 2).
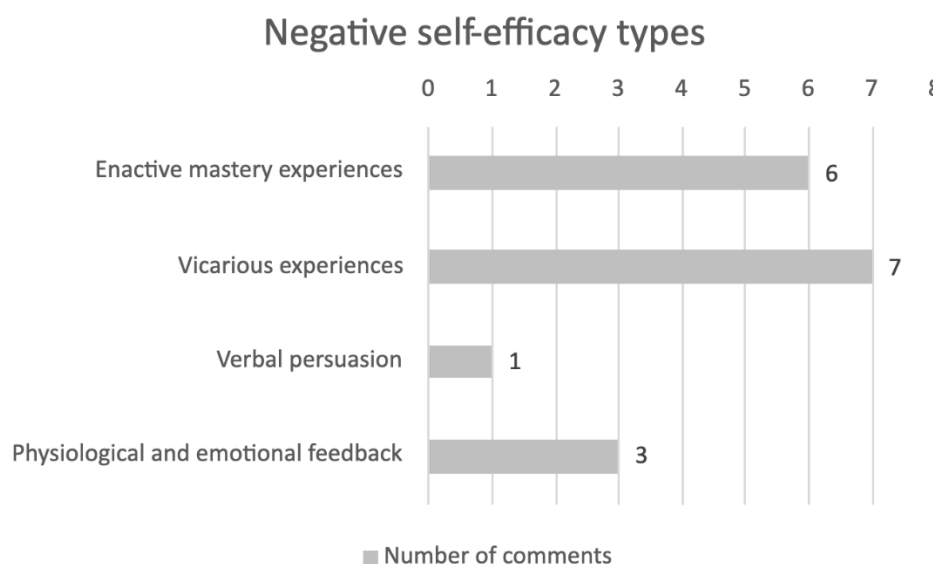
Negative self-efficacy types

Figure 2. Negative self-efficacy types

In these references, negative self-efficacy emerges from vicarious experiences related to content management, delivery, and assessment. A few participants considered that, compared to their peers, they were less able to structure their subjects, prepare attractive teaching resources, and use gamification or active methodologies. Also, they compared their ways of assessing with their peers' and concluded that their co-teachers provided more and better-quality feedback to their students. Participants also mentioned difficulties with the use of ICT. It is worth noting that these comments belong to the pandemic (2019-2020), when most instructors in Spain had to deliver their lessons either online or in blended mode. It seems that some instructors considered themselves less able or prepared to face the challenge of teaching through these modes.

Negative self-efficacy informed by enactive mastery experiences is often related to participants' perception of their specific academic and/or professional profile. In one instance, an instructor wrote in the diary: "I'd need to make an effort to be more academic in the next course. Students know about my professional career outside the university, as I am a professional editorial translator, and consider me less academic for this reason" (Prof E). We also found features of the reverse case in another example (Prof D), who happened to be the co-teacher of the previous case: "The students

perceive me as more academic and, therefore, more difficult. I want to change that perception this year and am making slide in my power points simpler and eliminating content that is too theoretical."

Although fewer in number in our sample, participants also include some instances of negative self-efficacy concerning verbal persuasion, and physiological and emotional feedback. Specifically, they verbalize concerns surrounding student perception that the co-teacher may be a better instructor or have a more educational profile. Also, participants reported having felt uncomfortable or out of place in some lessons, especially when they believed they were not contributing significantly to students' learning. For instance, Prof D said, "and it sort of hurts when [the students] say no that what I do is not what the others do or whatever."

5. Discussion

The results indicate that co-teaching positively influences the development of self-efficacy in participants and that enactive mastery experiences most often inform this. According to Artino (2012), enactive mastery experiences "are the most influential source of efficacy information because they provide the most direct, authentic evidence that an individual can gather the personal resources necessary to succeed" (p. 78). Because co-teachers are necessarily involved in a process of negotiation and discussion of how the subject will be delivered and why, there is recurring reflection on their own practice, whether individual or collective. This reflection has been found to benefit professional development and the transfer of methodologies and tools (Buckingham et al., 2021). Similarly, we have found that reflecting on positive practice and successes through dialogue and personal reflection is also a catalyst for the development of teacher self-efficacy (TSE). The majority of positive self-efficacy references found in this study are heavily related to reflective practice. More specifically, participants claimed that co-teaching led them to discuss content organization, student-teacher communication, and learning assessment. These reflections were probably triggered by the need to share those with their co-teachers and negotiate how to work together in "reflective conversations" (Crow & Smith, 2005), which led to understandings and changes in teaching practice. It may be said that co-teaching, when it is well implemented, involves a fruitful dialogue that promotes instructors' self-reflection on their own practices.

Even if enactive mastery experiences are the more significant source of information to measure self-efficacy, participants' comments also refer to observation as a primary information provider. When an instructor witnesses a co-teacher managing challenges successfully, this can positively impact their own self-efficacy. In other words, "if she can do it, so can I", as long as the instructor sees the co-teacher as an equal. This result may be caused by the collaborative nature of co-teaching. As Yim (2023) indicates, collaborative teacher education contexts foster teachers' vicarious TSE. Also, instructors engaged in Professional Learning Communities (PLCs) seem to experience significant changes in their self-efficacy due to contact with vicarious experiences, among other factors, as Mintzes et al. (2013) pointed out. These results may highlight the importance of including collaborative teaching as part of preservice teachers' education, supporting the recommendations made by Bowlin et al. (2015) and Sasson and Malkinson (2021). This training may be divided into collaborative lesson planning and delivery, lesson observation, analysis and reflection, and improvement of the lesson plan.

Furthermore, the reflection that occurs in conversations between co-teachers and the inevitable comparison of oneself with a co-teacher (Buckingham et al., 2021) may highlight the differences between co-teachers, as seen in the results above. If these differences are seen as complementary, collective TSE may be further developed. In other words, when a co-teacher sees him or herself as complementing the profile of the co-teacher, the pair of instructors can be viewed as more effective than one single instructor, increasing the self-efficacy of the pair as a whole. Since instructors were

not directly asked about their collective TSE in this study, this finding is inconclusive, though it would be consistent with that of Pizana (2022).

Regarding the last two sources of self-efficacy, co-teachers did not often mention verbal persuasion. This may be because instructors had already identified situations related to the more influential enactive mastery and vicarious experiences and did not find this as relevant. Similarly, there were very few references to physiological and emotional feedback. It may be that participants were not directly asked about their feelings and, therefore, did not find these reflections to be relevant.

Even if negative self-efficacy instances in our study are not numerous, it is worth looking at their nature. Generally, they have originated from first-time co-teachers and/or in relation to the use of ICT during the pandemic. Regarding novice practitioners in co-teaching, this may indicate that co-teaching may open instructors up to personal reflections and comparisons with others that may unnerve them for a time. However, the fact that there are no negative comments from more experienced co-teachers suggests that after this initial discomfort, self-efficacy seems to develop in most professionals as they gain experience in co-teaching partnerships. Regarding the use of ICT, the finding of cases of negative self-efficacy in the data collected during the pandemic raises the question of whether collaborative teaching was useful to counteract professional isolation, as other studies have proved (Quezada et al., 2020; Elmas et al., 2023). Indeed, establishing a well-grounded relationship with your co-teacher may help to develop positive perceptions of self-efficacy. This finding is consistent with that of Rytivaara et al. (2019), who argued that co-teaching could contribute to instructors' professional development when it involves elements such as commitment, engagement, and negotiation. Similarly, Scantlebury et al. (2008) indicated that co-teaching requires a conceptualization of co-generative dialogue, co-respect, and co-responsibility, supported by a well-designed implementation process. All these requirements may need time to be well-planned and deployed, and, therefore, co-teaching cannot be organized in a rush but with careful attention to diverse variables. One positive takeaway from the negative self-efficacy instances found in the sample is that, in most cases, participants seem to be committed to improving their practice in the future.

Even if experiencing co-teaching seems to be influencing positive self-efficacy, it is yet to be explored whether the relationship between these variables may be the reverse, pointing to one limitation of our study. Some studies indicate that instructors with high self-efficacy are more likely to successfully engage in collaborative teaching modes (Raudenbush et al., 1992; Schunk & Pajares, 2009). It may then be argued whether these instructors are more inclined to volunteer to be part of co-teaching initiatives and are perhaps better candidates to implement them better. Although experienced and inexperienced instructors were given equal status in our study, it may be worth looking at how the former could be labeled as 'mentors' of the latter and which implications this may have in our findings. For example, Karathanos-Aguilar and Ervin-Kassab (2022) indicated that mentors benefited from the co-teaching experience in four areas, among them critical reflection, but also in pedagogical renewal, in-situ feedback and refining practice, and application of learning to leadership roles. The results of co-teaching with colleagues of different levels of experience may then be subject to further study.

6. Conclusion

The purpose of this study was to understand how the practice of co-teaching is related to the teacher self-efficacy (TSE) of university professors. The results provide supporting evidence that co-teaching triggers metacognitive skills that contribute to the development of TSE (RQ1). Of the four sources of information distinguished by Bandura (1997), enactive mastery experiences are referenced most frequently, affirming that collaborative teaching triggers self-reflection on one's own teaching practice, therefore enhancing instructors' metacognitive skills.

The development of TSE is also informed through vicarious experiences, being the first source of information when producing negative comments related to TSE. It seems that comparison with others can generate a sense of inability or inadequacy, especially in instructors new to co-teaching. Therefore, in response to RQ2, TSE may be positively and negatively affected, and the difference will depend on the relationship between co-teachers and the comparisons made. First, if one's co-teacher is seen as an equal, vicarious experience will have a positive effect on one's own TSE, but conversely, if an instructor perceives the co-teacher's actions as an impossible achievement for themselves, there may be an opposite effect. Second, in a new co-teaching partnership, there tends to be some uncertainty and unnerving comparisons that could result in initial negative feelings. However, it may be claimed that the more they experience co-teaching, the fewer instances of negative self-efficacy are found. Therefore, in the long run, co-teaching may favor stability, commitment, and respect between co-teachers, which will likely lead to more positive effects on TSE.

Our results strongly suggest that co-teaching may be a powerful strategy to improve university professors' professional development, supporting previous findings (Buckingham et al., 2021). There are two fundamental reasons that lead us to consider this. First, co-teaching tends to be a self-efficacy builder, as it generates opportunities for comparison and reflection. Second, co-teaching invites instructors to put reflective conversations (Crow & Smith, 2005) at the core of their everyday practice, thus influencing their professional development. The caveat to these arguments is that the co-teaching relationships should be ones that are chosen or approved by the participating instructors, to ensure comfort and good rapport among partners. Additionally, there ought to be an understanding that developing good co-teaching practice requires time, commitment, and mutual respect so that positive effects may not be seen at the outset.

The study also shows some limitations. First, it is not a longitudinal study, even though it has been conducted throughout 5 years, as the same participants have not been followed through time. We do have some individuals who have repeatedly provided data, but the sample is not big enough to establish any comparisons. Second, as explained in the discussion, there may be a sort of self-selection in the type of instructors participating in collaborative teaching modes, as suggested by Raudenbush et al. (1992) and Schunk and Pajares (2009). If that is the case, positive self-efficacy will be ensured from the very beginning, not as a result of co-teaching. Finally, evidence of self-efficacy in narratives is challenging to analyze, and there may be some instances we have overlooked. These limitations have been lessened by involving two independent researchers in all the stages of the study, who conducted a thorough analysis of information.

7. Suggestion

The findings of this study have led us to consider some future research. First, it would be interesting to determine whether instructors with high TSE are more likely to take part in collaborative teaching, as Raudenbush et al. (1992) and Schunk and Pajares (2009) suggest. This would indicate that there is a sort of self-selection among co-teachers who may be influencing the relationship between co-teaching and self-efficacy. Second, it would be worthwhile to more directly measure the effect on collective TSE among university professors who co-teach. Though we can deduce from our data that this may be positively influenced, adding a question to instructor interviews may confirm these findings. Finally, exploring the effects of collaborative teaching as an institutional practice would be fascinating. Due to the growth in co-teaching practices, we have witnessed over the years in at least one of the participating universities, we wonder whether an embracing of collaborative teaching on the part of the institution would have effects on the institutional culture in general. If co-teaching has the potential to develop more positive TSE for individuals, perhaps evidence of a more remarkable evolution would be possible to witness.

Declarations

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