

Effects of a model for multidisciplinary peer observation of teaching in teacher professional development and in nurturing a reflective school

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ABSTRACT

Peer observation of teaching has for long been defended as a valuable device of professional and institutional development in higher education, but is almost unexplored at primary- and secondary-level schools. This paper introduces a model for multidisciplinary peer observation of teaching that has been developed and implemented in a professional development programme in two Portuguese school clusters of basic and secondary education in collaboration with its teachers. After four years of developing the programme in these school clusters, a case study was conducted through a qualitative analysis of observation guides completed throughout the years ($N = 563$) to identify perceived effects of participating in the programme for both teacher professional development and reflective practices. The programme emerged as a powerful initiative to foster teacher collaboration, innovation, and reflection for improving practices. Implications related to current national curriculum and educational policies are discussed.

ARTICLE HISTORY

Received 4 June 2022

Accepted 25 September 2022

KEYWORDS

Peer observation; classroom observation; feedback; educational improvement; professional development; teacher collaboration

Introduction

This paper presents and discusses a qualitative study of the effects of a four-year implementation of a multidisciplinary peer observation program (MPOP) in two public basic and secondary education school clusters in the northern part of Portugal.

Increasing social and political demands have been accelerating change in school and teaching practices making teacher professional development a central component of the modern proposal for improving education (Guskey, 2002). However, differentiated models for career-long continuing professional development are required (Collinson et al., 2009) in order to nurture the teachers' commitment with school change (Dumčius, 2018). Effective and innovative pedagogical practices are often led by teachers whenever there is engagement in professional development programs closely articulated with work environments, particularly with peers (Monteiro et al., 2020). This was especially highlighted in the COVID-19 pandemic

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This article has been corrected with minor changes. These changes do not impact the academic content of the article.

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challenging times for schools, when opportunities for professional support and development that were provided were key in shaping the teacher's experience during the transition to distance education modalities (Torres et al., 2021).

Programmes of peer observation of teaching (POT) have been implemented at several levels of education and have shown positive results in terms of improving the quality of teaching (Hendry et al., 2012), creating professional learning communities in schools (Hamilton, 2013; Visone, 2019), promoting the professional development of teachers (Bozak et al., 2011; Byrne et al., 2010) and increasing the reflection about teaching practices (Mouraz & Ferreira, 2021; Nguyen, 2020). As such, its implementation in schools for teacher professional development can have a significant effect on improving individual and institutional practices and in responding to the social and political demands currently required from schools and their teachers (Mouraz & Cosme, 2021).

After four years of implementing a MPOP, as a model for teacher professional development, we conducted a study of the processes and effects of observation and joint reflection reported by participant teachers. Drawing on this study, this paper aims at relating reflective practices among peers promoted by a multidisciplinary peer observation programme with the professional development of teachers. For that, we open with a conceptual framework about peer observation of teaching based on our literature review and move on, afterwards, to the introduction of the model of multidisciplinary POT we implemented with the support of our conceptual framework. After explaining our study's methodology, we present and discuss our findings concerning perceived effects in teachers and in reflective practices to discuss the potential of multidisciplinary POT to respond to the challenges of educational change which schools and their teachers are presently facing.

Peer observation of teaching: from teacher professional development to the relevance of curricular policies

The present-day context of the teaching profession is characterised by a great internal and external demand on the processes and results of teachers' work pushing it for constant change. Professional development programmes are systematic efforts to bring about changes in classroom teachers' practices, attitudes, and beliefs and student learning outcomes (Guskey, 2002). However, Guskey (2002) also warns for the risk of failure of most of these programmes when they do not take two essential factors into account: a) what motivates teachers to get involved in their professional development and b) the process by which change in teachers usually occurs. What attracts teachers to professional development, therefore, is the belief that it will expand their knowledge and skills, contribute to their growth, and increase their effectiveness with students (Guskey, 2002). Peer observation of teaching makes it possible to meet teachers' development expectations in aspects that are effectively useful for professional needs, an important consideration for the success of these programmes (Guskey, 2002) and, for this reason, can become more effective improving individual and institutional practices.

We acknowledge that professional development for teaching improvement has been highlighting a spectrum of diverse observational practices like classroom observation, lesson study, and peer observation. However, peer observation of teaching can be broader in its scope as it can include a multidisciplinary collaborative dimension that

boosts reflection beyond classroom subject-specific approaches. The multidisciplinary peer observation model we subscribe detaches observation practices from its often perceived formal appraisal purpose and puts the focus on the formative dimension of the model (Mouraz & Pêgo, 2017). Moreover, it moves the observation focus away from mere subject-content aspects, placing it instead on pedagogical aspects and on teacher–student interactions (Torres et al., 2017), increasingly defended as fundamental aspects for the quality of teaching. On the other hand, the multidisciplinary component is also useful for helping teachers to make comparisons between their colleagues’ practices and their own. This allows observers, in the face of positive observed practices, to develop self-awareness, confidence, and enthusiasm to experiment with new teaching styles and strategies (Torres et al., 2017).

Peer observation of teaching has been widely associated with teacher professional development (Bozak et al., 2011; Byrne et al., 2010). The benefits reported by the literature in this area are various and in different dimensions. For Drew et al. (2017), peer observation can play a powerful role in improving teachers’ educational practices, as well as providing an opportunity for effective collegial engagement. Furthermore, peer observation processes are an iterative and continuous process of reflection on teaching practices (Drew et al., 2017). Byrne et al. (2010) highlighted its potential for conducting rigorous and effective exchanges about practices in safe contexts as a pathway for improvement of teaching. In the same line, Hendry et al. (2012) report as four main benefits: 1) learning how to use new teaching strategies by watching; 2) affirmation of current teaching practice by watching; 3) gaining self-confidence to implement strategies once considered as too difficult to put in place; and 4) learning from feedback given by the observer. Positive effects of peer observation for early-career teachers are also reported. Furthermore, Bozak et al. (2011) add its contributions to teachers’ self-esteem, self-respect, and self-awareness, but also to the improvement of mutual trust, respect, and cooperation between teachers, which consequently contributes to the success of students and schools.

But we also must underline the ‘peer’ component of this observational processes and how its emphasis on collaboration and mutual professional development is strengthened and can help improve long-term professional development and develop communities of practice (Byrne et al., 2010).

Peer observation, as a collaborative practice, has the potential to promote individual and institutional reflection, constituting a vehicle for the construction of a ‘reflective school’, which according to Alarcão (2001), can enhance improvement and meeting the demands placed on it. To Hammersley-Fletcher and Orsmond (2005), ‘reflection is a very important part of learning’ (p. 221), and observation processes can be tools to encourage and develop reflective practice.

One of the main elements in the relationship between peer observation and reflective practice is the feedback provided by the observer. Providing relevant feedback is a key issue in the peer observation experience (Bell, 2001). For Shortland (2010), basing feedback solely on isolated observer’s interpretations and perceptions is ‘inherently dangerous’ (p. 302). This can be interpreted by the observed teacher as critical, evaluative, or threatening, although this is not normally the observer’s intention. To avoid these difficulties, the author suggests some conditions of peer observation programmes that can enhance the provision and usefulness of feedback, namely: a) the existence of training

that prepares observers to discuss interpretations of feedback in an empathetic and constructive manner; b) the right of the observers to choose their observation partners, according to the familiarity and respect already built; c) the use of a checklist to guide observation, but also feedback; and d) conducting a pre-observation briefing to determine the development objectives of the observed teacher (Shortland, 2010).

Looking the issue from the perspective of curricular policies implementation is possible to state other arguments to look for collaboration among teachers in schools. In a recent book focusing in Europe, it is concluded that teacher agency is a focal question in this process of curriculum making and it could be referred to as a professional orientation that combines skills and opportunities to steer and develop one's own teaching, but mainly to act as an accountable author in educational contexts (Alvunger et al., 2021). Furthermore, it is noted that such priorities are common in several European countries and frame recent education policies put into practice in such territories. The discussion, particularly following the most recent TALIS report, (OECD, 2018a) is about how to improve the ability to act collaboratively within schools and among teachers to reach the aim of teachers' agency (which must be collaborative).

Concerning the Portuguese case, and according to the recent curricular reform (OECD, 2018b), promoting cooperation among teachers is one of its strategic objectives in order to expand on proposed curricular changes. Among them, it is possible to identify an integrated and more interdisciplinary approach to the curriculum (Mouraz & Cosme, 2021), which goes hand in hand with the collaborative and multidisciplinary peer observation model.

Introducing the programme of multidisciplinary peer observation of teaching

The model of multidisciplinary peer observation focused on here started in the context of higher education with the implementation since 2009 of the 'Peer to Peer' programme (Mouraz & Pêgo, 2017) at the University of Porto. The research team made the necessary adjustments to the model to make it feasible for the specific context of basic and secondary education. These adaptations were tested in a pilot project, which took place in a partner school during the 2013/2014 academic year. In the following year, the project was validated and incorporated as an in-service teacher training programme. Having emerged at the initiative of the educational community itself, the take-up of teachers was high and has been consistent over time, up until 2019–2020 with the restrictions imposed on schools due to the COVID-19 pandemic. From this experience, it was also possible to consolidate the adopted model and tools, allowing the project to be extended to other schools. However, only in two school clusters has this participation been consistent and sustained over the years, which justified a more detailed analysis of it in this paper.

The currently implemented model of peer observation is aimed at developing collaboration, interdisciplinarity, innovation, and reflexivity about practices and, by so doing, lead to their improvement. As a teacher professional development process, the program has some key aspects that are the basis of its functioning and structure, that are in line with some models of peer observation reported in the literature and that showed positive results (e.g.; Mouraz & Pêgo, 2017; Bovill, 2011; Drew et al., 2017; Gosling, 2002; Shortland,

2010). The model we propose goes beyond each one as it makes a new combination of principles which are:

- it is voluntary – only teachers who are truly willing and available to participate should try it;
- it is a symmetrical process – all participants are observed, and everyone is an observer;
- it is multidisciplinary – it embraces visions and perceptions from different disciplinary fields, thus enriching reflection on practices;
- it is flexible in the observation focus – because it intends to consider the development or improvement goals of the observed teachers and, therefore, it must be flexible in the aspects on which the observation is focused.
- it is confidential – the formation of observation groups is carried out by teachers under conditions of confidentiality, which is essential to establish a relationship of trust in the observation process and to keep within the observed the power of choosing what to do with the feedback provided regarding their classroom practices.

The process begins with the formation of quartets of teachers, two from each subject area. The organisation of the quartets is carried out autonomously by the teachers, according to the objectives of the observation, established interests, or relationships. The formation of quartets provides conditions for each teacher to be observed in one class, at least by two observers, one from the same subject area and one from another. To support the assembly of quartets, there is a program coordinator in each school.

Once the quartets are assembled, the observation process is organised into three phases: pre-observation, observation, and post-observation. In the pre-observation phase, lesson plans and learning objectives, and other relevant information are shared between each of the quartet members, as well as the observation foci chosen by each teacher when being observed. The next phase concerns the observation of classes itself. During class observation, the two observers are asked to complete an observation guide proposed by the research and monitoring team. This guide is composed of five dimensions: structure, organisation, content, class climate, and the teacher's attitude. Each of these dimensions consists of a set of descriptors that can be ranked on a 5-point Likert scale about their greater or lesser presence in the observed class and commented on in an open space. Teachers are asked to rank and comment in a minimum of one descriptor per each of the dimension. The post-observation phase consists of a joint reflection carried out by the quartet of teachers on the observations made, in which the perceptions about the observed classes are shared and suggestions for improvement are made. Some of these reflections are also registered in the observation guides. The observation guides are completed on paper and their completion is reproduced on an online form using one code, so the research team can gain access to the teachers' records keeping their anonymity.

This process is repeated in three observation cycles. In the first observation cycle, there is the completion of the observation guide and the production of suggestions for class activities or strategies for improvement. In the second observation cycle, the observed teachers are challenged to test and implement improvements in their pedagogical practices that might have emerged from the joint reflection in the first observation cycle – it's a rehearsal phase. In the third observation cycle, the observers are asked to pay attention to impacts of the improvements or innovations being implemented by the

observed teacher as a way of assessing its feasibility and sustainability. This three-part observation-cycle approach allows the participants to be able to implement the changes they wish to experiment with in their pedagogical practices in a more secure and supported way.

The teacher training programme accompanying the multidisciplinary peer observation cycles consists of two face-to-face sessions and one online session. In the first session, the researchers/trainers introduce the observation model, support the assembling of the quartets, promote the exploration of the observation guide, and discuss possibilities of observation focus. The second session, online, consists of the introduction of the analysis of the aggregated data of the observation guides completed in the first cycle of observations and joint discussion about the overall perceptions and reflections recorded by the teachers in the guides. In this session, the researchers/trainers also promote the planning of the second and third observation cycles, namely through the support on decisions on improvements or innovations that teachers chose to introduce and how teachers can assess them while being in the observer role. The final session, which is face-to-face and held at the end of the three observation cycles, compares the results of the observation guides completed in the first and in the third observation cycles, highlighting the improvements implemented and the dimensions that can still be enhanced. This session also promotes the joint discussion of the use of collaborative class observation processes in teacher professional development and how it can be sustained afterwards. Observation and reflection sessions are considered as the main professional development elements. In the context of this teacher training programme, the creation of learning communities between participating teachers and the reflection about the implemented improvements and innovations are the main drivers of development.

Methodology

This section opens with an introduction of the participant schools and teachers and then moves on to an explanation of data collection procedures and data analysis.

The participant schools and teachers

The project was implemented in two public school clusters – hereinafter referred to as A and B – in a peri-urban area of the northwest of Portugal. In Portugal, school clusters, which have existed since 2008, are groups of schools of different educational levels, ranging from pre-school to upper secondary education in the same geographical area, that work according to a common educational project, administration and management team and teaching staff. At this respect, we should note that Portugal has an ageing teaching workforce, with teachers' average ages around 50 years' old, according to their education level. The TALIS report pointed out the age of the teacher population, the high proportion of non-permanent staff and weaknesses in induction and continuing professional development as important challenges to overcome (OCED, 2018a). However, strong investment has been made recently in curriculum and pedagogical innovation and digital infrastructures and skills. This has triggered the attention to the specific issues of how veteran teachers face the pressures to educational innovation and, hence, resulted in Monteiro et al., (2020) highlighting how school leadership, collaborative work, and

professional development opportunities are crucial in the improvement of the teaching practices, but also in deepening the resilience and adaptability of teachers.

School cluster A comprises 11 schools ranging from preschool (ages three to six) to the end of upper secondary education, corresponding to the 12th year of schooling (ages 15 to 18). 3400 students attend this school cluster with a teaching staff of approximately 337 teachers. The educational success of school cluster A is considered to be good. Participants from this school cluster were mostly female with an average age of 49.5 years old. With some differences between school years, lower and upper secondary education teachers were the ones who kept more consistently participating in the programme. The school also had punctual participation from pre-school and primary education teachers.

Unlike school cluster A, school cluster B offers pre-school education (ages three to six) until the end of basic education, which in Portugal comprises primary and lower secondary education (ages six to fifteen), up until the 9th year of schooling. It comprises seven educational establishments attended by 1700 students and has 93 teachers. This school has a high percentage of educational success. Participants from this school cluster were also mostly female with an average age of 48.8 years old. With some differences between school years, lower secondary education teachers were the ones who kept more consistently participating in the programme. Groups of teachers from pre-school and primary education also participated, but in lower numbers.

HT School cluster A has participated in the programme since 2013 and school cluster B entered in the following year, 2014. This consistency of participation and maintenance in the programme's operation justifies the analysis of how the continued implementation of the programme has institutional and individual effects on the schools and the participating teachers.

Data collection procedures: the observation guides

To determine the effects of the multidisciplinary peer observation programme, we used a document analysis (Patton, 2015) based on the observation guides the teachers provided us anonymously after their class observations. The use of the observation guides allowed for an interpretative and longitudinal analysis of the reflections that the teachers participating in the programme carried out over time, particularly those related to the effects generated by the programme.

Regarding the observation guides, only the component related to the joint reflection carried out in the teachers' quartets was analysed. This refers to an open question field at the end of the guides where teachers were asked to answer the question: 'What is your appreciation of the final reflection you made with your observation group colleagues?'. The choice of this component is justified by the fact that, in this part of the observation guides, the possible effects of the observations made on the pedagogical practices and on the professional development of the teachers are reflected by the participant teachers' own words and impressions. For the purpose of this study, observation guides from a three-year period – 2016/2017, 2017/2018 and 2018/2019 – were considered. These three years were selected because they are already a reflection of some consistency of the programme, in terms of its implementation and development, and already represent sustained practices of class observation, feedback, and reflection by the teachers at these school clusters.

Data analysis

The last open question of the observation guides that required participant teachers to comment on their appreciation of the process of final collaborative reflection with their observation peers were imported to a NVivo®12 database and analysed. The content analysis combined a mix of pre-determined categories and emergent categories and sub-categories. Pre-determined categories encompassed effects of the programme on individual participant teachers and on their schools.

A first exploratory analysis of results of partial analysis of yearly collected observation guides combined with the literature review led to establishing a coding frame of emergent categories that was intensively discussed and negotiated within the team of authors, including informative descriptors for each emergent category. This coding frame was used in separate coding moments by the study's authors. After an initial phase of developing the coding frame and preliminary decisions regarding the number of coders and depth of coding between all the study's authors, one of the paper's authors made the coding of the data in NVivo® with a subsequent revision of the coded data in emergent categories and sub-categories. Regarding this process, it is important to state that in observation guides (written discourses), the coding units were sentences.

Finally, we calculated the proportion of references coded in each category in each year of the programme, to compare the evolution over the years. However, we must acknowledge that the cohorts of participant teachers were not exactly the same each year. Since participation was voluntary, some chose to stay in the programme, but others left to give their place to new participants. Still, we believe there is a significant amount of institutional learning and development that can be interpreted from the teachers' perspective of individual effects due to the several joint reflection sessions that were periodically organised, just as much in small groups of participants as in whole-school groups of participants through the teacher training programme.

All ethical procedures of informed consent participation and guarantee of confidentiality and anonymity in accordance with ethical guidelines were assured. This is why in citations of illustrating references, we use codes replacing names.

Findings and discussion

This section presenting the effects of the programme in teachers as reported in the observation guides throughout the defined three-year of its course.

Perceived effects in teachers and in reflective practices

References to the effects of peer observation were coded from the observation guides. Out of a total number of 563 observation guides ($N = 563$), 485 references were coded since some data units, often whole sentences, could not be added to one exclusive category. A summary of the coded references per category and year of programme is presented in [Table 1](#).

A considerable proportion of references had to do with the potential of the programme for developing collaborative work ($n = 144$). The idea of sharing was the most often referred to in the appreciation of the joint reflection moments in the observation

Table 1. Summary of references in observation guides coded in categories of effects in teachers, in relation to each year of the programme.

CATEGORIES OF EFFECTS	YEAR OF PROGRAMME						TOTAL
	2017		2018		2019		
	n	%	n	%	n	%	
Identification of needs for change	25	11.0	13	6.0	11	25.6	49
Improved practices	21	9.3	5	2.3	0	0.0	26
Innovative practices	8	3.5	1	0.5	0	0.0	9
Collaborative work	52	22.9	84	39.1	8	18.6	144
Peer recognition	38	17.7	41	19.1	12	27.9	91
Learning and development	83	36.6	70	32.6	10	23.3	163
Identification of needs for training	0	0.0	1	0.5	2	4.7	3
TOTAL	227	100	215	100	43	100	485

groups. That is why there were references within this category from teachers who praised the opportunity to boost the sharing ($n = 52$) of teaching strategies and resources as well as improvement ideas and suggestions. But there was also a stimulus to share ideas among teachers of the same subject groups that were not participating in the programme. Teachers referred to situations in which ideas shared and discussed within observation groups were, afterwards, brought to their subject groups creating a multiplying effect in reflection about teaching practices. Such evidence fosters the data reported by Mouraz & Ferreira (2021) concerning the application of a similar programme at the higher education level as they stress the absence of effects noted in collective bodies where teachers belong. Other times, teachers just felt the need to have the challenge to their colleagues written down in the observation guide by stating, for instance, that ‘it would be quite important and enriching that the produced resources were shared with colleagues from the same subject group and department’. Within collaborative work, teachers also referred to a general increase in teacher collaboration ($n = 42$), often relating it in their statements with improvements in teaching strategies, students’ learning, professional satisfaction, self-esteem, and proximity amongst peers. These results are similar to those reported by Drew et al. (2017) or Herbert and Bragg (2017). In this respect, some teachers also took the opportunity to point out how this collaborative work strengthened professional and personal relationships with their observation group colleagues ($n = 13$). But many also just referred to specific procedures or purposes of the collaborative work ($n = 40$) and fewer referred to quite general appreciations of the joint reflection act ($n = 8$) without explicit references to actual effects.

Another category that grouped a considerable proportion of references was peer recognition ($n = 91$) in which references were included to recognition or professional admiration of the competence of their observed colleagues ($n = 26$) which they were not able to recognise so clearly before the experience of their class observations. Within this category, there were also references to increases in the self-esteem and professional satisfaction of teachers ($n = 19$), in the appreciation of opportunities to cross different perspectives and contexts from different disciplinary backgrounds ($n = 16$) and in the recognition of disciplinary specificities in class and pedagogical management ($n = 15$). Teachers also reported some episodes in which they improved curricular coordination, mostly between different disciplines ($n = 11$), as illustrated below:

It allowed for us to plan a link between history and visual education, not only in terms of thematic contextualisation but also in the uses of resources and materials.

We highlighted the importance of interdisciplinarity between “physics and chemistry” and “biology and geology”, given that there are themes that relate and that need to use the same terms in some concepts.

The opportunity for joint reflection also allowed teachers to identify needs for change ($n = 49$) in teaching practices, that were mostly presented as changes in the observed teachers ($n = 24$), but also as overall changes in the teaching staff ($n = 21$). In fact, other studies carried out on peer observation of teaching show similar effects on teachers’ teaching practices (Hammersley-Fletcher & Orsmond, 2005; Nguyen, 2020). As concerns overall changes in teaching, teachers mostly highlighted the need to increase the frequency of use of peer and group work amongst students in teaching and learning activities and the importance of increasing interdisciplinarity and curricular coordination. Such results strengthen the connection of programme opportunities and the priorities established by curricular policies, as stated above.

Two other main categories aggregated references to improved practices ($n = 26$) and to innovative practices ($n = 9$). While the first was related to changes introduced to improve pedagogical or curricular practices or correct identified problems, the latter aggregated ideas about experimenting with practices which were completely new to the teachers, in a sense of engaging with innovation. References to improved practices included improvements in the students’ participation in the class ($n = 8$) and in the use of strategies and resources, including ICT ($n = 2$). But most references to improvement included unspecified changes in classes ($n = 16$). As regards innovative practices, the expressed effects were mostly motivational. Teachers expressed a will to experiment with the observed innovative practices themselves since they were able to fully understand in loco how they worked in the class dynamics.

This first observation was very interesting because my observed colleague used several digital tools such as Padlet, which I was already aware of but had not yet used. The use of these tools and the sharing of this experience aroused curiosity in me about incorporating these into my teaching practice.

Only in three observation guides did teachers manifest having recognised the need for training in specific pedagogical domains. However, several teachers from the schools ended up bringing specific in-service training courses to the school, or registering in training courses outside the school, in order to develop in specific pedagogical practices, mostly through the use of digital technologies.

One must acknowledge that the majority of references were coded in the category of learning and development ($n = 163$) since they included unspecified references to having learned a lot, being able to reflect about teaching practices or compare different teachers’ practices, with no explicit reference to concrete effects or changes caused by the joint reflection. The reflection generated by observation, particularly that caused by the comparison between practices of colleagues from different disciplinary areas, seems to have been essential for the realization of a more in-depth and integrated reflective practice in the school community. Based on this observation, we can understand that

this multidisciplinary peer observation model can contribute to the expansion of reflective practices, enhancing the construction of a 'reflective school' (Alarcão, 2001).

Looking to data in other perspective, the longitudinal one, is possible to check that some effects did improve over time, as others decreased their importance. Therefore, collaborative work increases from the first year to the second year and decreased in the third. The effect that continuously decreased was the learning and development category. On the opposite dynamic, the peer recognition effect did gradually get more importance, over time.

Discussing such results from the longitudinal perspective, even having in mind that teachers were not the same, allow two possible explanations.

Teachers' professional development has been gradually understood, not as an individual task to perform, but it depends more and more from collaboration with peers and from a collective perspective and related with work contexts, as was before highlighted in findings from Mouraz & Cosme (2021). Such evidence also shapes the movement of teachers' professional development from an individual responsibility dimension to a more collective one. For instance, peer recognition plays an important role in this movement and can be strengthened by peer observation practices, as was highlighted in this study, but had also been pointed out by Bozak et al. (2011). Moreover, such movement is also in line with the pursue for schools' quality trends as it points out the effectiveness of the work those teachers can do with their students (Guskey, 2002).

The other explanation could rely on the changing nature of what teachers request from their work environment: peer recognition to improve and promote quality of reflection on practices, even those that enlarge specific scientific subject fields of the curriculum. Such explanation deepens the idea of the expansive learning environment (Hodkinson & Hodkinson, 2005) that characterizes reflective and learning schools (Alarcão, 2001). This interpretation also corroborates the changing nature that professional development of teaching is suffering, as the average of teachers' age increases, and what is expected from teachers is not a sort of professional accommodation, but a fully and convicted agency in order to meet relevant curricular policies (Mouraz & Ferreira, 2021).

Conclusion

It is time to look again to the main objectives of the paper and to make some concluding remarks. The effects reported in the observation guides by the teachers show that the multidisciplinary peer observation model has considerable potential for teacher professional development. The characteristics of the implemented model showed great relevance and impact on the reported effects. Thus, voluntarism, multidisciplinary, flexibility in focus, symmetry, and confidentiality of the process showed positive results, which were directly linked to the effects of the program on the professional development of teachers and on the development of reflective practices in the school community. Moreover, the programme contributed to forwarding each one of the axes that matter to teachers' improvement: scientific, pedagogical, and relational knowledge. The collaborative work and the general increase in teacher collaboration was the main vehicle that allowed pedagogical improvement, but also the scientific dimension. The third axis of teacher professional development, the relational, was indirectly developed as teachers recognised

the importance of the programme for self-esteem, proximity amongst peers and peer recognition.

We also conclude that teachers changed their pedagogical approaches, as collaboration was the opportunity for joint reflection about teaching practices, also allowing the identification of needs for change made evident in the observation sessions. The fact that the teachers come from different scientific fields seems to cross the curricular limits of the subjects and spread the opportunities for reflection and improvement to different curricular departments, enhancing the construction of an integrated reflexivity in the school community.

Bearing in mind the issues discussed, it is possible to further conclude that multi-disciplinary peer observation has a strong potential to promote teachers' professional development and the reflective practice about how to develop pedagogical and curricular approaches. Furthermore, this professional development is clearly aligned with teachers' curricular agency aims.

Acknowledgement

Ana Cristina Torres is funded by the Portuguese Foundation for Science and Technology (SFRH/BPD/108950/2015) and the Centre for Research and Intervention in Education from the Faculty of Psychology and Education Sciences from the University of Porto, Portugal (UID/CED/00167/2019; UIDB/00167/2020).

Disclosure statement

No potential conflict of interest was reported by the author(s).

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