

Leading teacher learning: the networked middle leader of professional development model

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RESEARCH ARTICLE



Leading teacher learning: the networked middle leader of professional development model

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ABSTRACT

While the value of teacher professional development is widely recognised, middle leaders who oversee it remain under-examined. Recent conceptualisations of middle- and teacher-leaders conveying information flow pave the way for a more specialised consideration of school-based professional development leaders (PDLs), including leadership preparation, roles enactment, and professional growth. This paper presents a secondary analysis of data from an initiative involving 40 English schools. Each school identified a PDL to lead professional development. We analysed PDLs' reports, using codebook thematic analysis based upon existing models, to understand how the PDLs learned about and enacted their roles. We propose a model comprising three supporting structures: a middle leader community of practice, boundary-crossing facilitators and internal feedback loops. Individually and in combination these structures enable PDLs' leadership practices, supporting the flow of information. Our study provides a new understanding of the importance of networked practices in support of PDLs' roles and synthesises findings to offer a model that can be employed to support middle leaders of teacher professional development.

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Teacher; professional development; middle leader; boundary crossing; communities of practice

Introduction

This paper reports on findings from the secondary analysis of a dataset derived from a professional development initiative. The 'Wellcome CPD [continuing professional development] Challenge' ran in 40 primary and secondary schools in England (Leonardi *et al.* 2022, Perry *et al.* 2022). Each school identified a professional development leader (PDL), who took on a typical middle leaders' role, offering connectivity between the initiative, their school leaders and teacher colleagues. With a focus on formal, intentional professional development, these middle leaders of professional development (PD) introduced, organised and refined new approaches to PD in their schools.

Over 2 years, the PDLs were supported through activities within the initiative, including bringing them together as a collective, regular contact with an expert facilitator

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and ongoing feedback. These interactions provided opportunities to engage with evidence about teacher PD, trial new approaches in their school's PD practices, and share learning with PDLs from other schools.

The initiative was implemented in England against a background of increasing policy interest in teacher professional development. The government has funded large-scale teacher PD programmes for early- and mid-career teachers, and school leaders (Department for Education 2023), but there has been limited evidence of sustained change towards all teachers participating in high-quality PD throughout their careers (Sellen 2016, Molway 2019, Allen *et al.* 2024). Therefore, the aim of the initiative was to understand whether, and how, schools could improve the quality and quantity of teacher PD, with the PDLs playing a central role in leading this change.

In this paper, we explore the nature and development of the relational and communicative practices (Muijs and Harris 2007, Grootenboer *et al.* 2015, Angelle 2016) through which the participating PDLs learned about and carried out their roles. Each PDL provided regular reflective reports of their progress towards the PD goals of their school setting during the initiative. We analysed this dataset using a codebook initially derived from pre-existing theoretical models of PDLs, including elements of PD leader learning and adaptive leadership (Perry and Boylan 2017, Boylan 2018).

Through our analysis, we propose an original contribution: the *networked middle leader of professional development model*, which comprises three supporting structures for professional development leadership: a middle leader community of practice, boundary-crossing facilitators and internal feedback loops. The model offers new insights into the ways in which PDLs' practices, both within and beyond their school environments, can enable, and be enabled, through information flow (Boylan 2018, Margolis and Strom 2020). In showing how information flows, we consider how other middle leaders of professional development might be supported to understand and develop their practice, and thereby improve support for the teachers they work with.

Context of the study

In England, teacher professional development (PD) is widely available through a range of providers and in-school provision (Chedzey *et al.* 2021). Teachers' engagement with PD varies in quantity and quality (Sellen 2016, Molway 2019, Allen *et al.* 2024) and, in comparison to other jurisdictions worldwide (OECD 2019), there is no statutory entitlement to PD beyond a two-year induction period (Department for Education 2023).

A growing body of evidence identifies the reasons for the variations in teachers' access to, and engagement with, PD. For example, internationally, teachers often experience barriers to engagement through workload and scheduling conflicts (OECD 2019). In England, appropriate PD may not be available, or its cost may be prohibitive (Ofsted 2023, Allen *et al.* 2024). In addition, teachers' engagement in PD can vary due to the leadership of PD in their schools (Stevenson *et al.* 2016). Some teachers feel that their PD is not always prioritised by school leaders, and school leaders may hold different views about the appropriate focus or content of PD (Allen *et al.* 2024, Ofsted 2023). There is a gap in the evidence base about the leadership of professional development (Kennedy 2016). This includes a lack of knowledge about issues such as: how leaders of professional development plan, select and organise PD, the development of PD leaders' roles and the

practices used in the enactment of these roles (Meijer *et al.* 2017, Perry and Booth 2021), the knowledge and expertise used by PD leaders and appropriate models of preparation and support to help them develop these (Perry and Boylan 2017, Prediger *et al.* 2022) and the theorisation of teachers' leadership of PD (Boylan 2018, Perry 2023).

Middle leadership of professional development

Although these gaps in the evidence base persist, several studies internationally have identified that in-school leadership of PD is often held, formally or informally, by middle leaders within distributed leadership models (Admiraal *et al.* 2021, Lipscombe, Tindall-Ford *et al.* 2023). In England, there is no clearly defined role for in-school professional development leaders: those who initiate, coordinate and organise PD activities for teachers and other school colleagues (Boylan 2018, Perry 2020). Where there is a designated leadership role for PD, it is often combined with other leadership responsibilities with no dedicated time or resourcing (Bevins *et al.* 2024).

Notwithstanding the formalisation or otherwise of their roles, middle leaders have been shown to support teachers' PD through practices, understood as the activities performed and relationships built with colleagues (Tindall-Ford *et al.* 2024), which are often characteristic of adaptive leadership (Boylan 2018). For example, they:

- promote professional relationships and dialogue between colleagues, create climates of professional learning and professional learning communities (Harris and Jones 2017, Tang *et al.* 2023, Stone and Stone 2024);
- encourage, facilitate and create opportunities for dialogue, communication and knowledge-sharing between teachers, and organise and facilitate workshops and other activities (Angelle 2016, Lipscombe, Buckley-Walker, *et al.* 2023, Edwards-Groves *et al.* 2023);
- support evidence use, lead pedagogical innovation and reform, and model approaches and attitudes (LaPointe-McEwan *et al.* 2017, Grice 2019, Stone and Stone 2024, Ainsworth *et al.* 2024);
- engage beyond their immediate contexts, to bring in new perspectives and resources, within and across vertical and horizontal organisational structures to influence interactions between teachers and leaders (Bryant 2019);
- build trusting and collaborative relationships with a sense of responsibility for their colleagues' professional learning (Grice 2019, Edwards-Groves *et al.* 2025).

The skills and expertise required by middle leaders are distinct from those of teaching (Irvine and Brundrett 2019, Lipscombe, Tindall-Ford, *et al.* 2023), as are the skills and expertise required by leaders of professional development (Perry and Boylan 2017, Prediger *et al.* 2022). However, for both middle leaders and professional development leaders, there appear to be few examples of formalised PD (Perry and Boylan 2017, Lipscombe, Tindall-Ford, *et al.* 2023, Stone and Stone 2024). Therefore, for middle leaders of PD, the lack of professional development opportunities is of particular concern.

One such example of a programme for middle leaders of PD comes from the context of mathematics, in which 'teacher leaders' of PD were supported through cycles of

modelling, analysis, planning, delivery, feedback and review, with rehearsals of sessions between teacher leaders forming an important contributor to their learning (Borko *et al.* 2021). In England, the government has recognised the need to support in-school leadership of PD by implementing a specialist 'National Professional Qualification: Leading Teacher Development' (Department for Education 2024). While evaluation findings suggest positive outcomes (CFE Research 2024), national funding for participation has recently been reduced (Schools Week 2024). Perhaps in response to the lack of formalised support, in England a grassroots support network has recently formed for PD leads. The 'Trust-wide CPD Leaders' Forum' was established in 2022 for practitioners in these roles to share information and advice and to offer 'moral support' through monthly network meetings (TrustWide CPD Leads 2025). The group has gained influence with policy-makers and, for no cost, offers PD leads opportunities for professional development.

Improving engagement through professional development leadership

The initiative in this paper was commissioned in response to the challenges to teachers' engagement with professional development described above. The 'Wellcome CPD Challenge' ran for 3 years from 2018 to 2021 (Perry *et al.* 2022), alongside an external evaluation (Leonardi *et al.* 2022). Forty schools in England, representing a mix of school types and contexts, were set the challenge of meeting defined criteria relating to professional development, with the intention of increasing the quality and quantity of PD which teachers engaged in (Perry *et al.* 2022).

The initiative drew on principles of effective PD (for example, Opfer and Pedder 2013, Maandag *et al.* 2017, Cordingley *et al.* 2020), teacher leadership of PD (for example, Margolis 2012, Boylan 2018), and evidence-informed practice and change implementation in schools (for example, Maxwell *et al.* 2022, Sharples *et al.* 2024). This evidence base includes research on 'teacher leaders', whose role situates them as middle leaders; we draw on both bodies of work to inform this study.

To lead their participation in the initiative, each school designated a Professional Development Leader (PDL). Most of the PDLs were already middle leaders before participation, or they carried out a blend of strategic, managerial and leadership tasks characteristic of middle leaders in schools (de Nobile 2018, Lipscombe *et al.* 2020, Ghamrawi *et al.* 2023). Within the initiative, they held responsibilities including identifying and implementing opportunities for change in their schools' professional development; facilitating teachers' engagement with the evaluation; and reporting on progress. They were supported through activities including:

- 'Schools' Briefings', where they shared experiences with other PDLs and engaged with research evidence about PD and change leadership;
- Regular contact with an expert facilitator, external to their school, who supported the PDLs in identifying and reviewing opportunities for change;
- Ongoing feedback from colleagues.

There are parallels between the role played by PDLs in the initiative and conceptualisations of 'leadership from the middle' (Fullan 2015). For example, they engaged 'downwards': communicating the benefits of PD to teachers and motivating them to participate.

They also communicated ‘upwards’, ensuring participation in the initiative was understood and supported by senior leaders. This characterisation of middle leaders is critiqued for providing a partial perspective that is not directly applicable to those in schools due to the omission of focus on their ‘roles, practice and behaviours’ (Harris *et al.* 2019, p. 258), but there is indication that those in this semi-formal role act ‘in the layer between’ (Ainsworth *et al.* 2024, p. 543) teachers and senior leaders. The PDLs in this study are similarly situated, bridging distinct teacher and leadership communities of practice (Campbell *et al.* 2019).

The evaluation of the initiative found that most schools reported increases in the quality and quantity of teachers’ PD (Leonardi *et al.* 2022). These increases were often brought about by relatively small changes in school practices, such as shifting the focus of staff meetings to be more developmental, better recording and planning of PD to align school and individual priorities, and increasing the proportion of subject-focussed PD. The PDLs were central to these changes. As is often typical of middle leaders (Bryant 2019), they acted as brokers between the initiative and their colleagues, built connectivity between teaching and leadership staff and implemented change in their school’s PD offer (Leonardi *et al.* 2022).

Teacher leadership can be understood as grounded in interacting relationships (Klein *et al.* 2018), with the quality, speed, diversity and use of the information shared through teacher leaders’ communication an indicator of their success (Margolis and Strom 2020). Where PD is designed to enable interpersonal contact, the ‘brokering’ (Hartmann and Decristan 2018) of educational evidence is likely. Applying this conceptualisation here, the PDLs in this initiative can be understood as having the potential for boundary crossing (Akkerman and Bakker 2011).

The ways in which the PDLs enacted their roles in the initiative involved an interplay of factors, including the individual contexts and needs of their schools and colleagues, and their interactions with the resources on offer from the initiative itself. Therefore, a range of relational and communicative practices (Muijs and Harris 2007, Grootenboer *et al.* 2015, Angelle 2016) appeared to be at play in the PDLs’ roles, enabling the flow of information (Boylan 2018, Margolis and Strom 2020) within and beyond their school settings. In-depth theorisation was beyond the scope and funding of the initiative. However, as it seemed likely that further analysis of these practices and their interrelations (Grice 2019) would generate useful insights into how middle leaders of PD can be supported to understand and carry out their roles, and thereby support teachers in their professional development, we designed the study presented here.

Methodology

The dataset

We took as a dataset the reports submitted by each school’s professional development leader (PDL) throughout the project. Completion of these ‘termly reports’ was a requirement of participation in the initiative and they were collected throughout the initiative (from autumn 2018 to autumn 2020), in alignment with English school terms, with an additional report at the end of the final year (summer 2021), for seven school terms in total. These reports provided valuable insights into the PDLs’ direct experiences

of the initiative and how they enacted their leadership of PD, containing PDLs' reflections on their progress towards meeting the criteria for quality and quantity of PD set within the initiative, including what actions were taken and what supported and hindered their progress.

Response rates for the first four terms were high, at over 90%. This subsequently dropped to around 25% in direct response to the COVID-19 pandemic (Leonardi *et al.* 2021) but returned to around 75% in the final two reporting windows. We excluded the reports for terms 5 and 6 from our analysis, due to the fall in response rates and because preliminary analysis suggested their focus was largely on the external influences of the pandemic and therefore beyond the scope of this study. Our analysis includes the reports from five terms, the first four and the final report, constituting a dataset of 171 reports in total.

Secondary analysis

Taking this dataset of reports, we undertook secondary analysis (Heaton 2004), in order to explore these research questions:

- How did engagement with the initiative support PDLs to understand and enact their roles as leaders of professional development in their schools?
- What relational and communicative practices were used by the PDLs in supporting teachers' engagement with professional development?

Whilst qualitative data re-analysis is typically less common in this field, comparable examples, such as examinations of mentor training (Maxwell *et al.* 2024), demonstrate its strength and possibility. The use of secondary analysis allowed us to consider theorisation of the PDLs' role in a way that was beyond the scope of the original initiative. It also mitigated the potential burden of additional data collection for the PDLs, particularly important given their typically heavy school workloads (Lambert 2023).

In working with this complete, existent dataset, we recognise the potential issue of 'fit' (Heaton 2004). The prompts for the PDLs' termly reports were designed for evaluation of the initiative rather than for our research questions. The reports provide PDLs' own narratives of their experiences, rather than any observational or other corroborative evidence. There is also variability in the amount of detail that PDLs provided, which we were unable to probe further. We accept these limitations and balance them against the richness of the dataset as a whole.

Furthermore, following accepted practice that not all those involved in secondary analysis have been part of the original research team (Bishop 2020), our first author's interaction with this study was solely through the reanalysis, bringing a risk of losing contextual meaning in the abstracted data. This was mitigated by our second author's leadership role in the initiative. Our differing perspectives provided a close understanding of the initiative's rationale and design, and analytical distance.

The collection, use and analysis of data from the initiative and this study were subject to university ethical approval. All participants gave informed consent for the inclusion of

Table 1. Initial analytic framing.

PDLs’ learning as developing expertise in: <ul style="list-style-type: none">• knowledge and skills for teaching• facilitation skills and knowledge• knowledge about professional development (adapted from Perry and Boylan 2017)	PDLs’ role as: <ul style="list-style-type: none">• innovator propagating new ideas• responsive and purposeful to personal goals and interdependence• informal networker fostering information flow• working with complex systems (adapted from Boylan 2018)
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their data for the evaluation and subsequent related outputs and publications. In accordance with consent protocols, all participants and their schools are anonymised.

Data analysis

We used codebook thematic analysis (Braun and Clarke 2022), also termed template analysis (King 2012), to analyse the dataset of PDLs’ reports. This approach is recognised both for its utility in working with data at scale and for bringing theory into the coding process (Brooks *et al.* 2015).

We began with pre-existing frameworks of PDLs’ learning and roles (Table 1).

Table 1. Initial analytic framing

The preliminary analysis placed emphasis on important components of the theorisation for subsequent exploration (King 2012). We then allowed for the development of emergent codes from the data, alongside refinement of existing coding from the literature, enabling us to clarify the concepts in response to the specific experiences of the PDLs.

The use of codebook analysis offered a balance between inductive and deductive analysis. Themes were both inputs and outputs of the analysis process (Braun and Clarke 2022), meaning we were guided by previous theorisations and expanded and refined these in response to the data. In this way, alongside the seven overarching codes from the existing frameworks, we documented several emergent codes, such as:

- Navigating school structures and hierarchy between leadership and teachers;
- Meeting initiative expectations;
- Developing personal and community reflective practices.

Findings

The preliminary analysis directed us to three prominent interrelated practices: PDLs’ leadership roles as a networker, and as a system worker, and PDLs’ learning about facilitation of professional development (Table 2). Returning to the data in conversation with the literature, two important types of PDL practice stood out: (a) fostering relationships within an open professional development environment and (b) enabling communicative practices via the development of networks.

Table 2. Codebook analysis development

Further analysis led to the identification of three communicative and relational structures that supported and enabled the PDLs in enacting their roles. These were:

Table 2. Codebook analysis development.

Codebook theme	PDL learning of facilitation skills and knowledge	PDL as networker	PDL as system worker
Theoretical definition from literature	<ul style="list-style-type: none"> • generating a productive learning environment • establishing own competence and capability • awareness of specialised skills for different forms of PD (adapted from Perry and Boylan 2017) 	<ul style="list-style-type: none"> • informal and outside established structures • exercised through the development of networks through which ideas spread • foster information flows (adapted from Boylan 2018) 	<ul style="list-style-type: none"> • understanding and interacting with complex systems they are situated in (adapted from Boylan 2018)
Cross-theme connectivity	<ul style="list-style-type: none"> • creating and engaging in an open professional development environment that fosters professional relationships • PDLs acting as a conduit for communication which enables networked professional development 		
Communicative/relational practice	<ul style="list-style-type: none"> • middle leader community of practice • boundary-crossing facilitators • internal feedback loops 		

a middle leader community of practice, boundary-crossing facilitators and internal feedback loops. Although PDLs' leadership was contextualised within school settings, these central themes were broadly consistent across contexts and time.

Next, we describe each of these structures, illustrating how they related to, and built from, the key actions within the initiative, including representative quotes from the PDLs' reports. We then propose a model which offers a theorisation of professional development leaders' practices, showing how these structures interact and information flows through them, which we propose is transferable to other teachers in similar positions of middle leadership.

Middle leader community of practice

Our analysis showed that the PDLs' development was supported by joining a community of practice of fellow leaders (Campbell *et al.* 2019) that was external to their school setting. For example, during regular 'Schools' Briefings', PDLs shared practice formally and informally, through scheduled presentations, group discussions and coffee breaks. PDLs were presented with key evidence about professional development and its leadership within schools, through inputs from educational experts on research in the field and, as the initiative went on, from other PDLs, who had engaged with research through practice. One PDL summarised that;

The [initiative] briefings have provided opportunities for us to liaise with other schools [...] discuss areas we are finding difficult. We have then been able to troubleshoot and suggest ways of overcoming any challenges we may be facing. These briefings have provided opportunities to discuss the next strands of the challenge and ensure we are ready to move forwards. (School 6)

PDLs reflected on how presentations given by other PDLs helped them to consider what to change in their own practice; 'The case studies from the schools involved in the project

have sparked various discussions which have given us great ideas for moving forward with the Challenge' (School 39). Such presentations led PDLs to 'thinking about research roles, as suggested by one of the schools presenting at the meeting' (School 1).

PDLs also mentioned these sessions as a source of 'ideas': they were able to 'find out ideas from other schools' (School 2), the sessions had 'given us some ideas for next year on assessing "quality" [in PD]' (School 1) and meeting PDLs from other schools was 'beneficial in sparking new ideas and strategies' (School 20). Being part of this community thus offered a window into other schools' practices, and so an opportunity for PDLs to relate this back to their own practice.

Bringing the community of PDLs together provided a space for informal connection and sharing of reflections. One PDL viewed the Schools' Briefings as an opportunity to 'collaborate with other schools and share good practice in relation to the individual CPD [continuing professional development] package offered by schools' (School 24). A facet of this informal discussion was sharing their practices with others in similar school settings, with one PDL reflecting that they could 'discuss the progress made in our own school and share ideas as to how to continue to move forward' (School 6). Another commented that:

Listening to other schools' journeys and participating in discussions regarding others' experiences [has given] ideas for this school moving forward and improving my confidence in the work we are doing and giving me the knowledge that we are on the right path with improving the quality of CPD at [School 31]. Also that others' challenges are the same as mine and suggesting ways that we may overcome these. (School 31)

The external community of practice offered PDLs opportunities to share their experiences of engaging with evidence and allowed such evidence to move between individuals. It was notable, however, that whilst a number of PDLs referenced each other's presentations as being positive outcomes of participation, there is no mention of giving their own, though numerous PDLs did so. We tentatively propose that this implies that the PDLs were more focused on the information they received from the community, rather than that which they fed in.

We conceptualise this relational space as a community of practice of middle leaders (Campbell *et al.* 2019; comparably termed teacher leaders). The community comprised other PDLs working in different settings and thus enabled information flow (Boylan 2018, Margolis and Strom 2020) into the initiative as formalised presentations on educational evidence, and between the PDLs as presentations and informal discussion opportunities. Membership of this community of practice enabled PDLs to see beyond their own implementation of the initiative, to share experiences between PDLs, and strengthen their resolve in their own approach through reflection.

Through this examination of the middle leader community of practice we move to extend conceptualisations of middle leaders engaging in 'upwards' and 'downwards' communication (Fullan 2015), 'in the layer between' (Ainsworth *et al.* 2024, p. 543), to also include the possibility of 'outwards' communication with middle leaders from other school settings. This offers a fuller understanding of the roles that individual middle leaders can play, addressing earlier concerns (Harris *et al.* 2019) and throwing light on some of the communicative and relational experiences of PDLs.

Boundary-crossing facilitators

Each PDL was supported by a facilitator, who was an expert in teacher PD and external to their school setting (Perry *et al.* 2022). The facilitators worked with multiple PDLs, acting as a ‘broker’ (Akkerman and Bakker 2011, Hartmann and Decristan 2018) between activities and evidence from the initiative and the PDLs, and between the PDLs themselves. This included:

- Providing a personalised approach, directing PDLs to specific evidence by ‘forwarding relevant links to research [...] to share ideas and best practice’ for their school settings (School 6).
- Encouraging them to ‘be outward facing and engage with research’ in support of their role (School 13).
- Supporting them to consider the quality of teacher professional development, examining ‘what “high quality” means and how this can be identified [and] also recognised by staff’ (School 22).

The facilitators also reflected back PDLs’ learning to them to support their understanding and to communicate their developing plan for PD. Several PDLs described their facilitator as a ‘sounding board’ (School 2, School 4), demonstrating how they helped the PDLs to navigate the movement of evidence from the initiative into schools. As one PDL reflected;

The [initiative] facilitator provides an essential support and structure to the process. It is vital to be able to discuss the project with a professional who has a grasp and overview of the project aims. [Facilitator] accurately summarises the work we have done [and] is able to provide a much needed reflection. (School 32)

The facilitators also promoted communicative practices between PDLs by encouraging networking within the community of practice. This supported the movement of information between schools. One PDL reflected that their facilitator ‘has worked with other schools which she will be contacting on our behalf to allow us to network further and make links sharing best practice in CPD [continuing professional development]’ (School 24). The facilitators also encouraged PDLs to continue communicating independently, such as by transferring contact details.

Our findings suggest that, by encouraging networking and brokerage between PDLs, facilitators also provided a model for the PDLs to adopt in their own leadership roles. For example, one PDL found that ‘working with [facilitator] has enabled me to articulate my approach to CPD across school. I now can explain my CPD strategy ... to enable me to deliver CPD which meets the standards.’ (School 7). The encouragement of communicative practices by their facilitator thus supported the PDLs to communicate information within their school and beyond.

The utility of expert support for the development of relational practices in middle leadership is already recognised (Klein *et al.* 2018), as is support from experts for middle leaders when learning about and engaging with evidence (LaPointe-McEwan *et al.* 2017). In this initiative, the external facilitators supported the PDLs to develop and enact their

roles, enabling relationship-building and communication of information within the PDLs' internal and external communities.

We conceptualise the facilitators as brokers that were crossing boundaries within the initiative (Akkerman and Bakker 2011, Hartmann and Decristan 2018), for example bridging the boundary between education research and evidence, and PDLs' school settings. By modelling brokering activities (Hartmann and Decristan 2018), the facilitators also supported the PDLs to practise such boundary-crossing themselves. The facilitators supported collaborative learning, and enabled information flow (Margolis and Strom 2020) between PDLs, school sites and the initiative.

Internal feedback loops

Our analysis also indicated that PDLs were better able to lead professional development because of increased channels of communication: within their schools, with teachers and school leadership, and between the PDLs. This led to the identification of the third supportive structure, internal 'feedback loops' (Boylan 2018, Margolis and Strom 2020), and is reflective of previous research on semi-formal teacher leadership, where, if working optimally in their role, 'they assist themselves, and others, in creating new information within specific and local contexts' (Margolis 2020, p. 405).

For example, internal feedback from teachers to PDLs took place formally through regular recording of teachers' PD participation. The PDLs used these records to assess the progress of their colleagues' PD, and plan future PD opportunities and support, before re-assessing their success through subsequent records of PD participation. One PDL reflected that this was not just useful for their own leadership of professional development, but that communication and recording of the PD was a form of acknowledgement and 'makes staff aware of the opportunities they are receiving' (School 6).

PDLs also used less formal routes of communication in their schools. In their final reports, several PDLs reflected on the need to discuss PD with colleagues in order to develop their school's provision, and for this to be a reciprocal process. For instance, one PDL felt that developing an understanding of teachers' ongoing PD needs was crucial for effectively carrying out their role. When asked to provide advice for PDLs in other schools, they recommended;

Try to target what exactly it is that you need to improve and what you expect the outcome to be. Ask teachers what they teach well; not so well; want supporting with, etc. and from this, you can formulate a CPD plan which is much more personalised to each individual. (School 4)

Another PDL reflected on the need to 'make sure as much time as possible is given to departments to really work on meeting school, department and individual priorities as departments are the best place to find support and expertise' (School 13). Whilst it was often the PDLs bringing PD expertise into their school, they also communicated with colleagues, drawing on their specialist knowledge. The importance of dialogue with leadership colleagues was also noted, that to develop the school's provision for PD, PDLs should 'have a clear plan [and] produce it when [you are] with your middle management so they have ownership' (School 37). These perspectives indicate the importance to PDLs of keeping open dialogue between themselves, teachers and school leadership.

The networked middle leader of professional development model

Our findings reveal several key points that are important in understanding the nature and development of, and connections between, PDLs' roles and the communicative and relational practices that support PDLs to learn about and carry out their roles. We found that: (a) the creation of a PDL professional learning community offered the chance to communicate 'outwards', enabling discussion with those in similar roles; (b) boundary-crossing facilitators supported information flow and enabled PDLs to become brokers themselves; and (c) formal and informal information flows supported ongoing dialogue within, and beyond, school communities in support of improving teachers' engagement with professional development.

We now bring together this analysis to propose the *networked middle leader of professional development model* (Table 3). This model outlines the three communicative and relational structures, the connections between the relational practices, and the direction of communications within and beyond PDLs' school settings. The model offers several networks of connection and comparison: between the directions of communication (*with whom* and *how* PDLs communicate within and beyond their settings); and between their differing relational practices (*where* PDLs make connections). For example, as we have described, internal feedback loops are a form of relational practice between the PDLs and their colleagues. The feedback loops support communication upwards and downwards within the school system, functioning with support from their external facilitator. Within the wider community of practice, PDLs share their experiences, in conversation with the evidence base and the outwards communications with their PDL peers.

Table 3. The networked middle leader of professional development model.

We visualise the model as information flow (Figure 1). This demonstrates how the PDLs' communicative and relational practices are underscored by the flow of information (Boylan 2018, Margolis and Strom 2020) through the three supporting structures.

Our model shows how information flows in cycles, around and between each structure, within and beyond the school setting, through the PDLs' practices. The PDLs learn

Table 3. The networked middle leader of professional development model.

	Boundary-crossing facilitators	Internal feedback loops	Middle leader community of practice
Communicative and relational practices between:	PDL and external facilitator	PDL, teachers and school leaders	PDLs in different schools
In support of communicating:	Upwards, downwards and outwards	Upwards and downwards	Outwards
In connection with other practices, including:	Support and brokering from facilitators, reflection on internal feedback loops, encouragement to develop networking with those in the community of practice.	Formal and informal discussions with, and feedback from, colleagues, supported by boundary-crossing facilitator, drawing on evidence from the middle leader community of practice.	Considering evidence and practices from the community of practice, sharing own experiences as enabled by reflections from internal feedback loops and facilitators.

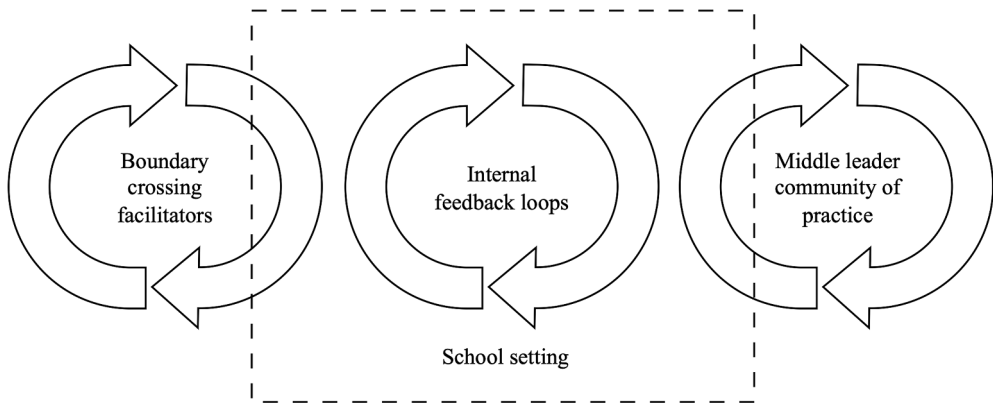


Figure 1. Information flow within the *networked middle leader of professional development model*.

from and contribute to each information flow, connecting to their school and peer communities (Harris *et al.* 2019), gaining feedback and feeding information back in. In this way, the PDLs' learning, and thereby their practice in leading PD, is supported and improved, with each communicative and relational practice enhancing the others.

The model offers a route to supporting middle leaders of PD to develop and understand their practice. For example, for practitioners designing professional development activities for PDLs, they might consider:

- PDLs coming together in a community external to their schools and how this creates opportunities for engagement with evidence and sharing of practice through formal and informal discussions.
- The support of external facilitators, such as how their expertise can enable brokerage of evidence, reflection and conveying of PD aims and intentions, including through modelling of practice.
- The ways in which PDLs can open channels of communication, feedback and reflection within their schools to support the development of schools' PD activities.

Further, for PDLs wishing to better understand and develop their leadership practice, our model offers a way in which they might trace the flows of information within their roles to gain understanding of their role. They might consider, for example, where and how they are gaining evidence about PD, both internally and externally, with whom they are communicating this, including teachers and school leaders, and how that evidence is being used to improve PD activities within their schools. They might also reflect on whether and how they are supported by relationships outside their school settings, whether, as in this initiative, a 'facilitator', and/or a community of practice of other practitioners in similar roles.

We recognise that there may be imbalances to the information flow, such as PDLs perceiving that they receive more information through communication than they personally offer into the network, and we acknowledge that this model does not currently offer any detail of enablers of, or barriers to, information flow. However, we echo calls (Margolis and Strom 2020) for more in-depth analysis of teacher leaders'

communications, and offer the model as a framework for future research in order to gain greater understanding of the connectivities between the relational and communicative practices, and the moderators of the flow of information.

Conclusion

The aim of this study was to contribute to the understanding of professional development leaders' practices, in the context of an initiative aimed at improving teachers' engagement with professional development (Leonardi *et al.* 2022, Perry *et al.* 2022). Secondary analysis of a dataset of professional development leaders' (PDLs) reports, collected for the evaluation of the initiative, enabled the identification of three communicative and relational structures: a middle leader community of practice, boundary-crossing facilitators and internal feedback loops.

Our findings demonstrate how information flows between and within each of these structures, which enables a theoretical understanding of connectivity between supporting activities, communicative and relational practices, and PDLs' experiences of leading professional development. Through inductive and deductive theorisation, this study brings together earlier models of PDLs' leadership and leader learning (Perry and Boylan 2017, Boylan 2018), alongside considerations of information flow (Margolis and Strom 2020). To the best of our knowledge, the resultant *networked middle leader of professional development model*, is the first of its kind to bring together these facets of practice and communication in the leadership of professional development.

In line with previous research (for example, Perry and Boylan 2017), we acknowledge the limited evidence base on what constitutes subject knowledge or pedagogical content knowledge for PDLs, and, although this was outside the scope of the present study, our model shows how gaining such knowledge might be supported through the flow of information. What remains to be uncovered is a greater understanding of the specific nature of, and moderators to, the information that flows through PDLs' practices. This sits in parallel to calls for a more detailed understanding of teacher leaders' practices in support of information flow, including the use of more dynamic methodologies (Margolis and Strom 2020).

Our findings use empirical insights to offer a new model of PDLs' development and practice, which highlights the importance of understanding the different practices, both relational and communicative, through which PDLs' roles might be supported and enhanced, and the ways in which the flow of information can enable these. The model has the potential to support middle leaders of PD across diverse school contexts to consider their own practice and the structures that can support them. Finally, in proposing a model of relational and communicative PDL learning, we offer a route to more informed design of future programmes of professional development for middle leaders of professional development.

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