

# **Can models of distributed leadership be used to mobilise networked generated innovation in schools? A case study from England**

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## **Abstract**

There is now an increased focus on using networks to drive school improvement. Achieving the benefits of engaging in networks requires leaders to think and act differently; specifically, to benefit all teachers and students, the leaders of schools participating in networks must actively support the mobilisation of networked-driven innovations. One approach to mobilization is enabling distributed leadership-type approaches. At the same time, distributed leadership, as a means of facilitating the take-up of network-led innovation, is relatively understudied. This paper explores how distributed leadership approaches can support innovation mobilization (or not) and what is required for them to do so effectively.

## **Introduction**

Professional Learning Networks (PLNs) represent learning collaborations between stakeholders with a common interest in improving outcomes for children. Extant examples of PLNs include Data Teams in the Netherlands and Research Learning Networks in England (Poortman & Brown, 2018). PLNs form part of a general focus in education on using networks to achieve a myriad of benefits, including: more effective distributions of professional knowledge; the development of context specific strategies for school improvement; and facilitating schools and others to share resources (Hubers, 2016; Prenger, Poortman, & Handelzalts, 2017). At the same time,

achieving these benefits requires school leaders to think and act differently. In particular, the leaders of schools participating in networks must actively support the broad mobilisation of networked-driven innovations to ensure that benefits can accrue to teachers and students alike (ibid). One promising approach to such mobilisation is the enablement of distributed leadership. At the same time, distributed leadership, as a means of facilitating the mobilisation of network-led innovation, is a relatively understudied area. Correspondingly, this paper explores how a distributed leadership approach can support innovation mobilisation within PLNs and what is required for it to do so. A mixed methods approach (interviews, survey questionnaire data and social network analysis) was used to examine models of distributed leadership within schools participating in a Research Learning Network in Hampshire, England. Findings suggest that approaches to distributed leadership that involve a whole-school collaborative process and where potential distributed leaders are centrally placed within their networks tend to be most successful in ensuring innovations are mobilised.

### **Professional Learning Networks**

The recent, prominent, focus on networks within education has been driven by a number of factors. These include: the complex nature of the issues facing education, which are typically too great for single schools to tackle by themselves; changes to educational governance structures, which involve the hollowing out of the middle tier of government; and an increased emphasis on education systems that are ‘self-improving and school-led’ (Earley & Greany, 2017). Within this context, achieving teacher and school improvement requires cultures of enquiry and learning to be established, both within and across schools. Since not every teacher in a school can

collaboratively learn with every other teacher in a network, the most efficient formation of networks comprises small numbers of teachers learning on behalf of others and subsequently sharing their learning with colleagues in their 'home' school.

It is this recognition that networks operate most effectively at the level of the teacher that has seen a growing number of school leaders and policy-makers turn their attention to PLNs as a way of improving education in schools and across school systems (Armstrong, 2015; Earley & Greany, 2017). PLNs are defined as any group who engage in collaborative learning with others outside of their everyday community of practice; with the ultimate aim of improving outcomes for children (Poortman & Brown, 2018). The aims of any given PLN can therefore range from exploring and seeking to improve specific teaching practices and their outcomes, to engaging in a critical examination of the purpose and the aims of the curriculum. PLNs can also vary in composition, nature and focus: with potential membership including combinations of teachers and school leaders from different schools, local or national policymakers, as well as other stakeholders such as academic researchers. Ultimately, however, irrespective of composition or focus, the aim of PLNs is to build capacity, which is defined as "the power to engage in and sustain learning of all people at all levels of the educational system" (Stoll, 2010, p. 470). Capacity is built, first, by helping PLN participants to create and share knowledge about specific educational problems as well as innovate (i.e. develop novel responses to these problem). Capacity is also built as PLN participants mobilise new knowledge and/or new innovations within their home schools, ensuring all colleagues benefit. At the same time capacity depends on teachers in PLN schools being more than just passive implementers of new practices; rather they need to be 'active change agents' (Hubers

& Poortman, 2018). This means all teachers should be critically engaging with, and refining, new practices to maximize their impact. To understand what effective critical engagement really looks like, however, and how it can be achieved, it is useful to consider the notion of teacher 'expertise'.

### **Learning and expertise**

To illustrate what is meant by expertise, we draw on *The Dreyfus Model* (Dreyfus & Dreyfus, 1980), which suggests five 'levels' of human learning: a) novice; b) advanced beginner; c) competent performer; d) proficient performer and e) expert; with each level comprising recognisably different behaviours in relation to performance at a given skill. A novice, for example is new to particular situations and will, during instruction, learn about facts corresponding or characteristics pertaining to the situation. This results in 'rules for action' to be applied. As learners advance from 'novice' and through the levels of 'advanced beginner', 'competent performer' and 'proficient performer', however, three things occur to facilitate the normalisation of more intuitive behaviour. First, instances of performing in real life situations increase, meaning the number of real life situations encountered and tackled by the learner also increases. Second, recognition of different situations accumulates, as does recognition of the context in which those situations occur. Third, dependency on specific 'rules for action' diminishes as learners are able to interpret and judge how to perform optimally in any given situation.

The Dreyfus framework can be augmented by work undertaken by Nonaka and Takeuchi (1995), whose model of knowledge 'creation' suggests that expertise can be achieved when teams work together to: 1) **share** what is already known, so making

their tacit knowledge explicit; 2) **combine** what is already known with new knowledge; 3) collectively **develop** new practices based on this knowledge; and 4) **test** these new practices out through continuous process of trial and error. After a period of on-going practice and refinement, the use of these new practices eventually becomes tacit knowledge: in other words, something practitioners can simply do well without thinking. Hence the practitioners involved have become experts. What Nonaka and Takeuchi's (1995) work adds to the Dreyfus framework, however, is the understanding that, by making the tacit knowledge of the group explicit, we develop an understanding of our collective assumptions for why things are as they are. In turn opening up our assumptions allows for a collective sense-making process in which we can better understand particular issues and how they might be resolved. Furthermore, working together to resolve issues enables teachers to support one another to develop and test out solutions: providing feedback and additional ideas in terms of what was effective and how new practices could be further improved.

In relation to PLNs, what the work of both Dreyfus and Dreyfus (1980) and Nonaka and Takeuchi (1995) illustrate is that expertise emerges from collaborative practices such as sharing what is already known, sense-making and experimentation. Thus if learning networks are to deliver sustained capacity building and the development of teachers as change agents, who effectively mobilise new practices within their schools, they need to be connected to within-school processes involving: a) interaction, b) the opening up of teachers' practice; and c) processes of trial and error, where mutual support aids teacher improvement. In turn these processes need to be on-going and regular in duration. The result should see teachers both critically engage with and refine new practices/new innovations to maximize their impact across

classrooms, while also integrating such practice with their existing practice/tacit knowledge to ensure such impact endures.

### **Distributed leadership**

In order to ensure PLNs are able to build capacity effectively (i.e. in a way that delivers expertise as described above), effective leadership is needed. In the first instance, leadership is required *of* the networks themselves to ensure that they function effectively (Dowling, 2016). Second, however, it is also the role of school leaders to ensure the right processes are in place to allow meaningful participation by their teachers in network activity and that this participation makes a difference within teachers' 'home' schools (Poortman & Brown, 2018). Of the two aspects of leadership, it is the latter – leadership *for* networks – that is explored in this paper. In particular, we examine how school leaders organize their schools to facilitate the mobilization of network outputs using models of *distributed leadership*.

While there is no one universally accepted definition of the concept, distributed leadership is generally understood to involve an expanded understanding of school leadership beyond the activity of the school principal (e.g., see: Azorín, Harris, & Jones, 2019; Harris, 2009; Leithwood, Mascal, & Strauss, 2009; Spillane, Halverson, & Diamond, 2001). At the same time distributed leadership is more than the recognition that there can be many leaders in a setting: although clearly roles such as *professional learning leader* exist. Rather, distributed leadership can be seen to represent a form of collective responsibility, intelligence and sense making, with leadership for school improvement emerging as an interactive process of influence

designed to achieve organisational ends (Boylan, 2018; Spillane, Healey, & Kim, 2010).

The use of distributed leadership approaches to facilitate the mobilisation of knowledge and innovation emerging from networks is key. This is because the interplay between network and school is an exemplar of what Kotter (2014) describes as *the dual system*. As Kotter (2014) notes, “in truly, reliable, efficient, agile and fast enterprises, the network meshes with the more traditional structure... it is not a super task force that reports to some levels in the hierarchy... it is seamlessly connected and coordinated with the hierarchy...” (p. 20). In other words, Kotter’s seamless meshing requires PLN participants to be afforded the autonomy and freedom associated with distributed leadership so that they can both innovate, and successfully scale-up the use of innovations.

Typically the focus of distributed leadership is on *instructional* leadership-type action: that is, action designed to improve teaching and learning activity in schools. In such instances, conceptions of distributed leadership are often based on the notions of distributed cognition and communities of practice. Here it is assumed that knowledge is *stretched* across groups of individuals and artifacts (Spillane & Sherer, 2004). In other words, knowledge is viewed as residing in the people, practices, objects and structures that comprise our environment, and is mediated through interactions between these. From this perspective it is argued that instructional leadership should be stretched in the same way. This notion of distributed leadership points to the need for the practice of instructional leadership to be recast as a coordinated decision making process that enables that the collective wisdom and expertise of an

organization to be ‘downloaded’ from the environment and interactively engaged with. New knowledge and practices can then be ‘uploaded’ to the same environment, again through a process of interaction.

Assessing whether distributed leadership practices are being employed in a given setting, as well as whether they are contributing to the effective mobilisation of new PLN-related innovations requires a way of identifying distributed leadership practices in action. Hairon and Goh (2015) argue that identifying instances of distributed leadership requires researchers to examine the actual practices of individuals rather than their assigned roles or functions. Specifically, that we should look for the presence of three dimensions of distributed leadership in the actions of school staff. The first dimension is ‘empowerment’: the ability or power of ‘subordinates’ to make decisions. Empowerment requires school leaders to relinquish power, albeit while still ensuring alignment and coherence of the focus of distributed leadership, with the priorities and values of the school.

The second of Hairon and Goh’s (2015) dimensions is ‘interaction’ for shared decisions. Here the notion of leadership corresponds to the influence that emerges as individuals at all levels engage with one another. To necessitate this second dimension, forums or situations will be required to enable educators to interact effectively. The third dimension, is ‘developing leadership’. This dimension suggests that distributed leadership can only function effectively when individuals within the organization have the required skills to engage in activities such as: “rallying others towards common group goals, considering individual needs of group members in decision making, making decisions based on micro and macro contextual



knowledge... and promoting shared ownership and accountability” (Hairon & Goh, 2015, p. 709). In relation to PLNs, therefore, in order to ascertain the presence of distributed leadership practices and the nature and likely effectiveness of these practices, researchers need to explore whether: 1) PLN participants are empowered to engage in and mobilise new practices and innovations developed in learning networks; 2) PLN participants and other staff are facilitated to engage with and influence one another’s decisions; and 3) PLN participants have the skills and capacities required to lead effectively.

### **Research setting and questions**

To date there have not been studies that examine whether models of distributed leadership can help mobilize networked learning activity. Given the emergence and importance of PLNs for school and school system improvement, and because PLNs rely on the effective mobilization of innovation to build capacity, understanding this issue is significant. To explore it further, this paper reports on data taken from a case study of the *Hampshire Research Learning Network*.

Research Learning Networks (RLNs) are a specific type of PLN designed to enable the roll out of new research-informed teaching practice at scale (Brown & Flood, 2019). RLNs operate by establishing one (or more) PLNs with participants from a number of schools, then using these participants to generate research-informed practices during a series of network workshops. Participants then work with their wider school colleagues to embed these practices in their ‘home’ schools. To address the knowledge gap highlighted above, the research questions informing our study, were:

1. What models of distributed leadership do school leaders facilitate to ensure all teachers in their school know about, input into, engage with and embed, as well as continue to improve, the innovation emerging from the RLN?
2. To what extent do these forms of distributed leadership lead to the effective mobilization of RLN innovation?
3. Do other actor-related factors also impact on the mobilization of RLN innovations?

### **Research approach and analysis**

To address these research questions, a mixed methods approach was employed. Fieldwork commenced with in-depth semi-structured interviews with all school leaders of schools participating in the RLN (six interviews in total). Focused on addressing research question 1), the purpose of these interviews was to ascertain what approaches to distributed leadership school leaders facilitate to successfully mobilize RLN-related innovation. In-depth semi-structured interviews were also held with other key teachers participating in the RLN (six interviews in total). The purpose of these interviews was to ascertain additional perspectives relating to models of distributed leadership; how effective approaches to distributed leadership were perceived to be; and potential improvements moving forward.

With research question 2), 'effective' was assumed to mean the extent to which all teachers within RLN schools were able to benefit from and contribute towards the RLN-generated innovation. To address this question, a survey questionnaire was developed and administered to each school within the RLN case study. The

questionnaire explored types of RLN-related interaction undertaken by teachers and how teachers were using the innovations emerging from the RLN within their practice. To investigate the types of innovation-related interactions that were occurring, the survey questionnaire drew on social network theory and methods to provide an understanding of the patterns of knowledge sharing and collaboration relating to the RLN (Spillane et al., 2010). A social network perspective is also pertinent to address research question 3). This is because social network theory tells us that the circulation or use of an innovation within an organisation will be tied to characteristics such as that organisation's network 'density' and 'centrality'. In a dense network, many people are connected; conversely in a sparse network there are fewer connections. Dense network structures tend to support the movement of complex knowledge, while less dense structures facilitate the transfer of simple or routine information (Finnigan & Daly, 2010). Centrality, meanwhile captures the number of people an individual is connected to. Centrality is vital for mobilisation and implementing change. For example, the presence of central actors is conducive to the diffusion of knowledge and the top-down mobilisation of innovation (Moolenaar & Slegers, 2010). In addition, it is crucial to understand the location of change agents in the social network: a change agent (i.e. an RLN participant) who is not particularly central to their school network may struggle to engage others (Moolenaar & Slegers, 2010).

Alongside these network-related components, the survey questionnaire also examined how the 'recipients' for new innovations were engaging with them: in other words the extent to which people felt involved with any new approach; the extent to which they employed the new approach; and, as a result, the likelihood that any new approach

will impact on practice. To examine such engagement, the questionnaire employed the *Levels of Use* scale, which originates from the *Concerns Based Adoption Model* (CBAM; Hall & Hord, 2020). Here Levels of Use range from the user doing nothing, to them behaving as a novice, to them behaving as an expert user, so making major modifications to the innovation to improve its efficacy.

### **Collecting and analysing interview data**

A total of 12 of the 15 staff involved in the RLN were interviewed. Of these, six interviews were the senior leaders of participating schools, five were with participating teachers and one was with an executive principal. To aid interpretation of the findings, Table 1 identifies which RLN participants belong to which school (to preserve anonymity, both participating teachers and the executive principal have been grouped together under the column 'teachers'). All interviews were undertaken by the first author and were recorded. Once data from the recordings were transcribed they were then analysed thematically; using inductive analysis to provide a categorization of responses, with codes allocated to individual turns of speech. Once all data was coded this way, relationships between codes were assessed and mid-level codes were built from the aggregation of the initial codes until all of the initial codes could be adequately explained in a conceptually meaningful way. The final coding framework can be found in Figure 1, below. To test the construct validity of the codes that emerged, the third author used the coding frame developed to independently apply the coding framework to three randomly selected transcribed manuscripts (this represented a quarter of all manuscripts collected and so was viewed a good sized sample). The inter-rater reliability: i.e. the ratio of the total amount of agreement in the coding and the total amount of coded text excerpts - was 85% and considered

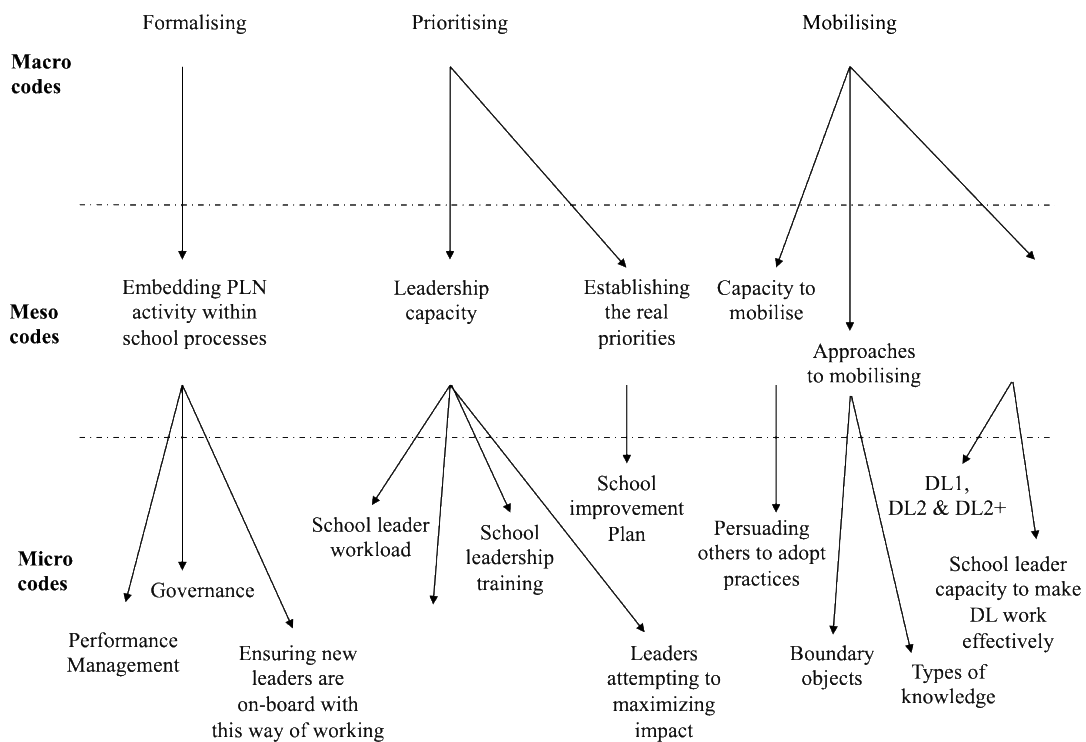
reliable (Miles & Huberman, 1994).

**Table 1: Research Learning Network participants listed by school**

School	Senior leaders	Teachers
'N',*	#1	#1
'S',*	#2	#2
'C',*	#3	#3
'M'	#4	#4
'O'	#5; #6	#5; #6

\* Schools 'N', 'S' and 'C' are federated. As well as individual heads of learning for each school, there is also an Executive Headteacher responsible for all three schools.

**Figure 1: Coding structure following the RLN interviews**



## **Collecting and analyzing survey questionnaire data**

A roster design, i.e. a pre-populated, complete list of all potential members of a network, was used to collect network data. This meant, all RLN schools were asked to supply a complete list of the names of their teachers and senior leaders. The survey questionnaire itself was developed using survey monkey. Prior to its distribution, the survey was piloted with teachers from the primary sector not involved in the project, and with academic colleagues. Once ready, the questionnaire was distributed electronically to all school teaching staff (teachers and teaching assistants) through the main school contact. In keeping with best practice, we sought to achieve a response rate from each school in the region of 80-85% (details on the actual response rates are provided below) (Moolenaar & Slegers, 2010). It should also be noted, however, that there is a tension between completeness in terms of response rates and the ethics of surveying staff: particularly with regards to respecting the types of workload demands already placed on teachers and the need for potential participants not to feel compelled into completing the survey questionnaire. In the end, one reminder communication about the survey was sent out to schools and, as with the original communication, the important but non-compulsory nature of the exercise was communicated. Overall, therefore, in terms of response rates and related criteria, it should be noted that: 1) school 'O' decided not to take part in the survey due to workload issues; and 2) response rates for each school were: Federation of 'C', 'N' & 'S' = 82% (27/33); 'M' = 78% (14/18). In terms of respondent characteristics: 1) Federation of 'C', 'N' & 'S' = 100% female; 'M' = 93% female; and 2) average years in service: 'C' = 9.6; 'M' = 6.4; 'N' = 9.4; and 'S' = 9.

Social Network Analysis data was analysed using the 'R' coding language and UCINET 6 (Borgatti, Everett, & Freeman, 2002). Other quantitative data was analysed using SPSS. Analyses were undertaken to: 1) examine the multiple relational dimensions of the survey questionnaire data and to create nominal categories for each possible combination of relationships individuals might have with one another. These include single relations: e.g. the occurrence of only conversation between individuals, or the seeking out of work related advice; and all three relations (conversation, professional development & collaboration). The other network characteristics calculated were 'density' and measures of 'centrality'. Relationships were explored between these and the multiple relationship characteristics.

### **Findings: interviews**

**Models of distributed leadership:** It was noted above that Hairon and Goh (2015) posit that actual instances of distributed leadership can be identified by exploring the existence of empowerment, interaction and capacity building. Applying these three dimensions to the interview data highlights the existence of three models of distributed leadership designed to ensure that practices from the RLN are mobilized effectively. In the first model (DL1), primarily evident in schools 'S', 'M' and 'O', participating teachers were empowered to make decisions regarding the RLN, with new ideas expected to permeate through being championed by advocates. For example RLN participants were typically encouraged to influence colleagues by persuading them to adopt practices; with the skills required to achieve this persuasion mostly corresponding to effective change management. For instance, through establishing a "sense of urgency" (senior leader #5). At the same time, respondents also noted the need for RLN participants be motivated and to really encourage this

way of working to get it off the ground “[you need to be] really enthusiastic and really want to drive it and keep it going... developing the resource... and putting in all the hard work” (senior leader #4); with teacher #5 also noting the need to bring on board those who are resistant to adopting new approaches to teaching and learning.

Respondents also reflected that in an environment in which there is both a *lassaiz faire* market of ideas and practices, as well as multiple competing priorities, “whoever ‘shouts loudest’ [i.e. most effectively espouses the benefits of something] is most likely to get encouragement and buy in for their ideas” (teacher #4); vitally, the notion of ‘shouting loudest’ was also viewed as incorporating additional approaches to mobilization, such as the modelling of a new approach, in order to demonstrate the impact of new ways of working.

In the second model of distributed leadership (DL2), primarily evident in school ‘N’, all teachers were empowered to make decisions regarding the development of new teaching and learning practices linked to the RLN, but teachers participating in the RLN were empowered to facilitate this process as a collective endeavor. Here influence occurred via collaborative inclusive decision-making, taking place within, for example, a school professional learning community. For example senior leader #1 noted that in her school: “we now have an in-school learning community that wasn’t there before... [where we] use learning conversations as a basis for supporting and challenging each other”. The skills required for DL2 to flourish were identified as, for those supporting the process, effective facilitation, (“usually they’re led by [RLN participant, who explains] where we’ve got to with the network and then sets them something to do, or discuss”: senior leader #1) as well as an awareness and understanding of the needs and the aims of the organization. For example as evident



in the following quote from senior leader #1: “we actually started in a meeting, in this very room. I said, ‘What’s the biggest barrier for learning in your class?’” In other words, facilitators needed to be aware of the desired outcomes and accepted limits – from an organizational perspective – of any given decision process.

Within school ‘N’, decision-making using DL2 was focused on a specific issue, was collective in nature and followed a relatively linear pathway; which moved from knowledge and discussion ⇒ decision-making ⇒ trialling and embedding. But DL2 could also occur as a process where individuals or small teams each have their own foci, situated within a common theme, and are supported to engage in a process of iterative exploration in relation to this focus. A variant of DL2: DL2+, therefore, occurred when the role of RLN participants was to facilitate an ongoing process of investigation within their school. This variant could be seen in school ‘C’, with senior leader #3 observing: [our approach is now] “this is the issue, what are we going to do to address it, what [research] is out there that has been tried successfully?” As a result the discourse in the staff room is more collaborative: “[a teacher] will come in with their moans about a child, which often happens, and then somebody else will say, ‘Ah, but I was trying that with so-and-so as part of our research, and that’s really worked well’, or, ‘I was reading something about this, try this.’” Likewise, teacher #3 stated that: “the school staff room is constantly somewhere where [in relation to each research inquiry project] we’re going, ‘I tried that today and it really worked with them’ and [name of colleague] is like, ‘Oh, I read a bit of research about this.’ So we engage in the process like that”.

**Capacity to make distributed leadership work effectively:** The interview data also

showed, however, how the DL process could break down. For example if effective interaction was not being facilitated. This was particularly pronounced in the case of teacher #2: “sometimes I can feel a bit isolated...[because] I work with job shares. So the team I start off the week with are not the team I end the week with. Although we all are aware of... what [I’m] developing in the school, there are different levels of what people know... there's never been a point where we've all sat as a staff with TAs [teaching assistants] all together in just our school and really talked about it”. A second comment by teacher #2 made it clear that some of the issues with not being able to meet were contractual in nature: “I think what's lacking is that, even just maybe in the staff room at lunch time would be an opportunity to have a discussion. Then again, no one's there: [teaching assistants] don't stay for lunch and that is their right to do that. They're not paid so they go home. That would be such a great casual conversation, thought-provoking opportunity to keep the momentum.” This observation by teacher#2 highlights the possibility that if the employment contracts of teaching assistants means they are not required to be at school at certain points, then school leaders could change these contracts or pay ‘overtime’ so that TAs can be in school more often or at required times. Indeed, in her interview, senior leader #2 admitted that “I don’t think we’ve included [teaching assistants] quite enough... because... other things that they've had to cover... and we sort of thought, ‘Well, actually, this needs to be done,’ there are certain... boxes that need to be ticked and things that they have to have covered”. This admission flagging senior leader #2’s priorities within school ‘S’, when it comes to allocating meeting times that TAs can attend. Alternatively, school ‘S’s way of working stands in contrast to other approaches, such as that of school ‘M’, where it was noted that: “we worked with the staff and the TAs as well. The TAs come to twilights, but we then attend the TA

meetings to support them further” (teacher #4). And together these quotes serve to nicely illustrate that, if distributed leadership is to function properly, then school leaders need to act to ensure that each of three elements outlined above are properly attended to (Hairon and Goh, 2015).

Finally the data revealed there was variation in terms of which staff members were regarded as important to the process of distributed instructional interaction. For instance (as highlighted above) teaching assistants were often not present at meetings. Often this was a legacy issue: “[historically] teaching assistants haven’t come to [professional development meetings]; The informal [meetings] again have traditionally just been teachers”. At the same time ‘they [might] go to a lunchtime meeting [but] it’s not been compulsory’ (senior leader #1). This suggests: 1) that teaching assistants, with the exception of school ‘C’, have not traditionally been empowered as instructional leaders; and 2) that if teaching assistants are not included in key meetings, there is likely to be lack of both knowledge flow and a flow of influence, in both direction. This is problematic for the DL2 and DL2+ models of distributed leadership because it means that distributed leaders and absent teaching assistant ‘followers’ have little or no opportunities to engage with one another to make decisions that are shared and mutually reached. In turn, this lack of interaction is likely to impact both on the efficacy of these decisions and the likelihood they will be adopted effectively. Given that the role of teaching assistants is to aid learning, for example, by providing 1:1 student support, taking whole classes during teacher planning, preparation and assessment time, as well as engaging in aspects of planning and assessment, their involvement would seem vital (Blatchford, Russel, & Webster, 2012). At the same time senior leader #1 had found ways to encourage teaching

assistants to attend key meetings which they have traditionally not been obliged to come to. In particular she used the social influence of one or two teaching assistants to encourage others to get involved: “so [previously] we decided to have a lunchtime event [about the practice] and make sure at [least the most influential teaching assistants attended], and I think because the others [who didn’t attend] then felt that they didn’t know what was going on, more and more are coming. So... it’s kind of spiralled” (senior leader #1). At the same time the teaching assistants at school ‘N’ were also described as “a tight unit who always engage with each other” (senior leader #1), which perhaps helps school leaders to utilize social influence in this way.

### **Findings: questionnaire data**

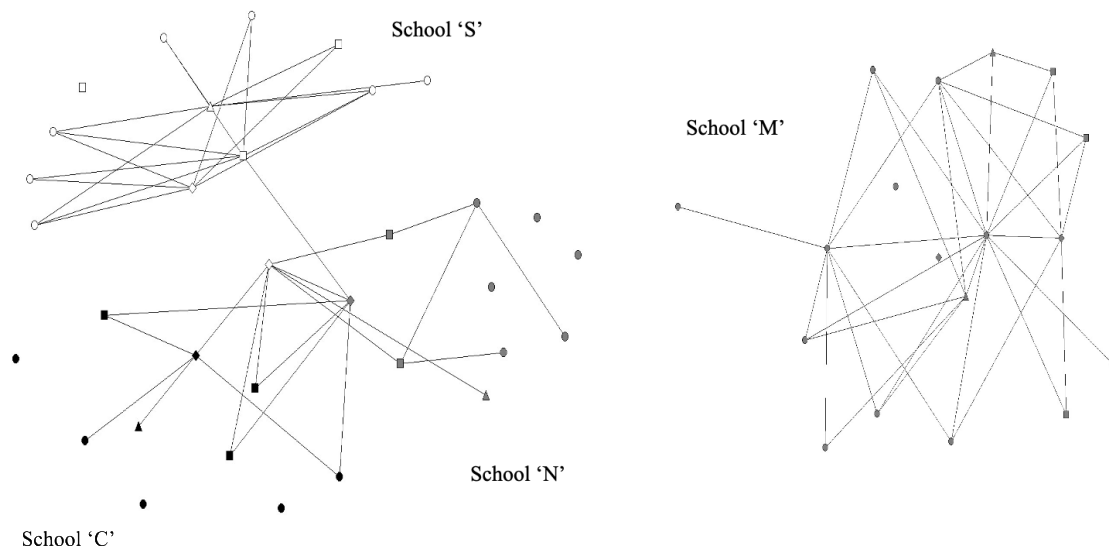
In the earlier section on PLNs, we argued that the purpose of PLNs is to build capacity; specifically the capacity of all teachers connected to the PLN to learn, and for this learning to result in improved practice. Key to successful capacity building is that teachers are actively engaging with PLN outputs to refine new practices and develop expertise in relation to them in order to maximize their impact. With our analysis of the questionnaire data therefore we sought to understand whether teachers within participating schools have not only learned about RLN related innovations through interactions with their colleagues, but also whether they are engaging in a collaborative process of use, experimentation and refinement, in order to ensure these innovations are delivering maximum impact. We begin here by looking at the social network data that emerged from the questionnaire. This can be found in Figures 1 and 2, below. To help interpret the figures, it should be noted that: Circles = Teaching assistants; Squares = Teachers; Triangles = Middle leaders; Diamonds = Senior leader; and Lines represent connections between teachers, teaching assistants, school

leaders etc. Where combined data is presented for schools 'C', 'N' and 'S' (who operate as a federation), it should be noted that: Black = School 'C'; Grey = School 'N' and White = School 'S'.

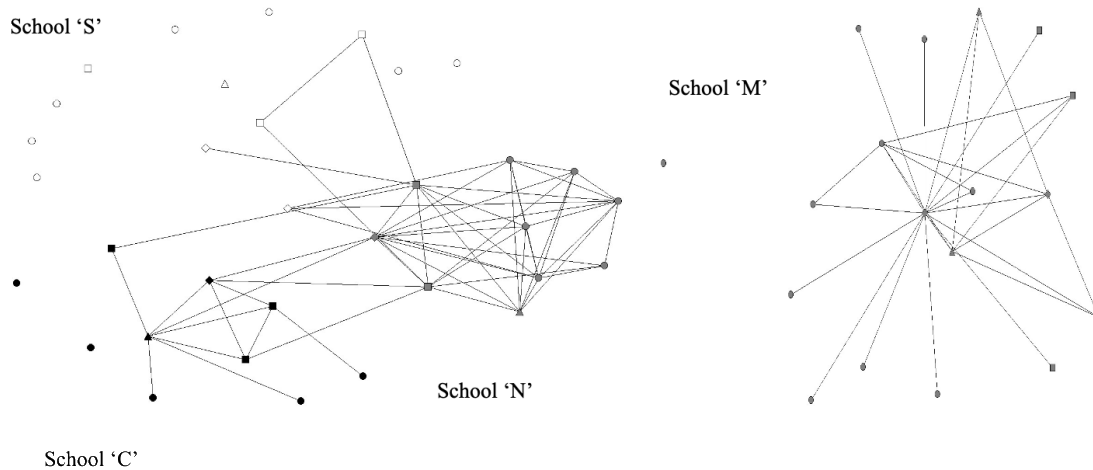
**Are PLN outputs being used in an expert way?** To explore the use of innovation, we began by examining whether there is basic level interaction occurring around RLN related outputs, such as conversation. For example, Figure 1 looks at responses to the question: 'In relation to the work of/new practices emerging from the RLN, with whom have you engaged in conversation regarding these new approaches to teaching and learning'. Importantly, this analysis explores only instance of conversation, ruling out the possibility of conversation plus some other activity. Here it can be seen that *just* conversation between staff in relation to RLN outputs seems to be much more prevalent in schools 'S', and 'M', while less common in schools 'C' and 'N'. This can be confirmed by calculating the density metric for each network. Density is the proportion of actual connections between individuals in relation to all possible connections. Measuring the density ( $D$ ) of these relationships shows that for school 'S',  $D = 23.1\%$  and for school 'M',  $D = 21.6\%$ . For schools 'N' and 'C', meanwhile,  $D$  is much lower, and only equals 8.9% and 6.7%, respectively. The variable homophily model can be considered significant, with  $p < .001$ . Variance explained ( $R^2$ ) is low however (7.3%) because of the interconnectedness of schools 'C', 'N', and 'S', and so the potential for between-school conversation (school 'M' was not included in this statistical comparison). Since conversation alone is insufficient for attaining expertise, which also requires the ongoing, hands-on use of an innovation, we can also look at how conversation is combined with other activity. For instance, Figure 2 illustrates who questionnaire respondents say they have conversations with

AND who they engage with ‘in professional development activities regarding new approaches’ as well as ‘collaborate with to trial and embed new approaches’. As we move away from conversation exchanges to explore relationships that require more interaction and collaboration, it becomes clear that this is most prevalent in school ‘N’ and, to a lesser extent in school ‘C’. Returning to the density metric,  $D = 75.6\%$  for school ‘N’, and  $22.2\%$  in school ‘C’. For school ‘M’,  $D = 17.6\%$ , while for school ‘S’ it is practically non-existent. The model can be considered significant and demonstrates that a moderate relationship exists, with  $p < .001$ ,  $R^2 = .45$ .

**Figure 1: Relationships involving just conversation regarding RLN-related teaching and learning approaches**



**Figure 2: Relationships involving conversation, professional development and collaboration regarding RLN-related teaching and learning approaches**



The questionnaire data also reveals *how* school staff were using RLN outputs. As suggested earlier, the expert use of a new approach moves beyond more mechanical, instruction-led use, to use that is tailored and responsive to context and situation. To explore this, survey respondents were asked to indicate the way in which they were using RLN-related innovations via the *Levels of Use* scale (Hall & Hord, 2020), designed to explore the take-up of innovation. The question asked to respondents was ‘Thinking about the RLN your school is engaged with, to what extent are you using the new approaches to teaching and learning (innovation) that relating to/emerging from it? (tick one)’ The responses they gave can be found in Table 2, below.

The questions in the Levels of Use scale can be broadly divided into four use types. These are: ‘no’ use, which corresponds to the first question on the scale; ‘preparing for use’, where respondents are getting ready to begin using innovations, typically by finding more out about them and what their use entails; ‘mechanical use’ is typically usage without reflection or with a view to change and improvement. In other words, mechanical use involves employing an innovation in accordance with how one was shown or told to use it (and getting this use ‘right’). ‘Expert use’, on the other hand is

when we begin to understand how our use of an innovation can be modified according to the specifics of a situation so that its impact can be improved. When it comes to teaching, expert use also involves the collaborative modification of new approaches to teaching and learning so that all students benefit.

As can be seen from Table 2, in school 'C', just over half of respondents (55.5%) suggested they were engaging in some form of expert use of the RLN-related innovations, with a fifth (22.2%) engaging in some form of mechanical use. For school 'N' all teachers were engaging either in expert (66.6%) or mechanical use (33.3%) of the RLN related interventions. For schools 'M' and 'S', however, usage was much more concentrated at the bottom end of the scale. For instance, nearly half of staff in school 'M' (45.5%) were not using the innovations at all, with just over a third (36.4%) preparing to use them. For school 'S', 44.4% of staff were either not using RLN-related innovations, or preparing for their use. A third of school 'S' staff were engaging in mechanical use which just a fifth (22.2%) were engaged in expert level use.

Ideally we would be able to explore the relation between the density metrics of each school with the RLN innovation use scores presented in Table 2. This would then provide a measure of the extent to which more intense interaction led to more expert use of innovations. A direct comparison between the two however isn't possible. This is because the density metric looks at the network as a whole, while the levels of use scale relates to individual behaviour. An alternative is to use the degree centrality of respondents in each school as a proxy for density. The metric 'degree centrality' provides an indicator of the number of people who are connected to an individual.



Generally speaking, we would expect that higher degree centrality among school staff would lead to a higher density overall. This is because higher degree centrality means that more people are connected to individuals; while density looks at the proportion of all possible connections that are actually happening. Using this metric as a proxy measure for density does indeed show that a mix of conversation, professional development and collaboration is a significant predictor of the use of RLN innovations by school staff (here,  $F = 4.694$ ,  $p = .009$ , so this relationship can be considered significant); whereas just conversation is not (with  $p = .245$ ).

**Table 2: To what extent are school staff using the new approaches to teaching and learning relating to the RLN?**

School	Use type	N(=9)	S (=9)	C (=9)	M (=11)
I have little or no knowledge of these practices and no involvement with them	No use	0%	11.1%	22.2%	45.5%
I am preparing for my first use of these practices	Preparing for use	0%	22.2%	0%	0%
I have recently acquired or are acquiring information about these practices and/or have recently explored or am exploring their value and their demands for both myself and students		0%	11.1%	11.1%	18.2%

I am focusing most effort on the short-term, day-to-day use of these practices with little time for reflection	Mechanical use	11.1%	0%	11.1%	9.1%
I am now regularly using these practices and am confident in my ability to do so		22.2%	33.3%	0%	9.1%
I am varying the use of the innovation to increase the impact on students within my immediate sphere of influence (e.g. my class or similar). Variations are based on knowledge of both short- and long-term consequences for students	Expert use	11.1%	0%	11.1%	0%
I am combining my own efforts to use the practices with the related activities of colleagues to achieve a collective impact on students within our common sphere of influence (e.g. in a year group)		44.4%	11.1%	33.3%	0%
I am re-evaluating the use of the innovation, and am seeking major		11.1%	11.1%	11.1%	9.1%

modifications or alternatives to achieve increased impact on students, and I am exploring new goals for myself and the school.					
Other (please specify)		0%	0%	0%	9.1% <sup>±</sup>

<sup>±</sup> ‘Refinement of the research focus’

### Further findings and discussion

From Figures 1 and 2 and Table 2 it can be seen that something is driving, within schools ‘N’ and ‘C’, a more collaborative interactive approach that ensures staff go beyond just the simple exchange of information, to engaging in behavior that is likely to help them develop as expert users of these new practices; with this behaviour, in turn, ensuring that innovations are continually refined in order to maximize their impact for children and young people. Below we consider possible options for this, including: the approaches taken by schools to distributed leadership, the power of existing within-school networks and whether participants were best placed to mobilize innovation.

**Distributed leadership:** It was shown above that the interview data revealed three approaches to distributed leadership, directed at mobilizing outputs of the RLN: DL1, DL2 and DL2+. In the first of these models, DL1, (School ‘S’, ‘M’ and ‘O’) RLN participants were responsible for developing new approaches to teaching and learning and then for encouraging their adoption by others. With DL2, (school ‘N’) all teachers were empowered to make decisions in relation to new teaching and learning practices, but teachers participating in the RLN were responsible for facilitating this process. In

school 'N' the DL2 approach was delivered using a learning conversation-type process within a professional learning community. The DL2 process in school 'N' was also focused on a specific issue, whole-school and collective in nature, and followed a straight line pathway; leading from knowledge and discussion to trialing and embedding. With DL2+ (school 'C'), RLN participants acted to facilitate a cycle of enquiry within their school. Here individuals and small teams each had their own foci, situated within a broader common theme, and were supported to engage in a process of iterative exploration in relation to this focus. While each model is clearly different, each has the potential to facilitate expertise as long as they enable types of collaboration that move beyond just the sharing of information and advice, to the active trialing of new teaching practice. At the same time, the data above seems to indicate that models of distributed leadership that *actively* involve staff in decisions about what innovations to adopt and how to adopt them, are more successful in getting staff to: 1) **actually engage** with innovation; 2) really **test out how new practices can be used** to improve teaching and learning, and; 3) **continue to use** and refine practices in an ongoing way.

This does not necessarily mean that DL1 approaches are ineffective, but it is clear from the interview data that if they are to work then two things need to occur. First, distributed leadership will only be successful when school leaders ensure that effective interaction occurs (Hairon & Goh, 2015). The interview data from school 'S', for instance, indicated that this clearly wasn't happening, meaning that approaches to distributed leadership were breaking down. Of course observation data in terms of what was happening within schools would have been helpful here to provide an additional perspective how approaches at DL were being actualized.

Second, distributed leaders need the capacity to lead (Hairon & Goh, 2015). For DL1, this capacity involves championing ideas, illustrating their relative benefits and persuading others to adopt them. This means that a DL1 distributed leader has to have confidence, the presence, and the understanding of (and ideally experience in) approaches to effective change management. If these things are lacking it seems unlikely that interaction alone will lead to the future adoption of an innovation. This requires school leaders to select their distributed leaders wisely, but also to support them in developing the skills they need to undertake their role effectively.

It should also be noted that, since the data suggests that DL2 is marginally more effective than DL2+, it may not be necessary for teachers to mirror the type of cycle of enquiry approach that occurs within PLNs, such as Research Learning Networks. Rather, discussing the knowledge and practices emerging from the PLN and how best such innovation can be used in specific settings, before engaging in a collaborative process of trial and refinement is enough. Alternatively, we might expect it to take longer for a cycle of enquiry-based approach to reach a situation in which new practices are trialed and adopted. This is because such an approach is likely to involve the additional steps of data analysis and of staff engaging with research to explore what is currently known, which are lacking from DL2. Furthermore, since in school 'C', staff could work individually or in teams, this may account for the instances of 'just' conversation (occurring between project teams) and collaborative engagement (occurring within project teams). The relative success of DL2 over DL2 + may also, however, be related to capacity. For instance, whether participating staff have the ability to successfully lead a cycle of enquiry and to keep such a process on track. For example, the following quote by teacher #3, illustrates that sometimes the cycle of

enquiry approach could often lead lots of cyclical moves and perhaps not enough forward momentum: “the only thing I'm nervous about with that is sometimes we can bounce around a bit too much. I think we need to learn where that needs to sit. You [might] do something for a few weeks and you go, ‘No. Actually, I'll try this,’ [but actually] you've got to do it for a while to know that it's working, don't you?” Again, this brings us back to the role of school leaders in making sure participating teachers have the skills they need to do what is required of them.

**The pre-existence of strong work related networks within schools:** Another factor that might help account for the presence or absence of collaborative interactive relationships in relation to the RLN is whether strong work related relationships already exist within each school. Recalling the interview analysis above, for instance, the school leader for school ‘N’ (senior leader #1) suggested that her teaching assistants operated as a ‘tight unit’. As a result senior leader #1, felt confident that one or two could be targeted for communication, and that this would be quickly passed on to others. To explore the presence of existing networks within schools, survey respondents were asked ‘since the beginning of the school year, have you turned to any of the colleagues listed below as reliable sources of expertise in terms of teaching and learning?’. They were presented with a list of all the staff within the school and for each person named, respondents were then asked to indicate approximately how frequently they had interacted with that person; with response options ranging comprising: a) more than once a week; b) weekly; c) every two weeks; d) monthly; and e) less than once a month. To analyse the data, this frequency of interaction was divided into ‘High’ and ‘Low’. ‘High frequency corresponds to advice seeking interactions that occur every two weeks, weekly, or more than once a week; ‘Low’

frequency interactions correspond to advice seeking that occurs monthly or less than once a month. Exploring the correlation between the frequency of everyday work-related interactions and RLN-related interactions involving conversations, professional development and collaboration indicates that no meaningful relationship exists between the two. In other words, there is little evidence to suggest that the presence of strong pre-existing network activity in a school was required to ensure effective RLN-related interaction was undertaken by school staff. This implies that school leaders can ‘kick-start’ interactions within a school in order to support PLN-related DL.

**The nature of the participants:** To understand who might be best placed to mobilize innovation within a school, we can consider what is referred to as the ‘centrality’ of individuals within a network. For example, centrality (more specifically, ‘in-degree centrality’) can represent the number of people who go directly to someone for work related expertise or advice. The concept of centrality is clearly linked to the successful implementation of change, especially when it comes to the DL1 approach to distributed leadership. This is because teachers who are trusted to provide effective advice and support in relation to teaching and learning - essentially those who are already acting informally as distributed instructional leaders - will be better placed to encourage the take-up of innovation than those who are not.

Considering another measure of centrality - betweenness - is also useful because the more ‘betweenness centrality’ an individual has, the *better placed* they will be (compared to their peers) to reach all individuals in their network. This means that someone with high centrality and high betweenness has both the power and the access

to mobilise innovations. 'Flow betweenness', meanwhile, represents the extent to which individuals *impact collective decision-making*. In other words, if an individual is involved in a multitude of information or social capital pathways, then it is assumed they are able to influence what 'flows' along those pathways and so the how specific information or social capital is used by others (Glegg, Jenkins, & Kothari, 2019). Someone with high centrality, high betweenness and high flow betweenness therefore has the power, the access and the ability to influence whether and how innovations are adopted. These three measures of centrality are, to an extent, thus analogous to the notion of distributed leadership discussed above. Here, distributed leadership was seen to result from school leaders deciding to: 1) empower individuals to lead; 2) provide them with the opportunity to interact with others; and 3) build individuals' leadership capacity (Hairon & Goh, 2015). In this case, however these three characteristics provide an indication of the informal ability of individuals to influence others within an organization (i.e. the influence they possess without being empowered by school leaders). When it comes to distributed leadership an ability to influence is vital. This is because, even in collaborative situations, those who are more influential will ultimately steer decision making if they are: 1) **accepted** as leaders; and 2) if they are **able to impact on a range choices and/or actions** through **engaging with numerous others** throughout the school.

In Table 3, the relative centralities for individuals are presented, meaning it is possible to ascertain whether those engaging in the RLN appear most appropriate to do so. In other words, to assess whether those selected to be RLN participants are also likely to be the most effective distributed leaders. Starting with school 'N', it can be seen that both teacher and senior leader participants had substantially higher centrality scores



across all three measures; meaning both teacher #1 and senior leader #1 were seemingly well placed to lead the mobilization of RLN related innovations. In this case by leading their colleagues through a learning conversation-type process that resulted in the trial, refinement and use of new practices. The data for School 'M' is interesting because, although the degree centrality is higher for RLN participants than non-participants, the betweenness and flow betweenness scores are lower. This suggests that, while the two RLN participants do seem to have relatively more power than others to affect change, they are not relatively more able to either reach or strongly influence the entirety of the staff in their school. This indicates informal power is somewhat diffused across school 'M's staff which, in turn, means the ability of the RLN participants to really lead whole-school change could be hampered by those with stronger relative centrality measures, wishing to put forward alternative courses of action. This danger is particularly pertinent since, in the interview data, school 'M' was described as having a *lassaiz faire* environment in which, 'whoever shouts loudest' was most likely to get encouragement and buy in for their ideas. The data for school 'C' likewise highlights there is room for improvement. Here one participant (senior leader #3) displays relatively higher centrality than her colleagues; teacher #3, meanwhile, seems less well placed to lead mobilization activity and perhaps in future an alternative participant may better situated to take charge of RLN-related change. For school 'S' however, centrality scores were universally low; this suggests that any participant from the school would have struggled to connect and influence others.

**Table 3: The relative 'centrality' of RLN participants**

	<b>Centrality Measure (Glegg <i>et al.</i>, 2019)</b>		
	<b>Centrality</b>	<b>Betweenness</b>	<b>Flow Betweenness</b>
Implication for Mobilising Innovations	Seen as an indicator of visibility, prestige or power resulting from lots of direct contact to many others	A proxy for control of mobilisation processes; high values equal a favourable positions for info flow	Used to determine contributions of individuals toward team decision- making
<b>School 'C'</b>			
Senior Leader #3	.156	.033	2.27
Teacher #3	.125	.015	1.71
Other Staff ( <i>n</i> =7)	.063(.075)	.020(.039)	2.27 (4.3)
<b>School 'M'</b>			
Senior Leader #4	.294	.007	2.57
Teacher #4	.353	.017	3.39
Other Staff  ( <i>n</i> =12)	.158(.225)	.049(.19)	5.39(18.97)

<b>School 'N'</b>			
Senior Leader #1	.344	.12	3.13
Teacher #1	.281	.082	6.23
Other Staff ( <i>n</i> =7)	.231(.055)	.021(.031)	2.20(3.14)
<b>School 'S'</b>			
Senior Leader #2	0	0	0
Teacher #2	.063	.005	1.81
Other Staff ( <i>n</i> =7)	.009(.021)	0(.001)	0.18 (0.57)

## **Conclusion**

Effective mobilization leads to more than school staff simply knowing about an innovation; it also leads them using the innovation. To truly change how they teach, school staff should develop as experts in relation to new forms of practice. Effective mobilization should therefore result in school staff exhibiting expertise. With this in mind, combining the interview and questionnaire data suggests that the different approaches to distributed leadership used by senior leaders have variable levels of success. In particular, the DL2 approach seemed most impactful. Here RLN participants facilitated a collective and collaborative process of knowledge sharing, decision making and the trial and refinement of practices. This was based on what occurred within the RLN and seems to result, ultimately, in staff using these practices in a more expert way. This does not necessarily mean that DL1 or DL2+ are fatally flawed, however. Instead, what a distributed leadership lens helps to illustrate, is that such an approach to mobilizing innovation is only likely to be effective if support is provided by senior leaders. In particular, support to encourage meaningful interaction between colleagues, or if senior leaders build the capacity of RLN participants to manage change, brokerage, or cycles of enquiry. Had this been the case for the schools examined in this study, then the survey results may have been very different. But it is also clear that the DL2 process was aided because RLN participants from school 'N' were very much central to their school's network and so able to deliver that model as distributed leaders. More so, in fact, than participants from other schools. As a result they had the power, reach, and influence to act as effective distributed leaders. At the same time, while RLN participants' centrality in a school

network is key, school networks do not have to have a history of strong interaction for successful effective RLN-related collaboration to subsequently occur.

In finishing, we suggest that the empirical significance of our work comes from its novelty, since our analysis has enabled us to explore and shed light on a hitherto under researched area. At the same time our work has meaningful practical merit. In particular, by: 1) exploring the effectiveness of different approaches to distributed leadership; 2) by considering who should be involved in DL processes and what skills they might require; and 3) by investigating whether pre-existing network conditions matter, we believe our analysis provides substantive food for thought for school leaders in terms of how to support the mobilization of PLN-related innovations using distributed leadership approaches. Moving forward, however, we suggest that a next step should be a larger scale intervention and evaluation research project that would enable the testing of these claims in terms of their impact on teaching practice and student outcomes.

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