Symposium: From Tensions to Opportunities: Evidencing Mathematics Leadership

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This symposium offers insights into the leadership enacted by those who lead the mathematics education professional learning of in-service teachers in schools. We provide evidence of mathematics leadership practice as a way of contributing knowledge to this undertheorised area of mathematics education research. Three separate accounts of mathematics leadership are reported, with two focused on leading enacted in primary school settings, whilst the third paper highlights the support offered to rural and regional mathematics leaders through a sector-wide leadership network initiative.

Although separate accounts of leadership are presented, each paper is connected through the ways that tensions in practice provided opportunities for mathematics leaders to develop leading practices within the spaces in which their leadership was enacted. In this symposium, the relational dimension of mathematics leadership is highlighted, providing evidence of the critical role that relationships play in the ways that mathematics leadership responds to tensions as opportunities for practice development.

The format of the symposium is as follows:

Chairs: Matt Sexton and Ann Downton.

Paper 1: *Evidencing How Primary Mathematics Leaders Balance the Supports and Challenges of Their Role.*
Kate Copping & Natasha Ziebell.

Paper 2: *Evidencing Mathematics Leadership as Relational and Developmental Activity.*
Matt Sexton & Ann Downton.

Paper 3: *Evidencing Sector Leadership for Mathematics Leaders Working in Rural and Regional Schools.*
Bernadette Pearce, andrea O'Connor, & Lauren Gould.

Discussant: Peter Grootenboer.

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Evidencing Sector Leadership for Mathematics Leaders Working in Rural and Regional Schools

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We share our experience of establishing a network for primary and secondary mathematics leaders working in rural and regional Catholic schools in Victoria. We evidence the influence of our sector leadership that addressed a tension concerning the leaders' work isolation through a network initiative. This network initiative was in response to the leaders demands for establishing a way to connect and to learn from and with one another using evidence-based mathematics learning and teaching practices.

For decades, a tension in mathematics education has existed that sees urban school students outperforming rural and regional students in mathematics (McConney et al., 2018). The Organisation for Economic Co-operation and Development (OECD, 2013) reported that according to the Programme for International Student Assessment (PISA) 2009 results, urban students outperformed rural students in every country that participated. On average urban students outperformed rural students by up to half a year of schooling (Lamb et al., 2014). Contributing factors to the widening gap include staff access to quality professional learning and educational resources (Murphy, 2018). For staff working in rural and regional schools, these factors cause another tension that problematises this situation further. These schools are faced with the challenge of attracting talent from urban communities, retaining the best talent over time, and conquering the tension of distance (Hargreaves et al., 2015).

Literature Background

The greatest in-school factor for improving student learning and achievement is teacher quality (Hattie, 2009). Fullan and Hargreaves (2012) discussed the benefit of building professional capital of teachers and leaders by investing in leadership through the provision of high-quality professional learning (PL). Opportunities are required to build and share knowledge, and provide feedback in communities characterised by relational trust, strong collaboration, and a shared vision to improve student outcomes. Unfortunately, access to quality PL and opportunities to connect and network with colleagues from other schools is a significant challenge for rural and regional teachers and leaders (Hargreaves et al., 2015).

Networks provide a platform for educational leaders to connect and collaborate through the delivery of high-quality PL to build professional leadership practice (Hargreaves et al., 2015). Rincón-Gallardo and Fullan (2016) highlighted the importance of three shifts needed in relationship between network participants and sector leaders for the establishment of successful networks. These shifts are critical to ensure the sustainability of any network. Figure 1 captures the shifts as reported by Rincón-Gallardo and Fullan (2016).

Figure 1

Required Shifts in the Relationships Between Networks and Sector Leadership

However, the effectiveness of networks measured through improved system-wide student learning outcomes is varied and is dependent upon how the network facilitates effective collaboration and relationships driven by a shared purpose (Rincón-Gallardo & Fullan, 2016). Figure 2 presents a summary of the eight Essential Features for effective networks that support the successful implementation and impact of professional learning features.

Figure 2

Eight Essential Features Required for Effective Networks (Rincón-Gallardo & Fullan, 2016, p. 10)

The eight features provide guidelines that support the development of an educational network by building relational trust that facilitates effective collaboration between system and school leaders. Relational trust is especially highlighted in features 2, 3, 4, 5, 6, and 7.

Our Response to the Tension

Catholic Education Sandhurst (CES) has been intentional in engaging with research literature concerning middle leadership and mathematics education as a tool to support innovation and improvement in student learning outcomes. In response to that literature and using the work of Rincón-Gallardo and Fullan (2016), CES sought to create a network for mathematics leaders working in the diocesan primary and secondary schools. One intention of the network was to provide opportunities that developed mathematics leadership practice through networking and relationship building. This was done in response to the tension of work isolation, which was compounded by the effects of the COVID-19 pandemic that faced the mathematics leaders working in schools within the CES diocese.

The establishment of the Sandhurst Numeracy Leader Network (SNLN) in 2021 aimed to provide CES mathematics leaders access to quality mathematics PL and to support the formation of a professional network between leaders, professional organisations, and mathematics educators working in universities. In essence, the SNLN intended to impact students' mathematical achievement by developing the professional practice of mathematics leaders so they could lead improvement in mathematics teaching practice in their schools.

During the formation of the SNLN, a steering committee was developed to set goals and develop a shared vision for the network. The steering committee included CES staff members, mathematics leaders working in diocesan schools and a mathematics educator working in a Victorian university. The formation of this steering committee was informed by Essential Features 6 and 7 for effective networks (Rincón-Gallardo & Fullan, 2016).

As a way of supporting the implementation of the SNLN, mathematics leaders were included in nominating content of the PL, making the content more demand driven and learning-oriented (Rincón-Gallardo & Fullan, 2016). CES staff developed a needs analysis tool as a way of collecting data, used to inform the content and implementation of the SNLN workshops. Workshops were a combination of virtual and face-to-face PL opportunities, used to address the tension of work isolation whilst focusing on mathematics leadership and teaching

practice development. In this paper, we evidence the influence of the SNLN drawing on data about the perceptions of mathematics leaders who have participated in the network.

Methodology

We draw on data from workshop feedback provided by 30 primary and secondary network participants who engaged in middle leadership of mathematics in CES rural and regional schools. Data were gathered using open response questionnaires. Participants were provided with prompts asking them to comment on new learning and actions they will take up as mathematics leaders in their schools. Using the features of effective networks (Rincón-Gallardo & Fullan, 2016), a coding scheme was created to support the deductive analysis approach that was used to generate evidence of those features in the mathematics leaders' responses. Workshop data were also read and coded using an iterative inductive approach that supported the development of themes that captured the leaders' perceptions.

Results and Discussion

Four key themes were generated from the data analysis which are presented in Table 1.

Table 1

Data Excerpts of the Mathematics Leaders Responses Aligned to the Themes

Themes	Essential network feature	Evidence of responses from mathematics leaders
Engaging in interactive opportunities to learn with other leaders	5, 6 & 7	Being able to engage with a [mathematical] task with other [mathematics] leaders from different settings
		Having time to dissect task with others to identify the maths involved, the possibilities for extension and enabling
		I was able to collaborate with a colleague that is further along the journey than I! Helped clarify next steps
		Great to listen to other leaders explain their journey with their MLAP [mathematics leadership activity plan]. Gave us some ideas
Developing strategies for mathematics leadership	4	Looking at the Data to help guide our planning, it's ok to start with a small team [of teachers] before trying to implement whole school [improvement]
		In planning sessions, being mindful to spend time explicitly planning for [differentiation] prompts. Also have teachers 'become the learner' with rich tasks so they feel confident to transfer this to the classroom
		Ensuring I am continuously meeting with my [executive leadership] team and referring back to data to inform our practice
Planning for leadership of school-based professional learning	1 & 4	Think more deeply about common student misconceptions with tasks and plan for them more explicitly
		Continue to work with staff on developing the use of open/challenging tasks and how we can enable and extend students
		Model/use the differentiation planning sheet to support staff PCK
		Using MLAP to develop goals and planning
Having access to resources to support leadership	8	The MAAP tool [mathematics task analysis document] is so useful for discussing the possible avenues that the task can take a learner
		I really enjoy activities where we get to trial a task. I want to do more of this with my teams at school
		Love the Jigsaw protocol, something I wish to incorporate into my learning leader meetings moving forward
		Add the MLAP tool to team meeting

Along with those themes, links to network features (Rincón-Gallardo & Fullan, 2016), and data excerpts (quotes from mathematics leaders) are also reported. The responses are illustrative

of how the SNLN provided opportunities for mathematics leaders to interact with and learn from each other to build their skills and expertise to enact this new learning with the teachers in their schools. This is evidenced in the theme of *Interactive opportunities to learn with other mathematics leaders,* suggesting to us that the SNLN responded in some way to the tension of work isolation by building relationships through networking. This highlights the importance of interacting and learning with others within network settings (Rincón-Gallardo & Fullan, 2016).

The data also suggest that the SNLN facilitated opportunities for mathematics leaders to focus on developing leadership strategies, allowing them to engage with executive leaders and teachers in their schools through leadership of mathematics PL. Focusing leadership work on school-based PL for teachers is central to the work of mathematics leaders (Sexton, 2019). It was also evident how the SNLN provided resources that mathematics leaders claimed they would use as part of their leadership. We interpreted this as another way of addressing the tension of work isolation as rural and regional staff members may have limited access to such resources compared to colleagues working in urban and metropolitan schools.

Conclusion

The establishment of the SNLN stemmed from a tension brought on by work isolation. It presented opportunities for our CES leadership to bring together geographically diverse mathematics leaders through networking as a relationship building initiative. We have evidenced enactment of the essential features of networks using data concerning perceptions held by the mathematics leaders. This small study provides opportunities for future research into the key features of successful networks and how they address tensions that exist in rural and regional settings. We had the opportunity to support mathematics leaders to connect, collaborate, and engage in mathematics leadership PL, but more importantly, influence relationships between the leaders as a response to the work isolation tension they faced.

Acknowledgements

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