PROFESSIONAL LEARNING NETWORKS IN DESIGN-BASED RESEARCH INTERVENTIONS

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In the current international policy environment, teachers are viewed as learning-oriented adaptive experts. Required to be able to teach increasingly diverse sets of learners, teachers must be competent in complex academic content, skilful in the craft of teaching and able to respond to fast changing economic and policy imperatives. The knowledge, skills and attitudes needed for this complex profession requires teachers to engage in collaborative and networked career-long learning. The types of learning networks emerging to meet this need comprise a variety of collaborative arrangements including inter-school engagement, as well as collaborations with learning partners, such as universities or policy-makers. More understanding is required, however, on how learning networks can deliver maximum benefit for both teachers and students.

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BY

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emerald PUBLISHING

United Kingdom – North America – Japan – India
Malaysia – China

Emerald Publishing Limited
Howard House, Wagon Lane, Bingley BD16 1WA, UK

First edition 2022

British Library Cataloguing in Publication Data
A catalogue record for this book is available from the British Library

ISBN: 978-1-78769-724-9 (Print)
ISBN: 978-1-78769-721-8 (Online)
ISBN: 978-1-78769-723-2 (Epub)

ISOQAR certified Management System, awarded to Emerald for adherence to Environmental standard ISO 14001:2004.

Certificate Number 1985
ISO 14001

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CONTENTS

About the Authors xi
Dedication xiii

1 Professional Learning Networks in Design-based Research 1
Our Contribution and the Organisation of the Monograph 5
What is a PLN? PLNs in Practice-embedded Research Approaches 7
The LSM 11
Key Theoretical Concepts of the Model 17
Outcomes of the Model 19

2 The Multiple Purposes of Networks 23
Purpose One: Establishing the Partnership 25
Purpose Two: Sites for Design and Redesign 29
Purpose Three: Sites for PLD 31
Purpose Four: Sustainability 34

3 The Features of Networks 39
Features of Networks: Structure, Composition, Focus and Content 40

Structure and Composition of PLNs. 44
Theorising the PLN Structure and Composition 48
Focus and Content of PLNs 49
Knowledge-sharing Across PLNs 52
Reducing Risks 54
Variations in PLN Across Applications of the LSM 58
Local Variations and Fidelity 58
Examples of Variations 59
Discussion of Content: Cultural Variations in Effective Discourse 59
Structural Variations 61
Variations in Composition 62
Role of the Researcher in PLNs 65

4 Constraints and Enablers for Setting Up, Sustaining and Using Networks Within a Design-based Research Framework 71
Policy Level Enablers and Constraints: Pressure and Support; Access and Availability 72
Policies That Enable and Constrain Networks 72
Policies That Enable and Constrain Data and Data Systems 76
Policies That Enable and Constrain Analysis of Data 80
Concluding Comments About Policy 83
School Organisation Enablers and Constraints 86

5 The Future of PLNs 91
PLNs and DBR 92
Defining PLNs in DBR 92
Contextual Considerations 93
Understanding the Relationship between PLNs, Valued Partnership and Student Outcomes 94
The Role of Knowledge in PLNs Focussed on Data Use 97
System Challenges 98
Variability and the Conundrum of Local Adaptation 98
Sustainability, Scalability and Capability Building: A Life Cycle Approach? 100
Risks 102
Digital Multipliers 105
Concluding Comments 108

References 109
Index 123

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DEDICATION

To our school and community partners.
To our families and to those who have become our family.
To our Learning Schools Model co-designers.

1

PROFESSIONAL LEARNING NETWORKS IN DESIGN-BASED RESEARCH

Professional collaboration has long been promoted as a strategy for improving a range of educational outcomes, from strengthening teaching practice to the improvement of valued student outcomes (Hargreaves, 2018). Many forms and incarnations – professional learning communities (PLCs), communities of practice, networked improvement communities to name a few – have led to refinements on what constitutes a collaborative professional community and how such communities can improve educational processes and outcomes.

A more recent emphasis is on the networks of professionals outside of their everyday sites of practice (Brown & Poortman, 2018a). Various arguments for the importance of these professional networks have been proposed: to meet the demands of an increasingly complex and fast-changing school context by continually honing teachers' knowledge and skills post-initial training (Stoll, 2010); to solve complex educational problems that cannot be solved by individuals

or individual institutions (Lai et al., 2020); and to accelerate the pace of teacher learning (Bryk et al., 2015). These arguments often draw on different theoretical frameworks, from social capital theory to collective intelligence with different frameworks of analysing and understanding these networks such as the use of social network analysis. But the claim made is similar – these networks have the potential to significantly improve educational processes and outcomes.

The significance of networks is widely recognised beyond schools and educational jurisdictions. Contemporary analyses argue for their historical significance and that we may have misjudged their significance by not understanding the role of networks as distinct from other kinds of social organisations, notably hierarchies of power (Ferguson, 2017). They also argue that going forward digital environments provide the possibility of greatly enhanced assemblies of networked collective intelligence (Mulgan, 2018). These aforementioned accounts emphasise two properties of the purposes of networks which adds to the idea of other kinds of learning communities. One is that networks are the means to harness a collective's time and energy to be more effective; and when well-designed, the whole is greater (is more effective) than the sum of each of the parts.

While the focus on networks appears a promising way for effective educational improvement, such networks are not yet the norm (Daly & Stoll, 2018), and there is still much that needs to be known about them. Daly and Stoll (2018) identify several gaps in the current knowledge of such networks, two of which are most salient to this book. Firstly, there is a need for conceptual clarity on what counts as a professional 'network' and how such networks should be defined. We discuss conceptual issues specific to design-based research (DBR) methodologies later in this chapter. Secondly, there is a need to examine both the depth and breadth of learning in

such networks including how to facilitate networks that will produce the depth of leaning.

A third gap in the field relates to the finding from an early seminal work in the field of PLCs. Bolam et al. (2005) concluded that the practical implications for developing such communities can only be understood and worked out in the specific conditions of particular contexts and settings. That is, how a community is enacted in a specific context is highly dependent on the context itself, and dependent on how partners shape these contexts though various interactions with each other within and across contexts, as described in ecological systems theory of development (Bronfenbrenner, 1979). Thus, a network of professional communities is shaped by the wider political and social context, its national educational policy and the specific school or local community in which the community of professionals are located. This means that research with networks needs to generate rich case studies designed within a specific context (Lai & McNaughton, 2018). Systematic descriptions can reveal how contexts provide both affordances and barriers to setting up such communities. These descriptions help uncover what is generalisable and what is context-specific; both of which will support the development and sustainability of communities in other contexts. Recent scholars have brought together volumes attempting to understand these networks across contexts (see e.g., Brown & Poortman, 2018b).

Finally, networks can not only be employed in a variety of ways depending on their context, but also understood using different theoretical frames and investigated using a variety of different methodologies. The methodological and theoretical framing constrains and explains what counts as a network and its functions. The framing we use in this monograph draws primarily on DBR (Anderson & Shattuck, 2012) which sits under the umbrella of what we

call 'practice-embedded research approaches' (Lai et al., 2020). Practice-embedded research approaches are the suite of research approaches which have, in various degrees the following elements:

> *embedding research in problems of practice, building and sustaining research–practice partnerships, attending to both innovations and their implementation, and the use of mixed methods involving rigorous, multiple iterations using data. (Lai et al., 2020, p. 7)*

We illustrate what is a 'practice-embedded research approach' with a study by Lai et al. (2014). The study reported on an intervention to improve adolescent literacy and increase the attainment of secondary school qualifications. It is considered to be a practice-embedded research approach for the following reasons: It is a partnership with and for schools to address a pressing problem of practice that schools in the intervention want to solve, that is, to increase literacy levels and increase the attainment of secondary school qualifications. It is a partnership where researchers and school practitioners collaboratively examine data to co-design instruction to solve the pressing problem. Mixed methods are used throughout (statistical analysis of student achievement, qualitative and quantitative analyses of teacher observations, etc.). Finally, iterative cycles of analysing data within and across years are used to test the efficacy of the intervention and its implementation. In the example above, the practice-embedded approach frames and constraints networks and their functions in the following ways: networks are conceived as partnerships between researchers and practitioners. Their aims are derived from the joint problem-solving and co-design, and the activities of the network correspondingly are to enact these aims.

OUR CONTRIBUTION AND THE ORGANISATION OF THE MONOGRAPH

In this monograph, we address the growing need for a theoretical and practical account of how to develop and utilise networks effectively within specific contexts. We focus here on what we identify as professional learning networks (PLNs) and present a theoretical and practical account of how PLNs based on collaborative analysis of data can be integrated into DBR to improve practice and contribute to research knowledge. The monograph draws on a research intervention developed, applied and replicated across contexts over 16 years, the Learning Schools Model (LSM) (e.g., Lai et al., 2020). The Model is a whole-school intervention that involves researchers and practitioners (e.g., school leaders and teachers) working in partnership to co-design solutions to solve shared and urgent problems of practice (e.g., improving low literacy levels). It aims to solve pressing school problems while advancing research knowledge, and draws its theoretical and methodological roots primarily from DBR. We describe the Model more fully later in this chapter.

The contribution here goes beyond synthesising descriptions of networks from previous writings about the Model. In this monograph, the LSM is used as a specific case by which to understand how networks relate to a particular research approach and how that research approach influences the ways networks are conceptualised, designed and enacted. It is used to explicate the contextual factors (e.g., government policies) that influence a network design, and to consider the future of researching educational networks, including how they might best address wider educational system challenges such as the challenge to build teacher and school leader capability in a sustainable way. In this way, the monograph is not a prescriptive one-size-fits-all model of how to design networks in DBR.

Rather, it discusses the constraints and enablers of the context that influence how networks might be implemented across different contexts with examples of how, despite variability and adaptation fidelity to the design, principles can be met.

In order to develop our framework for how networks can be used in DBR, we start by acknowledging the gaps in the existing knowledge-base, in particular conceptual clarity on what constitutes a network and how configurations relate to depth of learning (Daly & Stoll, 2018). To aid conceptual clarity, we re-examine what counts as a network for the purposes of design-based research; and the depth and breadth of PLN learning in DBR in relation to who learns what and how learning is associated with improvements in achievement.

We begin by discussing the concept of what counts as a 'network'. We then introduce the case study of the LSM, summarising its impact on student learning outcomes and knowledge-building over the years. The multiple purposes of the networks within an overall DBR framework are contained in the second chapter. In that chapter, we discuss the following purposes of networks: as the means to develop the partnerships required to design and enact the research, as sites for professional learning and development (PLD), as vehicles for designing the research and as the means for sustainability. These purposes are situated within various theoretical approaches to DBR approaches and networks. The third chapter describes the features of networks (e.g., their structure and content) that achieve these multiple purposes. This includes examining how various networks can demonstrate fidelity to the general structure of effective networks while adapting to local variations. The last two chapters focus on constraints and enablers of setting up and using networks within a DBR framework, and future directions in utilising networks within DBR to address wider educational system challenges.

WHAT IS A PLN? PLNS IN PRACTICE-EMBEDDED RESEARCH APPROACHES

A PLN is a concept commonly applied to a working community of professionals. However, the term 'PLN' is contested in the current literature, and there are calls for greater conceptual clarity to progress research in this field (Daly & Stoll, 2018). A common definition, and one used by the editors of this monograph is

> *any group who engages in collaborative learning with others outside of their everyday community of practice (Wenger, 1999) in order to improve teaching and learning in their school (s) and/or the school system more widely. (Brown & Poortman, 2018a, p. 2)*

The definition we use here is broadly similar to that of Brown and Poortman's. However, we position and understand our definition within the practice-embedded research approach to networks and within our specific approach in the LSM.

The first key influence on our understanding of networks draws from the goals on practice-embedded approaches. Practice-embedded research approaches have partnerships at their core of their designs (e.g., Anderson & Shattuck, 2012; Snow, 2015), albeit how partnerships are conceived and what aspects of these partnerships are foregrounded vary. Three prominent examples are: practice-embedded educational research promoted by the Strategic Education Research Partnership (Snow, 2015), improvement science (Bryk et al., 2015) and DBR (Design-based Research Collective, 2003); the latter two being the basis of the LSM are described further in this book. These partnership approaches have been developed in part to reduce the known gap in mutual influence between

research and practice and to enable greater contributions to educational effectiveness (Snow, 2016); making the boundaries between research and practice more conducive to mutual learning. In this way, research is not something external and done to the school, but something that a school engages in with researchers to solve pressing problems of school practice.

Applied to PLNs, one could argue that the intent of such designs, particularly in the LSM, is *not* to maintain the divisions between an inside (e.g., school) and outside (e.g., researcher) communities. Rather, to develop overlapping and embedded communities within and across schools whose boundaries are porous and dynamic, and membership is multi-layered. A critical meaning of being partners, particularly in the LSM, is to remove the traditional distinctions of membership (school as insider; researcher as outsider) to enable the co-design of interventions to address common goals. At its most encompassing then, the partnership is an overarching community that is made up of smaller embedded communities from within school(s) and from across school(s). In this conceptualisation, the spatial analogy is not inside and outside but it is successive levels of functioning like concentric circles with each circle a fractal of the other (discussed in Chapter 3).

The second influence in our work relates to the specific context in which the LSM is embedded. In our work, our Model has been informed by indigenous Māori theorising (Kaupapa Māori principles). What has contributed to our thinking is the concept of 'whānau (extended family) of interest' (Smith, 1999), where researchers and educators with their local communities function like an extended family. The metaphor draws attention to the reciprocal obligations, rights and roles that are similar to those operating in an extended family. Each community is developed to function like an extended family.