



Leading Lateral Learning: Learning and Change Networks and The Social Side of School Reform

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Executive Summary

This report springs from a year's exploration into how schools in New Zealand, working in a self-managing and often competitive system, might best work together as networks to improve student learning. If educational change is socially constructed, then the success of an initiative depends on the social fabric of the group undertaking change. This study examines a particular model of school networking called the Learning and Change Networks (LCN), a student engagement strategy co-administered by the Ministry of Education and the University of Auckland in which networks of schools and their communities partner with students to improve their learning environments. Using a mixed methods case study approach involving 9 of the 53 networks involved in the LCN strategy, this report explores this question: *In what ways do the social networks of Learning and Change Network leaders support or constrain educational change among participating schools?* Specifically, how do trust, collegial critique (challenge), and patterns of distributed leadership support or constrain educational change in LCNs?

Recommendations

A common theme across these recommendations is that of ensuring rigor in network activity without compromising the development of ownership and capability within networks.

Model, or manufacture if necessary, teacher-level classroom observations across schools as an expectation for networks. The benefits of teachers gathering feedback about their practice are well-documented, and this report suggests that networks that have enabled teachers to lead network activities report higher levels of trust and potentially greater shifts in student engagement and learning. In short, teacher-led change can complement and be complemented by student and family-led change. Facilitators can create an expectation in networks of greater teacher collaboration across schools and can model how those collegial conversations might best be conducted to build trust and professional learning

Model, or manufacture if necessary, family/whānau engagement activities as an expectation for networks While the ethos and methodology of LCN aims is to have students, families, and whānau driving change, too often they remain passenger-seat navigators. Similar to involving teachers early on in decisionmaking, some leaders have been reluctant to authentically involve families in the initial “messiness” of forming the LCN, while networks that have worked closely with families and communities extol the shifts for students they have observed. Community engagement is one of LCN’s most evident successes as a strategy, and ensuring that networks are involving those supporting people more intimately from the outset of their work should be of high priority moving forward.

Create an expectation that networks will select common network-level measures. If networks truly want to advance from simply a group of schools to a cohesive network, then common measures are a necessary, though not sufficient, step that enables a common platform for conversations about student progress. While the facilitation approach of LCN emphasizes flexibility and ownership, requiring schools to agree on the process by which they will conduct evaluative work ensures some comparability within the network without compromising the agency of the network to determine its path. It also enables conversations and creates an evidence base that can more readily inform decisionmaking for the network and inform larger research and policy pursuits.

Commission mechanism research. LCN boasts a wealth of both quantitative and rich qualitative data from its networks as a result of both its methodology and its emphasis on networks’ submitting self-review evidence. These data alone cannot tease out the most effective components of the LCN strategy or the contexts in which certain components work. Commissioning “mechanism” research into the impacts of these components can clarify next steps for networks and inform international efforts. Unlike standard evaluation studies that test impacts at the level of a policy or program, a mechanism study tests the key mechanisms of action through which those policies or programs may impact student learning. Mechanism studies can help uncover promising practices for schools and networks that may be masked by less effective strategies or implementation challenges.

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Introduction

This report springs from the principle that educational change is socially constructed, that the success of an initiative depends in no small part on the social fabric of the group undertaking change. It is a principle that counters a widespread but flawed assumption about the nature of change: that if an outside expert presents overwhelming evidence of the case for change and how to change, people will change. History is littered with the shipwrecks of well-designed policies that have run aground on the shoals of that assumption. Often the reasons given for faulty implementation focus on physical or individual resourcing supports: resources like professional development, instructional materials, budgetary constraints, and even policy guidance documents. These factors are indeed important, but social resources, the capacity created through connection, can make or break an initiative. As the saying goes, it isn't what you know but who you know; however, who you know also determines what you know. The breadth and depth of communication about a program or policy between various groups at various levels of an education system determines the flow of information and, thus, how those groups approach the proposed change. A lack of expertise, a competitive culture that discourages information sharing, a lack of critique, or simply a dearth of professional relationships among the people at each level of an educational system can derail an initiative.

For a project as complex and ever-evolving as educational change, a better understanding of how to connect all of the people involved in an initiative can mean better implementation. Richard Elmore¹, Michael Fullan², and other scholars of school reform have evidenced the importance of building internal capacity and professional accountability within schools. Even schools or groups of schools with strong levels of individual expertise can compromise the ability of a school to make meaningful improvements by overlooking how to collectively channel that expertise. In a similar vein of work, Alan Daly of the University of California at San Diego has spent the last decade mapping the relationships governing schools and school systems in the United States and abroad, finding repeatedly that poor connections throughout a school system, not just within a school, can stymie educational reform.³

School Networking in New Zealand

This report springs from a year's exploration into how schools in New Zealand, working in a self-managing and often competitive system, might best harness the social side of school reform, focusing not at the level of individual organizations (e.g. schools, community groups, the Ministry of Education) but at the level of connections among individual leaders within those organizations. The past decade in school reform in New Zealand, and in many countries worldwide, has featured a series of school networking initiatives designed to coordinate schools' efforts for improving outcomes for students. Networking as a strategy for school improvement is no panacea: Too often, the transaction costs of schools attempting to work together have outweighed the benefits to student learning, sacrificing time and funding that could have been spent within schools for students.⁴ The question remains: under what conditions can schools collaborate for a whole better than the sum of its parts? How do the relationships among school leaders in a network influence the network's success in forging that more beneficial whole?

¹ Elmore (2005)

² Hargreaves & Fullan (2012)

³ Daly (2010), Daly & Finnegan (2012), and Daly, Liou, & Moolenaar (2014)

⁴ Timperley & Parr (2010), Sweeney (2011), and Robinson & Timperley (2002). See also Robinson's op-ed in the New Zealand Herald following the announcement of the Investing in Educational Success strategy (2014).

This report takes that premise, that we ignore the social side of school reform at our peril, and applies it in investigating how school leaders work together in a particularly comprehensive model of school networking called the Learning and Change Networks (LCN). It explores this question: *In what ways do the social networks of Learning and Change Network leaders support or constrain educational change among participating schools?* Specifically, how do trust, collegial critique (challenge), and patterns of distributed leadership support or constrain that educational change?

While about three-quarters of New Zealand's schools are currently involved in a collaborative school "cluster" initiative, working together on improving particular outcome areas for students, the LCN strategy is unique in its mission to equip whole communities as the leaders of those changes for learning. In LCN, networks of schools are fundamentally made up of all of the people involved in educating the students each school serves, both inside and outside a school's walls. By laying the groundwork for distributing leadership to the broader networks of support surrounding students, LCN leaders—usually principals, deputy principals, and lead teachers—play a unique role compared to that expected for typical school cluster initiatives, making LCN a particularly compelling case study on social dynamics and leadership. The LCN strategy aims to build capacity laterally and locally rather than centrally, supporting groups of schools in using their communities' shared expertise as they work toward improving student learning. Ultimately, LCN hopes to create the capability for the students within each network to work with the adults supporting them to self-diagnose and make improvements to the environment in which they learn.

How has that aspiration translated in LCN's implementation? A recent report from the New Zealand Initiative⁵ on the LCN strategy focuses on the key features of the strategy's design, and this report drills down into the detail of how network leaders are working together as they adapt that design. It evidences successes and challenges and makes recommendations as LCN concludes its contract and the schools involved continue to collaborate in the future. As New Zealand moves toward a new era in educational policy via the Investing in Educational Success (IES) initiative, there is much to learn from LCN as many of the nation's schools form Communities of Schools in the coming years. This report makes a case for explicitly evaluating how IES and related school networking policies influence and are influenced by the existing social fabric of schools and communities throughout New Zealand.

What is a Learning and Change Network?

The Learning and Change Network (LCN) initiative is a student engagement strategy, co-administered by the Ministry of Education and the University of Auckland, in which networks of schools, students, and their communities partner to assess the environment in which students are learning and make changes to that environment.⁶ LCN is one of five initiatives worldwide to be selected to participate in the Innovative Learning Environments (ILE) project, an initiative of the OECD's Centre for Educational Research and Innovation (CERI).⁷ As of July 2014, there were 53 networks, comprised of 286 schools and kura, or about 11 percent of the schools in New Zealand. The networks consist mostly of primary schools, but many networks also include early childhood centres and secondary schools to integrate vertically as a community. The LCN contract will likely come to a close in 2015 as the Ministry of Education moves its focus to the Communities of Schools

⁵ Patterson (2014)

⁶ See the LCN website (<http://www.education.auckland.ac.nz/en/about/learning-and-change-networks.html>) and explanatory materials on the Virtual Learning Network (<http://www.vln.school.nz/file/download/869114>) for a much more thorough treatment.

⁷ The ILE project aims to inform educational practice, leadership, and reform by supporting and documenting new configurations of teaching and learning for young people. See <http://www.oecd.org/edu/cei/innovativelearningenvironments.htm>.

initiative that springs from the Investing in Educational Success (IES) policy. Many LCNs are opting to become Communities of Schools, adapting their LCN work to the IES framework. At the time of this report's writing, the LCN provider team is working with the Ministry of Education to collect evidence of progress from networks and to parse National Standards data to determine the impact to date of the LCN strategy on student learning.

What is a learning environment?

Though LCN allows schools the flexibility to develop their own priorities and plan for change, all must focus their efforts on improving students' *learning environments*, the physical, social, cultural, and digital setting in which learning takes place. Phrased another way, it is the people, sites, and tools—and the connections among them—that make up the resources a student draws on for learning. For example, take Maia, a senior primary school student. In the course of a school day, Maia might read a bit of *The Hunger Games* before school, then head to class and work on some maths word problems with her friend Claire, getting some help from her teacher when they can't solve one. If her class has high-speed internet access, perhaps the girls check Khan Academy online for tips. The teacher might lead the class that afternoon in a discussion about World War I in preparation for their inquiry projects. After school, perhaps she goes to practice for the school play or helps her father take inventory at his store. After dinner, Maia might sit at the kitchen table at the family laptop and research her science project, ask her mother for help, and email a copy of her final presentation to her grandfather to share what she's learning. Perhaps she takes some time to help her younger brother with sounding out some words in his book before bed. All of these scenarios depict Maia learning, whether in a classroom or not, and all should be considered as areas where improvements might help Maia learn more effectively.

In contrast to an idea of learning as something that happens largely within a school classroom, the focus on learning environments contends that learning can happen anywhere, at any time, and from anyone, and that harnessing those broader learning influences can improve classroom learning. It is the what, where, how, and why of building knowledge. The theory of action underpinning the LCN strategy, and the OECD Innovative Learning Environments programme, is that improved learning environments will lead to improved student learning outcomes, and that if whole communities are empowered to drive that improvement process, then those learning environment improvements in turn drive whole community improvements. It is beyond the scope of this study to evaluate whether that theory of action has translated into improvements in learning, though this report does recommend that research be commissioned to evaluate the impacts on learning of the many mechanisms through which LCN operates. This report instead focuses on at the network leadership level, examining how the social influences on the learning environments of LCN leadership teams. By the same theory of action underpinning LCN, improvements to the learning (and decision making) environments of network leaders could lead to improvements in the effectiveness of a network of schools.

Who participates in an LCN?

Though LCN ultimately aims to improve learning environments for all learners, networks currently focus on improving learning outcomes for *priority learners*, traditionally students who have achieving below year-level as measured via National Standards; however, there is some inconsistency in that definition in practice. Maori and Pasifika students, students from low-income backgrounds or with special education needs, and English Language Learners are more likely to be represented in a school's priority learner population, but students outside of these groups may be included as well. Priority learners are thus the primary participants in LCN, and they are aided by leaders, teachers, parents, and others who support them in their learning.

Each LCN maintains a network leadership team consisting of principals, deputy and assistant principals, and “enthusiastic leaders,” teachers tasked with making and modelling classroom-level shifts for staff. Additionally, a few leaders from the group serve as “practitioner evaluators”, visiting other schools to conduct survey interviews with students, parents, and staff.

Participation in LCN is voluntary, and schools receive no additional funding for release time or other resources for participating. Schools fund the work from operational budgets or with time already allocated out of collective contracts. This is partially because a \$7 million budget spreads thinly when over 300 schools are participating and facilitation and other supports receive the bulk of the funds, and partially a strategic decision to recruit schools who are authentically motivated to join.

Principles of Learning and Change

LCN aims to act as a conduit between the “supply-side” approach of schooling improvement that has characterized education reform in recent decades and a “future-focused,” approach to schooling that is demand-driven by learners.⁸ Schooling improvement centres reforms around the “instructional core,”⁹ making classroom-centred changes in teaching, curriculum, and students’ relationships to each. In recent years, the OECD and the Ministry of Education have begun emphasizing a “future-focused” approach that takes a broader view of both what constitutes a classroom and who determines how it operates. Future-focused pedagogy ultimately de-emphasises the role of school-based learning in favour of a “student-centred” model that allows students to personalise the pace and path of their learning and draw on people, locations, and tools to support their work that may not be accessible in a traditional classroom. Digital technologies can enable those connections beyond the classroom and are closely aligned with a future-focused vision, although it is certainly possible to imagine a student-centred classroom that does not involve students using digital tools. Technology acts as a means for enhancing learning, but it should not be interpreted as the central feature of the strategy. The shift in emphasis to more student autonomy in their learning is not without controversy, and I explore aspects of that debate and their implications for student learning in the latter section of this report. Annan acknowledges the debate surrounding this shift:

If you pick up the LCN frame of ours, it pushes back on schooling improvement and traditional leadership. [...] Schooling improvement is thirty years old, and the OECD is pushing a new way, future-focused learning. [...] But the issue is, if schools are pre-schooling improvement, is LCN a bridge to move people from schooling improvement to future-focused, or is it something totally different, pulling people there? I say it pulls people, [some say] LCN needs to create a bridge, and [others] want to move incrementally to future-focused from schooling improvement. We are all in different camps.¹⁰

LCN holds at its heart a faith in a cultural democracy that values improvement through discourse rather than perfection from the outset, a faith in the power of the piecemeal. Echoing Michael Fullan’s “ready, fire, aim” mantra and the “fail forward” ethos of business innovation, in LCN the imperfect can and should always be augmented, and all the better if it is augmented by collective decision. In pushing a transition from an era of schooling improvement to one of learning environment improvement, the LCN strategy thus emphasizes a high

⁸ Brian Annan, personal interview. For a recent overview of schooling improvement methodology in New Zealand, see Timperley & Parr (2010). For a schooling improvement-centred approach to the LCN strategy, see Timperley & Earle (2012). In May 2014, the Ministry of Education’s 21st Century Reference Group released a positioning paper outlining a policy agenda for future-focused learning: <http://www.minedu.govt.nz/theMinistry/EducationInitiatives/UFBInSchools/FutureFocusedLearning.aspx>. My Fulbright colleague Benjamin Riley has informally critiqued future-focused claims in his final report (2014) and on his blog: <http://kuranga.tumblr.com/post/79461244786/things-known-and-unknown-the-science-of-learning>.

⁹ Elmore (2009). See also <http://www.educationalleaders.govt.nz/Pedagogy-and-assessment/Pedagogical-leadership/Leading-the-instructional-core>.

¹⁰ Personal interview, June 2014.

level of flexibility in the priorities schools pursue and the process by which they pursue them. The LCN provider team has developed a series of principles intended to ground those varied approaches: Participants in the LCN strategy are encouraged to make five mindset shifts, ultimately changing educational practice¹¹:

1. **School-based learning to ecological learning.** LCN aims to draw attention to the learning that takes place throughout a child’s world and to draw in those people involved in that learning. LCN emphasizes viewing an education as an “ecology” of learning opportunities, in which classroom-based opportunities around the instructional core are but one aspect.
2. **Individual to connected students, teachers, families, communities:** At the heart of LCN is the theory of action that capability is best built laterally—by those at the local level—rather than predominantly centrally, by those working at a distance. While developing the teacher-student relationship has long been a classroom focus for improvement, LCN explicitly calls for partnering with and drawing on whole communities.
3. **Competition to collaboration:** New Zealand’s uniquely self-managing school system need not preclude meaningful partnerships among schools, but it does require clear communication of goals, expertise, and a willingness to draw on the productive elements of competition while simultaneously striving for the productive elements of collaboration.¹² The LCN implementation framework attempts to draw on both collaboration and competition in a mutually reinforcing way that leads to improvement.
4. **Passive to (inter)active:** LCN’s emphasis on ownership of the change process encourages a shift from students, teachers, and families receiving learning as determined by another authority (e.g. a teacher, school leadership team, or Ministry-designated professional development) to actively determining the nature of the learning themselves. “Interactive” implies LCN’s focus on lateral learning, seeking not only individual agency, but interaction among individuals as they learn from each other.
5. **Needy to appreciative view of students and families:** Drawing from positive psychology theory, this principle encourages a focus on the strengths priority learner students and families bring to the table, rather than simply their learning needs. This pointedly should not mean ignoring areas in which students need support. Rather, it means shifting away from a focus on learning deficits to a focus on amplifying learning strengths while still addressing learning needs.

The Process of Learning and Change

Once a group of schools signs on to the LCN strategy, the newly formed LCN works with a Ministry of Education-affiliated Lead Development Advisor (LDA) and a University of Auckland-affiliated facilitator to begin the change process. The group proceeds through an implementation cycle (*See Appendix A*) that allows room for the LCN to adapt the cycle to their particular context. LCNs work their way through a series of tools and discussions designed to guide the group in learning what to change, planning the changes, implementing the changes, and checking the impact of changes. In the course of this cycle, LCNs select a common *achievement challenge* (e.g. improving writing or reading outcomes) and a set of *change priorities* as a means toward that end (e.g. family/whānau engagement, digital learning pedagogies, student agency).

For example, an LCN might choose to focus their collective efforts on improving writing at the senior primary level for a target group of priority learners. Some schools in the network might choose to focus on a group of Maori boys, while others may have more of a need to focus on, say, Tongan boys and girls or students with special education needs. Based on their analysis of practice interviews with students, parents, and staff, the LCN leadership might decide to make family and whānau engagement a change priority and plan events that would enable families to help their children more effectively with their writing and to help teachers bring the experiences of families into the classroom more regularly. Networks eventually develop a joint plan and school-specific plans derived from it to guide their work. The LCN facilitation team encourages schools to

¹¹ Annan (2014)

¹² Robinson & Timperley (2002)

communicate these plans to teachers so that they can in turn communicate them to students and students can begin changing their own learning environments.

While this process may seem similar to those associated with schooling improvement methods, the LCN framework explicitly involves not only school staff, but students, families, and communities as well in collecting and analysing information about learning environments. Furthermore, LCN aspires to have the latter groups drive the process. Furthermore, schools and networks conduct these investigations in tandem, creating avenues for exchanging information and learning from others. As Brian Annan, Provider Team Director at the University of Auckland and a key architect of LCN, describes it:

This [LCN inquiry] cycle can be interrupted or sped up at any point. So in a networked environment, with a hundred heads working on this at once, you can speed each other's stuff up. And the whole notion of networking is not the cycle, but that you have all these cycles going on, and you're making connections between them. You speed up the cycles. And a cycle can take five minutes or five months.¹³

To help visualize the resources students might draw on as they go through their own cycle of learning, LCN uses a "learning map" tool¹⁴ that has proven both popular and often uncomfortably eye-opening for participating school staff. In conjunction with a broader analysis of practice, network leaders work with students and families to answer the question "how do you learn?" visually. The learning map tool makes visible the people, sites (e.g. school, church, the local river, home), and tools (e.g. Chromebooks, books) that compose a child's learning environment and are designed to provoke awareness of the physical, social, and psychological influences on learning within and outside of the classroom. Measuring changes over time in the lateral learning visible in students' learning maps allows LCN participants to evaluate their progress alongside other measures.

What does success look like?

Thus far, this section has dealt in aspiration: the theory of the LCN strategy. What would success in implementation look like? LCN aims to grow capability and accelerate achievement for priority learners by focusing on improving their learning environments. Therefore, measuring success requires measuring not only student achievement outcomes, but also capability growth and learning environment changes, both of which defy simple measurement. While every school involved in the LCN strategy will be evaluated by National Standards data, if they choose to submit it, the flexibility granted to each LCN to determine its own achievement challenge and change priorities requires a parallel flexibility in how each LCN measures progress.

Perhaps as a mixture of current national policy priorities as well as local needs, networks have most frequently prioritized building family-whānau connections, developing student agency, improving linguistic and cultural responsiveness, and incorporating blended learning pedagogies. The achievement challenge and priorities emerge through the initial investigation phase, which is designed to authentically include students and their families. Each network also conducts a series of "evaluative probes" throughout the cycle, survey items centred around student agency, student engagement, or cultural responsiveness. The probes are intended to provide a platform for discussion about next steps and, at times, step backs, and to provide network-level data for evaluation. After many networks found the prescribed probes too rigid, the probes are voluntary, but networks that choose not to use them are expected to develop their own evaluative tools.¹⁵

The success of LCN will ultimately be evident in the lives of the students who have participated in it. As the Ministry parses student learning data and qualitative self-review data submitted by networks in December 2014,

¹³ Brian Annan, Personal Interview.

¹⁴ For examples of learning maps, see the VLN: <http://www.vln.school.nz/file/download/869114>.

¹⁵ See the evaluation section of this report for further exploration.

indications of successes and challenges will become more evident. In the interim, this report instead focuses on how the aspirations for leaders working together as a network have played out in practice.

What is Social Network Analysis?

A central assumption of this study, and of the LCN strategy, is that the successful implementation of policies relevant to educational change—or change, period—are a function of the social capital of the people impacted.¹⁶ By social capital, I mean the relationships among actors (e.g. individuals, groups, and/or organisations) that create a capacity to act for mutual benefit or a common purpose.¹⁷ It is the social resource manifest in relationships. In the case of educational change, that common purpose is often improvements in student learning and life outcomes. That assumption builds on four decades of research in the field of social capital and social network theory, which provides perspectives and tools for analysing how the quantity and quality of relationships between groups of actors impact the groups' functions.¹⁸ Social network research specific to educational change has repeatedly found that influences like peer groups, power dynamics, and the structure of relationships among groups can make or break educational reform attempts¹⁹. Likewise, the Ministry of Education-sponsored Best Evidence Synthesis on school leadership reinforces the importance of cultivating relational trust in leading change²⁰. Who you know indeed influences what you know and how you work.

Research and practice have also begun to distill the ingredients of highly-effective networks. Dense, cohesive networks with lots of connections among the people in them enable the complex problem-solving often needed in schools,²¹ but they can also obstruct the entry of novel information and convey ineffective information too effectively.²² Density often cultivates trust, which in turn enables risk-taking and facilitates the exchange of tacit knowledge needed for school improvement²³; however, widespread trust without shared, informed accountability can be detrimental to group performance.²⁴ The position of key actors within networks can also influence capability development: people who act as bridges across gaps between groups of actors can play a critical brokering role, controlling the flow of resources among actors or bringing new information to the table. Though brokers can wield great influence, these actors may not hold formal authority positions within the network.²⁵ Illuminating the structure and respective roles of the people in a network also illuminates means for improving that network's effectiveness. Perhaps one network has a cohesive core group but needs to improve the flow of information to people on the periphery, while another network spreads information evenly but needs to improve the strength of the connections across the entirety of the group.

The learning map tool that has been well-received by LCN participants is essentially a rough-and-ready version of an egocentric network map, a map of an individual person's reported relationships. This study, by contrast, constructs maps at the level of whole networks, in this case individual LCNs. While an egocentric map like the LCN learning map tool allows us to see all of the reported connections of a single person—regardless of what group those people belong to—a whole network map allows us to see all of the reported connections of all of the people in a single LCN, but no non-LCN connections. In the former, you step into a person's shoes. In the latter, you step into an omniscient observer's shoes. Both impart information that can inform decisions about how to improve the social capital of the person or group.

¹⁶ The Albert Shanker Institute's blog has put together a "Social Side of School Reform" series that reviews the research on this assumption. <http://shankerblog.org/?tag=social-side-of-reform>

¹⁷ Statistics New Zealand (2002)

¹⁸ Borgatti and Foster (2003)

¹⁹ Daly (2010) and Penuel, et al (2009) summarize this work well. Alan Daly served as a distance mentor for this fellowship.

²⁰ Robinson, Hohepa, and Lloyd (2009)

²¹ Reagans and McEvily (2003)

²² Hannan and Freeman (1984)

²³ Bryk & Schneider (2002), Tschannen-Moran (2004), and Daly & Finnigan (2012)

²⁴ Elmore (2004), Timperley & Parr (2010)

²⁵ Burt (2005)

Why the Lens on Leadership?

School leaders are second only to teachers as school-based influences on students, and their impact appears to be greater in schools with greater socioeconomic needs.²⁶ By leading and participating in teacher professional learning, setting goals and high expectations, and guiding and evaluating curriculum²⁷, principals create the infrastructure around which teachers, students, and families can construct learning. Likewise, network leaders create infrastructure not only for their own schools in the context of the group, but also at the level of group as a whole. School leadership and school network leadership require overlapping though not identical skill sets; schools bring their own contexts, constraints, and priorities to the table, creating new complexities for collaboration. Under the self-managing ethos of New Zealand's school system, collaborating with other schools and forging a common identity is a new way of working for many.

LCN elevates that challenge by redefining leadership, by pushing schools to authentically involve students, families, and whānau in pursuit of more powerful learning for students. LCN network governance, crucially, may begin with a leadership team of school-based leaders, but the goal is to distribute leadership well beyond the bounds of the principalship or the school staff. As one principal involved in LCN put it, "I'm just the oil can here." Network leadership activities are therefore not the true work of LCN: The real work takes place in schools and communities. However, the decisions made by the school staff on LCN leadership teams heavily influence the ensuing activities of the network. How might the social networks among LCN leaders influence their joint work? This study seeks to unpack some of those dynamics.

What This Report Is and Isn't

Therefore, this report does not purport to evaluate the impact of the LCN strategy on student learning, but rather to offer depth of description to future evaluation efforts. The forthcoming fifth milestone report to the Ministry of Education will include time-series student learning data to enable more comprehensive evaluations. Classroom visits I conducted were informal, and my conversations with students were ad hoc and not formally a part of this research, though surely informative. My discussions of evaluation and the role of learning science emerge from questions raised by interview participants and from my personal research, but were not explicitly included in the study design. Therefore, I intend these sections as considerations for more systematic review. As policymakers, practitioners, and researchers begin to unpack the most impactful aspects of LCN, it is my hope that this work can inform investigations into the influence of leadership on network effectiveness.

Many of the recommendations and observations in this report will be familiar to participants in LCN, but by highlighting aspects of excellence and opportunities for strengthening, I hope to provoke reflection for those embedded in the work of the strategy and discovery for those working nationally and internationally in education who may not yet be familiar with the power and potential of networked approaches to improving learning experiences for students and their communities. Just as every student draws on their own network for learning, so too do the educators tasked with nurturing that learning. This report makes tangible and visible these networks within networks.

²⁶ Leithwood, et al. (2004)

²⁷ Robinson, Hohepa, and Lloyd (2009)

Methodology

This study takes a mixed methods case study approach, reflecting the combination of qualitative and quantitative data emphasized in the LCN strategy. I worked with 9 of the 53 networks involved in the LCN strategy as of July 2014, encompassing 63 of the 286 schools participating (about 22%). The cases were selected in conjunction with national-level facilitators for a mix of network size (at least four schools), network maturity (at least in the understanding phase; over a year old), location (rural, urban, suburban), and vertical-horizontal structure (e.g. primary-intermediate-secondary compared to, say, all intermediate schools). It is important to note that this is not a representative sample, but a series of case studies. Networks that have persevered beyond a year and into the process of implementing changes, as these networks have, have a special character that is likely not representative of the range of schools participating in the LCN strategy, which are themselves self-selected into the strategy and not likely representative of the broader set of New Zealand's schools.

Table 1: Network Case Characteristics

LCN Code	No. of Schools	Composition	Median Decile
A	4	Horizontal	6
B*	4	Horizontal	2
C	4	Vertical	8
D	6	Horizontal	7
E	6	Horizontal	6.5
F*	5	Horizontal	2
G	10	Vertical	4
H	9	Horizontal	6.5
I	15	Vertical	4

Total: 63

*No survey conducted for two networks due to logistical constraints

For each LCN, I observed at least one network leadership meeting, conducted interviews with at least two network leaders as well as the facilitator and Lead Development Advisor (LDA), analysed network documents (e.g. network plans, individual school plans, newsletters), and surveyed the leadership team concerning the relationships and exchange of information among schools. Due to budget and scheduling constraints, I was able to survey seven of the nine LCNs and conduct only interviews with leaders in the remaining two. I also attended three regional networking days and analysed Twitter conversations and Virtual Learning Network (VLN) materials. In total, I conducted 44 interviews, about 35 of which took place at participating schools and of those, 15 involved classroom observations and informal conversations with students. In total, I transcribed more than 300 pages of interview and meeting recordings and notes.

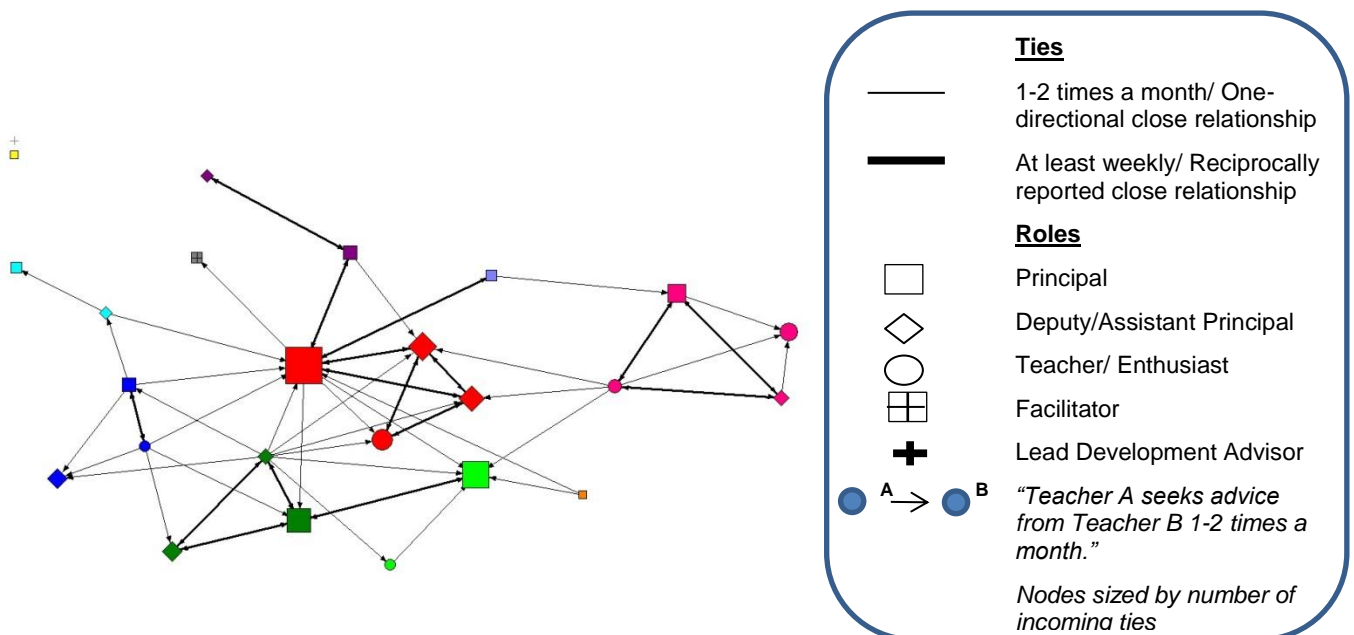
I also learned immensely from an untold number of informal conversations with various educators, policymakers, and researchers, and joined a handful of educators from around the nation for a hui at the Manaiakalani network of schools. Though the depth of the LCN strategy is best comprehended from within, by those embedded in the change, I am grateful to these schools for offering me a privileged look into the changes they are leading.

The singular beauty and challenge of education is that so much of learning is intangible, invisible, unnamed to all but the learner, and perhaps to her only unconsciously so. Yet we cannot deliberately change what we cannot name, and we cannot shift what we cannot define the edges of. Making visible the invisible, however imperfectly, creates a common platform on which that defining debate can take place. Similar to the learning maps that LCN incorporates into its methodology, this study uses a more quantitative technique called network

analysis to make lateral learning among LCN leaders visible and measurable. The resulting maps illustrate how LCN leadership team members exchange information and advice informally, revealing a social structure that influences how the group functions.

Each network leadership team completed a “lateral learning survey” which included items adapted for the New Zealand context from existing instruments used to assess group trust²⁸ evidence use and diffusion²⁹, and organizational learning.³⁰ These measures use a six-point Likert scale ranging from “strongly disagree” to “strongly agree,” with higher scores indicating higher levels of agreement. The measures are ordered such that higher levels of agreement indicate perceptions of higher trust.

In addition to survey measures of trust and challenge, LCN leaders completed a survey that asked them to indicate, for each other person on their LCN leadership group, with whom they have a close relationship (defined as someone with whom you share personal information and/or time in activities unrelated to work), from whom they seek advice about work-related dilemmas and how often, and from whom they seek expertise about research and how often. The measures use a four-point Likert scale, from “once every two months or less” to “more than twice weekly.” A software program called UCINET turns these data into a network map:



The survey also asks respondents to identify three key actors: their *likely leader*, the person they would be most likely to follow in the future; *influencer*, the person who has most influenced their practice; and *challenger*, the person most likely to challenge the thinking of the whole group. The purpose of all of these metrics, like the purpose of a point-in-time formative assessment, is to capture a snapshot to inform a richer picture. Snapshots for each of the seven participating LCNs can be found in Appendix B.

²⁸ Tschannen-Moran (2000)

²⁹ Finnigan, Daly, & Che (2012)

³⁰ Finnigan & Daly (2012)

Findings

Trust

Evidence from survey and interview data suggest that LCNs reporting stronger levels of relational trust throughout their network leadership team exhibited more of the traits of effectively collaborative networks than those reporting lower levels of relational trust. All of the seven surveyed networks skewed toward higher scores on measures of trust, but the networks differed in average scores and the spread among responses (*see Appendix C for comparisons among selected measures*). Networks with denser webs of close relationships and exchanges of advice and research tended to have not only higher average ratings on the surveyed trust measures, but also more agreement within each measure (e.g. clustered responses around “agree” and “strongly agree”).

LCN expects networks to ultimately share data, and the level of trust becomes rapidly apparent in conversations about data as a potential bellwether for other collaborative activities. Many leaders described their sense of trepidation in sharing data as a group at first, like this network D principal:

When we first put all our data out on the table, it was pretty scary. But seeing improvement in the data was great. And not only has the data improved, but the narrative alongside it is pretty jolly good! The learning from that is rich.

In contrast, LCNs still developing relational trust as leaders were working toward sharing data. A principal in a network with several first-time principals noted that difference:

We were a network that was newly formed, so we didn't have that trust already, compared to [another network] that's been working together forever. We hadn't, so we relied very heavily on our facilitator and Ministry person in the last 18 months. We're only just now weaning off, and I guess, because we're going through that weaning process, there's a lot of trust issues to overcome. It's not resistance, but reluctance to be open and honest with data. It's hard when you don't know, when you haven't shared data before with different groups of people.

A willingness to share data and discuss them openly is a necessary first step in moving from merely a group of schools pursuing a common mission to a cohesive network acting as a seamless whole. Sharing data is also a necessary first step in developing shared, meaningful measures of progress, a step some but not all networks have taken but one which this report strongly recommends.

Participants with a higher out-degree score on the map for close relationships— meaning those who reported a greater number of close relationships—tended to report a higher level of trust on survey measures for the network as a whole. Similarly, participants with higher in-degree scores—those with whom many others in the network reported a close relationship—also tended to report higher levels of network trust. That maintaining personal connections with LCN colleagues should build trust within the group is no surprise, but it also brings professional implications: Most of the leaders selected by their LCN as “likely leaders” also maintained central positions in the close relationship maps; however, in just two cases likely leaders diverged from that pattern. In one network, a leader was fairly new to the group but brought a strong dose of challenge to conversations and featured prominently in the research advice map, and in another the leader maintained strong advice and research ties, but had fewer close relationships relative to others in the network. These two act as a reminder that close personal relationships do not perfectly predict productive professional relationships. Friendships may preclude difficult conversations, just as a purely professional relationship may drive mutual learning.

Trust among teachers in sharing classroom practice emerged as both a challenge and a tremendous benefit for networks. LCN's focus may be in recognizing learning beyond the classroom, but improving teacher practice remains important for improving learning in class. Teachers also act as brokers of information and gatekeepers of engagement for families and communities, so creating collegial expectations around involving families also benefits LCN's goals for family engagement. In short, teachers may not be an emphasised group in the LCN strategy compared to students or their families, but teachers remain the people with whom both groups most often interact at school. Building teacher trust thus brings benefits beyond improving classroom practice, and improving classroom practice remains the most effective school-based means of improving student learning.

Many leaders noted difficulties with getting teachers to talk openly about their classroom practice in a way detailed enough to invite collegial critique but extolled the changes emerging once trust began building. A principal in network B shared strategies for building trust and the benefit to the network:

Initially, it was like we could have done the probes in 1997 or 2014. Teachers were nervous about opening up their practice to other teachers. The leaders were, too. Our most massive need is still getting teachers to be open. [...] Many wanted to observe but not be observed. Convenient! The network has broken that down now, but many don't realize that they need to reflect on what they saw and snap it into action themselves. We talked as leaders for far too long. Because we didn't have trust! It wasn't in vain, but we lead with the wrong concept.

So I started emailing out readings on relational trust. Email was big for us early on. They all said, "bingo." Then they modeled it back, and I just kept feeding research into our conversations. [...] Honestly, teachers have contacted me about being uncomfortable about meeting with other schools at first. So we've tried mixing and matching up [at joint teacher meetings with all staff]. Each school supplied questions, but people were bashing the questions at first. So we were clear and said to bring questions, no matter how basic, because even adults need to question. Same as in a classroom, modeled with adults. Now we're moving.

Like many networks, network B needed time and deliberately uncomfortable conversations to begin building teacher trust. Another leader in network B from a different school credits that trust now building among teachers as critical to the network's progress:

Now that they have relationships and don't feel judged, they own the data and their practice as something for THEM. It's really the conversations. They own it. It wasn't a change in policy, but in conversations that led to mindset changes. There's genuine ownership.

Other network leaders echoed the leaders in network B and credited teacher-level trust as a key driver for their network's cohesion. Network H stands out in this respect. In the group discussion excerpt below, leaders pinpointed teacher-level trust building as the cornerstone of their development as a group:

Sarah: What was the tipping point for you as a group, when you felt like a cohesive network?

Deputy principal: The classroom observations across schools really got to it for me and for our school. We just jumped in boots in. [heads nod in agreement across the table]

Principal: Exactly. I think because we went to teacher level first and set this expectation of teachers being in classrooms and being open to learning, it forged trust really early.

Enthusiastic leader (teacher): It was definitely a little scary at first. But the payoff has been so huge in terms of trust. I feel like I can ring up anyone now.

Building trust among teachers both enables and is enabled by challenging learning conversations about pedagogy and practice. What network leaders from B and H suggest is that developing trust among principals and deputies may not be as important as developing trust among teachers across schools. Principals act as gatekeepers, allocating release time for teachers to observe in other schools, for example, but teachers enact change at the level of the students they serve. And teachers on the LCN leadership bear a special role as they model LCN methods for other staff. Therefore, when building trust among LCN leadership team members, trust among staff with teaching responsibilities—both with other teacher leaders across schools and with staff in their own school—is of utmost importance.

Challenging Conversations

Trust is necessary but not sufficient for effective networking: A deeply trusting but uncritical network of schools is naught but a groupthink engine. LCN's emphasis on flexibility in network activity and in self-review evaluation makes collegial critique among network leadership all the more crucial to promote rigorous network activities that best serve students. What are the ingredients of collegial critique? In Robinson, Sinnema, and Fevre's conception of "open to learning conversations" (OTLs), each party engages in three "action strategies" to achieve a goal of not simply persuasion, but genuine learning: advocacy, inquiry and joint problem solving³¹. While I was not able to systematically catalogue behaviours as a part of this study, interview excerpts provide some indication of leaders' perceptions of the level of challenge in their conversations. Developing collegial critique remains a work in progress for many networks, but many leaders noted that their involvement in LCN had helped them to establish more challenging conversations within their schools.

More established networks credited the development of that critique as a key component of their effectiveness as a network. In Network B, for example, a principal credited the ownership onus placed on LCN leaders as driving challenging conversations that in turn drove challenging conversations among staff:

If you expect your thinking to be challenged you have to own it. Also, the older and more traditional teachers don't feel judged. They used to tell me that they were collecting data for the Ministry: they'd throw up smoke screens and use it for cover. I've seen lots of schools do that. But now that they have relationships and don't feel judged, they own the data and their practice as something for *them*.

In Network H, a relatively high-trust, dense network, a deputy principal described the norms around the group as challenging by design:

We've been open to lots of learning conversations: It's about being open and transparent enough to go to other people's schools and to be objective without being judgmental or critical, and for other schools to know that that's okay. So a lot around culture. And a lot around professionalism as well. It's not about going and visiting classrooms and then coming back and gossiping about what you saw. It's a cultural shift, a networking shift. Schools traditionally think that it is only their data and nobody else's. So this is a huge shift.

³¹ Robinson, Sinnema, and Fevre (2014)

Another principal in that same network felt similarly, but had to be persuaded. Persuasion arrived not in the form of talk, but in the form of visual evidence, of changes in students and staff:

It's an important point for me to make to you that I was skeptical at the start. I went to all these meetings and thought, "I have a lot to do in my school." I thought it was a bit of hot wind, to be honest. But I saw the right people driving it at the grassroots. [...] And I've seen engaged kids. [...] It's been a real success for us, holistically. And especially the collaborations, the meetings, the honesty, the hard conversations.

Networks that registered more consistent and higher levels of trust on their surveys were also more likely to identify multiple "challengers," defined as leaders who frequently critiqued the thinking of the group or presented conflicting evidence to promote discussion. Networks H and D, for example, reported high levels of trust and challenge on survey measures, as well as high levels of consistency among participants in those assessments. Each also reported the two highest proportions of network leaders identified as challengers: Network H leaders identified six challengers (27 percent of the group) and Network D leaders identified three (23 percent of the group). In comparison, only one other network, Network G, reported more than one challenger. Others reported only the facilitator as a challenger, suggesting that a loss of facilitation support would be accompanied by a loss of depth in network discussion. While it is certainly feasible that a single leader can provide meaningful critique in a network, spreading that role can lead to more robust discussions and thus, more robust decisions as a network.

Trust lays a foundation for a culture of collegial critique, but it does not guarantee it. Several networks characterized the depth of discussion among leaders as a work in progress. For example, a principal in Network G praised the level of cohesion and trust among those in the LCN, but lamented the lack of "nitty gritty" discussion about the actual processes by which schools pursued their change priorities:

"People don't talk about *how* they do something very often. They talk about their philosophy and what they believe in, and what should be concentrated on. But how you do that is sometimes shared and sometimes not."

Three of the facilitators I interviewed independently expressed that challenging conversations are not happening regularly enough in many of the networks in their portfolio. Perhaps the leader's observation above can be instructive: creating space and an expectation of delving into the details of *how* a practice is done enables constructive critiques.

Distributed Leadership

Distributing leadership, or devolving power, takes many forms in LCN. Leadership can be distributed among staff within individual schools and across schools in the network, and the networks in this study differed greatly in the degree to which they distributed power along these two continuums. They also appeared to differ greatly in the degree to which they devolved power away from school staff to students and parents, but analyzing that question falls beyond the scope of this research, though it is certainly an important inquiry. The ethos of the LCN methodology is one of radically distributed power, shared authentically with students, staff, and parents. As a principal in Network G phrased it, "I don't care what your title is: what are your gifts we can harness?" That kind of appreciative but urgent approach to expertise demands a certain level of distributed leadership to work. Networks are

devolving decisionmaking at different speeds and at different depths, but all are making progress in shifting to a “flatter” approach to leadership.

From a group of schools to a network

The majority of the leaders I interviewed pinpointed leader and teacher-level collaboration as their biggest value-added from LCN. In a few years' time, when the impacts of LCN on students are more measurable and evident, the ultimate value added from LCN will become clearer. At this relatively early stage of implementation in developing a long-term, sustainable network, however, building social infrastructure and capability remains the most visible outcome of LCN work. Central to that development is a conceptual shift: are the schools in an LCN functioning more as a group of schools working independently but towards a common goal, or as a collective, singular entity? For example, do the schools in the LCN simply draw on some collected resources to pursue their own goals and measures, or is every step of the process truly done in partnership with other schools, from problem-solving to data sharing and evaluation?

Network G provides a fascinating example of the transition from a group of schools to a cohesive network. Every leader I talked with spoke glowingly of the LCN and expressed excitement about and confidence in its momentum, yet there was also open acknowledgement that they were still quite leader driven and still dipping toes into cross-school collaborations. Comparing the relational maps of Networks G and H for advice (*see Appendix B*) illustrates this. Network G is characterized by discrete school-centric groups, while Network H has a greater density of cross-school connections.

“By far the biggest value for me from LCN has been the rich discussions with other leaders, but we’re still surface level,” said one Network G principal, “Is it really collaboration if every school just does their own thing but draws from a common pool of resources?” Network G has conducted several joint PD sessions with teachers that have yielded powerful discussions, she said, “but we’re not ready for teacher-to-teacher classroom visits across schools. The trust isn’t there yet.” Contrast that sentiment, and one which several Network G leaders expressed, with the reflections of a Network H deputy principal:

I think one of the differences with LCN as opposed to other initiatives is that the cultural shift happens outside of each individual school first. Cultural shift happened with the key teachers first, who were originally put in the group. The change was driven by them. It wasn't imposed, but something they drove. It took us two years—this is our third year now—to get our head around it, it's only recently gone school-wide. So it's been a while in the making, but it's definitely come from the outside in, whereas my past experience it came from inside out.

Change driven at the level of the network, rather than at the level of the school that then becomes a network, is a hallmark of the LCN strategy, and one worth earmarking as New Zealand's schools transition to Communities of Schools. Returning to the group discussion with Network H leaders mentioned in the findings on teacher-level trust, the leaders of Network H pinpointed teachers as the linchpin leaders for driving the shift from a group of schools to a more cohesive whole:

Sarah: What was the tipping point for you as a group, when you felt like a cohesive network?

Deputy principal: The classroom observations across schools really got to it for me and for our school. We just jumped in boots in.

Jumping “boots in” into teacher-level collaboration paid dividends for this LCN, and a later conversation with a deputy principal in network H reinforced that theme.

Sarah: If you were to take shift focus to a wholly different challenge, what would remain?

Deputy principal: If you took that away, the vehicle for implementing: the systems, the procedures, the culture is still there. So if we shifted focus, the process is still the same. What's significant for us is that we have the capacity to continue. The offspin from Learning and Change Network is massive. So far beyond teacher pedagogy and practice. I can call over to the cluster teachers and say "ah, we just got our data in and it looks pretty shonky, what's yours look like?" So it's those informal links as well, which in some ways are equally as valuable as what's going on in the classroom explicitly. It's so far-reaching, it's ridiculous.

One of the central goals of LCN is to build capability among schools and their communities so that, whatever the problem to be solved, the network has the ability to leverage its collective expertise to solve it. The infrastructure this deputy principal describes is strong evidence of that collective capability.

Core-periphery groups

While no “ideal” LCN exists, nor should there be one given the varying contexts in which schools operate, research on the benefits of whole-group buy-in and distributed leadership suggest that networks that are principal-supported, but teacher-driven, might be more likely to experience meaningful classroom-level shifts³². Likewise, and in keeping with the principle that you get out of something what you put in it, schools that feel more invested in the LCN work and more accountable to the others in the network might be more likely to achieve shifts for their students.

While this study cannot make claims about student learning outcomes for particular schools, the network maps and follow-up interviews evidence that internal accountability among leaders followed “core-periphery” patterns of network structure that could constrain the network’s effectiveness for those schools on the periphery. This was more evident in larger networks perhaps because larger networks are simply more likely to have schools aligned at the periphery. For example, a principal on the periphery of a larger network felt a more definitive “hook” was needed:

We did a probe and found that our parents don't always know what's going on and we assume a lot. We assume kids know their targets, but they don't always. That's helped us be more specific. There probably needs to be a step now to see examples of it, proof of it.

Sarah: And you don't feel that's happened?

Principal: No, I don't think. *Talked* about. I like when they give us a task: "Come back next time with this." But if it's just talked about and you go away and there's no--not consequence, but something--then you get caught up. You need a hook. When we've had homework, of sorts, or a few of those set things that we were more focused.

³² See Leithwood & Mascal (2008) and Spillane & Kim (2012) on the relationship between within-school leadership and student outcomes and Hite, Williams, & Baugh (2007) and Copland (2003) for literature on distributed leadership in networks of schools and potential relationships to student outcomes.

He also refers to the core group of leaders and facilitators as “they.” Peripheral schools and leaders were also more likely to refer to LCN as a “layer on top” rather than a foundational strategy for the school. What is the responsibility of participating schools and network facilitators in involving these more peripheral parties? Because the LCN strategy is currently voluntary and emphasizes demand-driven progress, less involved schools can be allowed to be less involved. With the advent of communities of schools and later policy iterations, that arrangement may shift.

In networks characterized by a core-periphery structure, those in the “core” more consistently agreed or strongly agreed that they “felt accountable to the group for actions I take in my school.” Comparing networks D and I illustrates this trend. Network D’s relational map and ensuing interviews suggest a “flat” network, and the answers across survey measures are tightly clustered together. Interestingly, even a leader in the network who emerged as an isolated actor—someone who reported no close contacts in the group and with whom no one else reported contacts—reported high levels of trust and feelings of personal accountability to the group:

But I'm always aware that I don't want to let them down by not holding up my end of the deal. But once I'm there, it's really an accepting and supportive environment, accepting of diversity and what other people have done. But there's always challenge in what you're going away with.

In contrast, Network I’s relational map exhibits a dense network, but one characterized by a relatively small core group of four or five key leaders. The survey measures echo that structure, with responses divided according to the relative location of leaders in the group’s social structure. Core group members consistently respond as a block, constituting the entirety of the “strongly agree” response for several indicators while the remainder of the group responds with lower levels of agreement. These differing responses suggest that the benefits of relational trust and collegial critique may not extend throughout the network, constraining effectiveness. While the core group of school leaders report significant shifts in the practices at their schools, two leaders at the periphery were questioning the merit of their involvement in LCN. Discussions among leaders about improving the work of Network I should address how to bring all network leaders more strongly into network activities.

Teacher Leadership

If LCN aims to create change at classroom level, teachers—and ultimately students—must lead network work. However, the majority of the networks with which I worked self-identified as largely principal-owned. If network leaders have not translated their network plans for teachers, there is little chance those plans have been translated by teachers for students, so that students understand the goals of changing their learning environments and can begin making changes themselves. Ensuring that teachers take the lead in LCN and its future iterations, even if that takes a manufactured form at first, can take change to the classroom level faster and more sustainably.

While principal support is a valuable asset for the teachers in a network, teachers can take the reins and make changes in their classroom with or without top-level support. I experienced this powerfully at a meeting with Network F. In my interviews with principals preceding the meeting, all expressed concerns about the future of the network and were skeptical that other schools had worked on LCN activities during a long hiatus from meeting³³. The network had started with promise but had faltered due to a multitude of factors, from principal turnover to a history of competition that had detracted from past attempts at joint work. To begin the meeting, the facilitator asked each school to report on the work they had conducted since the last joint meeting.

³³The long period between meetings contributed to my decision not to conduct a network survey for Network F.

To the surprise of many in the room, particularly principals, several teachers had made substantial changes to their classroom learning environments and a few had begun collaborating across schools. One college teacher had overhauled her term’s planning based on the learning maps students completed, sitting down with students to redesign the arc of the year’s curriculum and adjusting assessments to add an additional internal exam at the student’s request. In another pair of schools, two teachers had been collaborating on lessons and had started an online pen pal program between their classes. In another school, two teachers within the school had commenced regular joint planning. “We realized that before we could confidently collaborate across schools, we could be better about collaborating in our own school,” said one half of the duo. When presented with evidence of teachers making shifts in their classrooms, the group made plans to move forward with a joint activity among the parents and students participating from each school. This is but one example of teachers taking the reins in a network, but it evidences how LCN can reach students despite leadership-level challenges as a network.

Visualizing distributed leadership

The figure below plots each network according to their estimated vertical (i.e. within school) and horizontal (i.e. between schools) distribution of leadership. I have placed networks based on a composite of survey scores and qualitative observations, so their precise placement in relation to other networks should not be considered definitive by any means. Rather, the quadrants are the most pertinent level of analysis, and I include more specific placements to prompt reflection. Most of the networks with whom I worked remain largely principal-driven and with a core group of schools defining network direction. The theory underpinning LCN calls for networks to seek to move toward the lower right-hand quadrant of the figure, but for a multitude of reasons, many remain in the upper left-hand quadrant.

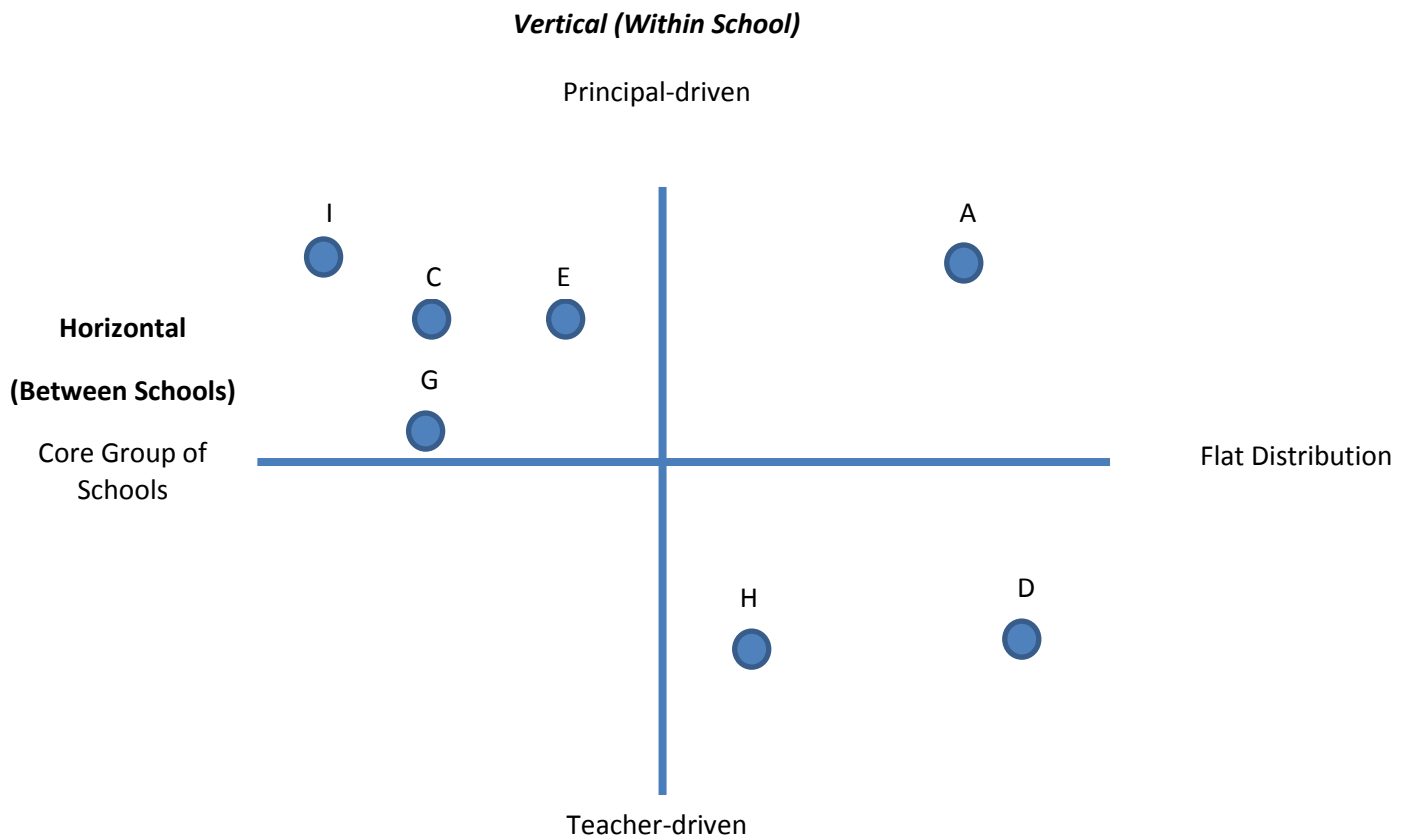


Figure 1. LCN Distributed Leadership Within and Between Schools

Why are Networks H and D different from the rest? While I cannot definitively answer that all-important question, it is important to note the similarities between the two networks that distinguish them from others. Both have been working together the longest of the seven networks, and have experienced relatively little turnover in leadership during that time. Both also boasted the highest proportion of “challengers” in their network, and both registered highly on survey measures focusing on trust and collegial critique.

Both have also pointedly involved teachers in their network planning and decision-making from early stages. In a group discussion with Network H leaders, I asked them what the “tipping point” in their trust of each other was in their history as a network. While the principals in the group focused on discussions held at the network meetings, many of the teachers felt strongly that the first time they observed each other’s classrooms and discussed their observations tipped their confidence in the group. “It was pretty uncomfortable going into it, but we just went in and it was so positive that we kept going,” said one of the enthusiastic leaders, for example. Similarly, when I asked an enthusiastic leader in Network D to describe how decision-making power was distributed in the network, she responded, “Flat, flat, *flat!* Any one of us can drive the discussion.” Any or a combination of these factors may be underpinning their highly collaborative approach, both across and within schools, but lessons from these networks surely can inform future school networking efforts.

Network G, a network that I characterize as one working to improve teacher-level ownership but with strong momentum, provides an interesting foil to Networks H and D. In talking with a principal in the network,

[Another principal] said to me the other day that a lot of our staff [among the schools] don't understand the networking stuff. We've had the meetings and workshops, but it hasn't gotten in yet, how it works. So every time I go to a meeting, I bring someone. It's exposure, isn't it? We'll get there.

Likewise, when I asked a principal in the network if teachers had observed each other’s classrooms, she responded, “Oh, we’re not there yet. The trust isn’t there yet. Yet.” This network has been in operation for well over a year. LCN takes a light touch approach to facilitation that expects messiness and tolerates slow movement in service of long-term sustainability. Yet at what point does a tolerable amount of messiness become intolerable, become predictably preventable? Given the enthusiastic responses of networks that involved teachers (and ideally, families) from the outset, taking steps to deliberately encourage and even manufacture those connections might accelerate the development of network cohesion.

Network A also provides an interesting case study. It is distinct in that it is a smaller network that shares power evenly among schools, but remains predominantly principal-driven. While the principals in the group were enthusiastic about the progress of the network, teachers in the group rated the trust within the group lower than did the principals, and one teacher noted that the best evidence of shifts in the classroom as a result of LCN was a “just a handout about LCN tacked to the staff room bulletin board.” That within-school ownership gap will be an important criterion to consider when student achievement data trends are collected in the new year and effectiveness can be examined alongside these network structures.

Expectations among Staff, Students, and Communities

“At the end of last term, I was reading those [target] kids' reports. It hit me in the face: those kids are now expected to be at standard. Perhaps not all, but a good chunk of them are. And that's a direct result of a bomb being put under them, but also under their teacher.”

What’s transformational about that last sentence is *who* “put a bomb under” the teacher: It was a joint effort from both the principal and, eventually, the students themselves. As this principal elaborated later in our conversation, she manufactured higher expectations until the students took on that responsibility themselves:

“The expectations--what hits me is the expectations of the students of their teacher. It now wouldn't be ok to come to school and just cruise because the teacher is having a slack day. They'd say, "What are *you* doing to deliver this next piece of learning for me?" That kind of role reversal. We talk about elevating expectations for kids, but what about their expectations of us?”³⁴

If systems are perfectly engineered to get the results they get, as the adage goes, then it seems people engineer for themselves the results they expect³⁵. The task of educators, then, is to enable students to exceed their own expectations so that they then continually elevate them. Another principal noticed a similar effect:

I'll tell you what Learning and Change Network did that deepened our practice. The finest thing I heard was "you make the shift." To work with students and say, "Mister! You are the one who needs to make the improvements and needs to be sweating!" So [the LCN philosophy] synced with my philosophy: no pandering, no mamby pamby, just "you need to do it, son."

In allowing students to drive changes, however, schools must maintain a clear focus on learning or risk empty engagement at the expense of higher-level learning. A Network D principal echoed this concern:

Devices engage, but they don't necessarily produce learning. It's about the language you use, so everything is framed around learning. We keep tight on that, and monitor it tightly. That was the risk with Chromebooks: to be quite honest, we've worked too hard to raise achievement to let it go to play. We're not going to go there! But what it's done for our middle kids and kids who are achieving well is that they can increase the pace of their learning. I reckon they'll get 1.5-2 years of learning this year. For them, their cognitive engagement will be improved, and they now expect to improve. And that's a byproduct of what we're trying to do for our priority learners.

I explore the role of relationship between engagement and meaningful learning, and how the best available evidence from research and practice must inform it, in the latter section of this report. As networks work to elevate expectations for students and the expectations of students, maintaining a clear focus on student learning must guide that work.

Family and Whānau Connections

One of the clear strengths of the LCN strategy emerging from participant interviews is in improving home-school partnerships, and indeed in reducing the perception of the division between home and school entirely. In coding the interviews I conducted for key themes, only “trust” appeared more frequently than did comments related to family/whānau engagement. As schools progress in LCN work, many are engaging students, families, and whānau more closely in their decision-making, though the degree to which networks involve them and the stage at which they involve them varies considerably. Rallying a child's community around her learning is one of LCN's most evident successes as a strategy, and ensuring that networks are involving those supporting people more intimately from the outset of their work should be of high priority moving forward.

³⁴ Though it is important to note that the principal quoted above had been working on transitioning passive learners to active learners before getting involved in LCN, she viewed LCN as an integral and complementary aspect of that work.

³⁵ If you place faith in meta-analysis, John Hattie's *Visible Learning* identified students' expectations of their own performance as the single-highest predictor of student performance, with an effect size of 1.44.

Many network leaders noted the impact of the initial qualitative investigation process in raising awareness of the need for more authentic parent engagement. As part of that investigation, leaders talked with priority learner parents about their child's learning and how both the school and the parents might better support the child. As one principal observed, "That work we did around meeting with families, kids, teachers and getting their perspective? The qualitative piece? Just talking to people? It seems crazy, but it hadn't happened!" Often the parent, student, and teacher's hunches about the root causes of the student's learning challenge varied substantially, creating eye-opening moments in some cases, as one principal observed:

The whole process has made my staff more aware of engaging priority parents. When [teachers] saw how the parents saw themselves in that education picture, they choose they chose family/whanau engagement of priority students as a school-wide performance goal as part of our performance management system. So they designed metrics on how many face-to-face and other forms of contact--what will that look like--and what will home visits look like, and the protocols around it. Making every attempt to engage and communicate, to lower barriers. That's been an outcome, and we haven't yet seen that in achievement data yet.

Those networks that are embracing parent partnerships have frequently held events with parents to obtain their feedback and share strategies they can use with their children in reading, writing, and maths. A principal in Network H was enthusiastic about the shifts he saw in parent involvement:

One area we hadn't been good at was parent engagement. We sat down last year to think on it, and now we run workshops for our target students. Some not all teachers are in contact with target students, so we're working on it. Too often we tell parents that they should be helping their students, but we give them no strategies. We ran reading, writing, and maths workshops, and the parents were just blown away that they were being supported. We gave them bags of worksheets, and dice and cards that they could use at home. So just thinking how to support parents to support at home. [...]What I've seen over the last 3 years is that parents are more engaged in their child's learning.

The shift is not only one for schools, but for parents as well. Many of the leaders working in lower decile communities noted the initial hesitance parents showed at early parent engagement events. "Even just saying how to help at home, some of them find it hard, because they want the teacher to tell them," said a Network D deputy principal, "In some cases, they haven't realized that what they're doing at home is *great*." Part of the parent engagement process has thus been about shifting parents' expectations of not only school staff, but of their own capabilities. Another principal in Network H recalled shifting his thinking after hosting a parent evening and realizing that his school had created new expectations from parents around engagement:

We had 60 or 70 parents and kids turn up for a staff room meeting. We walked them through the LCN in non-educational speak. Then we said, "How do you want us to communicate with you in the future?"

Sarah: And that was something they weren't likely used to?

Nick: Yeah! Education in the past has always told parents what to do. Not this time. So we went through the rationale and the why, looked at priority learners, how we're measuring. The power of it--I went home on such a high. It was one of the most powerful, authentic interactions teachers and parents had that I've ever seen. And it was just a bunch of stickies on a board. And we sent resources home then and digitally. That's huge. Great buy-in. In this community, parents are quite honest and they said we had too much lag between events. About 6 to 8 weeks between them. I take that on the chin.

As this principal observes, schools are adjusting to a new normal of intensive parent engagement, and because many are just beginning that engagement, the shift takes time. Such engagement cannot be a one-time thing, nor should leaders make promises they cannot keep. The impact on parent-school relationships may be counterproductive if momentum is not maintained.³⁶ Nevertheless, just as networks that kicked off with teacher classroom observations and collaboration now credit that initial messiness to building trust, networks that involve community voices from the beginning could benefit their students powerfully.

Despite demonstrated mindset shifts among school staff around family and whānau engagement, the LCN strategy in implementation remains quite school-centric for many networks. While the ultimate goal is to have students, families, and whānau driving change, in many cases they remain passenger-seat navigators. That in itself is an important shift from traditional consultative approaches to home-school partnerships, and deserves note, but LCN strives for true partnership, co-driving. As one leader put it, “We want to feel confident as a group of network leaders that we’ve got it together before we bring in the community.” If parent partnerships are to be truly meaningful, parents should be part of the “getting it together” process. The LCN lead team has observed the need for earlier engagement with the community in the process of defining the achievement challenge and change priorities:

While it has probably been important in the formative stages of the strategy to be cautious in the practical application of the ecological, interactive approach to broaden the thinking of school-based learning beyond teaching, new networks will have the opportunity to include a wide representation of participants early. All networks, whether newly forming or well developed, need to be aware that authentic participation of family, whānau and community is more difficult to achieve if they are kept on the periphery of the network by a firmly established core professional group.³⁷

While pursuing authentic parent engagement and agency can result in real gains for students and communities, and should indeed be one of LCN’s priorities moving forward, the nature of parents’ roles matters as much as their preparation for it. The form of engagement matters: In the 2009 Best Evidence Synthesis on school leadership and student outcomes, joint parent and teacher intervention on behalf of a student registers an effect size of 1.81 on student learning. Similarly, school strategies to access family and community strengths and knowledges boasts an effect size of 0.93. However, involving parents in governance registered no effect on student learning at all.³⁸ Parent governance may have other positive effects or more indirect effects on student learning, but as schools move to engage parents, the best evidence of where to invest their energies should inform those efforts.

Reconnecting in Te Awahou

Though many schools have come up with creative approaches in engaging parents in learning alongside their children, Coley Street School in Foxton has added a noteworthy blend of the digital and cultural through its recent “parent sleepover” programme, and they have agreed to share their work here. After debating how to introduce parents to the digital tools and pedagogies their children were encountering in the classroom, the Coley Street leadership team decided to stage a model blended learning lesson for parents and students to share in together. They organized a Marae visit to reinforce the learning and provide an opportunity for create a more lasting relationship among those in attendance with the Marae elders. Tina Maclean, Deputy Principal of Coley Street School in Foxton, shared with me how the sleepover night has not only ignited parent interest in blended learning, but also in reconnecting with tikanga Maori:

³⁶ Robinson and Lai (2002) offer an in-depth treatment of the significant challenges inherent in parent partnerships.

³⁷ Annan (2014, p.3)

³⁸ Robinson, Hohepa, & Lloyd (2009)

As part of our inquiry, our team organised a student-parent-staff trip to the Marae. This linked to our students learning Maori tikanga, waiata and also pepehas, and the trip concluded an inquiry about Matariki [Maori New Year]. Students engaged parents to learn about their whakapapa, and parents were then invited to join our syndicate team when we practiced waiata. One mother came and taught a song that was traditionally written for Coley Street School.

We then had a sleepover to prepare for our trip to the Marae, and parents came and joined in, learning the protocols for the powhiri. Students and several parents then slept over in their classes. Some shared their Mihi with parents, other classes taught some adults the songs we would be singing. The next day we went to the Marae, and many parents provided transport, stayed and joined in the powhiri and events. The time spent preparing students and parents around protocols, etc. was well spent and really engaged our school community. Parents provided so much food for the sleepover supper that there was ample food for supper, lunch the next day, a shared class event, *and* for giving to a family in the community who had tragically lost a child. The support was overwhelming.³⁹

In recounting the story to the group, Maclean noted that many of the parents told her that they hadn't been back to the Marae since childhood, that the experience had reawakened in them a hunger to reconnect with those roots. Parents have since asked for another round, which is currently being planned. It is important to note that I share this story as an example of the ecological learning goal of LCN, of learning that is not captured by National Standards but is no less important. Stronger connections with culture, with families and family history, cultivate stronger children, and those strengths often translate into the kind of learning that is measured on assessments, though its worth extends much more broadly.

Evaluation

In a departure from past school networking initiatives, the LCN strategy emphasizes a self-review approach that collects qualitative information to create a narrative alongside student learning data. In conjunction with a National Standards database to which schools can voluntarily submit data (and most do), the Ministry and University of Auckland LCN teams collect artefacts of network activity. For the forthcoming final milestone report, for example, schools can submit evaluative surveys they've developed, examples of learning maps, or videos of students talking about how their learning environment has changed. As a result, the LCN initiative boasts a richness of recorded detail about the implementation of the strategy in various contexts.

That rich narrative is particularly important given how difficult discerning the impact of the LCN strategy is and will be. Though student learning gains will ultimately serve as central measure of success for LCN, improvements in various capabilities among school leaders and staff (e.g. leadership, instructional, evaluative) and among families, whānau, and students, are both valuable and difficult to assess.

By emphasizing self-review throughout the process of identifying, implementing, and evaluating change, the LCN strategy aims to develop the capability of schools and networks to continue that process beyond LCN's time. Self-affirming narratives are an inherent risk to self-review, and especially when so many networks are just finding their footing, external evaluation remains all the more important. The risk of self-affirmation is simply too strong when networks are asked to submit self-reviewed evidence, based on tools they have often themselves developed, to assess against success criteria they have themselves chosen. An experienced principal in a network with several years of experience working together argued similarly:

³⁹ Paraphrased from email communication, November 2014.

Sarah: The learning maps feed into another LCN thing that's different: evaluation. Is the qualitative aspect new for you?

Principal: Yes, and I think the narrative that sits alongside the data--the visuals--is good. But I reserve judgment a little bit, because who evaluates the narrative? It's really easy to believe something without it being critiqued. We're always really cautious about self-affirmation. While we have this group of people in this network, we won't have that. People always ask "where's your evidence?" The talk is challenging.

Sarah: Is there a policy role in ensuring that happens? Or is it too difficult to engineer challenging conversations externally?

Principal: I think there is a role for LCN in terms of setting success criteria and measurements. Even if it's "teachers will be able to talk about X and students will be able to talk about X." There should be numbers alongside it to aim for. Like 80% of teachers, etcetera.

As this principal notes, self-review is only as valuable as the evaluative capability of, and the challenging conversations in, a network. Particularly for networks that are new to working together or involve leaders that are less experienced with evaluation, self-review may mask challenges. Facilitators, with their bird's eye view across networks, can act as a check at the school and network level of evaluation. Independent, external evaluators are needed to act as a check at the strategy level. Like many of the recommendations in this report, this is a "both/and" rather than an "either/or" argument: Networks need the flexibility to develop their own approaches, but they also deserve an expectation of evaluation in conjunction with their own internal lens to ensure that they are serving their students as best they can. Though qualitative richness adds needed depth to evaluation, it should complement, rather than substitute for, independent external evaluation across multiple networks.

Collecting network-level measures of success, measured consistently across schools, provides another needed check against the risk of self-affirmation. Most of the networks with which I worked have a series of progress metrics maintained by each school, but they are not comparable across the schools in the network. As one principal noted, "Are we really a network if we all go home to our own ways of measuring everything? How will we know what's working across all of our schools?" Requiring networks to develop and agree upon common, concrete measures of progress need not compromise the ownership emphasis of LCN. In fact, it elevates the expectations of ownership by generating internal accountability. A principal in Network G shared this view at a recent regional networking day, following a session on self-review:

Principal: We need more structure.

Sarah: Can you clarify what you mean? What concrete aspect needs structure?

Principal: I don't mean prescription in probes or anything top-down like that. We don't need someone telling us what questions to ask. But we should have common measures. We can develop them ourselves. And we need a common process for getting those measures. I think that's what I mean by structure. We have to have some accountability to each other in a way that's comparable when we're evaluating, otherwise we're just a bunch of schools with a common pool of resources, right? Some more structure in the process across schools.

As part of the LCN framework, networks complete evaluative "probes," or surveys designed to assess progress in areas like student or parent engagement or student agency. These probes create network-level data that allows for discussions and decisions on next steps as a network, and most networks have conducted at least one of the four probe surveys designed by the LCN team. However, in the course of the implementation of LCN, as schools found the probes too rigid for their purposes, the LCN leadership team has encouraged networks to

develop their own. For networks that choose this route, they can craft measures that deliver data pertinent to their context, and networks that chose this route were enthusiastic about the information they gleaned. Developing probes helps networks build their own internal evaluative capability as well. As one facilitator noted, “It’s essential that schools see the topics of the probes as important to evaluate so they actually evaluate them. How they choose to do that doesn’t need to have uniformity.” Conversely, a facilitator involved in the early development of the probes, however, raised the “don’t know what you don’t know” dilemma, arguing in favour of privileging the topic-area expertise in the existing probes:

Schools don't always know what they've missed. Those dimensions [in the probes] were carefully thought through. It's a great framework for schools to use in self-review, to say "are we considering all of the issues in whanau engagement, or responsiveness, or pedagogy?" [...]The probes were developed carefully and with expertise in particular areas. Schools don't know what they don't know, you know?

It is beyond the scope of this study to ascertain the quality of the evaluative approaches each network has chosen. I raise these points as threads for further inquiry as LCN and its future iterations evolve. However, a further “don’t know what you don’t know” concern is that several networks neither developed nor conducted several of these surveys, meaning they lack network-level data on their progress as a network. If moving from a group of schools to a cohesive network is a goal for LCN, an expectation of network-level accountability to network-level metrics in addition to school-level metrics can help networks toward that goal.

Because of the flexibility networks have in choosing change priorities and designing their own implementation approach and measures for changing learning environments, requiring consistent measures across networks (other than National Standards data) is inappropriate. However, if networks are expected to create their own consistent network-level indicators, against which schools within the network can compare themselves with reasonable confidence, then those networks have not only elevated their accountability to each other but also created a new resource for problem solving. This is not an argument for an external entity to dictate how networks should measure progress, but rather for requiring that they develop consistent measures of progress, consistent processes for obtaining those measures, and an ongoing timeline for checking that progress.

Whether in learning environment shifts or in the indicators measuring those shifts, the schools involved in the LCN strategy are pioneering new ways of approaching educational change. The LCN strategy is drawing worldwide attention, and lessons from LCN can inform worldwide practice. All the more reason to commission formal research to decipher what aspects of the strategy, and what conditions of implementation of that strategy, generated engagement and learning for participating students. The LCN strategy depends on a multitude of moving parts, and networks use those parts in differing ways based on their chosen change priorities and achievement challenge. As one principal noted:

We don't know that this Learning and Change Network work is quantifiable. We think we're probably having an impact, but it's hard to quantify in terms of *what* had that impact. Getting information from individual students and seeing the change in them—potentially. But lots of things contribute to that as well.

To this principal’s point, untangling the effect of so many moving parts is difficult, but independent, rigorously designed research can help clarify the mechanisms within LCN that most benefit students. Qualitative evaluation, nor even quantitative student learning data at the level of National Standards, cannot isolate those components, or mechanisms. The rich qualitative material emerging from the networks can identify promising strategies, and can evidence the conditions and constraints surrounding those strategies, but it is most powerful when used as a complement to rigorously designed research studies. If one piece of the LCN strategy is working at cross-purposes with another, National Standards data will not necessarily reveal that dynamic. Similarly, if a practice generates buzz but does not generate learning gains, the qualitative data may prove self-

affirming and mask the true impact of that practice. The Woolf Fischer Research Centre’s work evaluating Manaiaakalani is an exemplary first step in unpacking some of those mechanisms. Expanding the scope of their investigation to look across networks and at specific sub-strategies schools are employing can solidify guidance for future reform efforts. By taking an innovative approach to evaluating an already innovative initiative, LCN deserves praise, and the field of education stands to benefit greatly from the new methods networks are developing to measure the social side—the lateral learning—in their work. With so many schools in so many networks experimenting with so many interlocking strategies for building student success, LCN has the opportunity to discern not “what works,” but for whom and under what conditions certain things work. Distilling those lessons will require a mix of old and new in evaluation.

Learning and Change and Learning Science

A foundational assumption of the LCN strategy is that students will be more engaged, and learn more, if their learning environment better reflects how they learn best. As one teacher put it, “I’ve been teaching ten years and I never thought to ask my kids how they learned! It’s not a rocket science question!”

True, but it is a learning science question.

I often observed in my conversations with LCN participants a blurring of what we mean by “how do you learn best?” I make the distinction because recent research, particularly in the cognitive sciences, distinguishes the question of “how” from questions of what, from whom, and under what conditions students learn best. Cognitive science has more to say today about the “how” of learning than ever before. It raises an important question for the LCN strategy, and the innovative learning environments project writ large: *What happens when a student’s beliefs about how she learns best don’t agree with our current best research evidence about how people learn best?* In short, students, like all people, don’t know what they don’t know. Educators have a responsibility to check students’ beliefs about how they learn best against their professional judgement and existing evidence of how that student might learn best. This need not take away from student agency, but rather focus student agency in the most productive directions.

The learning map tool, for example, makes visible the people, sites (e.g. school, church, the local river, home), and tools (e.g. Chromebooks, books) that a child leverages for learning. These fall into the “from whom and from what” category, and to some extent in the “under what conditions” category. The learning maps have served as powerful tools for raising awareness among families, students, and staff that learning is a social activity, and that students can too often be passive in their learning. But students, just like all people, may not be aware of important influences on their learning, and it is the role of educators to try to anticipate gaps in the learning maps students produce.

The growth of cognitive science research over the past fifteen years astounds: New technologies and techniques are enabling researchers to answer questions about the mysteries of how the brain acquires, assimilates, and applies new knowledge. In *Why Don’t Students Like School?*, University of Virginia cognitive scientist Dan Willingham distils from learning science nine principles of how people learn. A few of these principals seem to be at odds with common interpretations of the personalised, future-focused pedagogy promoted by LCN. I offer a short explanation for each, with annotations for further reading, but the principles themselves are verbatim⁴⁰:

- 1. People are naturally curious, but they are not naturally good thinkers.** Students can get frustrated or bored if the level of challenge in their learning gets too far away from their “Goldilocks level,” not

⁴⁰ I am indebted to Benjamin Riley, a 2014 Ian Axford Fellow, for helping me inquire more deeply into learning science and its applications in New Zealand and American education. The arguments in this section draw on some of the arguments made in his fellowship report (2014).

too hard, not too easy. Teachers must know their students in order to calibrate instruction effectively. An overwhelming cognitive load deters from learning.⁴¹

2. **Factual knowledge precedes skill.** Critical thinking skills and related higher-order thinking skills are not purely transferrable, because topic-specific background knowledge must reside in long-term memory to facilitate thought. For example, the context-specific nature of problems means that there is no such thing as a generic capacity to problem solve.⁴² Likewise, reading comprehension is variable across texts dependent on the reader's content knowledge.⁴³ In sum, "learning how to learn" cannot be isolated from *what* students learn.
3. **Memory is the residue of thought.** This is a point about motivation and distinguishing between being taught and learning. Students must be actively thinking about the learning objective—and not any novelties in the lesson wrapped around that objective—to learn. For example, students focusing on the technology used to produce a presentation rather than the substance of the presentation distracts from learning rather than enhances it.
4. **We understand new things in the context of what we already know.** Knowledge is cumulative. Similar to No. 2, building deep knowledge takes time. Direct teaching can create a baseline when students arrive at a topic with varying levels of prior knowledge.⁴⁴
5. **Proficiency requires practice.** Whether it's teaching, algebra, playing cello, or coding, practice makes perfect. And sustained practice over time is preferable to cramming.
6. **Cognition is fundamentally different early and late in training.** Also called the "expert-novice difference," this principle acknowledges that all experts were once novices. Thinking like a scientist requires developing cumulative knowledge and foundational skills over time.
7. **Children are more alike than different in their learning.** Boy, does this require qualification. While students' identities, prior knowledge, interests, lateral learning connections, and abilities undoubtedly and beautifully vary, the *cognitive processes* by which people learn are by and large alike. The nature of the content should guide the mode of instruction, and multi-modal learning most often benefits all learners rather than a single mode of presentation.
8. **Intelligence can be changed through sustained hard work.** So many of the abilities we consider as evidence of intelligence are really products of prior knowledge and accumulated skill.⁴⁵ Praising effort rather than smarts can improve students' confidence to improve.
9. **Teaching, like any complex skill, must be practiced to be improved.** Experience does not always practice make. Reflective practice and meaningful feedback, like with students, fuels improvement.

Willingham's seventh principle is particularly relevant to the LCN strategy, and thus worth a deeper look. The line between knowing what your learners need and knowing what *most* learners need is a fine one indeed, but an important line to walk closely.⁴⁶ Students will vary wildly in their passions, methods of motivation, natural proclivities, and responsiveness to certain modes of instruction, and LCN rightly elevates the expectations of schools and students in incorporating student voice into learning. However, certain strategies for teaching and

⁴¹ The KQED Mindshift blog explores the role of cognitive load and "desirable difficulty" further: <http://blogs.kqed.org/mindshift/2014/03/whats-the-sweet-spot-of-difficulty-for-learning/>.

⁴² Willingham and Rotherham (2009) discuss the relationship between content knowledge and skill in the context of the 21st-century skills movement. Viviane Robinson (2001, p. 65) also makes this point in reference to organizational learning approaches that emphasize abstract "learning to learn" strategies.

⁴³ Fisher and Frey (2014). See also Pondiscio (2014) for the blog interpretation of Willingham and Lovette (2014).

⁴⁴ Hmelo-Silver, et al. (2007) offer needed nuance for this principle in defence of direct teaching in inquiry and problem-based learning that builds on a sequenced curriculum, in rebuttal to Kirschner, Sweller, and Clark (2006).

⁴⁵ As I mention in the case study of Korakonui School, researchers (West, et al, 2014) are just beginning to unpack how schools improve "fluid cognitive ability" alongside factual knowledge, but intelligence is definitively not fixed.

⁴⁶ However prevalent the concept may be across the world's classrooms, learning styles stand on very shaky footing, yet many LCN participants interpreted LCN's focus on student voice in their learning environment as a call for auditory, kinaesthetic, or visual instruction. Learners may prefer to receive information in a certain way, but they almost certainly benefit from receiving it in a multitude of ways. See Howard-Jones (2014) and Willingham (2010), or for a nifty infographic, try Edudemic (2014): <http://www.edudemic.com/the-myth-of-learning-styles/>.

learning wield a much more robust evidence base than others, and students may not be aware of why one way of doing something is more effective than another.

The “teacher as facilitator” role—moving from a “teacher-centred” to a “student-centred” model—also merits a close check against the best evidence gathered of how students learn at varying levels of development. In my conversations with LCN participants, the definition of what “facilitator” looked like varied wildly. As one educator who expressed similar concerns described it to me, the “just right” level of teaching and learning balance arrives when three instructional core “bubbles” –student, teacher, and curriculum—are balanced:

It's the moment the teacher becomes just facilitator. When the student's preferences, drive, wholly dictates the teacher's behavior. I'm not saying there shouldn't be consideration of child's needs. Quite the contrary. It's the degree of push that's being suggested is that the child's view totally dictates the teacher. To me, it's all about defining the right level of tension between what the teacher believes is best for that child--knowing that child--and what the child is motivated to do. That's the nub of it. If you can get that balance right, to have enough individualization or personalization to maintain motivation, but also bring teacher expertise, then you are approaching the ideal of what personalized learning could be.

A “best evidence” bubble is warranted as well. As one educator with a reputation for excellence phrased it, “Don’t let go of the good stuff in the name of experimentation. We don’t want to lose learning for the sake of engagement. We rig this for success: the kids have choice, but they are all rigorous choices.” Network facilitators, likewise, have a responsibility to rig for success. Facilitators or LDAs have occasionally expressed reluctance to put research on the table for fear of compromising the ownership and agency of the network. Developing expertise need not be at the expense of offering expertise. In keeping with the “rig for success” ethos, networks may need to be presented with evidence that conflicts with their chosen direction, even if they don’t guide themselves to it. Innovation often requires a “ready, fire, aim” ethos, to borrow a phrase from Michael Fullan, but readiness requires research, both from practice-based evidence and from rigorous studies. As schools move to implement personalised, future-focused pedagogies, teaching practices with a proven track record still merit a privileged place, and those practices continue to be largely oriented around Richard Elmore’s instructional core.⁴⁷ While the instructional core too often ignores the learning that takes place outside of a classroom and the circumstances that a student brings into it—conditions to which the LCN strategy draws increased attention—decades of expertise around effective teaching and the critical importance of curricular content and materials⁴⁸ need not go out with the bathwater. Another principal in Network D expressed a similar caution:

Devices engage, but they don't necessarily produce learning. That scares me most with this. And it's about the language you use also, so everything is framed around learning. We keep tight on that, and monitor it tightly. That was the risk with Chromebooks: to be quite honest, we've worked too hard to raise achievement to let it go to play. We're not going to go there! But what it's done for our middle kids and kids who are achieving well is that they can increase the pace of their learning. I reckon they'll get 1.5-2 years of learning this year. For them, their cognitive engagement will be improved. And that's a byproduct of what we're trying to do for our priority learners.

⁴⁷Elmore (2009). See also <http://www.educationalleaders.govt.nz/Pedagogy-and-assessment/Pedagogical-leadership/Leading-the-instructional-core>.

⁴⁸A Brookings Institute study (2012) found that the impact of curricular materials rivaled that of effective teaching in a second-grade math classroom in the States.

It is important to note here that some on the LCN facilitation team acknowledged the need for facilitators to be more deliberate in prompting networks to probe for relevant research before arriving at solutions. “The danger of that is that you get back into just hearing an idea from somebody and doing it,” said one facilitator, “Which is what’s happened in the past: ‘Ah, such and such tried this, so I’ll do it.’ The huge advantage of this, though, is that they get a grounded understanding before they make explicit change.” Interrupting inquiry cycles can beget acceleration, but accelerating in the wrong directions serves no one well. Regardless of whether a network prefers structured guidance or open-ended exploration, facilitators have a critical role to play in asking tough questions and cultivating an atmosphere of safety in having challenging discussions about the evidence underpinning network decisions.

This is not an argument to privilege “evidence-based” practices in network (and classroom) action at the expense of practice-based evidence, professional judgement, and context. Nor is it an argument to forgo experimentation for fear of failure, for cravenly clinging to a paint-by-numbers conception of “what works” in education. An education dictated purely by the aggregates of science would be a dull and imprisoning, and ultimately doomed, enterprise, a factory model of education in sheep’s clothing. Just as networking creates potentially transformational opportunities for schools to work together closely to drive innovation, so too does it create opportunities to spread alluring but ineffective practices with snake-oiled efficiency. Such are the risks and rewards of networking, but the potential transformational rewards far outweigh these risks, which can be mitigated. Facilitators and LDAs can be that check, directing networks to develop their own approaches rooted in a solid evidential foundation.

The “Don’t Know What You Don’t Know” Dilemma

Similar to the need for a “best evidence bubble” is the need to acknowledge that personalised pedagogies bear a heavy “don’t know what you don’t know” risk that could compromise learning. As an illustration, consider the following story, which I summarize from “The Science of Smart,” a recent radio documentary from American Radio Works⁴⁹:

UCLA psychologist Bob Bjork’s bailiwick is interleaving. Yes, interleaving, with an “L.” Interleaving is a clunky term for a simple cognitive concept: instead of practicing, or “blocking,” the same concept or skill repeatedly in one session, it is more productive to learn by weaving various concepts together and practicing them in succession. Students who are assessed after interleaved studying in Bjork’s lab experiments consistently outperform those who used blocked study patterns. Participants got about 60 percent of the interleaved examples of artistic styles of famous painters correct, compared to just 35 percent of the blocked examples. But what has surprised Bjork and his colleagues isn’t the fact that interleaving is consistently more effective.

“The thing that’s really interesting that’s come out of this study and related studies is that people consistently don’t understand what’s good for their own learning,” says graduate student Veronica Yan, who helps run the experiment. Participants are asked afterwards which worked better for them, blocking or interleaving. Some 70 percent of participants believe blocking was the more effective way to learn, even though it wasn’t.

Why is this pertinent for LCN? Regardless of your stance on homework, the example is illustrative: If asked how they learned best, most of the students—and their teacher—would have gone with blocked homework. Likewise, when LCN leaders ask students how they feel they learn best and respond to those requests, they must be cognisant of when those requests are in tension with our best evidence of how people learn. In

⁴⁹ Aired 20 August, 2014: <http://www.americanradioworks.org/segments/variation-is-key-to-deeper-learning/>. *The New York Times* (2014, November) has also covered interleaving and assessment for learning.

directing attention to how students learn best, LCN is rightfully enabling students to be agentic in shaping their learning environment. All the more reason to make students agents leading school-wide conversations about how the latest lessons from learning science apply to their learning environment.

The Importance of Content Knowledge

In a similar vein, students who choose their own path may not know what they don't know in terms of the actual content they could choose to pursue. In a personalised learning environment, and even in an inquiry learning environment, if the path students take—whether chosen by them or by the teacher—through the material does not build cumulatively in a sequenced way, learning is lost. The New Zealand Curriculum, and the future-focused approach to learning, de-emphasizes content knowledge in favour of process, of learning how to learn. Yet, as Willingham notes, skills cannot be learned well in isolation from the subject matter in which they will be applied. To take reading as an example, reading comprehension is dependent on student knowledge of the subject.⁵⁰ I can't pick up a newspaper article about a cricket match and comprehend it well, because I have never spent time learning about the vocabulary and rules governing cricket. I must build my knowledge of the subject over time. In a teacher-centric classroom, the teacher determines the path of the students and can more easily ensure that students proceed through a cumulative path

Yet the importance of content is rooted in not only learning science. As one principal noted, content knowledge is also cultural currency:

To get at this for LCN, I wonder if parents are encouraging us to put more content back into it, possibly. They say "I want my kids to be competitive for the best jobs," but what does that actually mean? I'd say it means they need the knowledge and the skills to do that, not just the skills. Not just working collaboratively with everyone and knowing how to get new information. They need to know how to speak the language of power in order to engage with it. They must be widely read, knowledgeable about their area, verbally skilled. The child might not say that's what they want to do, but there's a lot in what the parents are telling us. That perhaps we should give equal, if not more, credence to.

As LCN schools, and schools across New Zealand, enable students to choose what they study, the rigor of the content itself matters as much as the fact that the path through the content is cumulative. Therefore, ensuring that all learners, and especially priority learners, are encountering challenging content that is aligned closely to the New Zealand Curriculum is all the more important.

There is an “irreducible situativity” to teaching,⁵¹ that means that “what works” is often a cacophony of contextual factors working in harmony to produce something beautiful: learning. Evidence-based practice and practice-based evidence together create only a palette from which teachers and students can paint masterpieces. But establishing the palette is a critical first step. Great teachers can both nurture students' inspiration to paint and ensure that they use high-quality paints and pursue sublime subjects for paintings. You can't paint a Picasso simply by using his palette of paints, but as Picasso said, you can learn the rules like a pro so you can know when to break them like an artist. With the advent of new technologies and research breakthroughs in the past few decades, the rules for education are changing. Or, rather, the rules governing learning are becoming more knowable, and the rules governing school are becoming less relevant. LCN has an enviable role to play in showing the world what learning can look like for New Zealand's students.

⁵⁰ Willingham (2010), and see also Shanahan (2014), a professor emeritus at the University of Chicago, for a blog approach to these points.

⁵¹ Thanks to Ilana Horn for that helpful mouthful of a phrase: <http://teachingmathculture.wordpress.com/2014/10/22/relational-density-in-the-classroom/>.

Recommendations

Though the contract for LCN will soon draw to a close, these recommendations are intended for future iterations of LCN as well as currently existing networks that will soon transition into Communities of Schools. A common theme across these recommendations is that of ensuring rigor in network activity without compromising the development of ownership within networks.

Model, or manufacture if necessary, teacher-level classroom observations across schools as an expectation for networks. In seeking to shift schools' focus from traditional school improvement approaches to a learner-centred ecology of learning, LCN has deliberately eschewed a focus on teacher-level connections, preferring to focus on student and family ownership. Nevertheless, the benefits of teachers gathering feedback about their practice are well-documented, and this report suggests that networks that have enabled teachers to lead network activities report higher levels of trust, and potentially greater shifts in student engagement and learning. In short, teacher-led change can complement and be complemented by student and family-led change. Facilitators can create an expectation in networks of greater teacher collaboration across schools and can model how those collegial conversations might best be conducted to build trust and professional learning. By prioritizing teacher-level collaboration up front, networks can create connections that may help network leaders distribute leadership more effectively within and among schools.

Model, or manufacture if necessary, family/whānau engagement activities as an expectation for networks. While the ethos and methodology of LCN aims is to have students, families, and whānau driving change, in many cases they remain passenger-seat navigators. Similar to involving teachers early on in decisionmaking, leaders have been too often reluctant to authentically involve families in the initial "messiness" of forming the LCN, while networks that have worked closely with families and communities extol the shifts for students they have observed. Community engagement LCN's most evident successes as a strategy, and ensuring that networks are involving those supporting people more intimately from the outset of their work should be of high priority moving forward. Networks should determine their engagement activities (e.g. a parent maths workshop night, community hui, etc.), but the LCN facilitators can accelerate those activities from a network's earliest stages.

Create an expectation that networks will select common network-level measures. Too many networks have the capability to compare their progress across the network, but have not yet agreed upon the measures with which those comparisons will be made. If networks truly want to advance from simply a group of schools to a cohesive network, then common measures are a necessary, though not sufficient, step that enables a common platform for conversations about student progress. While the facilitation approach of LCN emphasizes flexibility and ownership, requiring schools to agree on the process by which they will conduct evaluative work ensures some comparability within the network without compromising the agency of the network to determine its path. It also enables conversations and creates an evidence base that can more readily inform decisionmaking for the network and inform larger research and policy pursuits.

Commission mechanism research. LCN boasts a wealth of both quantitative and rich qualitative data from its networks as a result of both its methodology and its emphasis on networks' submitting self-review evidence. These data alone cannot tease out the most effective components of the LCN strategy or the contexts in which certain components work. Commissioning "mechanism" research into the impacts of these components can clarify next steps for networks and inform international efforts. Unlike standard evaluation studies that test impacts at the level of a policy or program, a mechanism study tests the key mechanisms of action through which those policies or programs may impact student learning. Mechanism studies can help uncover promising practices for schools and networks that may be masked by less effective strategies or implementation challenges.

Conclusion: Toward an Ecology of Policy, Research, and Practice

Aristotle argued that the aim of education was to get the pupil to assign to things and ideas their proper value.⁵² LCN has put forward the radically traditional concept of situating schools into a broader environment of learning, to assign to the learning that happens in school its proper value compared to the valuable learning that happens on the mountain, at the dinner table, at chapel or seated at grandpa's feet for story time. As I have argued, the best evidence of how people learn must also be assigned its proper value as schools shift their practice through LCN. Additionally, teachers face a set of constraints and opportunities "at the chalk face" defined by not only the children in front of them, but by national and school-level policies. Understanding the mechanisms, constraints, and contexts through which LCN is generating impacts, whether positive or negative, requires a close relationship between research and practice, which are in turn influenced by and influencing policy. While there has been much talk of improving the "research-to-practice pipeline" in education, a pipeline is an impoverished metaphor that implies a one-way directionality and an ignorance of these constraints. LCN has maintained laudably close connections among the research, practice, and policy spheres by design, with Ministry Lead Development Advisors working in close contact with network leaders and facilitators, and researchers affiliated with the University of Auckland conducting comprehensive evaluations for selected networks.

What would an ecology of educational policy, research, and practice look like? Assigning each component their due value as part of a larger whole, what types of partnerships might emerge? LCN has dabbled in this perspective with its unorthodox partnership between the Ministry of Education and the University of Auckland facilitation team, in which each network has direct contact with facilitation from both parties. Participating LCN schools have had an unusually direct contact with Ministry representatives, and the rich qualitative self-review data they have provided also represents a shift away from traditional definitions of reporting to policymakers. In this ecology, national research agendas would be informed by identified practitioner needs, practitioners could contribute practice-based evidence to those agendas through action research and in turn receive pertinent evidence-based guidance. Policy plays a role in funding that emerging research agenda and in creating policies that build on the best evidence emerging from that joint work between educators and researchers. The expertise relevant to each of these professions would retain a distinct role, but cross-pollination among these would gain new urgency. LCN has taken initial steps toward this vision of an ecological education system, and emerging student learning data and other outcome indicators will evidence its success in that pursuit. The communities of schools forming under the Investing in Educational Success (IES) initiative create the next iteration of an opportunity for groups of schools to collectively shape and be shaped by policy and research. Ecologies are ever evolving, and so too with New Zealand's collaborative approach to improving student learning in a self-managing system.

⁵² As paraphrased by C.S. Lewis in *The Abolition of Man*.

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Case Study: Brain Gain at Korakonui School

It's 9:15am, and a handful of junior students are already hard at work in the library at Korakonui School. All is silent in the library computer lab save for steady mouse clicks. Kids don headphones and advance through a series of adaptive games designed to boost their brain function: An eight-year old boy directs a squirrel to shoot acorns at a basketball hoop in "Hoop Nut", matching acorn labels to spoken phonetic sounds, while his neighbour launches "Paint Match" and begins arraying wriggling paint tubes labelled with a mix of written and spoken words. This is "Brain Gain" class, one of the first New Zealand-based experiments in a growing international commercial industry that brings cognitive training to the classroom.

All of the Brain Gain students have been identified by psychoeducational reports or by the school special education needs coordinator (SENCO) using newly found executive function assessment tools, as having persistent learning challenges, but instead of doubling down on subject-specific academic interventions, Korakonui principal Carla McNeil is placing her bets on cognitive interventions, targeting the brain functions that drive ability across subjects. Cognitive intervention theory inverts the long-running logic of academic intervention in schools—poor performance in reading means remediation with reading-specific instruction—by targeting foundational cognitive skills like working memory, processing speed, auditory processing, and ability to focus.

"I have this analogy of a vegetable garden," McNeil says, "We prepare the soil before planting and water it continuously to ensure we harvest a good crop. I wonder if we give thought to how well we prepare our brains to learn, and perhaps even more relevant, what if we as educators knew more about our individual learner's brains and executive function before we aim to fill them with content specific knowledge. Perhaps if we consciously grow their potential to learn we may see a significant difference in student agency, and rates of progress across and within the curriculum."

"I feel like I'm sitting on this golden egg," McNeil tells me in her office overlooking the hills near Te Awamutu. We pore over two writing samples of a boy who is currently participating in the Brain Gain pilot. His first sample shows dark, cramped letters jumbled into what might be a short sentence or two. It is illegible. "It took him three days to write that in March. Now look at this." She hands me a sheet filled with lighter handwriting, more evenly spaced words and a paragraph's worth of sentences with only occasional spelling or punctuation errors. "That's from July after a few months of Brain Gain, and he hadn't had *any* writing instruction during that time, just the computer programme and teacher aide time."

McNeil had long been frustrated by the persistent lack of growth she'd seen among her lowest performing students, but her interest in finding alternatives to traditional interventions took on new urgency when her son was diagnosed with dyslexia and auditory processing impairments. She began looking closely at the interventions in place within her school and the impact this was having both short-term and long-term on students. Searching for a departure from Reading Recovery and the other programs in place at Korakonui, she made contact with Anne Gaze, founder of the Gaze Foundation, who brought a cognitive training method called the Arrowsmith Programme to NZ. After realising that the Arrowsmith Programme would be neither financially sustainable nor scalable nationally, Gaze suggested CogMed, currently the most popular commercial cognitive intervention programme on the market.

CogMed and related "brain training" programs are an increasingly popular but expensive investment for schools—on the order of tens of thousands of dollars—and have thus been the subject of intense debate among scientists.⁵³ In the last decade, hundreds of evaluations have delivered varying verdicts,⁵⁴ from cautious optimism to wholesale condemnation.

⁵³ Dan Hurley (2012) with the *New York Times* captures this well and has also written a well-received book on the subject. See also *The Economist* (2009).

“What you care about is not an intelligence test score, but whether your ability to do an important task has really improved. That’s a chain of evidence that would be really great to have. I haven’t seen it,” says Bror Saxberg, Chief Learning Officer of Kaplan, Inc., in *The New York Times*.⁵⁵ Saxberg, who holds two PhDs in electrical engineering and computer science from MIT and an M.D. from Harvard, echoes the scepticism of many who question the ability of cognitive training to transfer beyond the narrowly-defined scope of the training tasks to academic abilities. While there is an emerging consensus that marketing-friendly claims made by these programs are overly optimistic,⁵⁶ researchers have not yet untangled the mechanisms that may be at work in multi-component programs that may have beneficial impacts. Many of the clinical trials used to evaluate CogMed, for example, do not test combinations of components—like time with a teacher aide or working memory techniques integrated into subject-area instruction—that could interact for a collectively greater impact. In light of these mixed results, some schools are opting for non-computerized, non-commercial—and less expensive—strategies in pursuit of similar gains.

“The pressing need now is to put existing methodologies for cognitive training to one side,” writes Susan Gathercole, Director of the Cognition and Brain Sciences Unit at Cambridge, in *The Journal of Child Psychology and Psychiatry*, “and move the field forward in two ways: by designing new approaches to training that overcome existing shortcomings, and by improving the methods used to assess their impact[...]. Cognitive training methods may have greater value as components of multi-faceted programmes of support extending across the childhood years.” Essentially, brain training is no silver bullet, but elements of it show enough promise that researchers are scrambling to decipher for whom it might work and why.

McNeil found the emerging evidence for cognitive intervention intriguing enough to set up a trial. Last March, she placed thirteen students, the ones who weren’t responding to multiple interventions, in a two-hour Brain Gain session for four sessions per week for nine weeks. From 9-10am, the students work through CogMed computer sessions, and then for another hour work with a teacher aide on a language based programme which also focuses on increasing executive function and reading readiness. According to assessments administered by the SENCO, the students displayed strong improvements in executive function in their ability to retain information and instructions, willingness to take risks back in their mainstream classrooms, as well as some transference of skills and capabilities in curriculum areas such as maths basic facts and writing. They also showed increased confidence and a growing perception of themselves as capable learners. After a few months, McNeil was approached by not only these students but their parents for a plan to continue the programme into the next term.

With the school board’s blessing, she looked into other programmes for the existing group of thirteen students and began a second group. McNeil opted in favour of a more financially sustainable Australia-based programme called Fast ForWord and moved fourteen more students into Brain Gain. With twenty-five students now participating, eleven of whom have already had CogMed training (two students moved), she hopes to discern any differences in performance between the two groups. “Most recently we have gathered reading and spelling data, and things are still looking very positive,” McNeil wrote to me in an email during Term 4, “All of these students have also written and presented speeches to their class very confidently - teachers were suitably impressed!”

She’s also working with teachers to restructure the school day so that students don’t miss out on literacy or writing instruction while they are in Brain Gain. McNeil notes that as result of the implementation of such a programme and increased teacher awareness of the role of executive function in learning their school

⁵⁴ A basic Google Scholar search for “CogMed working memory school” yields 367 studies or commentaries since 2010. The British Psychological Society (2013) summarizes recent meta-analyses that find negligible effects of working memory training, while Jaeggi, et al. (2012) offer a rebuttal, arguing for further research into the programme mechanisms and implementation contexts that may drive impacts and the specific target groups who most benefit.

⁵⁵ Hurley (2012)

⁵⁶ Jaeggi, et al. (2012)

philosophy has taken on a new lens. Korakonui has started working with Dorothy Howie from Auckland University to trial a whole school approach to the teaching of thinking through Feuerstein's mediated learning approach.

While the mechanism or combination of mechanisms driving the progress of the young man at Korakonui may be impossible to isolate without the expense and rigor of randomized trials, thoughtful design by schools can deliver actionable insights at the school level that can feed into larger research investigations. McNeil is adamant that no programme will work without rigorous implementation, and careful consideration to the relevance of school culture and context. "We've put significant time, effort and expenditure into the implementation model. We've focused on putting strong home school partnerships in place, clear communication links between classroom teachers, teacher aides and SENCO, and professional development for all teachers and teacher aides. That's crucial for understanding the role of executive function in learning."

That focused experimentation can inform a broader inquiry into the mechanisms effective schools use to develop student intelligence. "This is a perfect time for cognitive psychologists, educators, and perhaps even game and software developers to join forces in rapid-cycle experimentation to explore whether and how schools can broadly and permanently raise students' fluid cognitive skills," writes a team of Ivy League researchers in an *Education Next* article published last March.⁵⁷ The team conducted a study comparing test score gains and underlying fluid cognitive ability—read: intelligence—gains among a group of high-performing charter schools in Boston, finding that only some of the charters were elevating fluid cognitive abilities alongside crystallized knowledge, as measured by test scores. What were those schools doing differently from the others that they were getting equally impressive test score gains, but also boosting students' underlying cognitive ability? The researchers will be pursuing that all-important question next, but the study provides further evidence that intelligence is malleable.

Networking among schools can accelerate tweaking and rapid-cycle experimentation. After the promising results from that initial pilot, McNeil is looking to scale up. She has a team of partner piloting schools through Korakonui's involvement with the Rural and Roses LCN. McNeil recently offered a workshop on cognitive intervention for the ten-school network, and several schools are looking to adapt it in some form to their school context. After a meeting at the end of Term 3 to discuss a multi-school strategy, and several schools plan to begin implementing elements of brain training next year. Trialling differing combinations of programs among schools may help uncover some of the mechanisms driving success, just as it might reveal components of intervention that don't generate improvements in learning.

"We've been thinking strong and hard about what that would look like here," said a principal at a neighboring school that also belongs to Rural and Roses, "And we think all of our children--not just priority learners--could benefit from that work. We've got some pretty bright kids, and we want to progress every student. I see this as being another part of the jigsaw of making this powerful in our school. We want to trial this next term. Have a group on CogMed, one on Fast ForWord, one on STEPS, and we look at measurable data. Get our in-data, out-data. We're thinking about variables at the moment: one age group, one cohort. Approaching this quite scientifically." While none of the schools are trialing a non-computerized strategy for comparison, faithful implementation could generate important similarities and differences between schools that can inform future work.

As the Rural and Roses schools prepare to experiment together, McNeil is optimistic but focused on improvement. "We haven't figured out the calibration yet," McNeil says, "CogMed may not be it. Feuerstein may not be it. We will need to tweak. This will look different in five years. But we believe in the theory underneath it."

⁵⁷ West, et al. (2014)

Case Study: Chris Theobald, Seaview LCN

The following is an edited transcript of my conversation with Chris Theobald, formerly deputy principal at Sacred Heart School in Petone and an active participant in the Seaview Learning and Change Network. Chris recently became principal of Holy Family School in Porirua and graciously spared some time from the flurry of new principalship to talk about what led him to overhaul his classroom.

Sarah: Let's first talk about how you found yourself in LCN at Sacred Heart.

Chris: I didn't know anything about LCN when I prepared to be an enthusiastic leader, but doing the Aspiring Principals Programme woke me up. And Twitter kept me tuned in. I'm not a huge geek, but I do dabble in things like Twitter. All the good stuff comes to you if you're tuned in and connected to the right people. I like that position of being able to say, "Have you thought about this?" And then next term everyone is talking about it. Having that finger on the pulse.

My development as a leader was really in realizing that there were lots of good things going on the research side. My master's was on Pasifika education, and Sacred Heart is a half Maori-Pasifika school that was a good testing ground for what I was researching. It created a connection between what's happening worldwide and what's happening in Petone.

It doesn't have to take ten years to get from A to B. You can read it and do it. "Oh, this research team found that this works, so I'll do it tomorrow." It doesn't have to be packaged into a nice, teacher-friendly cartoon for me: I can just do it.

Sarah: What specific things did you give a try?

Chris: In terms of that Pasifika cultural lens, it was inviting the students to share more of their culture in class. Someone once said that a good teacher for Maori and Pasifika students has always been a good teacher. They aren't new inventions: they've always cared about relationships, about families, about the cultural context of each individual. It's not about saying all teachers need to learn to operate in a different way, because certain teachers are always that great with all of their students. They may have been teaching in an all Pakeha school, but they were good because they'd developed relationships with each kid. Transport them to a different cultural context and they'll still be a good teacher. Thinking of students and inspiring them to do their best was always blind to that cultural nuance.

I wouldn't put myself in the category of doing that naturally, even though I grew up in a relatively multicultural environment, it wasn't part of my classroom practice. Opening my eyes to the Eurocentric domination of education in NZ and the rest of the world was interesting to me. I always found it hard when I was given a shield at age 7 and told to fill in my culture. The Samoan kid and the Tokelauan kid, I would think they had it easy! Actually, my culture is embedded in every single cultural context around me. That was awareness raising, for me.

So when Seaview Learning and Change Network came up, I was keen from that cultural lens. In New Zealand, white men largely set up what schools look like today in 1840... let's not do that again! Let's not rejig it with a lot of white men sitting at a table on behalf a population that is increasingly multicultural. For me, Learning and Change Network was a good chance to continue to push that cultural agenda of mine, but also to tap into what was next and what was happening. Other people in our network had a lot more experience than I did. But at this stage it was about collaborating, and the senior teachers were saying that back before 1989, before Tomorrow's Schools, they used to collaborate all the time! When it came in, it got more competitive and schools became silos, but all I've ever known is silos.

Sarah: There's a global and a local component to that as well, with the silos we create for ourselves.

Chris: Breaking down those silos is enriching and enlivening and exciting. It makes a whole lot of sense that we have six schools with large demographic differences, but some real similarities as well, so it's just about learning from one another. Like I said before about reading something from Germany or London and putting it into practice the next day, you can do that with the school down the road. It's about those beneficial shortcuts. Because if we do trial something extensively and keep it as clinical as possible, then a whole cohort of kids misses out until we do get it right. And "getting it right" isn't just a set of criteria.

So Learning and Change Network for me was a chance to keep on pushing myself as a teacher. I love being in the class, but I need something else. Learning and Change Network was that for me for that period of time. Before that, it was study, before that it was another program at the school that was externally-funded, so I've always needed that.

Sarah: Talk a little bit about the start-up phase for you with LCN. How did you arrive at the decision to change things up so drastically in class?

Chris: I think the learning maps with LCN were one of those common sense things—asking, "How do you learn?" And the answers I got from that were varied. Two weeks later, I was at the Learning and Change Network regional meeting and Brian Annan--and at this stage I wasn't too sure what was going on in the network around who the network leaders were. But then Brian says I'm a leader, and that the networks were our schools! I had thought the leaders were the network. Brian said that your schools and communities, and families are the network. And that this is a pilot and that we're learning as we go, but that doesn't mean changes can't happen immediately. So I'd figured out that kids liked X, Y, Z two weeks ago, so the next day I started planning what the class would look like on Monday. And on Monday things started to change, and it was ::snaps:: BANG change.

Sarah: So that regional day conversation from Brian was the spark?

Chris: Yeah, he said "don't wait." I wasn't consciously waiting, but I was thinking "Ok, I've learned this, now Learning and Change Network will tell me what to do next." And he said not to wait, but just to do it. Common sense stuff! The kids had told me what to do.

Sarah: What were those things?

Chris: Kids wanted to learn in different ways all the time, with different environments where they could learn. So we started to change the learning environment for the kids, starting to have more freedom and flexibility to cater for the diverse range of answers. That was end of last year, Term 4, when we started to trial a few different things. Then over the summer, I went on TradeMe and got a whole bunch of furniture for next to nothing. Got a set of free pallets and built a set of riser stairs, covered with free ply from Mitre 10 and free carpet from the carpet place. Got two dining tables for the classroom. It melded in my head that we've got to create an environment where the kids can learn, but I've also got to create an environment that breaks down the barrier between home and school. When you go home, more than likely you're working at a dining room table or a couch. We had one room at Sacred Heart where we had a bunch of couches. And again, borrowing a trailer and \$2-5 dollars later and maybe a donation to someone, and you've got a reasonably good couch.

So it was pretty hectic, a summer of me building thing and picking up things. But the first day, the kids came in and thought, "Oh, this is something different." That's when it all started to click for me, breaking down home and school dissonance, which I was keen to do for our Pasifika families. And since we are full primary, we didn't have the luxury of resetting the clock: intermediate teachers can set up some really good routines, and because the kids have changed schools, they go along. It's not that what they did at the old school is forgotten, but it's the old school. Whereas, with full primary, a lot of those things carry through. So by changing the learning environment, we hope to cut the cord with some of those childish behaviors and say that we want you to behave in this way, to take ownership of your learning and get ready for college. Finally, just responding to

what the kids wanted. They wanted to have bar leaners, to stand up, and we had a whole lot of cushions for the steps we made. Creating a new kind of environment to reset some habits and foster some learning.

Sarah: Since furniture does not learning or ownership make, what were some of the pedagogical shifts you made?

Chris: Just listening to what the kids wanting to do! I had a floating timetable where the kids chose when they wanted to come talk to me. We were lucky to have 1.6 teachers funded for the class, so we had 1.5 classrooms for 1.5 teachers. So we would move in and out of there, and we did that for the first term. This year we spent a lot of time talking about what the rest of the year was going to look like. For the kids who'd never worked like that at all and for whom it was unexpected, it was going to be a bit of a jump. And for parents, they were pretty nervous about what the hell I was doing. And fair enough, too. So we had a term of, "Ok, let's identify what you need to learn. Looking at feedback from your AsTTle test and feedback from your books, we've got a workshop on paragraphing. Do you think you should go to it?" Having those scaffold discussions with students so they see what they need to work on and how they are going to take control of their learning.

Saying that, we didn't get to term 2 and do something for the rest of the year. I realized, "Ok, we've had 5 weeks of this, so how's it going? We need to monitor who is going to what workshops, we need to track it a bit tighter." Another criticism from the students: "If we want to go to workshops, that's great--we're engaged and hooked in--but all of our independent learning tasks we don't have time to do!"

So we went to a different model of doing a week of workshops, then a week of independent learning tasks. One of those tasks--and they vary from spelling and grammar to writing and reading, all linked into our inquiry topic--but one of them made you show what you learned in workshop the week before. It could be learning paragraphing or alliteration or synthesizing information. You have to show us and annotate it and show that you synthesized from certain sources. So them taking ownership and putting what they learned into workshop into what they had to do. It wasn't just about learning stuff and then keep doing what they've always done. A lot of kids were used to just doing that, so there was consciousness raising about what they were doing throughout the process. So it became more about learning instead of just doing.

Sarah: How did the content of it--the "what" of learning--shift?

Chris: It's just trying to eek it out of the students around what they thought they needed--which we knew they needed, mostly. We ask those probing questions: "What's wrong with this bit of writing?" over and over again. By and large, we would have workshops throughout the week, then some flexible ones.

Sarah: In the environment you've just described, is it purely personalized in terms of content, or are there ever instances where kids are, say, reading and writing about the same thing?

Chris: Trying to think. We had a section on animals for inquiry class. So we were all looking at the same animal. Not just creating a fact file about a snow lynx, but actually thinking about what makes a snow lynx adapt to its habitat. A deeper layer. We went through that process together, then the students created their own animal. Some created their own animal for an imaginary landscape. So there was some give and take there, with kids being able to choose some areas. But it was quite teacher-directed.

This is out of the time frame we're talking about, but the class did an inquiry on genetically modified food because I asked them, "What do you want to learn about food?" The closest we got to learning was different colored carrots. My learning from that was that if you open up the gates too much, then it becomes too hard for the teacher to plan a whole term of work based on *whatever* the kids want to do. It was a little too open. I now try to get some control there--in the animal unit that was quite teacher-controlled, they had to do an animal and it had to be about adaptation. In other inquiry units, it's been, "This is how we've done our inquiry, and now you can do it in a similar way."

Sarah: In terms of changes in the students' learning after making all those changes, what did that look like?

Chris: Academically, I can't say that I saw much. I hope the results coming in in 3-5 weeks' time are going to be showing us some movement, that some of them moved somewhere. But the level of ownership for their learning was the impressive part. They were getting to school early. The bell goes at 9am and we encourage them to get to school at 8:40 to get on with the things they need to do as Year 7-8s--here and most schools they are doing assembly, patrol monitoring, all these things--so we said, "If you can, get here by 8:40." And we had 80 percent getting here at 8:30 and wanting to get into learning, with questions. Before they'd get there and sit around and talk. Now they just eat and get working on learning. And just the overall ownership, and for some students in particular, it's really clicking. They think, ok, this is what I need to learn, so this is what I've got to do.

Sarah: As you're implementing all these new things in your class, making shifts, did others in your school pay attention? Did they change anything that you know of as a result?

Chris: I was pretty lucky that my principal actually was very open to it. We had some discussions where she saw that I had some thought and theory behind it, that I hadn't just bought a lot of shit off of TradeMe. She was a little bit apprehensive when she saw my trailer of pallets, but she genuinely supported me because she saw I had genuine interest in the kids, so she was happy to support it. Other staff in the school: some were keen to come check it out and made their own changes. Some wanted to talk about Learning and Change Network, so it started raising the profile of Learning and Change Network among some staff. No real push from the top, just some teachers starting to change things.

I think that's Learning and Change. It's opened up that critical lens. Connection to Learning and Change is realizing you can be critical of what's around and you can make changes as and when necessary.

Sarah: Thanks for taking the time to talk, and for sharing some of those "do it NOW" moments.

Chris: It's funny; I don't think I've always been that way. That's out of my [master's] study and Learning and Change Network as a confluence of different ideas. I wouldn't wait for this at home, why would I wait now?

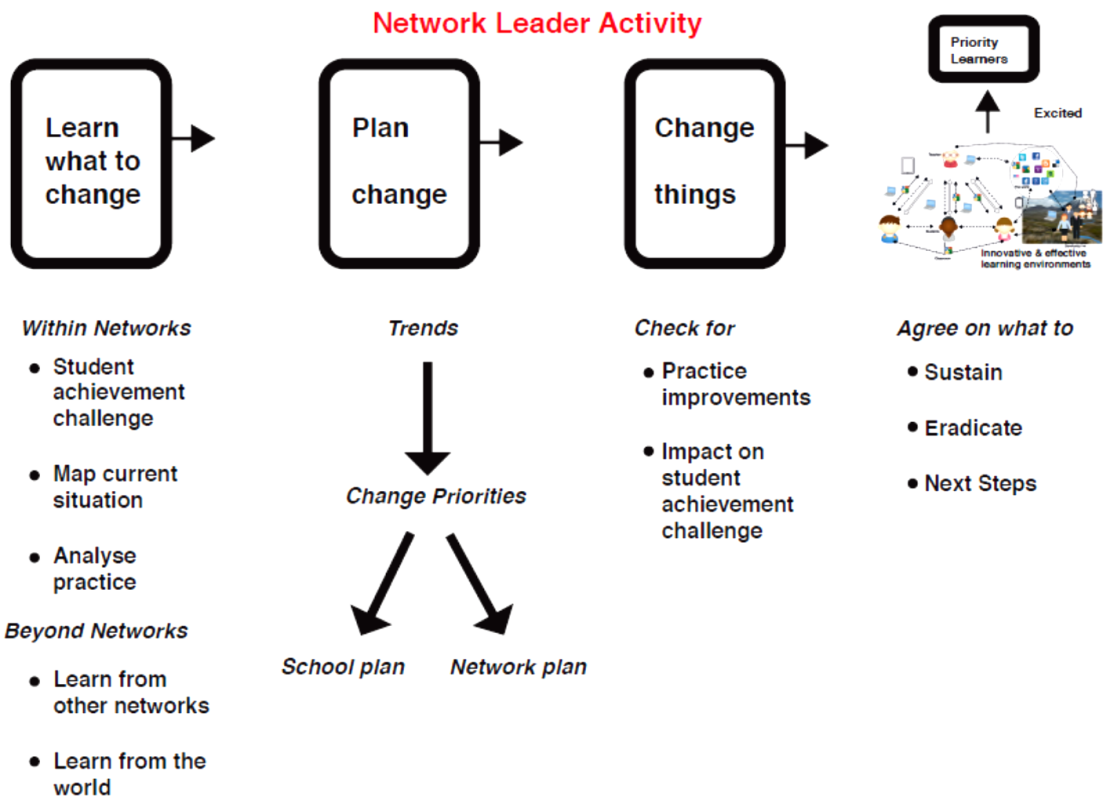
Another brief example: I was a practitioner evaluator and went around to other schools to interview students and staff. I found that most of the staff didn't know about the Learning and Change Network, so I made a quick video⁵⁸. That was an example of, "There's a problem: Fix it!"

So I made it in 2-3 days and sent it to LCN colleagues and Mary [the network facilitator] and said, "What about this?" They said, "We could change this and this." Mary came in with a question: "Aren't we already talking about it because it's not perfect?" The message was to put it in and share it and just say it's your interpretation, not the golden rule. So that video is an example of just going for it. I didn't wait until the next network meeting. I made the video and sent the link. It was just trying not to overcomplicate things.

And with Learning and Change Network, I mean, all these people came up to me about the video and said, "Do you mind if I share it?" And I said, that's the point! If I think you're doing something good, I'm going to ask you. So I want you to ask me. That's why I agreed to talk, because that's the point, you know?

⁵⁸ Available at https://www.youtube.com/watch?v=IZ895_WMQ3Y.

Appendix A: The Learning and Change Implementation Framework⁵⁹



⁵⁹ Learning and Change Networks (2014). Additional explanation of the framework available at <https://cdn.auckland.ac.nz/assets/education/about/learning-change-networks/LCN%20Framework.pdf>.

Appendix B: Network Analysis Maps

Each of the following pages displays the network analysis maps generated from survey results from each of the seven networks. The legend below explains how to approach interpreting each map.

Type of Map

Close Relationships: Respondents checked a box next to the name of each person in the network with whom they felt they had a close relationship, defined as “someone with whom you share personal information or spend time in informal activities.” Close relationship maps provide a look at the personal trust evident in a network, as well as emotional ties that may facilitate or obstruct the flow of information and challenge in the group. It is important to note that personal ties do not imply rigorous professional ties: Close friends may refrain from tough conversations, just as a person may be highly influenced by a person they respect but with whom they do not maintain a close relationship. Note also that a lack of a tie can mean either a neutral or a negative relationship.







Advice: Respondents answered for each other network member the question “How often in the past two months have you sought out this person for advice about a sensitive work-related problem?” The options are based on a four-point scale: once every two months or less, 1-2 times a month, 1-2 times a week, and more than twice weekly. Connections reported only once a month or less were dropped for the map analysis, because reports of infrequent ties are less reliable. Advice networks provide evidence of how information flows through the network, but also an indication of trust and willingness for open to learning conversations. Approaching someone for advice about something sensitive can indicate a level of relationship that requires a willingness to be vulnerable, as compared to those for sharing research or practice-based tips, which may not carry the same personal attachment.

Research Expertise: Respondents answered for each other network member the question “How often in the past two months have you sought out this person for expertise about research on a particular topic?” The options are based on a four-point scale: once every two months or less, 1-2 times a month, 1-2 times a week, and more than twice weekly. This dimension surfaces leaders who may carry topical expertise, as well as the trends within the network of turning to each other for direction about evidence-informed practices.

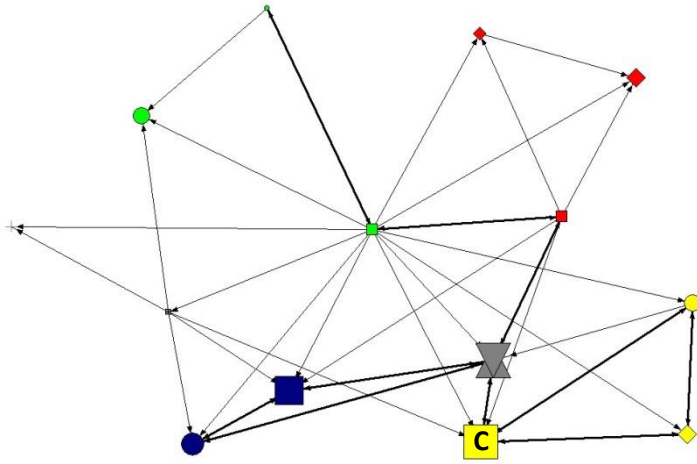
Density: Each map features a density score, which is the sum value of all connections (ties) divided by the number of possible ties. It can be interpreted as the average strength of the ties across all possible (not actual) ties. Density can be compared between networks. Because these maps represent a point-in-time measurement and are necessarily a rough measure, it is more valuable to compare the differences in density across networks rather than emphasize the actual scores.

Map Legend

For example, in an advice network map the following interaction, $\bigcirc^A \rightarrow \bullet^B$, represents that teacher A seeks advice from teacher B, and that the two are from different schools, based on the different colours of the circles.

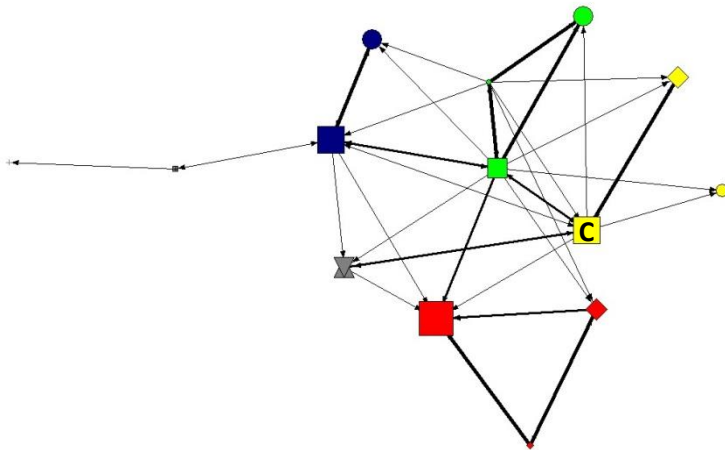
	Each line between shapes, or nodes, represents a reported connection. Thinner lines represent a one-directionally reported close relationship <i>or</i> a connection 1-2 times a month. Bold lines represent a reciprocally reported close relationship <i>or</i> a connection reported to be at least weekly.
	Principal
	Assistant or deputy principal
	Lead teacher, enthusiastic leader teacher
	Network facilitator (University of Auckland)
	Lead Development Advisor (NZ Ministry of Education)
Node Size	Each node is sized by indegree centrality, meaning the number of connections reported to the person by other people.
Node Colour	Nodes are coloured by school, and facilitators and advisors are in grey.
C	Respondents selected this person as “challenger,” someone most likely to challenge the thinking of the group.

Network A



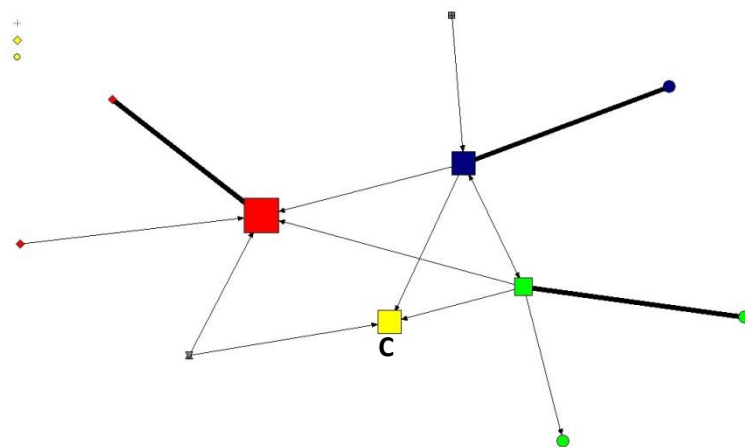
Density: 0.24

Close Relationships



Density: 0.22

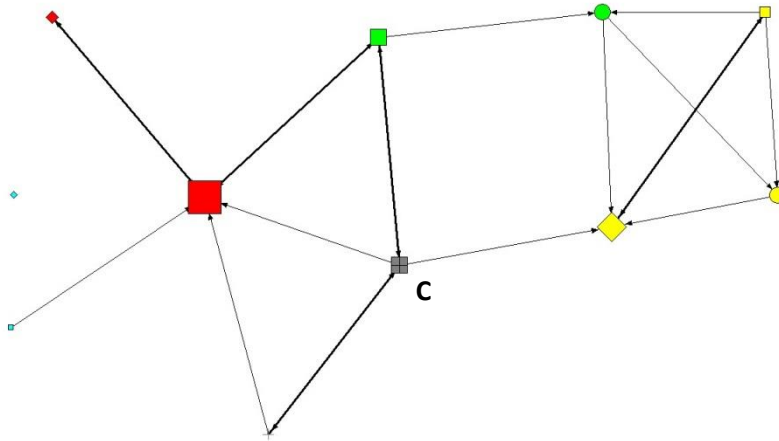
Advice



Density: 0.09

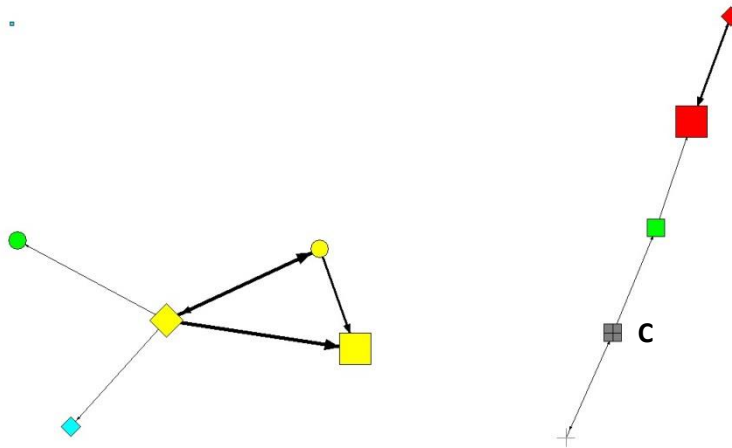
Research

Network C



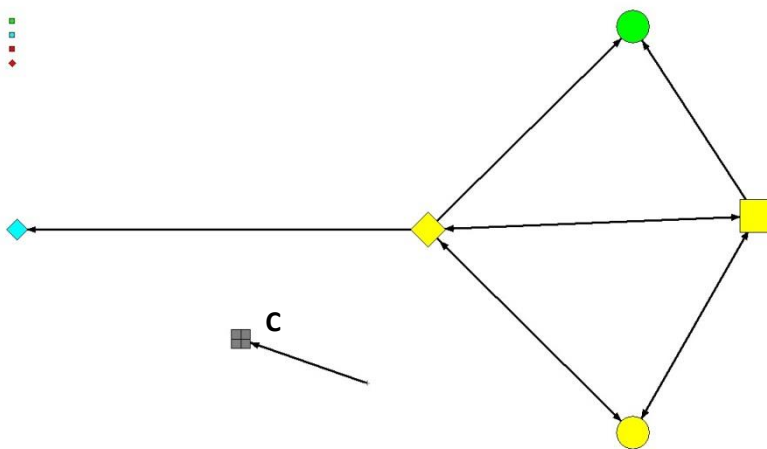
Density: 0.18

Close Relationships



Density: 0.12

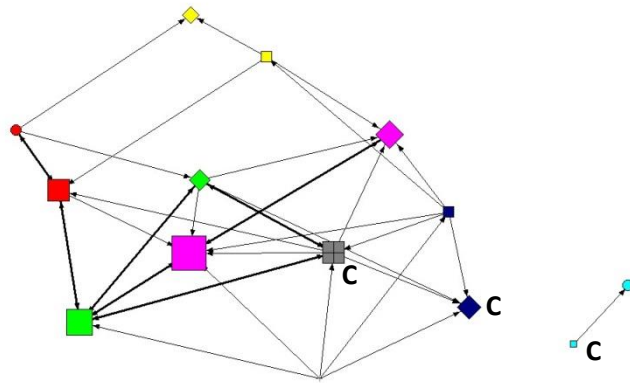
Advice



Density: 0.09

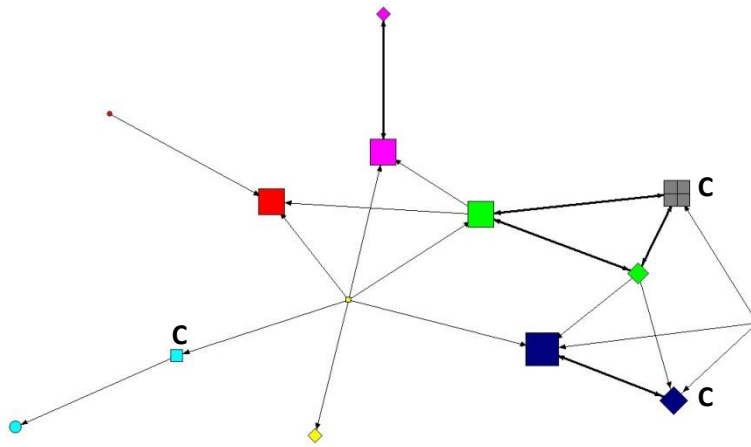
Research

Network D



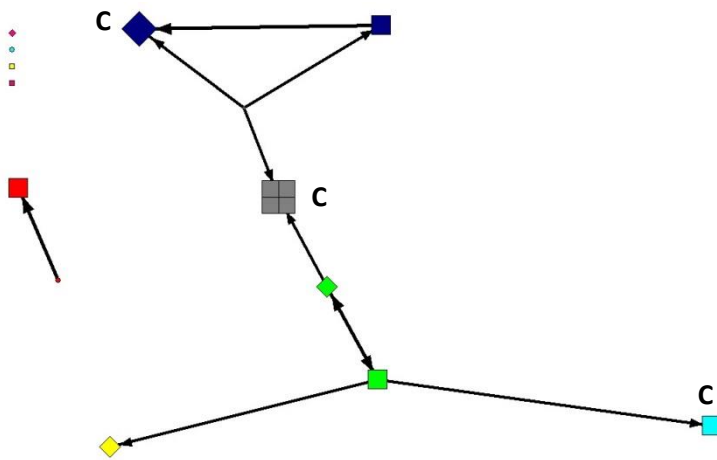
Density: 0.21

Close Relationships



Density: 0.14

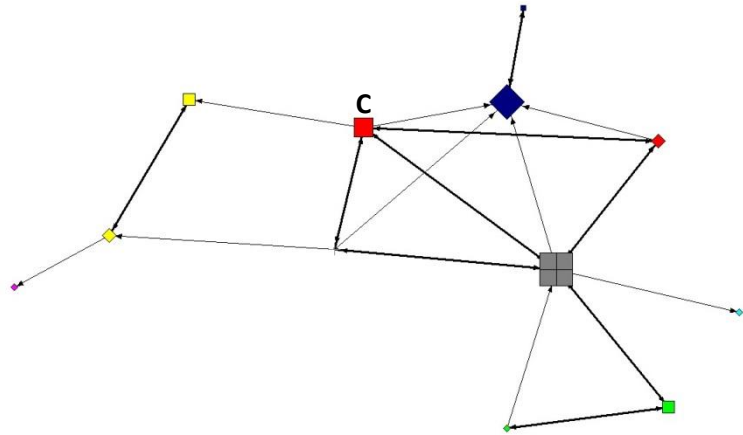
Advice



Density: 0.06

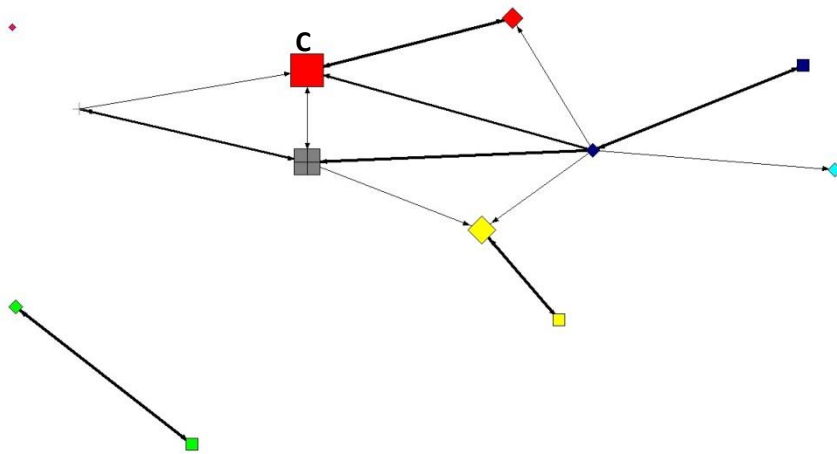
Research

Network E



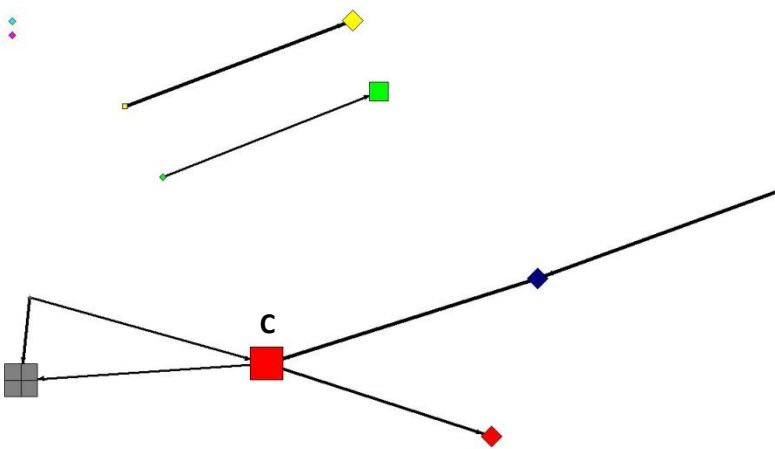
Density: 0.21

Close Relationships



Density: 0.14

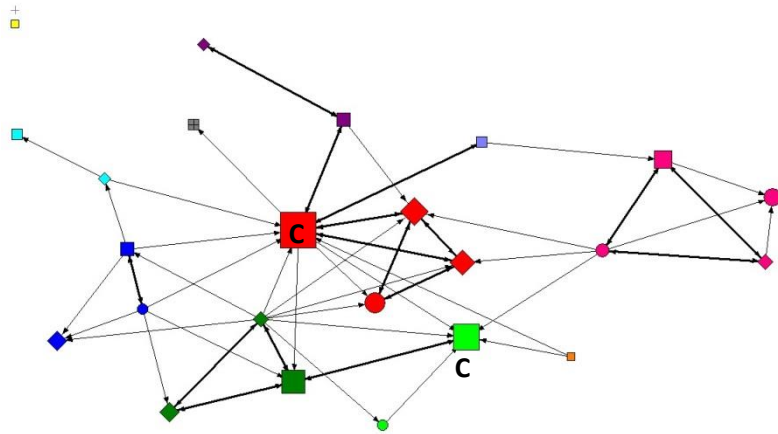
Advice



Density: 0.06

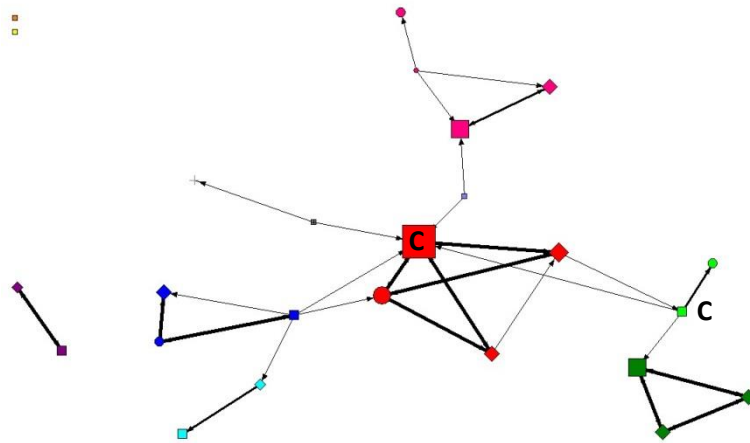
Research

Network G



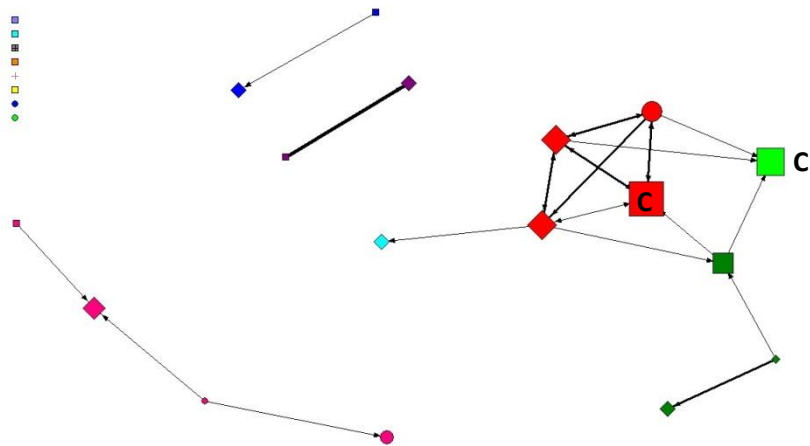
Density: 0.11

Close Relationships



Density: 0.07

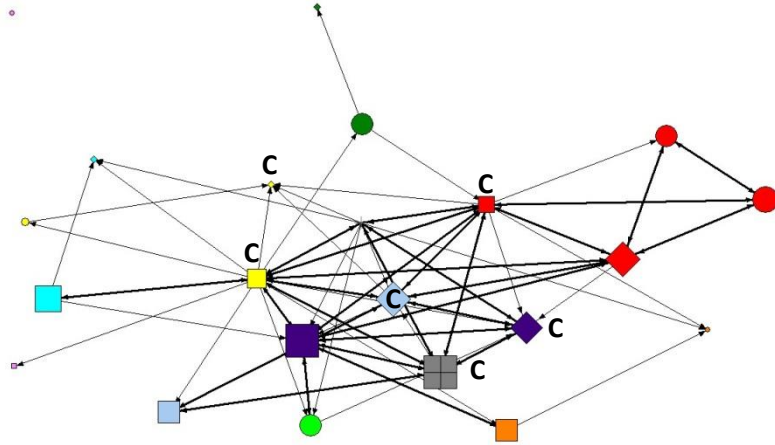
Advice



Density: 0.07

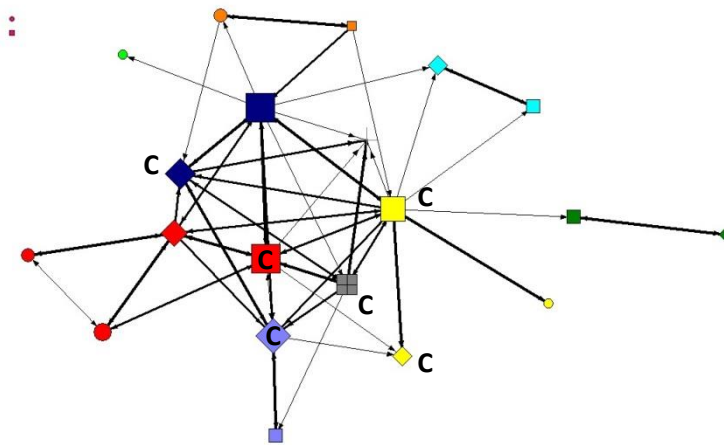
Research

Network H



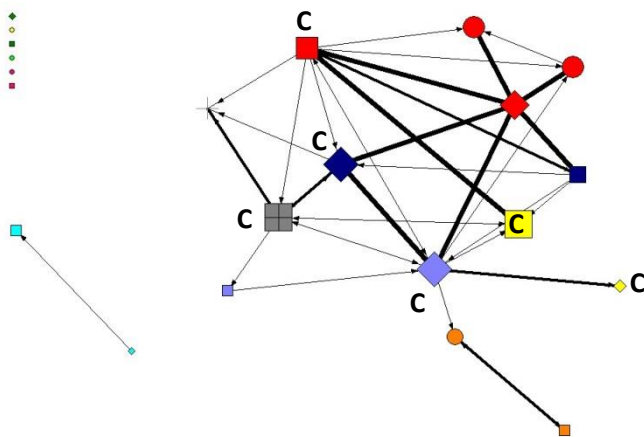
Density: 0.19

Close Relationships



Density: 0.15

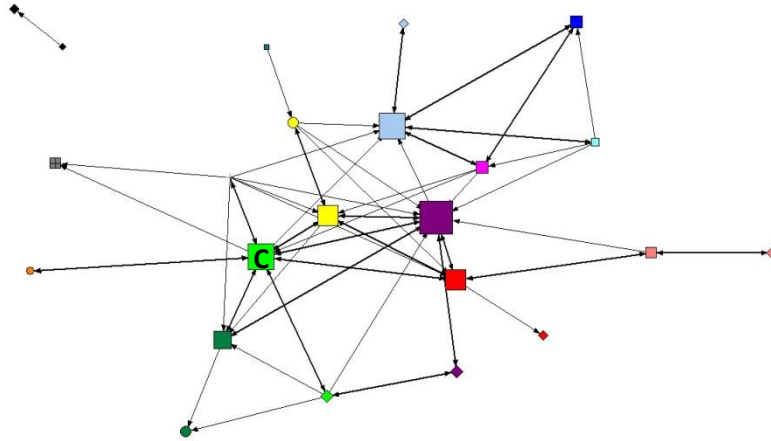
Advice



Density: 0.09

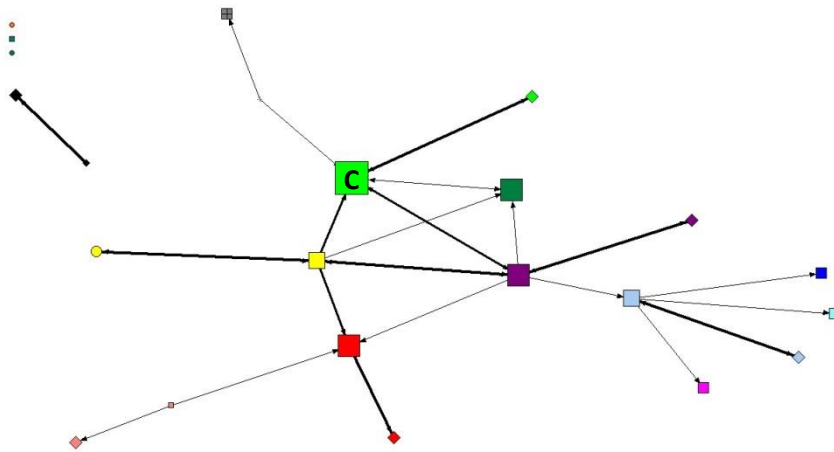
Research

Network I



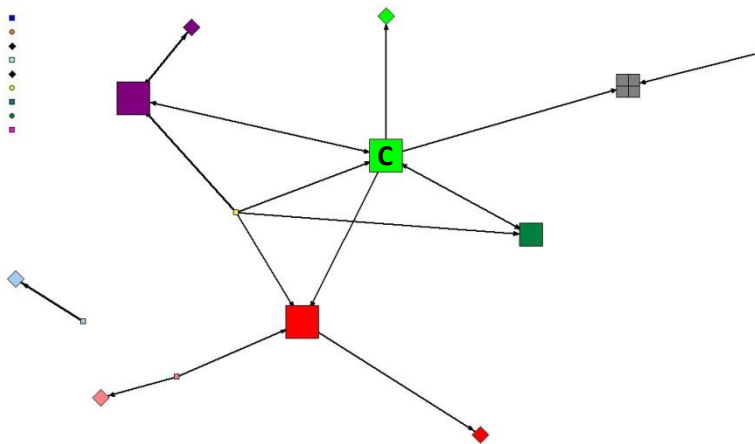
Density: 0.14

Close Relationships



Density: 0.06

Advice



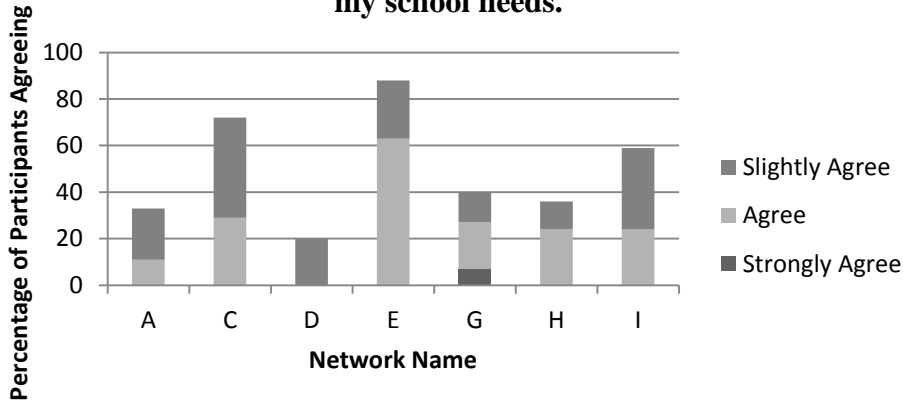
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Research

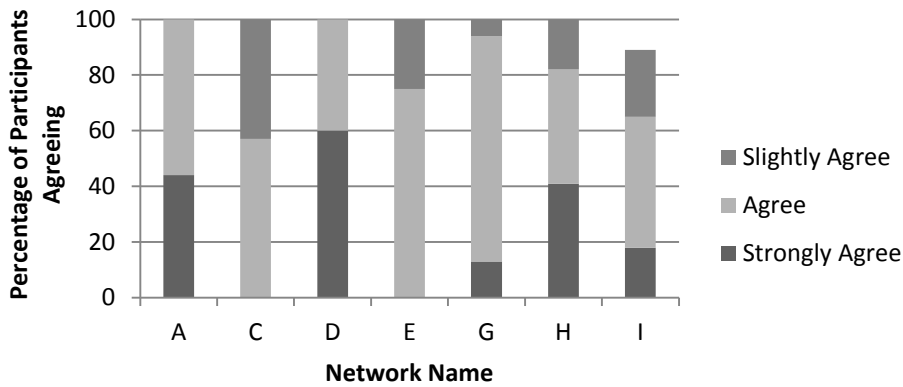
Appendix C: Comparing Trust and Challenge Measures

Selected Measures of Trust

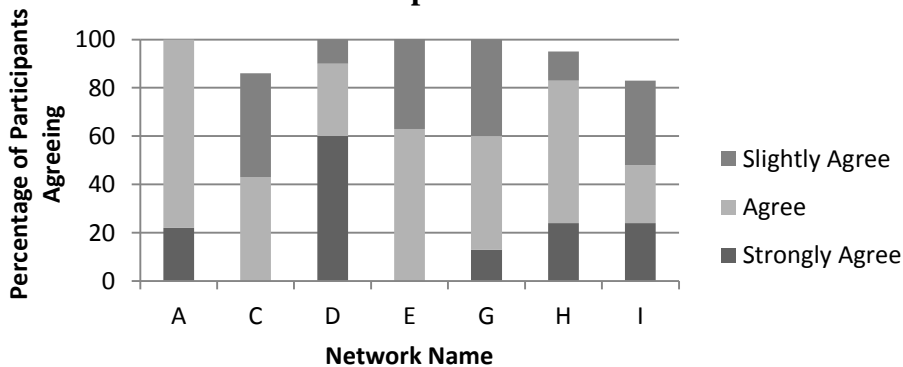
Common improvement decisions in my network are more closely linked to Ministry priorities than to what my school needs.



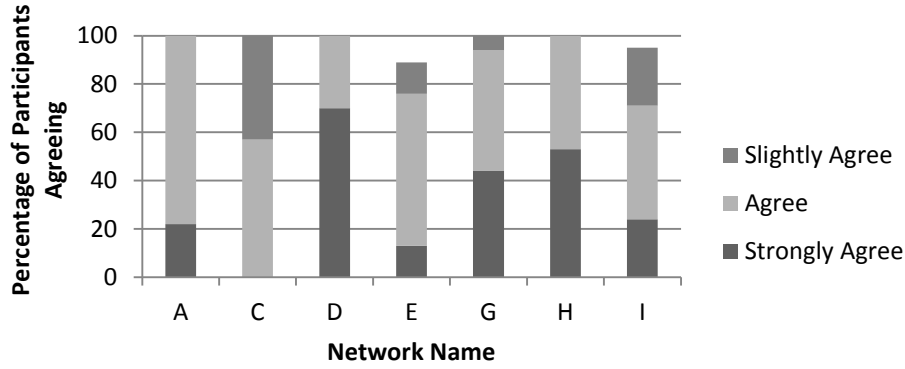
People in this network help and support one another.



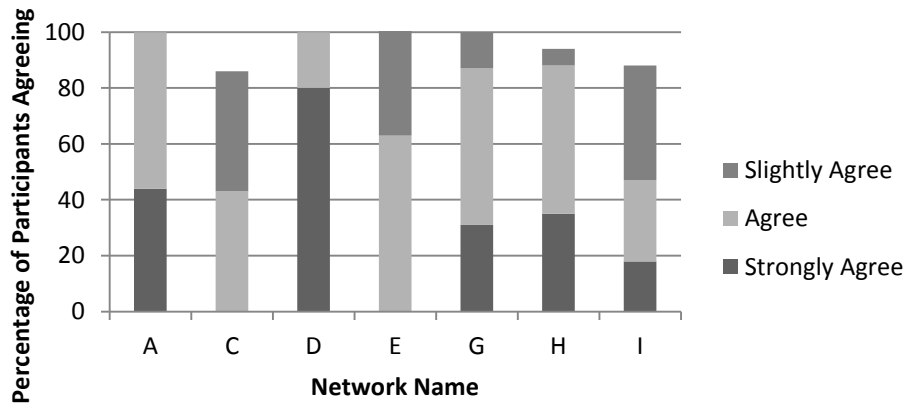
Even in politically difficult situations, people in this network can depend on one another.



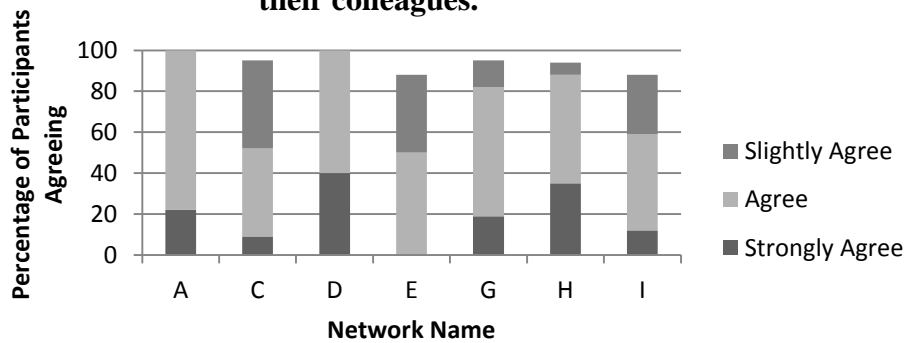
People in this network are eager to share information about what does and doesn't work.



There is a team attitude and collegial spirit among the people in this network.

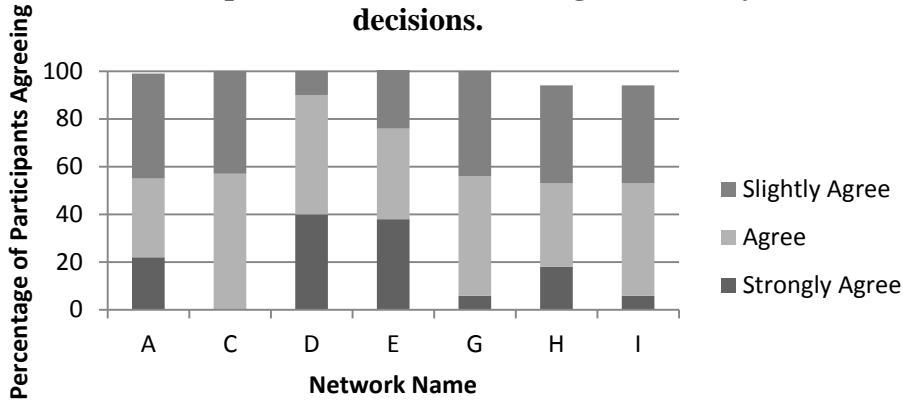


People in this network have faith in the integrity of their colleagues.

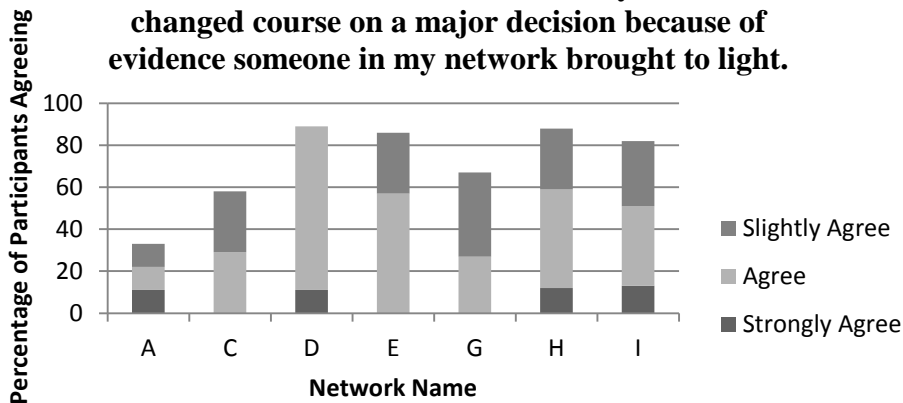


Selected Measures of Challenge

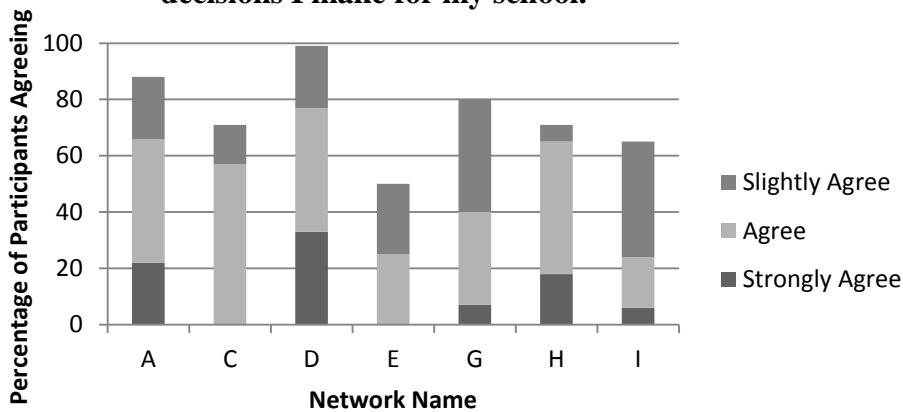
This network frequently discusses underlying assumptions or hunches that might affect key decisions.



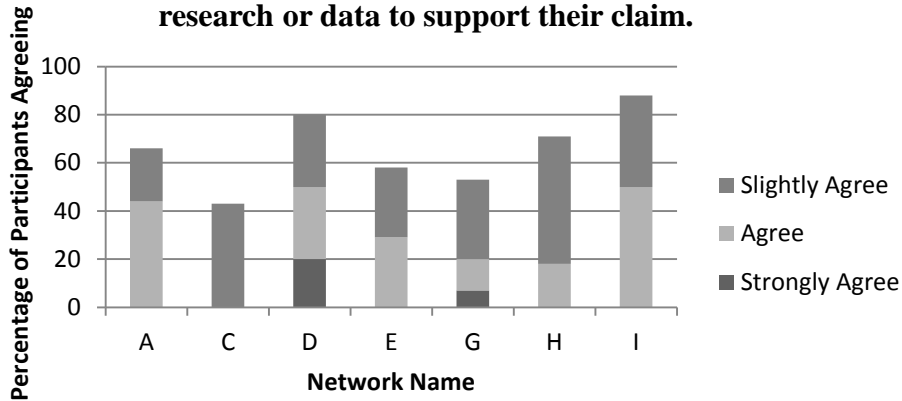
I can recall a time within the last two years when I changed course on a major decision because of evidence someone in my network brought to light.



I feel accountable to the people in this network for the decisions I make for my school.



There is an expectation in formal network discussions that someone expressing an opinion will provide research or data to support their claim.



People in this network often challenge each others' ideas in a productive way.

