Pontificia Universidad Católica de Valparaíso
Perspectiva Educacional. Formación de Profesores
Enero 2023, Vol 62(1), pp. 63-91

GROWING INNOVATION IN RURAL SITES OF LEARNING

CULTIVANDO LA INNOVACIÓN EN ESPACIOS RURALES DE APRENDIZAJE

Leyton Schnellert (*)
The University of British Columbia
Mehjabeen Datoo
University of Toronto
Donna Kozak
Miriam Miller
The University of British Columbia
Graham Giles
York University

Abstract

The implementation of a revised curriculum in British Columbia, Canada's rural schools and school districts is providing rich opportunities to study and document processes that support and prompt system change, as well to generate knowledge that can be shared across the province and more widely. This project aimed to study closely the practices and structures within BC's Growing Innovation in Rural Sites of Learning professional learning network (PLN), to examine how this partnership between a university, the Ministry of Education, and the BC Rural Education Advisory is spurring innovation through collaborative, inquiry-based professional learning. This study examined how a PLN can generate and mobilize knowledge related to innovative and effective practice, particularly across rural or remote communities, and the role of PLNs in provoking and sustaining educational innovation. Key findings revealed that innovation occurs when educators find openings and gaps that create space and necessity for change, and that collaboration and reflection are key factors in sustaining and spreading innovation. Key drivers of this change included the new curriculum in BC as well as student learning needs and the challenges of the various rural contexts. Key factors in sustainability included administrative and district support as well as the ability to share their learning, including within the network.

Keywords: educational change, collaborative inquiry, professional development, rural education, professional learning networks.

Resumen

La implementación de un currículo actualizado en las escuelas rurales y los distritos escolares de la provincia de British Columbia (BC), Canadá, brinda valiosas oportunidades para estudiar y documentar los procesos que respaldan e impulsan el cambio del sistema, así como para generar conocimientos que se pueden compartir en toda la provincia y más ampliamente. Este proyecto tuvo como objetivo estudiar de cerca las prácticas y estructuras dentro de la red de aprendizaje profesional (PLN) del proyecto para Cultivar la Innovación en Sitios Rurales de Aprendizaje de BC, para examinar cómo esta asociación entre una universidad, el Ministerio de Educación y la Asesoría de Educación Rural de BC está estimulando la innovación a través de la colaboración y aprendizaje profesional basado en la indagación. Este estudio examinó cómo una PLN puede generar y movilizar conocimiento relacionado con prácticas innovadoras y efectivas, particularmente en comunidades rurales o remotas, y el papel de las PLN en provocar y sustentar la innovación educativa. Los hallazgos clave revelaron que la innovación ocurre cuando los educadores encuentran aperturas y brechas que crean espacio y necesidad para el cambio, y que la colaboración y la reflexión son factores clave para sustentar y difundir la innovación. Los impulsores clave de este cambio incluyeron el nuevo currículo en BC, así como las necesidades de aprendizaje de los estudiantes y los desafíos de los diversos contextos rurales. Los factores clave en la sustentabilidad incluyeron el apoyo administrativo y del distrito, así como la capacidad de compartir su aprendizaje, incluso dentro de la red.

Keywords: cambio educativo, indagación colaborativa, desarrollo profesional, educación rural, redes de aprendizaje profesional.

(*) Autor para correspondencia:
Leyton Schnellert
The University of British Columbia
Vancouver, BC V6T 1Z4, Canadá
Email: leyton.schnellert@ubc.ca

SUBMITTED: 20.06.2022
ACCEPTED: 18.12.2022
DOI: 10.4151/07189729-Vol.62-Iss.1-Art.1393

1. Introduction

British Columbia (BC) is a province with 60 school districts – small and large, urban and remote – serving diverse communities across the province. Currently BC is undergoing large-scale change within its K-12 education system with a commitment to ensure that all students can develop and thrive as 21st-century learners positioning BC as a global pioneer in the shift from a centralized standards-based curriculum towards flexible learning paths that enable student voice and choice (Bristow & Patrick, 2014; Dumont, Istance, Benavides, Centre for Educational Research and Innovation & OECD, 2010; Organisation for Economic Co-operation and Development [OECD], 2013, 2015). In particular, the aim is for learners to develop the skills of "creative thinking, problem solving, initiative, curiosity, and the ability to lead and work well in groups" (BC Education Plan, 2015, p. 3). To achieve this goal, notions of what needs to be learned, how, and where have changed significantly within BC curricular materials (British Columbia Ministry of Education, 2015; First Nations Education Steering Committee [FNESC], 2008/2014); these transformational changes require all stakeholders to take risks, develop innovative practices, and work together.

However, change initiatives at the system level (i.e., national, provincial) tend to be designed and led by policy makers, educators, and academics from cities and more densely populated areas. This positions rural students, communities, and teachers at a disadvantage and leaves everyone involved trying to retrofit directions and approaches for rural schools. Corbett and Gereluk (2020) write that the:

> challenge of addressing rural teaching and learning is in part located in the nuances and complexities of the particular places, yet this challenge has overlapping threads that weave across the communities and sit within rural, regional and remote educational, cultural, economic and social geographies. (pp. 6-7)

Remote and rural families face economic instability "due to a decreased demand for workers in mechanizing primary production industries" (Corbett & Gereluk, 2020, p. 6). Geographic and social isolation contribute to low educational aspirations, achievement, and attainment (Irvin, Byun, Meece, Farmer & Hutchins, 2012). Similarly, Parsley notes that "teachers in rural areas don't get many opportunities to communicate and collaborate with other teachers" (p. 35). This contributes to their sense of "cultural and professional isolation" (Bryant, 2007, p. 9).

Growing Innovation in Rural Sites of Learning is a partnership between the Ministry of Education, a university in British Columbia, and a number of rural and remote schools and

districts, supported by the BC Rural Education Advisory launched in 2011. Since its launch, the initiative has supported projects and connected project leaders within the *Growing Innovation* professional learning network (PLN). Project leaders and teams inquire to "grow" a situated innovation in response to a local challenge or opportunity, and meet online with other teams during the year to share and support one another. At the end of each year there is a symposium where project teams share their learning. *Growing Innovation in Rural Sites of Learning* is a network premised on a simple belief: rural schools and classrooms are often the sites of innovative and rigorous educational experiences developed as a result of a local need, problem, or interest.

2. Perspectives

2.1. Educational Change and Teacher Professional Development

Research has shown that government mandated, top-down approaches to educational improvement are not effective in a world of constant change where demands are made for shared responsibility among the public, educational professionals, and governments (Darling-Hammond & Rothman, 2015; Horn, 2002). Worldwide, the real challenge in education is to enact and sustain change through collaborative partnerships among the public, educational professionals, and governments (Arnove, 2005; OECD, 2012; Schnellert, 2020a). It is understood that achieving outcomes for learners is dependent on teachers taking up new practices at the classroom-level (e.g., Darling-Hammond & Leiberman, 2013; Stein & Coburn, 2008). Therefore, what we need to effect change, particularly in diverse rural and remote settings where local needs vary, is to recognize the knowledge and expertise of educators, the importance of teachers' adapting practices to meet local needs, and the necessity of nurturing teachers' investment in innovation (Barnett, 2004; Brenner, 2012; Kitchenham, Fraser, Pidgeon & Ragoonaden, 2016; Robertson, Hill & Earl, 2004; Ryan & Brown, 2005; Ryan & Weinstein, 2009).

In BC there currently exist a number of promising professional development practices that support the above educational change. These include inquiry-based approaches which have been found to impact, not only teachers' learning, but also their practice in classrooms (Butler, Schnellert & Cartier, 2013; Schnellert, 2020b). When engaged in cycles of *inquiry*, teachers identify student learning needs, pose questions, develop criteria for monitoring success, draw on resources to enhance their own learning, and embed evidence-based and values-salient ideas in practice (Halbert & Kaser, 2012; Schnellert & Butler, 2014). In contrast to short-term, more fragmented professional development approaches such as one-shot workshops, inquiry-

based professional development assists teachers to sustain attention to goals over time, and to integrate new ideas into practice to address the learning needs of students (Butler & Schnellert, 2012; Cartier, 2009; Luna, Botelho, Fontaine, French, Iverson & Matos, 2004; Morrell, 2004). Particularly impactful inquiry-based professional development approaches are collaborative in nature, and either develop or are based in collaborative networks of professionals that are generative and enduring over time.

2.2. PLNs, Collaborative Inquiry, and System Change

Poortman and Brown (2018) define a PLN as "any group who engage in collaborative learning with others outside of their everyday community of practice, in order to improve teaching and learning in their school(s) and/or the school system more widely" (p. 1). A PLN brings together stakeholders who identify shared goals, develop plans, enact strategies and collaboratively reflect on and adjust their efforts. From the onset of learning, educators engage in collaborative inquiry (Butler & Schnellert, 2012) questioning, making connections, drawing inferences, and validating knowledge (Greenwood, 2013; Larreamendy-Joerns & Leinhardt, 2006). Studies show promising findings in regard to the potential of PLNs to: improve community engagement (Hargreaves & Shirley, 2012), build on evidence-based approaches to enhance student learning (Butler & Schnellert, 2012; Hadfield & Chapman, 2009), and spread innovative approaches (Poortman & Brown, 2018; Schnellert, 2020a; Stoll, 2009).

Collaborative, inquiry-based PLNs have significant potential to enable knowledge mobilization, improve communication, and flatten hierarchies to facilitate relational trust and move past rhetoric to actual change in practice and outcomes for students (Chapman & Hadfield, 2010). Almost all studies of PLNs, however, concern schools that are in urban or suburban environments. What characterizes these networks is that they draw upon resources in the immediate geographical environment or look to and connect with similar settings. Studies of PLNs thus far have almost entirely excluded rural and remote schools who have to draw upon resources from diverse and geographically distant settings. One notable exception is the Northwest Rural Innovation and Student Engagement Network (NWRISE) (Hargreaves, Parsley & Cox, 2015). NWRISE brings together educators from rural communities across five American states to share ideas and develop practices together. They collaboratively develop pedagogical experiences to serve the particular needs of their rural learners. Parsley (2018) highlights that a key component in the success of NWRISE is the intentional focus on providing access to what rural educators expressed as their most significant value, to connect with those who had similar experiences and challenges; this focus undergirded efforts to expand and grow the network. Other significant components to its success were to "steer lightly" (p. 37) so that educators had autonomy while also receiving diversified support, and to bring in experts as needed to help

guide the network and to provide access to relevant research. The latter components are common to the success of PLNs in rural and other contexts.

This study seeks to highlight the processes of rural PLNs and reveal how strategic alliances within and across rural education contexts can yield greater results and insights than could be achieved by any one site, institution, or scholar alone. Additionally, what is missing from studies of networks are those that illuminate how recurring patterns of action can create amplified impact within a connected system or institutions (Easley & Kleinberg, 2010). We attend to both in our program of research.

2.3. Supporting Teachers' Professional Learning and Innovation

Learning and practice development emerge when collaborative teams (including administrators, pedagogical consultants, and teachers) work together to foster student learning (Cartier, Butler & Bouchard, 2010). The authors' research investigates processes and outcomes associated with teachers' engagement in *collaborative inquiry* within networked learning communities (Butler & Schnellert, 2012; Schnellert & Butler, 2021) including how collaborating in inquiry affects participants' experiences and outcomes, and whether and how participating educators draw on evidence-based practices when identifying "new ideas," thereby forging research-in-practice connections (Butler & Schnellert, 2008). When individuals participate in collective inquiry, their shared knowledge becomes a resource from which they can all draw (Hargreaves, 2019; Slotta, Quintana & Moher, 2018).

We apply a "communities of practice" framework (Larreamendy-Joerns & Leinhardt, 2006; Lave & Wenger, 1991; Yang & Liu, 2004) to study how inquiry and innovation are supported within rural PLNs. A "communities of practice" framework provides an appropriate lens to study the interactions and learning that occurs within these complex networks as it focuses on the relationships, movement, and resultant learning of the participants within a professional context. Professional relationships within networks can be both formal and informal, a communities of practice framework encompasses all of these. Our focus in this study was to determine whether, how, and why the collaborative opportunities and supports built into this existing network resulted in knowledge production and mobilization such that may be scaled within new partnerships in innovation in education.

Understanding how a community of practice operates requires attention to how engagement in inquiry is influenced by other stakeholders. Within PLNs, inquiry is socially-mediated (Bandura, 2006; Vygotsky, 1978). For example, when engaged in collaborative inquiry,

educators influence one other's goals, actions, and learning (Hadwin & Järvelä, 2011; Meyer & Turner, 2002; Volet, Vauras & Salonen, 2009). Peers who are not in the network, school- and district-level leaders, and community members also play a role in supporting or hindering PLN members' inquiry plans and actions and/or access to resources (Kim & Martin, 2020; MacNeil, Butler & Schnellert, 2021).

Leaders at various levels can impact teacher engagement in collaborative inquiry and whether it will be sustained in both positive and constrictive ways. The more teachers "own" an inquiry, the more they will invest in it – seeing it as a way for them to improve their own teaching and their students' learning rather than an agenda being imposed from their district or province (Butler, Schnellert & MacNeil, 2015). Butler, Schnellert & MacNeil (2015) found that district- and school-level administrators who valued and supported teachers' inquiries provided material supports such as funding, and/or relational supports such as positive feedback, both facilitated agency and continued openness to learning in teachers. This agency and desire for continuous learning fueled ongoing inquiry and spread change beyond teachers' immediate classroom or school contexts. However, when leaders worked in a more "top-down" or directed way or remained at arms' length from teachers' inquiries it had a demotivating effect or resulted in teachers' inquiries being out of sync with leaders' efforts.

2.4. Innovation

Educational innovation can be understood as "any kind of dynamic change that is intended to add value to the educational processes - this can apply to different levels, ranging from systemic to classroom innovation" (Cerna, 2014, p. 5). It can include "implementation of a new or significantly improved product (good or service), or process... or a new workplace organisation or external relations" (OECD and Eurostat, 2005, p. 46). Within the BC context, educational innovation has been conceived from multiple perspectives including technological, pedagogical (*e. g.* inquiry-based learning), reconciliation with Indigenous communities, holistic education, and 21st century learning, to name just a few. In *Growing Innovation in Rural Sites of Learning*, projects may take up any or all of these innovation lenses from a commitment to place-consciousness where educators identify situated issues and opportunities specific to their schools and communities and propose, create, and enact responses.

As noted above, promising findings suggest the capacity of PLNs to improve educator engagement, their ability to strategically and systemically disseminate innovative pedagogy, and ultimately to promote system change. Another advantage of a PLN as a collaborative space for advancing innovation in rural/remote locations, is that it offers educators new perspectives through reciprocal engagement across contexts and innovations (Schnellert, 2020b). Educator

professional development in networks can be conceived as dialogic where participants contribute and build on each other's knowledge of situated and shared experiences. This research contributes by investigating how PLNs can invigorate pedagogical innovation and school/system change in rural schools.

2.5. A Research Practice Partnership

Scholars and policy makers are calling for research and practice partnerships that build networked learning systems to enact and enable educational change (Darling-Hammond & Bransford, 2005; Fichtman & Currin, 2017). Partners brought together through this project included: Provincial Partners, School District Partners, and Academic Partners.

Provincial Partners: Our Partners include the BC Ministry of Education, and the BC Rural Education Advisory. These two partners have been involved at every step of the development of *Growing Innovation in Rural Sites of Learning* including providing small annual grants to the rural inquiry teams. Other provincial partners include the BC Teachers' Federation and the BC Aboriginal Child Care Society. These two organizations attend annual meetings to provide feedback.

School District Partners: 18 geographically representative rural and/or remote BC school districts, where the initiatives are situated, are also partners in the study. A foundational piece of this study is that it builds on strong, established reciprocal relationships with partner school district superintendents who are members of the Rural Education Advisory. They are committed to supporting research in how PLNs within and across their districts are achieving goals.

Academic Partners: A university in British Columbia is the Academic Partner in this study, specifically a professor of Rural Teacher Education co-facilitates the online meetings and annual symposium. The professor and post-doctoral and doctoral students engaged as Partners in this research to co-develop project goals and enact research processes; co-facilitate PLN meetings; and support knowledge dissemination.

Network Partners agreed on a common goal of studying collaborative inquiry within rural PLNs (Schnellert, 2020c). They suggested we study how initiatives impact not just individuals, but also systems, for example by establishing a "culture" of collaboration and innovation. More specifically, it was agreed that we should study gather evidence related to two research questions: (1) How is the *Growing Innovation in Rural Sites of Learning* PLN structured to foster

inquiry *and* systemic innovation? and (2) What potential do networked approaches to professional development hold for rural educators, schools, and systems?

3. Methods

3.1. Methodology

We conducted case study research (Grosvenor & Pataki, 2017; Merriam, 2009) to understand PLN processes and outcomes. In this research approach there is no assumption that methods per se are causal; indeed, particular teaching approaches that work in one setting may not work in another (Dyson & Genishi, 2005). Dyson and Genishi (2005) described that the "aim of such studies is not to establish relationships between variables (as in experimental studies) but, rather, to see what some phenomenon means as it is socially enacted within a particular case" (p. 10). To investigate rural/remote PLN processes and their link to advancing outcomes for learners and supporting school/system change, we conducted parallel case studies for 17 of the 21 regionally-distributed rural collaborative hubs within the *Growing Innovation in Rural Sites of Learning* PLN *(*Yang & Liu, 2004; Yin, 2014*).* Two hubs did not continue to the end of the 2019-20 school year (COVID 19 onset) and another two hubs did not have members who participated in year-end interviews, a key data source. Table 1 demonstrates the diversity of rural contexts in British Columbia from small island fishing communities, to remote mining towns to farming communities to small cities in remote settings with harsh winter climates. Following consent procedures approved by the university's Ethics Board, a research assistant sent an email to all members of the Growing Innovation PLN inviting them to participate in research interviews after the year-end symposium. All schools in British Columbia are inclusive of Indigenous learners.

Table 1: Research Participants and their Contexts

A	A-1	Teacher working across 7 rural elementary and secondary schools with resource-based economies (*e. g.* Mining).
B	B-1	Teacher working in a rural secondary school of less than 400 students located in a rugged mountainous area.
C	C-1	Teacher librarian in a grade 7-12 secondary school with less than 200 students located at the junction of highways connecting several small artisan-based communities.
D	D-1	Teacher working at an elementary school with 200 students in a northern town with a resource-based economy.

E	E-1	Vice-principal working in a small secondary school with less than 200 students. The majority of the school population is Indigenous.
F	F-1	Teacher working at an island secondary school with less than 100 students. The majority of the school population within this small fishing community is Indigenous.
G	G-1	Teacher working at a small k-7 elementary school with less than 200 students in a northern community with strong religious ties.
H	H-1	Technology helping teacher in a remote northern industrial city (*e. g.* oil and gas).
I	I-1	Teacher in a k-12 school with approximately 200 students in an agricultural community.
I	I-2	Teacher in a k-12 school with approximately 200 students in an agricultural community.
J	J-1	Secondary school in a 7-12 school in a northern remote farming community.
K	K-1	Teacher in a 7-12 secondary school in a primarily Indigenous community.
K	K-2	Teacher in a 7-12 secondary school in a primarily Indigenous community.
K	K-3	Teacher in a 7-12 secondary school in a primarily Indigenous community.
L	L-1	Principal working in a rural secondary school with less than 400 students in a valley between mountain ranges.
M	M-1	Teacher working at a secondary school in a northern community with 400 students that draws from all elementary schools in the region.
N	N-1	Principal of a small outdoor-oriented k-4 school with approximately 100 students in an island community.

3.1.1. Significance of Case

Educators in this study worked in rural and/or remote schools and communities throughout British Columbia (BC). BC has vastly diverse geographical contexts built around waterways and the intersections of transportation routes. Some schools are extremely remote, including those

that are only accessible by water or air. Others face geographical realities of regular road closures, all adding to the sense of isolation. With the geographical challenges come additional costs both in terms of time and finances. Travel in winter is harsh, and yet important in terms of connections and relationships. The vastness of many of rural and remote districts is not fully understood and considered in provincial level planning.

3.1.2. PLN Design

Growing Innovation in Rural Sites of Learning was conceptualized as a strength-based approach to celebrate and learn from innovation in rural schools. School teams attend online networking sessions during the school year and an annual face-to-face symposium in the Spring. Each site project is facilitated by school-based educators passionate about their innovation. Since 2011, 71 *Growing Innovation* project teams from rural schools and school districts across the province have participated in the network.

In each context, educators work together in inquiry teams with the goal of improving student engagement. Participants at each site include teachers and school level administration. Online sessions using Zoom are facilitated by a university-based researcher [first author] and a retired rural school district superintendent. All participants share responsibility for creating, advancing, and mobilizing knowledge that makes a difference for rural learners in their schools and across the province. To join *Growing Innovation in Rural Sites of Learning,* inquiry teams must outline how they plan to collaborate with community partners to address a local issue or opportunity. They share what they are learning in three online Zoom meetings during the year, at the yearly symposium (see Figure 2 below) , and on the website, www.ruralteachers.com.

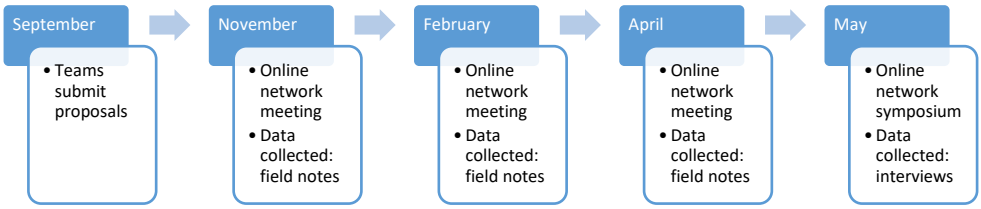

Figure 1: PLN Activities

3.1.3. Data Collection and Analysis

Figure 3 describes evidence we collected and analyzed as a research team to address the research questions. The PLN was already generating information that could be mined as potential data sources (see column 1); funding from the Social Sciences and Humanities Research Council of Canada allowed us to extend evidence available by juxtaposing evidence

from existing data sources with new data from interviews, observations, and artifacts (see column 2). In other words, rich data were already being collected in *Growing Innovation in Rural Sites of Learning* (Schnellert, 2020b); we drew on this data as part of the evidence base. However, SSHRC funding was necessary to extend the database in order to address our questions completely, and to deepen data analyses, and for a meta-level examination of whether and how rural PLN structures were working via cross-case study analysis (Butler & Schnellert, 2012; Yin, 2014). Note that, to ensure feasibility, we not only built from data already being collected, we also integrated new data collection into existing structures.

Existing Data Sources	New Data Collection (SSHRC Funded)
artifacts of student learning practice records and teaching artifacts video ethnography • project proposals and reports team meetings & network symposia	interviews/focus groups with teachers & district leaders fieldnotes at network meetings and symposia artifact collection and new forms of documentation (i.e. student-led; Indigenous-informed)

Figure 3: Data Collection.

Data consistent across all regional hubs included project proposals and reports, field notes during online PLN meetings, artifacts submitted by teams, and interviews. Data analysis involved the first four authors of this paper individually coding four participants' interview transcripts. Codes were shared and compared and transcripts re-read to develop a codebook. The four authors read these first four followed by an additional four transcripts to find confirming and disconfirming evidence (Miles, Huberman & Saldaña, 2014). Interpretations were discussed leading to agreement regarding codes and categories. As codes and categories solidified, the initial eight transcripts were re-analyzed along with the additional nine transcripts. Themes were developed from cross-categories, synergies and redundancies from which coding trees emerged. The data analysis team (authors 1-4) discussed data sources in relation to the coding trees and presented these coding trees for feedback at national and international conferences from March 2021 - January 2022.

4. Findings

We identified eight overarching themes: pedagogy, affiliation, collaboration, supports, impacts, innovation, identity, and sustainability. Two themes centered around the role of PLNs in educational change: innovation and sustainability. We discuss these two themes in depth in this

paper. Key findings revealed that innovation occurs when educators find openings and gaps that create space and necessity for change and that collaboration and reflection are key factors in sustaining and spreading innovation. Key drivers of this change included the new curriculum in BC as well as student learning needs and the challenges of the various rural contexts. Key factors in sustainability included administrative and district support as well as the ability to share their learning, including within the network.

4.1. Innovation

Our four-member team inductively analyzed data and found recurring patterns related to innovation. Categories derived attended to what catalyzed and/or propelled innovations and how educators experienced education change.

4.1.1. Innovation Occurs When Educators Identify Needs That Create Space and Necessity For Change

We found that the introduction of the revised curriculum in BC opened up possibilities for educators to look at their practice differently as well as to redefine their own conceptions of innovation. The organization of the curriculum around "big ideas", was seen as an invitation to rethink their practice and was described as being different from what and how they had been taught:

> Math looked almost identical to what I remember doing in school and that was one of those things where… the new curriculum came... and it was like okay we were looking at big ideas and… well, what do we need to teach? (G-1)

Another explained, "I think what's innovative is accepting that we're doing, we're covering less ground, first of all, but covering it, hopefully more deeply, I think it's far more deeply." (I-1)

Educational innovation has often been linked to the use of new technologies (Dooley, 1999; OECD & Eurostat, 2005); however, in our research educators shared that the new curriculum had expanded their conceptions of innovation beyond the use of new technologies to focus on the development of capacities within themselves, specifically creativity. A project leader reflected,

> The new curriculum has really opened the door because when people say innovation, I don't see it as just the concept of (using) technology as innovation, I see innovation as being creative and trying something new, or taking something that exists,

> expanding on it, so it's really about creativity. To me that's what innovation is …there is no one way to define innovation, which is what we saw at the symposium. It's defined by the person being innovative in whatever capacity they're doing that in. (H-1)

Technology was not excluded from educators' conceptions of innovation; however, they did express that the way it related to innovation had changed. In one participant's experience, there was a shift from thinking about using technology as a way to motivate students to using it as a way to have them connect directly with their discipline:

> So it's taking an innovative technology device and using it to engage our students directly with scientific learning, so it's not even like to inspire them to take up science, no, it's connecting directly to curriculum through innovation. (H-1)

The new curriculum's focus on bringing in post-colonial and Indigenous perspectives was also linked with innovation in educators' understandings. Although innovation is usually perceived as something new, in this educator's reading of the new curriculum, it is associated with something old:

> What we've been doing is almost more ancient, it's like going back into a space where school and teachers are there to support children in a community of people and it feels more ancient, right? … What's innovative is actually honouring non-colonial [ways of knowing], 'cause colonial ideas have really permeated everything for a hundred and fifty years and yet prior to that was like thousands of years of a different way of being. It's innovative to break free of the constraints, the kind of popular constraints and the way that we've all been told by whomever. (N-1)

Across participants, aspects of their context were driving forces for their inquiries and innovations. These spanned student needs, place-based aspects of their specific rural contexts, and emergent challenges in their school or community. Developing innovation in response to student needs was the most commonly identified reason for an innovation. For example, one teacher explained,

> We really wanted to make sure that those in [grade] 8 and 9 formative developmental years had a strong program building their literacy, building their numeracy across the board in Science and Socials as well as their Math and their English so that they'd be ready and they'd be competent and ready to take Pre-calc[ulus] 10. (E-1)

This was common of many teams' innovations; they looked at where students needed skill and competency development as part of their proposals and efforts. Addressing negative student self-perception was a goal for this team:

> the streaming and the negative perceptions of self that some kids were developing because [of streaming in high school], so that was problematic and we needed to deconstruct some of those ideas that [students were] developing of themselves. (E-1)

Creating engaging learning that matched the profile of their classes was a recurring theme:

> we had a couple of things that we needed to do...they need that physical activity still; they very much need to play and be physical. We needed to incorporate daily physical activity, daily numeracy, reduce the number of teachers. (E-1)

The impetus for change came from some educators moving away from expecting students to conform to their expectations and current models of schooling to pedagogies and school structures that better met the needs of students (and themselves):

> we had more flexibility and we could take this one activity that we were getting into and we could go deeper and we could go longer and that was okay. It is actually less planning, and because there's more consistency with the teachers and the kids did calm down. (E-1)

As evidenced above, innovation based on perceived student need drove innovations. While educators considered traditional forms for data such as literacy and numeracy assessments and student attendance, observations of student engagement and feedback from students played a more significant role in setting goals, designing innovations, and monitoring and adapting their efforts.

Across data sources it was evident that innovations were developed and incorporated because of rurality. Educators referred to attributes of rural schools such as "small class sizes", "the unique needs to our students", and how in rural and remote contexts you can take place-specific ideas and "dig into that." One teacher shared,

> in rural settings we innovate because we have to. We don't have the numbers of people to support full classes in all subject areas and things that make traditional

> practice easy. How do we get course offerings for kids at the senior level, and still have them do rigorous but innovative work? I think that [it is a] necessity. My grandmother used to say necessity was the mother of invention, and I think that's true for rural schools. (I-1)

Network members highlighted how they often had to find creative ways to offer learning opportunities for students because of their small schools. They offered multi-age classes, looking for "big idea" themes across grades to organize their teaching in one room schools, and capitalized on community members' expertise as mentors because they could not organize and/or teach in the same ways as larger schools in larger communities. Another teacher noted, in rural schools and communities "we have this kind of super power" (K-1) referring to constantly needing to find and create solutions. This kind of adaptive expertise (Timperley, Ell & Le Fevre, 2017) helped PLN educators conceive of and embrace innovations.

Participants highlighted how their need to constantly (re)consider how they organized learning and taught students made them receptive to ideas from other rural educators in vastly different rural contexts including small island communities, mining towns, counter-culture villages, and primarily Indigenous communities. One *Growing Innovation in Rural Sites of Learning* educator shared:

> When you're in a professional learning network, you can bring those ideas back to your classroom and I feel like there's a lot of traction. Rural schools seem to always be looking to innovate because they have to… You know we don't have the benefit of all of these external supports or like, we can't take our kids to big museums, or like we can but it's like really expensive and a pain in the ass, so like how do we innovate, how do we give our students the most rich learning experiences? (K-1)

Participants found coming together with rural educators across the province a way to gain support and inspiration for their innovations:

> I think professional learning networks are awesome for rural schools because we're already trying to innovate because we have to, we have to be adaptable if we're going to continue to serve our unique populations of kids. (K-1)

As alluded to above, rural schools and educators are constantly facing external demands and imposed factors often related to declining enrollment. Teams took up these challenges as opportunities to innovate. For example, one teacher librarian shared,

> Grade 7s were moved into the high school so we were the only high school in our district to have grade 7s… because the numbers… and the size of the building and they closed down one elementary school so it was all reconfiguration… and [we] knew [we] had to do something different. (J-1)

Another rural school district closed the town's elementary school and received money from the Ministry of Education to transform the secondary school into a K-12 school. One of the teachers noted,

> we basically said if we're gonna [try an interdisciplinary, inquiry-based approach for grades 7-9] we're gonna do it now because we were doing architectural changes to the building as well. [We decided to] get rid of the desks and [add] more tables and [created] bigger [open] spaces. (I-2)

This team leveraged the school reconfiguration and renovations to move to project-based learning that involved the community in integrated service-oriented learning. Teachers co-planned and co-taught with each other and their school's inclusion specialist.

These district-level budgetary-based changes were not within the control of the school-based educators in the PLN. While they found ways to use these challenges to develop structural and pedagogical innovations, there was emotional labour to contend with. For example, one principal noted, "It was a perfect storm for change, but also a perfect storm for complaining" (I-2). Change was not easy for educators or students. One teacher shared that

> instead of two grade eight classes and two grade nine classes, we had four classes of 8s and 9s. The 8s were okay about this but the 9s, their noses were up in the air, and they didn't want to do anything with the grade 8s. They felt that the grade 8s were babies, but one of things that happened was the growth around that, it was incredible to see how they eventually, even the toughest nuts, were willing to collaborate with their grade 8 peers and happy to take them into their area and work with them. (K-3)

Rural contexts offer many opportunities for innovation. For the educators in our network these were primarily a response to the needs of the students, constraints in their rural contexts, and externally imposed structural factors. Yet they used these challenges to reconstitute how learning could happen for students and introduce pedagogical approaches that align with 21st century competencies, place-based learning, and BC's revised curriculum.

4.1.2. Innovation Is a Slow Process Whose Ends Are Unknown

Participants described the trajectory of their experiences with their inquiries, noting how the support they received from the PLN and their school administration provided inspiration and ongoing motivation within a slow, uncertain, and often frustrating process.

Participants in the network learned about each other's projects in online meetings as well as in visits to each other's contexts, face-to-face meetings, or in other opportunities to see innovation in action. One participant describes how visiting a different context sparked their desire to change their practice:

> I feel like there's been a couple of instances in my career where I've gone and seen something and it's kind of like a lightbulb turns on and you're like what the hell have I been doing? I need to change everything but in a really inspirational way, and so going and seeing that in action, really changed the way I planned and taught. (K-1)

The *Growing Innovations Network* also broke the isolation that rural educators often face; isolation that exacerbates the frustration that often comes with trying out new things as described by one participant:

> Innovating in a bubble and innovating by yourself can be incredibly frustrating, and I think having a network of people who are trying things is awesome. I think it's really, really valuable to have a sounding board where it's a safe space. (C-1)

Participants also described how their engagement in the network played a role in the process of working through their inquiry and that this was ongoing. One vice-principal reflected on how they benefit from PLN meetings:

> what are the skills I need, what am I learning from listening to some of the administrators that are in the network, some of the people that are doing that work now? What are the things that they're facing, what knowledge can I gain? (C-1)

Another shared "I still feel quite connected to other people who are doing that which will allow me to help and still be innovative around or build my skills around taking student learning outside." (D-1)

Finally, they described the significance of the support of the network as well as their school and district administration in sustaining their motivation. One teacher shared, “I have the support of the administration, and I have the support of Growing Innovations, you know it's quite important to have people cheering you on, saying yes to you, because nothing kills innovation like a no.” (F-1) Another teacher explained,

> The administrators that we have are supportive of those things and they’re behind us a hundred percent...You’re not going to [hear] “you screwed up your job,” that conversation is not happening. There is some encouragement to try and fail which is what we try and do with the kids, as long as you are doing your due diligence. (C-1)

By its nature, the process of innovation is unpredictable and participants described the tensions created between themselves and others in their school contexts. Many participants were working with more-open ended pedagogical structures such as Project-based Learning (PBL) or even with new technologies and they experienced tensions with colleagues and others. For example, one teacher noted that there were

> …some variances when teacher autonomy came into play because the project was really long and it was build-as-you-go, like not many of us had done this before and certainly not on this scope and not with 90 kids, and so, it got fatiguing both for staff and students. (K-2)

Participants described the network as a place where they could become reinspired to continue their inquiries when facing the challenges of implementation in their contexts:

> I think having a network of people who are trying things is awesome. I think it's really valuable to have a sounding board where it's a safe space where you can say "oh my god these teachers they don't get it" like “what do I do, what are you guys doing?” It really fills your cup up knowing that I've got this place and I'll go and I'm going to get my energy back up and come back and hit the ground running. (C-1)

Participants in the *Growing Innovations Network* often stayed with the network over a number of years, even when they experienced changes such as new teaching partners, moving to a new school or a new role, which made it possible to look at some of the factors that sustained innovation as well as how innovation spread beyond their immediate classroom or team contexts.

4.2. Sustainability

Another theme identified in data analysis related to sustainability. *Growing Innovation in Rural Sites of Learning* PLN participants identified collaboration and reflection as two key factors in both sustaining and spreading innovation. A dominant category in the data pertained to consideration of future directions as a key sign that innovations would continue.

4.2.1. Collaboration and Reflection Are Key Factors In Sustaining and Spreading Innovation

Participants highlighted the impact of the network in providing them with a sense of validation, community, and connection. The PLN supported them to expand their perspectives and reflect on key factors moving them forward with their inquiry and sustaining commitment to it.

Participants in the network identified value they find in the network that goes beyond learning, specifically, they described the feeling of being part of a community where they were valued and where they also contributed value. One principal shared, "I feel like I'm lucky to be in it, I don't consider it more work by any means. I feel like I'm doing something important, I also feel like I get to a be witness to other people doing things that are important" (C-1).

Involvement in the network was seen as providing access to different perspectives and approaches to education, which is of particular value to those in rural contexts. The diversity of perspectives was seen as way of supporting educators to think outside their own frames. One teacher shared,

> it always reminds me, especially at the symposium, it's like yes, there are so many different ways of inquiry and exploration that isn't just science and I need to be reminded of that because that's my lens. …it's always good to just have these little reminders that there is a broader scope...just to keep us innovative. (H-1)

In addition to their perspectives being expanded from PLN encounters, the reflection and documentation requirements of participation also supported educators in making sense of and moving forward with their inquiries. For each of the online check-ins and in the year-end symposium, teams were asked to provide data that speaks to their inquiry as well as what they are learning. One principal shared,

> it's not just writing down what's happening, it's making sense of it. Making sense of it, interpreting it, telling a story, with the intention of both honouring the process and honouring the people that were part of the process, honouring the staff. To know that other people read it and might be inspired by it or inspired to ask questions about our

> journey, it sustains our work. If you can make it visible and explicit, it is a lot harder for people in power to blow it off. (N-1)

Another teacher reflected,

> the one thing that I really liked about Growing Innovations was it really made us reflect on what we were doing. We knew we had to think about the big picture when we were going to meet because we had to speak about it, so it was nice to have that, forced reflection so to speak. (K-3)

The role of the university researchers in this process was one of setting up sharing and reflecting structures within the network rather than one of providing expertise in particular educational approaches or innovations. Teams determined their own inquiries and the network was a place to share and move forward.

Looking beyond their own classrooms, participants described how their inquiries contributed to the spread of innovations to others in their schools and sometimes even beyond. At the school level, sometimes the spread was a result of the team's inquiry providing a model for other educators to try out, and in other instances, the GI participants provided leadership and support for others who were interested. For example, one teacher shared, "it's really neat to see the science department, really embracing this work and expanding their horizon and their learning environments." (J-1)

One participant named collaboration as a key factor in spreading and sustaining innovation, "it's just reaffirming that collaboration is so necessary if you truly want that innovation sustained or sustained learning application" (H-1). Another described how the innovation was supported as it spread throughout their district:

> the concept has kind of spread through the whole district; to maintain those programs they've come up with extra monies to pay for coordinators and facilitators and you know they're still doing it. (F-1)

4.2.2. Ongoing Consideration of Future Directions Is Key Sign That Inquiry Has Taken Hold

When particular innovations were described as being sustained or spread, the data often indicated that the process of inquiry had taken hold and become a part of a teacher's practice or a team's ongoing collaborative planning. One of these signs was the presence of a future

direction for their inquiry or clear plans on how they would continue with their innovation. For example, one teacher shared, “I'm excited about next year, you know we are trying to put all that we've learned this year into practice for next year in our planning and we are so lucky that we can get together now and get some of the planning done” (K-3). Another noted, “for this coming year I'm going to be looking at collaboration structures and design structures” (F-1)

One participant explained that even when their team changed, the inquiry process was still part of their ongoing planning:

> the team will be different again but we had a planning meeting yesterday, I would say it was one of our best planning meetings. We got through so much more than ever before, we got our start-up, really nailed down... we'll have to refine as we go but we know what we're teaching and how and what's important and why and what we're driving towards in a different way than we did last year. (K-1)

Shifts in ownership as well as the presence of capacity building were also signs that the process of innovation, of inquiry, had taken hold in a team. GI project leaders described the process of letting go of ownership over a project but feeling confident that it would be sustained by others as well as outlining clear processes to ensure that others felt comfortable in doing so. One participant noted, “There's a bit of a balance, too, between hanging on to something and spearheading it and then on the other also hand building capacity, so that when you do move on for whatever reason that the project doesn’t fall flat” (F-1). Another shared how in their “collaborative team doing cross-curricular stuff, project-based learning and that collaboration piece and the calibrating of our philosophies is really important, and letting [team members] actually have a voice and agency within the group” (L-1).

Situated collaborative inquiry processes were key to sustaining innovation. Participants who had been involved in GI for a number of years explained how their innovations evolved over years as they engaged in new iterations using feedback from peers, students, the community, and GI members. Ongoing inquiries adapted innovations based on new team members, changing conditions, and student need. The development of their leadership capacity as well as their concern for fostering ownership in others was also an indicator that spoke to sustainability.

5. Discussion

Early on in the meetings with partner organization representatives, we wrestled with how to define inquiry. Some individuals considered technology use to be the driving force for

educational change and even the hoped-for outcome. Others saw innovation as synonymous with inquiry – innovation as process-based. We also had members of the Partnership Team who thought of innovation as "next practice" (Hargreaves et al., 2015) where teams and schools move forward to the next needed innovation in their context versus implementation of top-down directives. This study responded to each of these perspectives. Overall, *Growing Innovation* participants and their teams demonstrated innovation as situated, open-ended exploration that seeks out, embraces, and responds to tensions. In terms of technology, participants were explicit about moving beyond technology-centeredness to place-consciousness. Five of the projects were specifically related to technology (particularly augmented and virtual reality), yet four of these teams spoke about their greatest successes as connecting VR and AR to place. In one case students in one small remote rural school district created virtual tours looking at the social, historical, and geographic features of their communities and shared them with the other schools. One participated shared "I just love how with our redesigned curriculum innovation isn't just defined as the integration of technology."

Important to note is PLN members' ownership of innovation. They derived their innovation based on what they saw in their local contexts. They engaged in inquiry based on scanning their contexts, identifying an issue, and proposing an innovation that would respond to this situated need (Timperley, Kaser & Halbert, 2014). For many GI teams and participants, innovation, like inquiry, is a verb. They continued to engage in future thinking in terms of next steps and ways to continue to customize their innovation in line with Hargreaves et al.'s (2015) notion of "next step" innovation. However, participants found that to expand or scale up their innovations, new team members needed the opportunity to critique, collaborate, and/or co-create to embrace innovations in their own practice. Perhaps most interesting was the development of educators' identity as innovators. The PLN created a culture of connection and collective identity. Even through innovations were localized and different, there was a sense of iterative, empathetic inquiry as the impetus and fuel for innovation.

This study illustrates one way a PLN can be structured to foster inquiry and innovation. Educators identified openings and gaps that addressed local issues. This situated approach was empowering for PLN members as they sought to improve learning for students by transforming aspects of schooling and pedagogy. Professional knowledge was generated by group members' situated inquiries and shared with PLN members from across the province. They received feedback from peers and PLN facilitators, but the ownership for ideas and innovations remained with the teams that posed the problems and crafted innovative responses. Sharing and documenting their works in progress fostered iterative cycles of inquiry (Butler &

Schnellert, 2012) and supported the development of knowledge of and for practice through evidence-based inquiry (Poortman & Brown, 2018).

Knowledge mobilization was demonstrated throughout the study as PLN participants collaborated with colleagues within their own local projects, but also shared what they were learning with teams from across the province. Time and again PLN members referenced what they learned from one another and either took up or passed on ideas to others in their contexts. By living and working in geographically distant and disparate locations these educators would not have met outside of this online PLN.

PLNs can foster educator agency and distributed leadership. Similar to studies by Washington and O'Connor (2020) and Kim and Martin (2020), we observed how PLN participation instilled pride and confidence in local practices, solutions, and rural communities. At the same time, educators built their capacity to listen to and support colleagues both within and beyond their rural and remote communities. Networked approaches to professional development can expand rural educators' perspectives, and help rural educators, schools, and systems access rural/remote created and tested resources. In the *Growing Innovation* PLN members recognized that approaches need to be localized with student, community, and educator funds of knowledge in mind (Moll, 2014).

6. Conclusion

This study offers a window into one long-standing PLN that supports rural educators to develop and implement innovations in response to problems in their local rural/remote communities. As a case study, the goal was not to offer generalizable pedagogical findings that can be directly applied in other contexts. To the contrary, the contribution of this research demonstrates the potential of collaborative inquiry-oriented rural PLNs in allowing rural/remote educators to develop their own knowledge and pedagogy creating and mobilizing innovative practices that respond to local needs. PLNs that foster educators' collaborative inquiry and ownership of innovation and knowledge mobilization, can lead to accelerated pedagogical innovation and local system-wide transformation. We posit that system-wide transformation aligned with 21st century competencies will come through fostering educator authorship and ownership of innovations, where researcher, government, school district partnerships collaborate to develop a climate of responsive, relational inquiry as "next step" innovation.

7. References

Arnove, R. F. (2005) To what ends: Educational reform around the world, *Indiana Journal of Global Legal Studies, 12*(1), 79-95.

Bandura, A. (2006). Toward a psychology of human agency. *Perspectives on Psychological Science, 1*(2), 164-180.

Barnett, E. (2004). Characteristics and perceived effectiveness of staff development practices in selected high schools in South Dakota. *Educational Research Quarterly, 28*(2), 3-18.

Brenner, C. (2012). *Examining the relationship between teachers' experiences of self-determination and teacher effectiveness.* Unpublished manuscript. Vancouver, BC: University of BC.

Bristow, S. F., & Patrick, S. (2014). An international study in competency education: Postcards from abroad. *International Association for K-12. Online Learning, CompetencyWorks Issue Brief.*

Bryant, J. A. Jr. (2007, Fall). Killing Mayberry: The crisis in rural American education. *The Rural Educator,* 7-11.

Butler, D. L., Schnellert, L., & Cartier, S.C. (2013). Layers of self- and co-regulation: Teachers working collaboratively to support adolescents' self-regulated learning through reading. *Education Research International, vol. 2013,* (19 pages). doi:10.1155/2013/845694.

Butler, D. L., Schnellert, L., & MacNeil, K. (2015). Collaborative inquiry and distributed agency in educational change: A case study of a multi-level community of inquiry. *Journal of Educational Change. 16*(1):1-26

Cartier, S. C. (2009). *Autorégulation de l'apprentissage des élèves et développement professionnel des enseignants dans une école primaire en milieu défavorisé; deuxième année de recherche-action en collaboration menée à l'école Jules-Verne.* Rapport sommaire de recherche remis au Programme de soutien à l'école montréalaise, Ministère de l'Éducation, du Loisir et du Sport.

Cartier, S. C., Butler, D. L., & Bouchard, N. (2010). Teachers working together to foster self-Regulated learning through reading by students in an elementary school located in a disadvantaged area. *Psychological Test and Assessment Modeling, 52*(4), 382-418.

Cerna, L. (2014, November). Innovation, governance and reform in education. CERI Conference background paper. Conference held at the Organisation for Economic Co-operation and Development headquarters in Paris. Retrieved from www.oecd.org/edu/ceri/CERI%20Conference%20Background%20Paper_formatted.pdf

Chapman, C., & Hadfield, M. (2010). Realising the potential of school-based Networks. *Educational Research*, *52*(3), 309-323.

Corbett, M., & Gereluk, D. (Eds.). (2020). *Rural teacher education: Connecting land and people.* Singapore: Springer.

Darling-Hammond, L., & Bransford. J. (2005). *Preparing teachers for a changing world: What teachers should learn and be able to do*. San Francisco, CA: Jossey-Bass.

Darling-Hammond, L., & Lieberman, A. (Eds.). (2013). *Teacher education around the world: Changing policies and practices.* New York, NY: Routledge.

Darling-Hammond, L., & Rothman, R. (Eds.). (2015). *Teaching in the flat world: Learning from high-performing systems*. New York, NY: Teachers College Press.

Dooley, K. (1999). Towards a holistic model for the diffusion of educational technologies: An integrative review of educational innovation studies. *Educational Technology & Society, 2*(4), 35-45.

Dumont, H., Istance, D., Benavides, F., Centre for Educational Research and Innovation, & Organisation for Economic Co-operation and Development. (2010). *Nature of learning: Using research to inspire practice.* Paris: OECD.

Dyson, A. H., & Genishi, C. (2005). *On the case: Approaches to language and literacy research.* (Language and Literacy Series). USA: Teachers College Press.

Easley, D., & Kleinberg, J. (2010). *Networks, crowds, and markets: Reasoning about a highly connected world*. Cambridge: Cambridge University Press.

Fichtman, N., & Currin, E. (2017). Inquiry for equity: Exploring the impact of practitioner research. *Journal of Practitioner Research, 2*(2), Article 1.

First Nations Education Steering Committee (FNESC). (2008/2014). *First Peoples Principles of Learning.* Poster retrieved from http://www.fnesc.ca/resources/publications/

Greenwood, D. (2013). A critical theory of place-conscious education. En R. Stevenson, M. Brody, J. Dillon, & A. Wals (Eds.), *International handbook of research on environmental education* (pp. 93-100). New York, NY: Routledge.

Grosvenor, I., & Pataki, G. (2017). Learning through culture: Seeking "critical case studies of possibilities" in the history of education. *Paedagogica Historica, 53*(3), 246-267.

Chapman, C., & Hadfield, M. (2010). School-based networking for educational change. In Second international handbook of educational change (pp. 765-780). Dordrecht: Springer.

Hadwin, A. F., & Järvelä, S. (2011). Introduction to a special issue on social aspects of self-regulated learning: Where social and self meet in the strategic regulation of learning. *Teachers College Record, 113*(2), 235-239.

Halbert, J., & Kaser, L. (2012). *Inquiring learning environments: New mindsets required*. East Melbourne, Victoria: Centre for Strategic Education.

Hargreaves, A. (2019). Teacher collaboration: 30 years of research on its nature, forms, limitations and effects. *Teachers and Teaching, 25*(5), 603-621.

Hargreaves, A., Parsley, D., & Cox, E. K. (2015). Designing rural school improvement networks: Aspirations and actualities. *Peabody Journal of Education, 90*(2), 306-321.

Hargreaves, A., & Shirley, D. (2012). *The global fourth way: The quest for educational excellence*. Thousand Oaks, CA: Corwin.

Horn, R. (2002). *Understanding educational reform: A reference handbook.* Santa Barbara, CA: ABC-CLIO Inc.

Irvin, M. J., Byun, S., Meece, J. L., Farmer, T. W., & Hutchins, B. C. (2012). *Educational barriers of rural youth: Relation of individual and contextual difference variables*. Thousand Oaks, CA: SAGE Publications.

Kim, M., & Martin, K. (2020). How rural educators improve professional capital in a blended professional learning network. En L. Schnellert (Ed.), *Professional learning networks: Facilitating transformation in diverse contexts with equity-seeking communities* (pp. 107-140). Bingley, UK: Emerald Publishing.

Kitchenham, A., Fraser, T., Pidgeon, M., & Ragoonaden, K. (2016). *Aboriginal Education Enhancement Agreements: Complicated conversations as pathways to success*. Retrieved from https://www2.gov.bc.ca/assets/gov/education/administration/kindergarten-to-grade-12/aboriginaleducation/research/aeea_report.pdf.

Larreamendy-Joerns, J., & Leinhardt, G. (2006). Going the distance with online education. *Review of Educational Research, 76*, 567-605.

Lave, J., & Wenger, E. (1991). *Situated learning: Legitimate peripheral participation*. Cambridge: Cambridge University Press.

Luna, C., Botelho, J., Fontaine, D., French, K., Iverson, K., & Matos, N. (2004). Making the road by walking and talking: Critical literacy and/as professional development in a teacher inquiry group. *Teacher Education Quarterly*, *32*(1), 67-80.

Merriam, S. B. (2009). *Qualitative research: A guide to design and implementation*. San Francisco, CA: Jossey-Bass.

Meyer, D. K., & Turner, J. C. (2002). Discovering emotion in classroom motivation research. *Educational Psychologist, 37*(2), 107-114.

Miles, M. B., Huberman, A. M., & Saldaña, J. (2014). *Qualitative data analysis: A methods sourcebook* (3rd. ed.). Thousand Oaks, CA: Sage.

Ministerio de Educación de British Columbia. (2015). *Building student success: B.C.'s new curriculum.* Retrieved from https://curriculum.gov.bc.ca/home

Moll, L. (2014). *L.S. Vygotsky and education*. New York, NY: Routledge.

Morrell, E. (2004). Legitimate peripheral participation as professional development: Lessons from a summer research seminar. *Teacher Education Quarterly*, *32*(1), 89-99.

Organización para la Cooperación y el Desarrollo Económicos. (2012). *Equity and quality in education: Supporting disadvantaged students and schools.* Paris: OECD Publishing.

Organización para la Cooperación y el Desarrollo Económicos. (2013). *Innovative learning environments, Educational research and innovation.* Paris: OECD Publishing.

Organización para la Cooperación y el Desarrollo Económicos. (2015). *Schooling redesigned: Towards innovative learning systems.* Paris: OECD Publishing.

Organización para la Cooperación y el Desarrollo Económicos & Eurostat. (2005). *Oslo manual: Guidelines for collecting and interpreting innovation data, 3rd Edition. The Measurement of Scientific and Technological Activities.* Paris: OECD Publishing.

Parsley, D. (2018). Remote but not removed: Professional networks that support rural educators. *American Educator, 41*(4) 34-37.

Plan de Educación de BC. (2015). *Focus on learning.* Retrieved from https://cep.org.au/wp-content/uploads/2020/07/british_columbia_education_plan_2015.pdf.

Poortman, C. L., & Brown, C. (2018). The importance of professional learning networks. En C. Brown, & C. L. Poortman (Eds.), *Networks for learning: Effective collaboration for teacher, school and system improvement* (pp. 10-19). New York, NY: Routledge Tailor & Francis Group.

Robertson, J., Hill, M., & Earl, L. (2004). *Conceptual frameworks in school-university action research communities.* Paper presented at the New Zealand Research in Education conference, Wellington, N.Z.

Ryan, R. M., & Brown, K. W. (2005). Legislating competence: High-stakes testing policies and their relations with psychological theories and research. En A. J. Elliot & C. Dweck (Eds.), *Handbook of competence and motivation* (pp. 354-372). New York: Guilford Publications.

Ryan, R. M., & Weinstein, N. (2009). Undermining quality teaching and learning: A self-determination theory perspective on high-stakes testing. *Theory and Research in Education, 7*(2), 224-233.

Slotta, J. D., Quintana, R. M., & Moher, T. (2018). Collective inquiry in communities of learners. En F. Fischer, C. E. Hmelo-Silver, S. R. Goldman, & P. Reimann (Eds.), *International handbook of the learning sciences* (1st ed., pp. 308-317). New York, NY: Routledge.

Stein, M. K., & Coburn, C. E. (2008). Architectures for learning: A comparative analysis of two urban school districts. *American Journal of Education, 114*(4), 583-626.

Stoll, L. (2009). Capacity building for school improvement or creating capacity for learning? A changing landscape. *Journal of Educational Change, 10*(2), 115-127.

Timperley, H., Ell, F., & Le Fevre, D. (2017). Developing adaptive expertise through professional learning communities. En A. Harris, M. S. Jones, & J. B. Huffman (Eds.), *Teachers leading educational reform: The power of professional learning communities* (pp. 15-34). Abingdon: Routledge.

Timperley, H., Kaser, L., & Halbert, J. (2014). *A framework for transforming learning in schools: Innovation and the spiral of inquiry*. Melbourne: Centre for Strategic Education, Seminar Series Paper No. 234.

Volet, S., Vauras, M., & Salonen, P. (2009). Self- and social regulation in learning contexts: An integrative perspective. *Educational Psychologist, 44*(4), 215-226.

Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes.* London: Harvard University Press.

Washington, S., & O'Connor, M. (2020). Collaborative professionalism across cultures and contexts: Cases of professional learning networks enhancing teaching and learning in Canada and Colombia. En L. Schnellert (Ed.), *Professional learning networks: Facilitating transformation in diverse contexts with equity-seeking communities* (pp. 17-48). Bingley, UK: Emerald Publishing.

Yang, S. C., & Liu, S. F. (2004). Case study of online workshop for the professional development of teachers. *Computers in Human Behavior*, *20*(6), 733-761.

Yin., R. K. (2014). *Case study research design and methods* (5th ed.). Thousand Oaks, CA: Sage.