Professional learning in global networks: Lessons from ARC

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Abstract

The value of Professional Learning Networks (PLNs) for school and system improvement is widely acknowledged in education research and policy. Still, the question of how learning happens for teachers and education leaders involved in PLNs remains largely unanswered. Moreover, little research exists on the increasing number of international networks for professional learning developed among education systems globally. This case study explores one such network, which we identify as a Global Learning Network (GLN), the ARC Education Project. ARC describes itself as a self-funded network of policymakers, scholars, and system leaders from a range of national and state-level systems with a shared commitment to equity, excellence, wellbeing, inclusion, sustainability, democracy, and human rights. Employing content analysis, we analyze observational notes and materials from ARC summit meetings, joint statements issued by ARC systems, membership records, and other key ARC documents. We draw from Rodway and Farley-Ripple's (2020) application of social network theory to examine this GLN as a relational space, given the challenges of global collaboration. We consider five key components of PLN efficacy: collaboration, sense of purpose, reflective professional inquiry, leadership, and boundary crossing. Specifically, we interrogate how the boundedness of ARC's membership mediates opportunities for the construction of new knowledge in the network. We conclude with implications for professional learning in global networks.

Keywords Professional Learning Networks (PLNs) · Global education reform · Social Network Analysis

Introduction

Research continues to uphold the value of Professional Learning Networks (PLNs) for facilitating educator development and enacting change throughout schools and education systems. Brown and Poortman (2018) define PLNs as "any group who engage in collaborative learning with others outside of their everyday community

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of practice in order to improve teaching and learning in their school(s) and/or the school system more widely" (p. 1). PLNs provide opportunities for members to engage with diverse perspectives from a range of stakeholders across boundaries of geography and culture (Schnellert, 2020) and inquire into common issues of practice (Cochran-Smith & Lytle, 2009; Hargreaves & Fullan, 2012; McLaughlin & Talbert, 2006). In doing so, PLNs contribute to the exchange of professional expertise and other social capital at a larger scale than can be accomplished through localized forms of collaboration, expanding the construction of new knowledge and problem-solving power (Brown et al., 2021). This exchange of knowledge and resources is the mechanism enabling educational change to occur (Godfrey & Brown, 2019). To ensure positive changes in teaching and learning, PLNs must cultivate strong relationships between members and structure learning activities that are useful and relevant to members' home environments (Daly & Stoll, 2018; Hollweck, 2020). Conditions enabling PLNs to have a positive impact on student learning include regular collaboration, a shared sense of purpose, reflective professional inquiry, strong leadership, and opportunities for boundary crossing (Poortman et al., 2021).

Juxtaposed with the recent proliferation of PLNs is an increasing tendency for policymakers to seek out strategies from high-performing education systems across the world as drivers for reform (Hargreaves & Shirley, 2012). The heightened interest in "policy borrowing" (Phillips, 2005; Steiner-Khamsi, 2014) reflects how globalization lends to the increased mobility of goods, services, capital, and labor across borders. Globalization encompasses large-scale migration, urbanization, growing social inequality, and the spread of information technology, all of which have been intensified by the ongoing COVID-19 pandemic. The rapid diffusion of ideas in the global sphere highlights the need for policymaking paradigms that extend beyond state or nation-bounded notions of governance. In the education sector, systems of international benchmarking have enabled comparisons between education systems globally (Meyer & Benavot, 2013). Competition over educational benchmarking continues to motivate the adoption of common "best practices" in the quest for global legitimacy, what Mehta and Peterson (2019) have termed "the new isomorphism" of education policy.

Taken together, these two trends underscore the need to better understand how PLNs function globally. International networks for professional learning or "global PLNs" (Tulowitzki, 2021) are becoming more prominent models in large-scale education reform. Recent efforts by the Organization for Economic Cooperation and Development (OECD) around Social and Solidarity Economy Ecosystems (OECD, 2021) and Innovative Learning Partnerships have illustrated the benefits when peer learning partnerships (Chen & Lo, 2013) are harnessed to address pressing global problems, foregrounding collaborative conversations and diverse perspectives. OECD (2018) has also spotlighted how co-construction of education policy can lend to increased trust between stakeholders and meaningful adoption of new curriculum. However, there is minimal research exploring the mechanisms by which systems learn from another through international collaboration (Butler et al., 2015). To explore this question, we consider the case of one global learning network, the ARC Education Project (formerly "the Atlantic Rim Collaboratory"). On its website, ARC describes itself as.

a global educational movement that advances equity, broad excellence, inclusion, wellbeing, democracy, sustainability and human rights in high quality, professionally run systems. As a learning network, ARC brings together policymakers, system leaders, and professional association leaders to learn with and from one another in deliberately designed processes (https://atrico.org/).

According to its founders, the idea for ARC was "fully born and founded in a Toronto restaurant in December, 2013 and further developed at the 2014 International Congress for School Effectiveness and Improvement" (https://atrico.org/). A partnership developed around the concept of a "collaboratory," fusing "collaboration" and "laboratory" to describe the creative processes of group members driven by similar values working across geographic divides (Muff, 2014). ARC now includes seven member systems and one global association who convene annually for bi-monthly virtual ThoughtMeets and 3-day in person summits. Teams composed of policymakers, government officials, scholars, heads of professional organizations, and other education leaders represent each system. Several "thought leaders'' also join ARC events to speak on key education policy issues. The aim of the ARC activities is for systems to support one another in navigating local challenges in education reform and changing the global landscape of education policy.

In this paper we explore ARC as a case of large-scale education reform and identify its unique characteristics as what we term a "Global Learning Network" (GLN). We define a GLN as a learning network for government officials and education leaders committed to change in education policy. This is to distinguish GLNs from other models for international collaboration such as global PLNs (Tulowitzki, 2021) and global professional learning communities (Huffman et al., 2016). Our terminology reflects that ARC members are policymakers—government officials, either elected or appointed, and representatives of professional associations—rather than practicing educators.

Curious how the case of ARC might help us better understand the ways global networks can support education systems in learning from each other, we asked: What are the defining features of a global learning network? How do global learning networks structure learning opportunities for member systems? Our focus speaks to recent calls in this journal (e.g. Mehta & Peterson, 2019) for more research examining how international organizations foster learning opportunities for system-level leaders and the mechanisms by which this learning occurs.

We begin by discussing several prominent models of collaboration for large-scale educational change and the various structures and functions of PLNs. We detail our method of content analysis as applied to observational notes and materials from ARC summit meetings, joint statements from ARC systems, membership records, and other key ARC documents. Drawing from Rodway and Farley-Ripple's (2020) analysis of PLNs through the lens of social network theory, we examine ARC's network structures to explore how GLNs can function as relational spaces. We address this question with respect to key considerations of PLN efficacy, including collaboration, sense of purpose, reflective professional inquiry, leadership, and boundary crossing (Poortman et al., 2021). We find that ARC's consultancy model and

leadership structures enable mutuality across systems. We also show that the boundedness of ARC's membership mediates opportunities for the construction of new knowledge within the network. We conclude with implications of ARC's model for learning in global networks.

Theoretical framework

Understanding PLNs from an international perspective necessitates reconceptualizing their relational dimensions. As Rodway and Farley-Ripple (2020) have argued, "How people learn through relationships is at the heart of research on PLNs" (p. 173). Research on how knowledge is circulated in PLNs (e.g. Jesacher-Roessler, 2021) has underscored the importance of relationship-oriented transfer systems in conveying institutional knowledge and expectations with the help of social positions and role-based systems. And a long history of sociocultural learning theory (e.g. Vygotsky, 1978) has established that learning is a social endeavor. Meaning is constructed in relationships—through dialogue and social interactions which facilitate knowledge sharing in particular contexts (e.g. Spillane et al., 2002). Learning is an "encompassing process of being active participants in the practices of social communities and constructing identities in relation to these communities" (Wenger, 1998, p. 4).

One challenge of learning in PLNs is minimal common context to draw from, since PLNs connect members with those outside their communities of practice (Brown & Poortman, 2018). This is a particular obstacle for PLNs operating globally, given the distance between members. Opportunities for building relationships are limited by constraints of time and geography. They are also complicated by participants' lack of familiarity with member systems. Additionally, global PLNs must contend with the social, political, and cultural hierarchies entrenched at the systems level which mediate relationships among members.

In theorizing the relational dimensions of GLNs, we draw from Rodway and Farley-Ripple's (2020) application of social network theory to relational spaces. While our study does not formally take a network approach, our analysis is informed by network thinking. We consider three general premises of social network theory from Rodway and Farley-Ripple's framework: boundedness, connectedness, and mutuality.

Boundedness refers to how networks are defined: what exists within the network and what is outside of it (Löw & Weidenhaus, 2017). Considering network boundaries illuminates who is included and who is excluded in the network and the benefits or consequences of these limits for members' learning. It also requires positioning members within a complexity of other networks shaping their learning. As a concept, boundedness provides insight into how networks construct their membership—who is invited to participate, who makes these decisions, and what roles members hold in the other social and political institutions of which they are a part. Attention to whose perspectives are foregrounded

in the network's structure is key to understanding the potential for new knowledge to be generated in the network.

Connectedness characterizes the strength and quality of relationships within the network. Rodway and Farley-Ripple (2020) define connectedness as "the degree to which the actors in a network have access to one another through their direct and indirect relationships" (p. 178)—that is, the patterns of relationships occurring within the network. Closed networks, which are densely connected and provide equal access to network resources for all members, allow strong group norms and belief systems to develop and foster trusting relationships (Daly, 2010). These are optimal conditions to further the goals of the network. However, closed networks may also function as echo chambers, limiting the diversity of perspectives and members' shared capacity for problem-solving. By contrast, open networks allow for "brokerage" (Brown & Poortman, 2018). They are characterized by structural holes—that is, weak or less frequent ties—which provide opportunities for new information to enter into the network's learning ecosystem (Granovetter, 1973). While closed networks can be "norm-enforcing," open networks can "expand the horizons" of their members (Maroulis & Gomez, 2008).

Finally, mutuality encompasses the degree of reciprocity in relationships between members of the network—that is, the extent to which members' social ties can be understood as beneficial to all members (Wasserman & Faust, 1994). Reciprocal or mutual ties of camaraderie and support enable deeper collaboration and inquiry work (Brown & Poortman, 2018). Reciprocal ties suggest the sharing of decision-making power and allow members to scaffold one another's engagement in cycles of inquiry. Schnellert et al. (2020) have referred to this as "co-regulation." Reciprocal ties are also stable over time, fostering high levels of trust and iterative learning which allows members to engage in open dialogue and challenge each other's assumptions (Brown, 2020).

Of interest to our conceptualization of GLNs is how relationships are mediated by—and mediate—the social and cultural conditions surrounding the learning network and the levels of formal and informal hierarchies in which its members are enmeshed (Kadushin, 2012). These are central considerations from a global perspective. The purpose of this paper is to better understand what relationship-building entails across geographic distance, the roles culture and politics play in shaping relational ties between systems, and how GLNs can structure meaningful learning for members given a wide range of contexts and experiences.

Review of the literature

Although education systems have long sought to learn from one another, increased global competition in education has made this a rising priority (Barber & Mourshed, 2007; Mehta & Peterson, 2019). International networks have been established so that system leaders can learn from one another in pursuit of better outcomes and system improvement (e.g. Huffman et al., 2016). While there is

considerable literature on cross-national learning in education, Mehta and Peterson (2019) note that "very few [researchers] go inside the 'black box' of what happens in meetings that bring together policy actors from around the world and how individuals and groups learn" (p. 330). To situate ARC in the context of global educational change, this section explores key structures for collaborative professional learning.

International learning communities

Mehta and Peterson (2019) define international learning communities (ILCs) as "organized activities designed to foster a sustained community whose members are learning with and from each other about education strategies across international lines" (p. 331). In ILCs, members engage in shared, ongoing learning; the format is structured so that frameworks and experiences build on each other; the community has a consistent membership; members typically gather in-person at least once a year; and the gatherings are small.

Focusing on two ILCs, Mehta and Peterson examined the joint learning of system leaders, predominantly ministry officials; heads of agencies for curriculum, assessment, or professional learning; and superintendents of large districts. They conceptualized three forms of learning in ILCs: *borrowing*, *co-construction, and systems thinking*. In *borrowing*, members take specific policy strategies from other countries, including small-scale ideas or practice models they might see in action during school visits, and adapt them to their own contexts. In *co-construction*, members from different countries work together to develop strategies addressing common problems. In *systems thinking*, members benefit from the experience of seeing how other countries have devised systems and structures to better their own.

Professional learning networks

The collaboration between educators and schools has been described in a variety of ways in the literature. Most recently, the term PLN is gaining traction and builds on the literature of networked professional learning communities and school-based networks. The concept of professional learning communities (PLCs) emerged in the 1990s as a structure to support educator collaboration (e.g. McLaughlin & Talbert, 2006; Stoll et al., 2006). PLCs, which are usually situated in the school context, have many interpretations and practices (DuFour et al., 2010; Hord, 1997) but have common elements such as collaboration focused on professional practice and student outcomes, shared leadership, common visions and goals, and job-embedded professional development (Hipp & Huffman, 2010).

PLCs and PLNs are closely related, the difference being the proximity of participants. While PLCs consist of educators working together to improve teaching and learning (Lomos et al., 2011; Stoll et al., 2006) and are bounded systems of teachers or leaders from the same schools or districts, PLNs are "cross-school
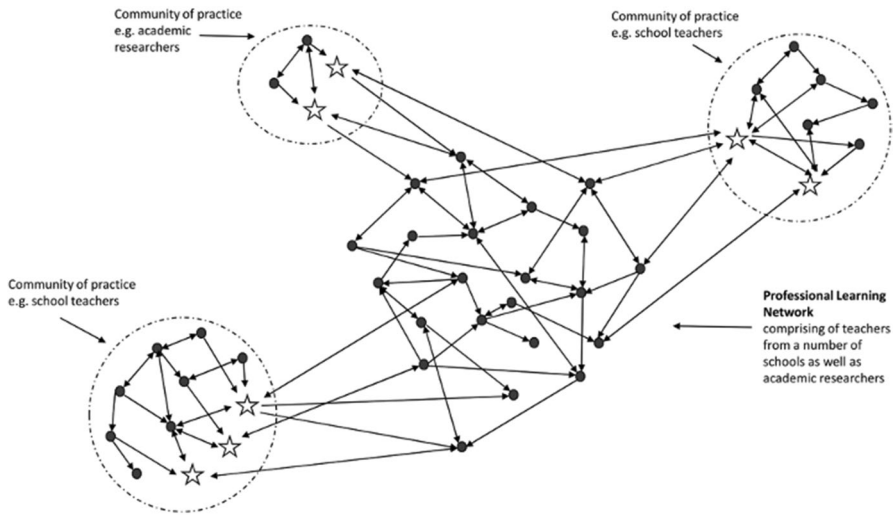
Fig. 1 Professional Learning Network (Brown & Poortman, 2018)

PLCs" (Prenger et al., 2021, p. 14), who do not necessarily share contexts and through which educators from different contexts collaborate to improve their practice (Ainscow, 2015). Hadfield et al. (2006) characterize PLNs as "groups or systems of interconnected people and organizations whose aims and purposes include the improvement of learning and aspects of well-being known to affect learning (p. 5)." Likewise, Brown and Poortman (2018) define PLNs as educators collaborating outside of their communities of practice. This is represented in Fig. 1.

Researchers have called for greater conceptual clarity regarding what constitutes a PLN (Daly & Stoll, 2018; Poortman et al., 2021). Brown and Poortman (2018) suggest that PLNs are defined by geography, membership/composition, and the nature of professional learning. They identify five interconnected characteristics of effective PLNs: focus, collaboration, reflective professional inquiry, leadership, and group and individual learning. Similarly, Rincón-Gallardo and Fullan (2016) highlight eight "essential features" of effective networks in education. These include linking student learning outcomes to effective pedagogy, developing strong, trusting relationships within the network, and continuously improving practice through cycles of shared inquiry. Importantly, these elements require ongoing attention at the network and systems level (Brown & Poortman, 2018; Katz & Earl, 2010).

One notable feature of PLNs is the varied nature of their structures. Unlike PLCs comprised of participants from the same school or district, PLNs form with members from different locations. Geographic proximity is still a factor, however; "closeness" makes it easier for participants to come together physically. It may reflect shared demographics, aspirations, and needs and a prior history of collaboration; it may include members with similar roles or different ones (Howland,

2015). Research suggests that PLNs may be more powerful when membership is based on some common criteria (Bremm & Drucks, 2018).

PLNs exist in many forms, such as hub-and-spoke systems, nodal systems, or crystalline networks (Hadfield & Chapman, 2009). In hub-and-spoke systems, networks are organized with a central information headquarters and participants on the periphery of the network. Major decision-making processes occur in the central hub and are disseminated. Nodal systems consist of several central hubs. In crystalline networks, interactions among participants occur across multiple levels. PLNs may be participant-led or externally led and governance may be highly-brokered by a single organization or shared amongst members. Highly-brokered governance may be more effective for larger networks, while shared governance may be more effective in smaller, homogeneous networks with high levels of trust (Ehren & Godfrey, 2017).

PLNs in education vary widely in their purposes. Broadly speaking, network collaboration allows communities of educators to exchange knowledge, materials, and information in the service of similar aims (Azorin, 2019; Katz et al., 2008; Rincón-Gallardo & Fullan, 2016; Trust et al., 2016). Muijs et al. (2010) identify three goals of PLNs in education: school improvement, broadening opportunities for improvement, and disseminating effective practices and resources. Hargreaves (2003) suggests that education networks have the potential to "feed the creative co-production of new knowledge that is the source of better professional practice and renewed professional pride" (p. 4). And Azorin (2019) classifies four types of education networks based on purpose: community networks with a focus on interaction between schools as the key element of school change; socio-educational networks that promote inter-sector collaborations to provide resources to schools; equity fostering networks consisting of educational, social, cultural, and political agents working to provide equal opportunities for students; and school-to-school support networks which aim to share instructional practices and professional knowledge.

The learning activities in which PLN members participate vary widely. Most commonly, PLNs involve educators in different forms of collaborative inquiry to reflect on their instructional practices. Educators may look at data and construct action plans for their classrooms (Butler & Schnellert, 2012; Day & Hadfield, 2005), draft and critique teaching materials (O'Hair & Veugelers, 2005), develop shared lessons and conduct observations to collectively strengthen practice (de Vries et al., 2017), or pursue action research topics of their choosing (Harris & Jones, 2017). Jesacher-Roessler (2021) distinguishes between two steps of knowledge mobilization in PLNs: activation of knowledge resources within the network and carrying knowledge into local contexts. Moreover, this exchange is bi-directional. She writes:

> In PLNs, participants work on problems of practice in interorganizational networks. In this way, the professional knowledge of each participant is activated; participants share and discuss their knowledge and link their own experiences with the new knowledge from others…Participants oscillate between the PLN and their own organizations; therefore, they take both organizational knowl-

edge to the PLN and the knowledge of the PLN to their "home" organization (p. 135).

Across this range of learning activities, research has found similar benefits. Participants in PLNs report a stronger sense of community, deeper self-reflection, and enhanced understanding of students' needs (Lieberman, 2000). Collaboration in PLNs may improve teachers' engagement with other professional learning opportunities (Hadfield & Chapman, 2009) and receptiveness towards new approaches to pedagogy (Stoll, 2009). According to a review conducted by the Networked Learning Group (Centre for the Use of Research & Evidence in Education, 2005), teachers in networks were more willing to participate in professional development and gained instructional knowledge. The review also connected collaboration in networks to greater achievement of students with special education needs. Similarly, teachers involved in lesson study through PLNs reported a heightened sense of professional community, leading them to share the tools and information needed for instructional improvement (de Vries et al., 2017). Participation in PLNs has also been linked to knowledge exchange, improved communication among different groups, and a lack of hierarchical barriers—benefits which are premised on a high level of relational trust (Daly & Stoll, 2018; Sahlberg & Walker, 2021).

Research illustrates the potential for PLNs to deepen teachers' understanding of content and their self-efficacy (Butler et al., 2015); explore evidence-based approaches to enhance student learning (Butler & Schnellert, 2012; Hadfield & Chapman, 2009); and share knowledge strategically and systematically (Brown & Poortman, 2018; Stoll, 2009). There is less evidence, however, that PLNs positively impact student outcomes (Azorin & Muijs, 2017; Poortman et al., 2021; Prenger et al., 2021; Muijs et al., 2010). As Brown and Poortman (2018) caution, "Working in a learning network does not automatically improve practice" (p. 2). The function of cross-school PLNs may be complicated by differences in geography and the professional roles of participants (Chapman, 2014). One persistent challenge is how to bridge the gap from planning for teaching out of context to making situated, responsive changes in the classroom (Cochran-Smith & Lytle, 2009). Stoll (2009) argues that a strong internal professional learning community is still necessary in PLN work "because most new knowledge and learning gained through network experience is channeled back into schools where changed practice has its main impact" (p. 472).

Poortman et al. (2021) offer some insight into the conditions necessary for PLNs to improve student learning. This work builds on an earlier framework outlining five characteristics of effective PLNs (Brown & Poortman, 2018). The authors (Poortman et al., 2021) identify five "enactment process variables" that influence a PLN's capacity to achieve its goals—that is, to positively impact teacher learning, instructional practice, and student outcomes. These variables include regular collaboration, a shared sense of purpose focused on student learning, reflective professional inquiry, strong leadership in the PLN, and opportunities for boundary crossing. *Collaboration* engages members with a range of knowledge, experience, and expertise, encouraging investigation and debate. *Sense of purpose* refers to the existence of a shared goal or vision around student learning that gives the PLN a sense of

direction. *Reflective professional inquiry* includes structured learning conversations, resources, and perspectives that help members inquire into their own practice. *Leadership* within the network supports the PLN through money, time, and resources; stimulates focus; and establishes the structures, policies, and procedures enabling it to flourish. And *boundary crossing* entails opportunities for PLN members to broker knowledge between the PLN and their school-based colleagues, putting it into practice in their own contexts. Across these variables, the authors call for further research to surface the link between what happens in PLNs and student learning outcomes.

Few studies have explored what we conceptualize as GLNs, in which policymakers and education leaders from different systems engage in collaborative learning. There is some research suggesting that networks offer convening opportunities for education leaders which can shape policymaking on a global and national stage (Tulowitzki, 2021). Such networks have the potential to equip education leaders with concrete examples of practice and innovation and in return can deliver upon major strategic and advocacy goals. They create opportunities for the sharing of diverse perspectives, integrating initiatives across a wide variety of contexts and shaping global thought leadership.

There are also many challenges to learning in global networks. Network structures must allow participants to form an ecosystem in which knowledge, practice, and influence is harnessed internationally. Research highlighting the central importance of relationships for collaborative learning (Rodway & Farley-Ripple, 2020) also raises questions about how global networks might create the conditions whereby strong relationships develop across geographical, linguistic, cultural, social, and political difference. The exchange of ideas in learning networks is at its core relational work, involving dialogue, collaborative problem solving, and mutual influence, whereby local actors transform new ideas based on their context's needs and values (Baker & LeTendre, 2005; Steiner-Khamsi, 2014). Further research is needed into the structures and functions of global learning communities to understand how these forms of international exchange can result in meaningful learning for policymakers and education leaders.

Methods

This study was conceptualized as a case study. Yin explains that "the distinctive need for case study research arises out of the desire to understand complex social phenomena, allowing investigators to focus on a 'case' and retain a holistic and real-world perspective" (2014). Case study design allows researchers to consider the particularities of a single case and creates the space for broader themes to emerge in the process of data collection, interpretation, and analysis. Our approach aligns with Yin's identification of exploratory case study research, which aims to characterize and define unexplored phenomena.

Table 1 Data sources

	2015–2016	2016–2017	2017–2018	2018–2019
Internal documents				
Agendas	1	2	2	1
Correspondences	9	12	5	1
Observational notes	3	3	2	1
School visit materials	1	2	1	1
Powerpoints	2	3	3	3
PUBLIC DOCUMENTS (available at https://atrico.org/)				
Mission/vision statement	1			1
System declarations	1			1
"ARC Talks" videos	6	6	4	4

Data sources

Our sources for this study included internal and publicly available documents from four ARC summits between 2016 and 2019.

Internal documents:

1. Daily agendas from summits and mini-summits, including itineraries and objectives.
2. Major correspondences sent by ARC organizers, such as invitations for systems and thought leaders, logistical information, and feedback surveys.
3. Low-inference observational notes from each day of the summit, including thick descriptions (Hammersley, 2008) of whole-group presentations.
4. Materials provided for school visits, including information distributed by teachers and school leaders.
5. Slides and supplemental materials from presentations by delegates and thought leaders.

Public documents (available at https://atrico.org/):

1. Mission and vision statements for ARC, composed by members.
2. Formal ARC declarations issued by member systems.
3. Video recordings and slides of "ARC talks" given by thought leaders.

Tallies of data sources collected by year are provided in Table 1.

Data analysis

We engaged in qualitative content analysis (Mayring, 2000), a systematic approach to thematizing recorded communication in which material is analyzed following a

step-by-step procedure and categories are developed directly onto the material guided by theory (Kohlbacher, 2006). Focusing on the characteristics of language with attention to content and contextual meaning, this approach enables nuanced analyses of latent themes, bringing to light the assumptions and ideologies underlying discourse (Hsieh & Shannon, 2005).

We began by reading the data corpus holistically (Hsieh & Shannon, 2005). We then used an open coding approach to get a deeper, defamiliarized sense of the data and abstract away from observation to categorization (Mayring, 2000; Timmermans & Tavory, 2022). After 25% of the material was coded independently, we met to compare initial categories and discuss the theoretical potential of our observations. Data was considered with respect to the relational dimensions of PLNs, drawing from Rodway and Farley-Ripple's (2020) framework and the "enactment process variables" identified by Poortman et al. (2021): regular collaboration, a shared sense of purpose focused on student learning, reflective professional inquiry, strong PLN leadership, and opportunities for boundary crossing. Since these five variables clearly define a PLN relative to positive impact on student outcomes, we found they provided a helpful organizational structure for our analysis. Using abductive analysis (Tavory & Timmermans, 2014), we then created a detailed coding scheme with definitions and examples for each variable and worked independently to code the rest of the material, taking note of any "tensions" that could lead to theoretical surprises (Timmermans & Tavory, 2022). Reliability was checked at two points by comparing coded materials and clarifying code application where necessary.

Analysis of membership data required a separate but complementary approach. We examined summit attendance rosters for delegates from 2015 through 2019 and placed these delegates in one of six predetermined categories ("government representatives, elected", "government representatives, unelected", "representatives of professional organizations", "academics/researchers", "local representatives", and "other"). We then tallied up delegates in each category by year, numbers of delegates per system, and how many delegates attended summits for multiple years (see Tables 4, 5 and 6).

Interpretation involved examining frequency counts of code application by data source to identify larger group trends. From these frequency counts, excerpts in each trend category were examined for commonalities and defining patterns, allowing underlying themes to emerge. Where relevant, major themes were analyzed across systems in order to create case descriptions for each system. Relationships between themes were compared and clarified by examining code cross-application and exploring the overlaps in coded segments.

Positionality

We, the authors, have all worked as project managers for ARC. We are also former or current teachers, school leaders, and educational researchers. While we received no funding from ARC for this research, access to data, particularly the internal documents, was made possible by our professional connections to the context of study. We did not participate in summit proceedings, but we were present as observers, note-takers, and event organizers, allowing us to form relationships with

members that inform our analysis. We place ourselves in the middle of Adler and Adler's (1987) continuum of participatory research, as active member researchers who became involved with the activities of the group without committing entirely to members' values and goals. This positioning provided us with a layered understanding of the research context, while also allowing us to keep a productive distance from the topics of study. Our roles as "insider-outsiders" (Dwyer & Buckle, 2009) enabled us to develop a depth of knowledge about the organization and made it all the more imperative that we take a critical stance in our evaluation of its structures and goals.

Our choice of methodology was made with this critical stance in mind, as content analysis provided a means of examining the data systematically. We engaged in "bracketing" throughout the research process, making visible and interrogating our own biases and assumptions by following Charmaz's (2000) recommendations for reflective and analytical memoing. Memo writing was particularly important when identifying categories. It allowed us to clearly define components of each category, to bring raw data into the memo ensuring we had sufficient empirical evidence to support our analytic claims, and to identify gaps in our analysis. We aimed to examine multiple data sources with the same rigor in order to triangulate our findings (Goetz & LeCompte, 1984). We also relied upon strategies that have traditionally been used to enhance the validity of qualitative research such as member checking (e.g. Eisenhart & Howe, 1992) with key ARC participants, including founders, thought leaders, and delegates.

Findings

In what follows, we present findings relative to each of the "enactment process variables" identified by Poortman et al. (2021): Regular collaboration, a shared sense of purpose focused on student learning, reflective professional inquiry, strong PLN leadership, and opportunities for boundary crossing. Before turning to our findings, we first provide an overview of ARC summits.

Summit overview

The wording of summit invitations stressed the importance of incorporating a variety of perspectives, including ministers of education, representatives from professional associations, and school board officials. Summit agendas were structured around a mixture of whole group presentations and small group discussions including members with similar roles and in mixed groupings. "Reflection" and "discussion" were often mentioned as intended outcomes. In one correspondence with members, the organizers explained how they aimed to create an itinerary that "doesn't mainly consist of stand-up, show-and-tell, whole-group presentations, either by thought leaders or by systems" and to promote a "learning stance" in how summits were facilitated. A sample summit agenda is included as Table 2.

Table 2 Sample summit agenda

Day 1	Day 2	Day 3
Opening and declaration of goals and definition of a participatory summit as distinct from a conference	A summary of key points from Day 1 by facilitator	Presentation on context for school visits
Introduction of all participants and thought leaders	Thought leader presentation and small group reflection, guided by a protocol (role-alike groups)	School visits coordinated by the host system and led by educational or ministry leaders from the host system
Thought leader presentation and small group reflection, guided by a protocol (role-alike groups)	Thought leader presentation and small group reflection, guided by a protocol (mixed groups)	Guided reflection following school visits (system groups)
Thought leader presentation and small group reflection, guided by a protocol (mixed groups)	Reflection, processing, and application in mixed groups. Questions could include: *What is working well in your own system re: the topic? What is not working so well and why? What ideas/possible strategies might you consider to improve _____? Are there any questions/issues that you would like to raise with the larger group?*	A conversation around ARC's sustainability
System-based discussion and action points	System-based discussion and action points	Review of group learning and closing remarks
System-to-system consultancy around pressing "wicked issues," or challenges (thought leaders assigned to each group)	System-to-system consultancy around pressing "wicked issues" or challenges (thought leaders assigned to each group)	
A conversation to summarize outcomes so far: What are we learning?	Plenary session presenting key learnings from thought leaders and small group conversations: *How is ARC making us think differently? What are we going to do differently moving forward?*	

One notable feature of how ARC summits were run was confidentiality. The press was not permitted at ARC summits. At each summit, the facilitator invoked Chatham House Rules, an international system for holding debates on controversial topics intended to protect speakers' identities. He explained that this was to create a "safe space" for "learning conversations."

Table 3 lists the dates and locations of each ARC summit, systems in attendance, and major themes discussed at the summits. Each summit was characterized by these different themes, identified in summit agendas, as well as structural and thematic changes implemented as the organization developed. At the first summit, delegates crafted a vision for the network which was formalized into a joint statement issued by member systems. The second summit began a collaboration between ARC and the OECD, which has had a central role in the formation of global education policy, when an OECD representative joined as a thought leader. The third summit occasioned a change in the network's name from "the Atlantic Rim Collaboratory" to simply "ARC." In his opening remarks at the summit, one founder explained that this was intended to project a more inclusive geographical and cultural identity. At the fourth summit, systems made a three-year commitment to financial support, which allowed for the development of a permanent center for the management of the network at the University of Ottawa.

Collaboration

The first variable Poortman et al. (2021) identify as essential to the successful enactment of a PLN's goals is collaboration. This collaboration must:

> go beyond superficial exchange of help, support, or assistance. Instead, deep collaboration entails teachers not only exchanging ideas, but also discussing the underlying beliefs guiding their teaching. The challenge for PLNs is how participants might engage effectively with, and maximize the benefits of, having access to the range of knowledge, experience and expertise present within the learning network (Brown & Poortman, 2018, p. 25).

In other words, an essential component of collaboration in PLNs is access to a wide range of perspectives, knowledge, and experiences, coupled with strong relational trust. This enables active participation, allows members to interrogate their underlying belief systems, and fosters the generation of new knowledge. To better understand the nature of collaboration in ARC, then, a central issue for us to examine was membership: Who was invited to the table at ARC summits, who built relationships with whom, and what did this mean for participants' learning? In other words, how did the boundedness (Rodway & Farley-Ripple, 2020) of the network influence opportunities for the generation and exchange of knowledge across ARC?

In examining ARC membership patterns (see Tables 4, 5 and 6), we accounted for the number of participants from each system over time, their specific roles, and the frequency of repeat attendance. During the years of study, the network consisted of predominantly European and North American nations. While thought leaders evinced a broader geographical perspective—from contexts such as Singapore and

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Table 3 Timeline of ARC summits

Date	Location	Attending systems	Major themes
September, 2016	Reykjavík, Iceland	Aruba, California (US), Finland, Iceland, Ireland, Ontario (CA), Scotland, Vermont (US), Education International (EI), International Confederation of Principals (ICP)	Wellbeing, equity, inclusion
September, 2017	Dublin, Ireland	California (US), Finland, Iceland, Ireland, Ontario (CA), Scotland, Sweden, Vermont (US), Wales, EI, ICP	Creativity, assessment, accountability
September, 2018	Los Angeles, California	California (US), Finland, Iceland, Ireland, Mexico, Nova Scotia (CA), Ontario (CA), Oregon (US), Ottawa (CA), Scotland, Wales, Washington (US), EI, ICP	Equity, diversity, and data usage
September, 2019	Cardiff, Wales	Finland, Iceland, Ireland, Nova Scotia (CA), Ottawa (CA), Saskatchewan (CA), Scotland, Spain (Basque Country), Uruguay, Wales, ICP	How effective assessment, including, but not limited to, large-scale assessment, can lead to better and deeper learning

Table 4 Representation by year

	2016	2017	2018	2019	Total
Aruba	3				3
California	3	2	8		13
EI	1	1			2
Finland	5	3	1	2	11
Iceland	6	4	5	4	19
ICP	1	2	2	2	7
Ireland	4	3	4	5	16
Mexico *Observer role			5		5
Nova Scotia			3	3	6
Ontario	4	3	1		8
Oregon			4		4
Ottawa			1	1	2
Saskatchewan				7	7
Scotland	6	6	2	3	17
Spain (Basque Country) *Observer role				1	1
Sweden		6			6
Uruguay				3	3
Vermont	3	1			4
Wales		4	3	5	12
Washington			2		2

Table 5 Roles by year

	Government representative (elected)	Government representative (non-elected)	Representative of professional organizations	Academic/researcher	Local representative	Other
2016	6	14	7	3	3	3
2017	3	21	5	1	1	4
2018	2	19	13	3	1	3
2019	6	18	6	1	3	2

Colombia, for example—there was minimal participation from non-Western, non-English speaking nations as ARC members. Although some systems, such as Uruguay, committed in 2019 to a 3-year engagement in ARC, the involvement of other systems such as Mexico and Basque Country was short-lived.

We characterized system involvement in ARC across four levels of engagement. Some systems participated at a "peripheral" level. These were the systems with low numbers of attendees at each summit and low attendance at the summits across time. Best illustrating this level of engagement were Aruba, Washington, and Basque Country, sending a small number of delegates to one summit only. Other systems participated at a "distributed" level, with a small number of delegates, but

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Table 6 Delegates by system

	Delegates attending 1 summit	Delegates attending 2 summits	Delegates attending 3 summits	Delegates attending all summits
Aruba	3			
California	5	2	1	
EI		1		
Finland	5	1	1	
Iceland	3	3	1	2
ICP	1	1		1
Ireland	7	1		1
Mexico*Observer role	5			
Nova Scotia	2	2		
Ontario	6	1		
Oregon	4			
Ottawa		1		
Saskatchewan	5			
Scotland	2	4	1	
Spain (Basque Country)	1			
Sweden	6			
Uruguay	3			
Vermont	5			
Wales	3		3	
Washington	2			

high repeat attendance. The best example of this was the International Confederation of Principals, which sent one to two delegates to each summit; Wales, Ontario, and Finland also fell into this category. There were systems whose engagement we classified as "dense." That is, they had a high number of attendees, but low repeat attendance. These systems included Sweden and Mexico, who sent a large number of delegates to one summit only (notably, Mexico joined the 2018 summit in an observer role and did not return). Finally, a small number of systems—namely Scotland, Iceland, and Ireland—could be identified as "enmeshed," with a high number of attendees and representation at all four summits.

An important characteristic of "enmeshed" systems was repeat attendance of delegates over time. It was these systems which were the most likely to send the same individuals to the summit each year and often sent higher-ranking officials than other systems. Enmeshed systems also clustered geographically around Western Europe. Outside of the summit, enmeshed systems committed to regular meetings, co-authored publications, and attended web-based professional development together. In some cases, they created smaller PLCs based on geographical proximity or shared needs. For example, after the first summit, Iceland, Ireland, Scotland, and Ontario organized a mini-summit on wellbeing, held in Ireland in 2017.

Importantly, these mini-summits were not initiated by ARC or part of the network's design. Rather, they came from members' own interest in continuing the work and having a more localized collaborative structure. Other features of "enmeshed" systems included high levels of involvement in administrative responsibilities of network management, like acting as a host system for the summit, and leadership roles as part of the ARC Advisory Board. The 3-year engagement contract established at the 2019 summit evinces that ARC is moving towards an enmeshed model in how the network is structured.

Several other trends emerged related to the specific roles of delegates across systems. The majority of attendees at each summit were non-elected government representatives. Specific job titles varied depending on structures of governance and policymaking in each system, but fell into the following categories:

- Deputy ministers of education (second in command to minister of education)
- Representatives from state departments of education (heads of unit, directors, inspectorates, etc.)
- Chiefs of staff and/or private secretaries, usually for highest-ranking official in attendance
- Policy advisors

While there were fewer elected government representatives involved in ARC compared to non-elected representatives, elected government officials (for example, ministers of education) had a high rate of repeat attendance. Membership records also suggest that there was a consistent presence of professional organizations and labor union representation at ARC summits over time. Union officials were the members most closely connected to the work of practicing educators. Other than one attendee at the 2016 summit, a social studies teacher serving on her local school board, there were no current full-time teachers or school leaders in attendance at any of the summits. When teachers were included, participation was usually limited to pre-summit activities and school visits, discussed in more depth shortly. Practicing educators are also excluded from the description on ARC's website, which states that teams from each system "should include three to four participants representing government and professional leaders." Additionally, a few systems had a small but vested interest in including other educational stakeholders—specifically those from their local business communities and research institutions—in summit participation.

Sense of purpose

Sense of purpose encompasses the existence of shared goals across a PLN, providing members with a common focus, vision, and direction to improve student learning (Poortman et al, 2021). We found that ARC systems shared beliefs that education reform must be: (1) equity-driven, (2) democratically-oriented, (3) grounded in a vision for success that goes beyond academic achievement, and (4) context-specific and community-embedded. These core beliefs were both constitutive of network involvement—that is, demonstrated commitment to these beliefs was a prerequisite

for network involvement—and determinative of how the network pursued its shared goals.

Equity was always included first on key ARC documents, such as ARC's mission statement, which reads: "ARC is a global educational movement that advances equity, broad excellence, inclusion, wellbeing, democracy, sustainability, and human rights in high quality, professionally-run systems." Across the summits, participants expressed interest in ensuring that students in their systems had "access" to the same "educational opportunities" and that students' differences were valued at school and in the larger community. For example, during the 2016 summit, participants generated discussion questions like "How do we create a culture that is supportive and inclusive for all our students?" and "How can we ensure fairness for all children?"

Participants also engaged in dialogue about systemic dimensions of equity. The stated objectives at various summit meetings often centered around addressing structural inequalities related to race, ethnicity, culture, socioeconomic status, language background, gender, sexual orientation, mental health, and ability. Thought leaders posed guiding questions to participants such as "What can be done to focus the attention of policymakers and politicians on structural inequalities in the school system?" and "How can teachers and principals be supported to sustain their commitments to teaching for social justice?".

ARC systems also shared a belief in democratic approaches to education reform. As one thought leader observed in the 2016 declaration, "In a world responding to global migration and diversity with fear, hate, conflict, and violence, it is beyond inspiring to see these education systems come together to grapple with how democracies can and should educate the next generation to be better." Delegates understood democracy as an "active, engaged process," in the words of one member. A key premise of ARC's democratic vision was the empowerment of teachers and others directly involved in the day-to-day of schooling. In the 2016 declaration, many ARC systems made statements like the following, from Scotland: "We are particularly focused on empowering teachers, parents, and education leaders to drive more of the decisions that shape the lives of their schools and investing in the quality of teacher leadership" (p. 20). In ARC documents, the term "professionally-run systems" was frequently used, contrasting large-scale efforts by policymakers to deprofessionalize teachers (e.g. Ravitch, 2014).

ARC members were also interested in student outcomes beyond academic achievement. Questions about assessment factored centrally at every summit. A theme noted by the facilitator at the 2016 summit was the need to "develop indicators that measure what matters beyond just academic achievement." As one member wrote in the 2016 declaration, "Moving beyond the facile use of academic achievement as the be-and-end-all of schooling, these systems have recognized and are working together to elevate the vital importance of wellbeing as what schools should strive for and how the goodness of schools and systems should be judged" (p. 23).

Finally, ARC systems coalesced around a commitment to context-specific and community-embedded approaches to education reform. One instance is the work shared at the ARC mini-summit on wellbeing in Ireland in 2017, attended by Iceland, Ireland, Scotland, and Ontario. Delegates from Ontario defined "wellbeing" in ways that reflected the strong influence of its Indigenous population. They shared a

graphic representing Indigenous understandings of wellbeing as a balance between cognitive, emotional, social, and physical self and spirit. They also described how they made it a priority to engage all stakeholders in designing their wellbeing policies through regional listening sessions, surveys, and community conversations. They recounted their efforts to hear diverse voices, including students who were homeless and students who identified as LGBTQ, as well as Indigenous partners. This example speaks to how ARC systems prioritized non-academic outcomes (e.g. wellbeing) and understanding of the community context in policymaking endeavors.

Reflective professional inquiry

As highlighted by Poortman et al. (2021), this variable of the PLN enactment process relates to group as well as individual learning through reflective dialogue, active learning strategies and the application of new ideas from scholarship, conversations, and data. According to ARC's vision statement, the network values shared expertise, favoring the co-construction of knowledge instead of privileging outsider knowledge or "expert" solutions. In our analysis of ARC agendas and observational notes, two core practices emerged as supporting reflective professional inquiry: (1) system-to-system consultancy and (2) individual and collaborative learning. Both practices were initiated at the inaugural ARC summit and have become established mechanisms for system learning. They capture the sense in which ARC functions as a "collaboratory" (Muff, 2014), enabling members to problem-solve across geographical divides and solidifying commitments to shared values.

One salient practice at ARC summits was system-to-system consultancy. Each summit included two or three opportunities for systems to pair up as "client" and "consultant." Consultancy sessions involved the identification of a strategic issue or challenge and a presentation of its background by the client, an opportunity for consultants to ask clarifying questions, an explanation of strategies already considered, questioning to raise possible challenges to the client's analysis, a proposal of other potential solutions, and the co-construction of an action plan. The protocol used during these sessions, termed "GROW" (Goal, Reality, Obstacles, Options and Way Forward), was popularized by Whitmore (2009).

ARC's consultancy model allowed systems to determine the "wicked problem" or strategic challenge they wanted feedback on. According to one thought leader, "[system-to-system consultancy] models for leaders the value of deep collaboration around issues they have chosen and that truly matter." ARC organizers stated that the goal of system-to-system consultancy was to "harness the collective experience and expertise of member systems towards creative solutions grounded in local needs and values." They talked about these consultancies as low-stakes opportunities for systems to develop critical friendships that would enable cultural exchange and drive meaningful social change.

In feedback surveys, members consistently identified system-to-system consultancy as the most valuable component of ARC summits. Likewise, Ireland provided the following endorsement in the ARC declaration from 2016:

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We appreciate the opportunity that ARC represents to learn from other systems and the chance to highlight successful, innovative practices with other countries. The summit also provides a valuable opportunity for Ireland to collaborate and strengthen communication networks that can be called upon to advise and support future developments across educational systems to support the learning of all students.

A similar sentiment was echoed by a thought leader: "Perhaps the most valuable outcome is built around dialogue and conversation between system leaders about how they see their work through the lenses of their colleagues in other countries."

Another core practice used in ARC summits was a focus on individual and collaborative learning. Opportunities for delegates to individually reflect on the ideas presented and discussed during the summit were built into the daily agenda. There were also frequent opportunities for network members to participate in small group discussions. The design and task of the collaborative learning varied depending on the purpose. ARC delegates collaborated in "same role" (ministers with ministers, union leaders with union leaders, etc.), "same system," and "mixed" (different systems and different roles) groupings. Key ideas from these groups were shared back to the network by a designated note-taker in each group and captured in the published summary. In 2019, ARC introduced an interactive technology tool to help facilitate individual and collaborative learning. ARC's "co-lab" tool (see https://info.learnlab.net/) provides anonymous word clouds, polls, ranking ladders, and written responses to questions or prompts. Using the tool, delegates share ideas, goals, and insights across the GLN and respond to contributions made by other network members. Although the use of the technology during an in-person summit was reported in feedback surveys as "awkward," using the co-lab tool has become a core ARC practice during the COVID-19 pandemic as all ARC activities transitioned to virtual gatherings.

PLN leadership

Brown and Poortman (2018) argue that both formal and informal leadership within the PLN are integral to the network's success. Strong leadership enables a shared focus to coalesce and provides the time and resources necessary for the network to grow and develop. A visit to the ARC website (https://atrico.org/) reveals that the two founders of ARC are prominent educational scholars and businesspeople. These co-founders used their combined social capital to solicit interest from member systems based on their knowledge of education reform efforts in these systems and alignment with their values and vision for the network. They also recruited educational thought leaders to deepen knowledge around the priority topics of each summit.

Involvement of thought leaders was another core ARC practice. In the four years we studied the network, ARC partnered with sixteen different researchers, writers, and public intellectuals in the field of education. Thought leader participation was solicited by ARC organizers based on needs voiced by ARC members. Members

drove the topic selection, while organizers identified the individuals who could speak to these topics. Some thought leaders attended for multiple years, developing working relationships with delegates.

At every summit, each thought leader gave an "ARC Talk," made publicly available on their website (https://atrico.org/arc-ideas/). Titles of these talks included "Children's Opportunities for Thriving in the 21st Century," "Education Policy: From Pathwork Initiatives to Coherent Policy," "Creativity," and "Teach Less, Learn More." In an ARC talk at the first summit, one thought leader argued that equity reform in education is only possible through a rejection of capitalism:

> Inequality is endemic to capitalist democracy and the role that schools play in maintaining capitalist democracy. Schools have two jobs. They have to teach core democratic values… and they have to prepare students to live in a capitalist economy. So we end up with these norms of individualism, competition, merit—all of which function to make inequality seem sensible and normal.

This example is notable for the explicit acknowledgement of schools' roles in structuring inequality and the way this speaker's views align with ARC's commitment to the democratic aims of education reform. It illustrates how thought leaders took on leadership roles within summit proceedings by offering critical perspectives and pushing members in their thinking.

Another component of thought leader participation was closed-door talks presented to member systems. These talks were intended to spur conversation about topics related to ARC values. During the 2016 summit, for example, one thought leader addressed how the U.S. has treated difference in its education system historically, presenting a "cautionary tale" of response to increasing immigration and urbanization. She provided a "walkthrough" of how U.S. policy used Jim Crow laws[1] to legitimize race-based discrimination in schools, utilized one-size-fits-all approaches to instruction that further marginalized students of color, and misappropriated IQ assessments, preventing children of color from accessing high-quality education. She encouraged ARC participants to reflect on this history in decision-making about equitable policies for children in their own systems.

In addition to ARC co-founders and thought leaders, one final leadership structure, the ARC Advisory Board, has taken shape as the network continues to evolve. This group began as an informal network of acquaintances who planned and ran the first summits. The leadership of the ARC Advisory Board became more formalized as ARC's headquarters was established at the University of Ottawa. Along with this move, a governance structure was formed which included the election of representatives from different regions to the ARC Advisory Board (see atrico.org/arc-governance). The ARC Advisory Board also developed a membership process and selection criteria described on the website as follows:

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[1] A system of laws maintaining segregation and the marginalization of Black people in the southern United States after the Civil War.

All member systems and global members support, adhere, and promote ARC's mission statement. Members commit to joining ARC for a term of three (3) years, with the opportunity to renew. Global memberships may be initiated by ARC member systems and partners or through applications from organizations seeking partnership. All proposals will be discussed by the ARC Advisory board in relation to ARC values, organizational scale and sustainability, and ethical considerations, and then referred to the ARC Secretariat for final decision (https://atrico.org/join-arc/).

The sustainability plan developed at the 2019 summit stipulated that participating systems commit to a minimum of three years as members of ARC.

Boundary crossing

Brown and Poortman (2018) highlight "structural holes" or "brokerage" as essential to the healthy functioning of PLNs. As Rodway and Farley-Ripple (2020) explain, the places in a network's structure where one finds weak ties are critically important, in that they facilitate the exchange of non-redundant information and connection to groups further outside of the network. A key objective of "boundary crossing" is to ensure that outcomes are being improved for all network members (Brown, 2020). Structural brokerage entails a process of communicating innovation from one community to another such that it engenders changes in the community's understandings and their actions. It is beyond the scope of this paper to consider what individual ARC members brought back home and how they applied knowledge acquired at the summit to policymaking in their own systems. However, it is notable that the collaborative structures at ARC summits gave minimal time to directly addressing issues in members' own systems. Summits tended to center context-specific initiatives of the host system as models for policymaking, rather than creating opportunities for systems to develop processes and structures for carrying their new learning into their own systems.

An example of this was the final core ARC practice we identified: the process of engaging in school visits at ARC summits. As the ARC website describes school visits, "A leading academic in the area of school evaluation may be seated next to a union leader of another country for a violin lesson in a country they are both visiting" (https://atrico.org/). According to summit organizers, school visits were "intended to bring a practical dimension to conversations at the summit" and to "recognize schools educating students in ways that aligned with ARC values." This was also an opportunity for ARC members to interact with practicing educators and to hear their perspectives, which informed later discussions at the summit. School sites were selected based on their connection with summit themes. For example, at the first summit in Iceland, where inclusion was a major focus, the group visited a school known for its inclusive teaching practices. After observing several lessons, delegates met with the principal to discuss the school's mission and the strategies teachers used to differentiate instruction. Participants were later asked to reflect on the site visit in focused, small group discussions.

School visits functioned to surface similarities across systems. As one participant stated in the feedback form for the third summit, "Our international dialogue around education is more common than different. Visiting schools helped me to understand that we are all grappling with similar issues, even with different governance structures and contexts." Another observed, "I am surprised by the similarity of schools around the world." Observations of school visits and materials acquired from them were used to inform small-group conversations during summit proceedings.

Discussion

This study of ARC was taken up to better understand how global networks can support education systems in learning with and from one another and what can be done to strengthen global networks. To these ends, we asked: What are the affordances and constraints of ARC's structured learning activities? Overall, we found that the learning opportunities were heavily mediated by composition of membership.

Analysis of ARC membership records provides insight into the boundedness (Rodway & Farley-Ripple, 2020) of the network. The majority of delegates were government leaders, tenure-track faculty, and union presidents. Minimal repeat attendance of delegates over time in many systems may indicate that network membership was subject to the whim of the governing party and persons currently in power. Thus, both the number and the status of the delegates systems chose to send were proxies for the system's interest in global education reform and desire to participate in professional learning experiences at that level.

Highly-committed systems—those identified as "enmeshed" in their involvement—were more likely to send high-ranking officials and more likely to send the same delegates over time. This afforded enmeshed systems a kind of "insider" status within the network. The fact that enmeshed systems clustered around the same geographic region of Western Europe echoes findings of Howland (2015) and others about the importance of proximity in the development of strong network ties. The level of social, political, and cultural commonalities shared across these different contexts may have allowed for stronger relationships, resulting in more meaningful work. Thus, enmeshed membership was both reflective of systems' commitment to the network and constitutive of it. Systems with a more peripheral or distributed status were less likely to continue to participate over time, suggesting that they may not have seen the same payoff from involvement in the network.

By asking systems to commit to a 3-year engagement starting at the 2019 summit, ARC is intentionally moving towards an enmeshed structure, recognizing the value of long-term network involvement in meaningful relationship building and, consequently, enactment of network goals. The fact that enmeshed systems have taken on increased leadership roles over time also suggests that ARC's leadership is evolving towards a "flat" structure—that is, a mix of senior leadership and members across systems—which Rincón-Gallardo and Fullan (2016) argue is ideal for network effectiveness. While these moves may provide stability and increase member commitment to the network, they may also narrow the scope of membership and limit opportunities for structural brokerage (Brown & Poortman, 2018).

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The hierarchy of relational ties developed across the network limited the diversity of perspectives within the network. The idea that some ARC systems attained "insider" status compared to others illustrates the way that ARC functioned as a closed network. There is research to support the value of collaboration in "role-alike" networks, such that members have a common frame of reference and are grappling with similar challenges (McGregor et al., 2020). Like positionalities may allow for members to develop high levels of trust and to share openly. However, closed networks can also function as "echo chambers," (Rodway & Farley-Ripple, 2020), reinforcing false or negative beliefs or limiting possibilities for the generation of new ideas. Commonalities in network membership may keep the comfort level high in ways that are norm-enforcing, rather than encouraging participants to think in new or different ways (Brown & Poortman, 2018).

The other research question we posed was: What are the defining features of a global learning network? Our findings point to the fact that ARC is an unusual case, in that it was intentionally designed as a network of high-level policymakers. While a range of stakeholder groups were represented in ARC's membership, all were groups that have historically held policymaking power. In this sense, ARC serves as a microcosm of educational policymaking circles, and begs questions about whose voices are missing from these conversations. Specifically, there was a lack of representation from teachers. ARC's value statements stress the importance of empowering teachers as agents of social change, yet practicing teachers were rarely if ever invited to summits. While the regular inclusion of representatives from professional associations speaks to ARC's cause of supporting "professionally-run systems," individuals in these positions are often far removed from the day-to-day realities of the classroom and may not accurately represent the perspectives of teachers.

Likewise, looking across all participating systems, the dominance of White, Western, and male perspectives, particularly amongst the systems with the strongest ties, is at odds with ARC's stated commitment to equity. The homogeneity of the network and high levels of involvement from systems with substantial economic wealth renders ARC susceptible to the same criticisms as OECD and other transnational educational organizations of perpetuating colonialist ideologies (El Bouhali, 2015). Lack of involvement from stakeholders most impacted—and in some cases marginalized—by the status quo of schooling may lead to policymaking that is disconnected from local needs, reproducing inequality across the education system.

The other defining features of ARC were the four core practices we identified that distinguish it as a "collaboratory" (Muff, 2014)—system-to-system consultancy, individual and collaborative learning, thought leaders, and school visits. In contrast to ARC's membership structure, these practices reflected the network's values and its attempt to shift the locus of decision-making power in the policymaking process. ARC's consultancy model addresses Lingard's (2010) call for policy learning that is tailored to school systems' particular contexts. This consultancy model presented opportunities for members to learn from one another in ways that were mutually beneficial, introducing new practices and perspectives. Reflective conversations in role-alike and mixed groups also illustrate how ARC leveraged multiple perspectives in the service of generating new knowledge, moving beyond simple policy borrowing (Mehta & Peterson, 2019).

Importantly, the potential for these collaborative structures to foster new learning was premised on high levels of relational trust between members. The membership data, however, underscores that ties between certain systems—specifically, "enmeshed systems"—were stronger both in terms of connectedness and mutuality. This is to suggest higher levels of relational trust between enmeshed systems, which may have contributed to their delegates experiencing the core practices in more meaningful ways. For those studying professional learning in networks, it is worth considering how the structures ARC relied upon for building relationships could be recalibrated to allow all members access the same learning opportunities.

School visits were one mechanism for strengthening relational ties between ARC members. Seeing how host systems negotiated practical dimensions of policy implementation fostered camaraderie and mutual understanding between ARC members, making visible the similarities in the problems they were facing and heightening commitments to shared network goals. School visits also had the potential to function as opportunities for boundary crossing (Poortman et al., 2021). However, the centering of the host country and the interest in similarities between systems suggests this potential is not being fully realized. Seeing specific examples of reform in action could have been an opportunity for members to grapple with social and cultural factors shaping education policy in their own contexts, to develop mechanisms for supporting knowledge exchange at both the individual and systems level, and to identify key actors as knowledge brokers. To draw upon Jesacher-Roessler's (2021) dual model of knowledge mobilization, there was heavy emphasis on activation of knowledge resources rather than how this knowledge might be carried into other contexts and by whom: how the new knowledge fit with established cultures, beliefs, and systems, and how it could ultimately be institutionalized.

ARC thought leaders were also optimally positioned as knowledge mobilizers given their status as educational researchers and knowledge of the field. Cooper (2014) defines a knowledge mobilizer as someone who (1) facilitates the linkage between different stakeholders, (2) increases awareness of empirical evidence, (3) makes knowledge for a broader community more accessible, (4) promotes engagement, (5) supports problem building capacity, (6) helps implement knowledge mobilization plans, (7) influences others (e.g. policymakers) and (8) enables them to use evidence to galvanize priorities or change. However, decisions about who to invite as thought leaders were made by ARC founders and later by the ARC Advisory Board; these leaders had an outsized role in determining the knowledge that would be exchanged by virtue of the "experts" they selected to attend. Moreover, the relationships between ARC members and thought leaders lacked mutuality (Rodway & Farley-Ripple, 2020). Members were positioned to learn from thought leaders, but there was little opportunity or intention for thought leaders to learn from them. This is in fitting with the type of brokerage which Malin et al. (2018) identify as "primarily one-way in nature, enabling the communication of research (and/or other) knowledge to practice communities" (p. 12). And yet it is increasingly clear that relational and interactive exchanges are essential for knowledge to translate to practice. There is untapped potential here, if thought leaders are carefully selected for their diversity of perspectives and critical orientations, for them to bring in systems on the peripheries of the network. Opportunities for the authentic exchange of ideas

between thought leaders and members will allow for a more meaningful, two-way brokerage that will enable knowledge exchange.

As a model for global learning networks, ARC exemplifies the importance of network structures which are conducive to the network's goals and reflective of its values, illustrating how opportunities for learning in networks are constrained or enabled by who is at the table. The "boundedness" (Roadway & Farley Ripple, 2020) of ARC's membership stands at odds with the egalitarianism it espouses and the learning structures it has developed. ARC has been successful in bringing key players in education reform to the table and engaging them as partners in work towards social change. However, reliance on established social ties to form the network has ultimately resulted in an insular group of high-level education reformers. Demonstrated commitment to equity, human rights, and democratic aims is a prerequisite for systems to join. This leaves many nations unable to access the learning opportunities provided by the network. Moreover, the growing partnership between ARC and other transnational educational organizations like OECD illustrates how proceedings are not entirely devoid of the effects of global governance (Meyer & Benavot, 2013). It casts doubts on the extent to which summit agendas have been set up in strong opposition to conventional approaches to global education reform. While ARC's vision for education reform stands in contrast to what has traditionally been thought about as policy borrowing (Phillips, 2005; Steiner-Khamsi, 2014), the hierarchical nature of relational ties in the network may work similarly to encourage the "isomorphic" (Mehta & Peterson, 2019) adoption of common policies and best practices in the quest for legitimacy.

Implications and future directions

Despite these limitations, ARC's case offers a promising alternative to the dominant paradigm of global education reform (Sahlberg, 2016). There are two important features of ARC that we believe have implications for future research on learning in global networks. The first is how the core practices of ARC create opportunities for authentic reflection and dialogue, leading to learning that is context-embedded. These practices encompass learning opportunities premised on strong relational ties and internal accountability, which Rincón-Gallardo and Fullan (2016) have argued are essential features for effective educational networks. In the ARC model, school visits have helped delegates to grapple with the challenges of policy implementation, embedding ARC's work in community contexts. Thought leaders have grounded ARC's work in equity through their scholarship and critique. Technology has been leveraged to support engagement with multiple perspectives across geographical distances. And system-to-system consultancies have reinforced collaborative problem-solving—rather than punitive accountability systems, international benchmarking, or market-driven approaches—as effective improvement strategies. By fostering an inquiry stance (Cochran-Smith & Lytle, 2009) at the system level, these practices have allowed members to make strides towards addressing policy issues that might otherwise feel intractable. The question of how ARC can continue to provide these meaningful opportunities for learning and self-reflection virtually as it pivots to

online collaboration during the COVID-19 pandemic will also be of central concern to those studying professional learning in networks, global or otherwise.

The second feature of ARC that has potential implications is the network's clarity of vision. ARC has reframed equity as a central concern for global education reform. In doing so, it has demonstrated the efficacy of values-alike networks. While all professional and political networks are to an extent values oriented, the degree to which systems' values prefigure participation in ARC suggests that it is possible for large-scale change to be driven by aims that are fundamentally ideological. ARC's case demonstrates that clarity of vision is particularly important when an organization's values are counter-cultural—in this case, opposed to popular approaches to education reform emphasizing privatization, standardization, and accountability (Hursh & Henderson, 2011). As a protected, private space, ARC has enabled this counter-cultural vision to coalesce for a small but powerful group of individuals.

The ongoing impact of ARC remains to be seen. Like many global organizations, the COVID-19 pandemic forced all ARC activities online, including the annual summit. Concomitantly, ARC launched its bi-monthly ThoughtMeet series to support its member systems navigating pandemic policymaking. ARC describes its Thought-Meet series as "a virtual bringing together of ideas and minds to create swift, timely, and practical collective solutions to urgent problems, such as the COVID-19 pandemic" (https://atrico.org/thoughtmeets/). In May 2023, ARC will host its first in-person annual summit in Oslo, Norway. With ARC's current 3-year contract ending, member systems are also invited to renew their commitment to ARC. Whether ARC can retain and grow its membership will provide further insight into its effectiveness as a GLN and the levels in which its members are enmeshed. Over the next 3 years, a mixed-methods research study will be co-constructed with the ARC Advisory Board to examine ARC's impact on member learning and policymaking.

Future research with ARC members drawing on conceptualizations of knowledge mobilization (e.g. Jesacher-Roessler, 2021) at both the individual and organizational level would illuminate the mechanisms by which the knowledge generated in the network can be circulated successfully towards educational change. The question of how localized collaborative structures can support translation to policymaking and practice within individual systems is a pressing one, as strong internal professional learning communities are essential to PLN effectiveness (Stoll, 2009).

The closed nature of ARC's membership limits the generalizability of this case to other contexts and to a model of GLNs more generally. Moving forward, it is incumbent on ARC leaders to consider how to strengthen engagement for systems on the peripheries to foster more porous knowledge exchange across the network, in line with its own democratic values. To this point, ARC stands as an unproven but promising alternative to current efforts at global education reform and underscores the possibilities that exist for the learning in global networks.

Declarations

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