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Robinson, G., Gallagher, A., Duffy, G., & McAneney, H. (2020). At the Boundaries: School Networks in Divided Societies. *Journal of Professional Capital and Community*, 5(2), 183-197.
<https://www.emerald.com/insight/content/doi/10.1108/JPC-11-2019-0033/full/html>

Published in:
Journal of Professional Capital and Community

Document Version:
Peer reviewed version

Queen's University Belfast - Research Portal:
[Link to publication record in Queen's University Belfast Research Portal](#)

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Title:

At the Boundaries: School Networks in Divided Societies

Purpose

This paper demonstrates the transformative potential of school networks in divided societies, where separate schools often mirror wider ethnic divisions. It describes Shared Education in Northern Ireland, where networks are being utilised to change how Catholic and Protestant schools engage with one another. The concept of boundary crossing is used to frame how staff members build relationships and bridge distinct knowledge communities shaped by socio-cultural practices and identities.

Design/Methodology/Approach

A mixed methods design was employed. Evidence is presented based on a social network analysis of teacher interactions within a Shared Education partnership of five primary schools in Northern Ireland.

Findings

Findings suggest that school networking can overcome systemic separation in divided societies and provide the infrastructure necessary to establish an alternative model for collegial engagement. The structural characteristics of the observed school network are discussed, including comments on its sustainability, the role of boundary crossing relationships, the professional value for those involved, and its transformative potential for society.

Originality/value

This paper provides a unique perspective on the application and utility of school networks for supporting the development of professional communities in challenging circumstances. It also presents valuable social network data on the structure and management of school networks.

Keywords

Collaboration; Networks; Divided societies; Boundary crossing; Social Network Analysis; Shared Education.

Introduction

A network is a construct used to describe a system of interconnected units that converge around a particular interaction or relation. Within these network structures, relationships are of central importance and are viewed as conduits through which resources and information are transmitted. Actions are also considered interdependent, such that units within the network can influence one another either positively or negatively. In education, networking seeks to connect the relational structures of multiple discrete schools into a much larger system of ties. This has the potential advantage of allowing teachers to look beyond the resources and expertise of their own school, to forge new relationships, or strengthen existing ones, with peers in other educational settings. In the best of circumstances, networking can enhance the capacity of teachers to find solutions to problems, and give them access to knowledge about new ways of working by providing opportunities for learning and developing professional capital (Harris & Jones, 2017). Likewise, schools can potentially benefit from being part of a wider network that offers access to a broader range of curricula, expertise, and resources. Not surprisingly, therefore, the strategic importance of networks has generated considerable interest within education.

Networking has informed education reform strategies, with the intention of restructuring or reframing teachers' practice and hence schools' effectiveness. As a mechanism for change that promotes collaboration and joined-up practice, networking has the potential to 'reculture' a system of schools (Chapman & Aspin, 2003). In most contexts, it is seen as a way to enhance organisational capacity and improve student outcomes. For example, in the UK, networking in the form of 'Federations' and 'Chains' have been central to efforts promoting school improvement and equity (Chapman, 2015); and in Spain, the opportunities provided by different forms of professional learning networks are being explored regionally (Azorín, 2019).

In the current paper, we show that alongside school improvement benefits, school networks have additional value as an effective mechanism for bridging schools in divided societies, where school structures often mirror wider ethnic divisions. The concept of ‘boundary crossing’ (Akkerman & Bakker, 2011) is used to describe the challenges that network initiatives face in this type of context. We focus on a model of inter-school collaboration in Northern Ireland—a post-conflict society in which religious, national and political identities continue to coalesce—where networks have changed the way in which separate schools, serving different communities, engage with one another. We demonstrate this with evidence based on a social network analysis of teacher interactions within a partnership of primary schools.

The Challenge of School Networking in Divided Societies: A Boundary Crossing Activity

Spillane (2015) argues that changes in infrastructure at different levels are crucial for creating opportunities for teacher collaboration. In divided societies, however, where separate schools often mirror wider ethnic divisions, the ability and incentive to develop this infrastructure is often constrained or impeded by structural barriers. Generally, networking activities require educators to establish connections that bridge their institutions, creating linkages and relationships that arguably reframe the way they deliver curricula. This requires them to transcend the institutional boundaries of their schools to create spaces for inter-professional dialogue, and engage with different perspectives, experiences and sociocultural practices (Edwards, 2011; Akkerman & Bruining, 2016). However, in a divided or post-conflict society, these processes can be fraught with difficulty.

Akkerman and Bakker (2011: 133) describe boundaries in education as ‘socio-cultural differences that give rise to discontinuities in interaction and action’. By (re)establishing interaction or action at these boundaries, new learning takes place (Engeström, 1987). The challenge for schools is to

create opportunities to connect a diverse range of boundary sites, within and across institutions (Daniels et al, 2010). Networking attempts to render boundaries permeable so that interaction can occur—potentially across institutional and interpersonal levels (Muijs et al, 2011). The action of crossing these boundaries situates individuals within ‘unfamiliar territories’ (Suchman, 1993: 25) that require new skills and understandings to ‘achieve hybrid situations’ (Engeström et al, 1995: 319). Wenger (1998) captures this form of learning with his communities of practice thesis, proposing that whilst social learning systems like schools can initially be effective by establishing clear boundaries and a strong intra-community focus, eventually they must look to engage in boundary crossing processes, such as ‘brokering’, to renew practices and develop learning.

Edwards (2009) suggests that in certain instances, the act of crossing these boundaries can be uncomfortable as it challenges the identities and priorities of individuals. In boundary spaces, where collaboration takes place, different practices and meaning systems may conflict, and are almost certainly subject to various tensions. Boundaries can represent markers of difference, created and maintained through an identity process of ‘othering’. In divided societies, boundaries are more pronounced and can demarcate contested spaces (Duffy & Gallagher, 2017). Therefore, harnessing the potential of school networks in this context may be perceived less positively and, in some cases, may be an unlikely prospect. This type of setting is found in Northern Ireland, where network solutions were adopted as a means of promoting cooperation between schools representing different cultural communities, and the intention of enhancing school improvement and social cohesion. The hope for networking in divided societies is that boundary crossing can also provide opportunities for individuals ‘to recognise the perspectives of others when interaction and action is (re)established’ (Vesterinen et al, 2017:2).

Shared Education Networks in Northern Ireland

Northern Ireland is a small region of the UK with a locally elected Assembly. It is also a society with a long history of division and conflict, based on religious, national and political affiliations. The most recent period of political violence began in the 1960s and concluded with a political agreement in 1998. The divided nature of the society is also characterised by duplicate public services and institutions for the two main communities, perhaps most notably in the parallel system of schools for Protestants and Catholics at primary and secondary phases. At a formal level, schools are divided into Controlled and Maintained schools, with the former taking mainly Protestant pupils and the latter mostly Catholic pupils, although there are no formal religious tests on entry. Sectoral bodies represent the interests of the different school sectors and, in practice, reinforce the parallelism in operation. Not surprisingly, the existence of parallel systems of schools, mirroring the divisions in the wider society, have caused some to question their impact on social cohesion.

Almost from the outbreak of political violence, many looked to the schools to contribute towards the improvement of community relations, with interventions ranging from curriculum initiatives, contact schemes, equal funding for the different sectors, and the development of a new sector of integrated schools. While these interventions were generally well intentioned, the evidence suggests they have had little systemic impact. The opportunity provided by the political agreement and peace process allowed for the development of a new intervention, predicated upon network solutions, seeking to change the nature of relationships between schools at a systemic level. It was based on the idea of establishing collaborative partnerships, which would operate across the community divide—the ‘Northern Ireland Model of Shared Education’ (Gallagher, 2016). Its premise was to establish dialogic spaces that support the development and exchange of new expertise pertaining to teaching and management, alongside facilitating joint classes for pupils on

a regular and sustained basis. Thereby contributing to school improvement and providing opportunities for pupil contact (Hughes et al, 2012).

The model was preceded by discussions of ‘softening the raw edges of institutional segregation’ through ‘greater shared practice in education’ (Bain, 2006) with the intention of leaving in place the institutional boundaries created by separate schools, but making these boundaries porous, so that teachers and pupils could cross between sites as a matter of routine. In this way, it actively sought to promote positive interdependencies, encouraging new relationships to filter across all levels of the participating schools. If successful, it was thought that routine engagement between teachers and pupils might extend to parents and, perhaps, the local communities associated with the schools.

The original delivery mechanism, the Sharing Education Programme (SEP), was introduced by Queen’s University Belfast (QUB) (Gallagher et al, 2010). The programme's foci were considered as threefold, presented as parallel activity strands that include pupils learning together, the support of teacher development, and the advancement of organisational learning amongst partners. The SEP had three successive cohorts of schools between 2007 and 2016, involving 153 schools and approximately 5000 pupils participating in shared classes (Gallagher, 2016).

Shared Education is now underpinned by two pieces of legislation: The Education Act (NI) (2014) and The Shared Education Act (NI) (2016), which provided a legal definition of Shared Education and placed a statutory duty to ‘encourage, facilitate and support’ schools’ participation. The Department of Education and the Education Authority administer two central programmes, the *Shared Education Signature Project* (SESP) and *Collaboration and Sharing in Education* (CASE). The SESP has involved 365 schools in 152 partnerships since 2015, and more recently CASE supports collaborative partnerships between schools located on both sides of the Irish border. This

work is supplemented by the *Network for Shared School Improvement* (NSSI), a framework for joint practice development between teachers.

Examining Relationships at the ‘Boundaries’ of Networking Schools

The research evidence is clear that the success and efficacy of collaboration between schools is predicated on positive relationships between teachers from the participating schools (Chapman & Hadfield, 2010). Similarly, there is a growing body of evidence to suggest that the patterns of these relationships are correlated with the success and efficacy of reform initiatives in education and their implementation (Daly et al, 2010). It is reasonable to think that the interactions between staff members and the patterns of their relationships will affect how a school network is organised, and have a significant bearing on its trajectory and efficacy.

A useful way of capturing the patterns of relationships that occur across school boundaries is by using social network analysis (SNA). The method looks at how individuals relate to each other across their groups and activities, and has the potential to illuminate the underpinning social structures that are imperceptible as captured by standard research approaches in education (Moolenaar, 2012). Its theoretical framework of ‘social network theory’ implies that some behaviours are better understood by mapping how people or groups share information, talk, or interact in other ways. The value of this approach in capturing inter-school relationships is that the sites of interaction at boundaries can be easily located along with the bridging ties that connect separate schools. Network graphs permit the observer to identify, schematically, a range of key aspects that are important when interpreting the efficacy of school networks—providing answers to questions such as, who are the key staff members? What does the social structure of the partnership look like? How does information flow? What is the nature of relationships? What might happen to these relationships if an issue arises? What are the strengths and weaknesses of

the partnership? Thus, SNA is not just an analytic or evaluation tool, but also a development tool. It permits schools and school leaders to adjust collegial practices and to reflect critically upon their networks with professional development in mind.

Through exploring and analysing certain patterns of social structure, ergo the quality and density of schools' social fabric (Moolenaar, 2012), social network theory seeks to illuminate and comprehend the tangible mechanisms responsible for social capital outcomes (Burt, 2000). In doing so, social network theory lends itself to interpretations of various concepts within education that are perceived to involve the mobilisation of social capital such as leadership, teacher collaboration, and education reform, amongst others.

The function of school networks in divided societies should, hypothetically, support better connection and movement of capital across the cultural and institutional boundaries of schools representing different local communities. Schools in NI have been collaborating for some time, yet little evidence has been presented on the extent of teacher connections between schools. Neither is there much evidence on the relational structures that underpin school networking activities in conflict affected contexts, more broadly. This study will seek to address these gaps by connecting the Northern Ireland model of Shared Education to the network paradigm in a more systematic and analytical manner.

Methodology

Through the lens of social network theory, the aim of this study is to explore i) the extent of connections between Catholic and Protestant schools, within a Shared Education partnership and, ii) better understand the nature of boundary crossing between schools of a different ethos. This will be evidenced through an SNA of teacher interactions. A mixed methods design was employed,

in which a network survey was conducted first, followed by semi-structured interviews with key actors to understand the underlying network processes.

Partnership Selection

A partnership was purposively selected based on existing knowledge of the schools. It included five primary schools that had been collaborating for three years. The city in which this partnership was located, is often cited as one of the most contested spaces in Northern Ireland.

Population

A whole-network approach was taken. The network boundary encompassed all members of the teaching staff from the five schools. A total of 97 staff members were eligible to complete the questionnaire—five were from School A (Protestant), 10 from School B (Catholic), 28 from School C (Protestant), 33 from School D (Catholic), and 20 from School E (Protestant). One key actor occupied the role of the partnership's externally appointed coordinator—funded by the schools collectively. In total, 43 staff members were employed in Catholic schools and 53 in Protestant schools, indicating a balanced number of staff members.

Staff members assumed different roles within the partnership's professional community, including 22 who delivered the foundation phase (ages 4 – 6), 21 at Key Stage one (KS1 [ages 6 – 8]), 32 at Key Stage two (KS2 [ages 8 – 11]), 8 occupying leadership positions, and 14 regarded as fulfilling 'other' positions.

Social Network Analysis

Each actor (ego) within the network boundary was asked to nominate up to 15 peers, using ID numbers from an accompanying roster, to answer four key questions—the colleagues that they a)

exchanged resources with; b) sought professional knowledge from; c) discussed personal matters with; and d) met in informal social settings. The network questions posed were intended to reveal ties motivated by typical, everyday interactions that reflect the outcome indicators for Shared Education. The question regarding ‘meeting colleagues socially’ was interpreted as a logically symmetrical relationship (i.e. reciprocated) whilst the others were asymmetrical in nature, such as advice-seeking relationships.

One-mode social network graphs were produced and analysed. Each discrete matrix was subject to multiple cohesion network measures. All four matrices were then combined into a multiplex format that overlapped all the predetermined collaborative interactions into one consolidated network (Hanneman & Riddle, 2011). This operation facilitated an overview of the partnership’s network and permitted us to examine the extent of boundary crossing relationships between the schools. A reduction method was preferred to combine the information about multiple interactions into a single relation that indexed the quantity of their ties (Hanneman & Riddle, 2005). The data for this matrix were dichotomised in order to avoid the duplication of interactions between actors, with the intention of simply indicating whether no interaction, or, indeed some form of interaction took place.

In total, 82 members from the partnership completed a questionnaire (85% of the pre-targeted population). All 97 staff members are included in the subsequent analyses and network graphs due to being either a respondent or having been nominated by a respondent.

Network questions were constructed from earlier studies on Shared Education and school collaboration, both quantitative and qualitative in their approaches. To test accuracy, participants were asked during the interviews to report on the rendered network graphs, which enabled the research team to differentiate between ‘true structure’ and ‘observed structure’ (Holland &

Leinhardt, 1973). The results from this face validity exercise were positive, with all the interview participants exhibiting familiarity with their networks.

Semi-Structured Interviews

Sixteen semi-structured interviews were conducted with teachers and principals after the SNA data had been collected and analysed. Participants were selected purposively according to their embedded positions within the network. This included the coordinator and three from each school: the principal, one teacher directly involved in Shared Education and one teacher not directly involved. Each were given the opportunity to reflect upon their partnership's relational structure during the session, by reviewing network graphs. Discussions focused on themes of interschool collaboration, sharing resources, professional knowledge, staff relationships, network perceptions, and sustainability. Their insights offered a way of further explaining the patterns that emerged from the quantitative data. The resulting transcriptions were subject to a thematic analysis. Subthemes and codes were reviewed by peers for verification and validity. The final subthemes were as follows:

• Antecedents of Network Formation	• Network stability	• Relational Behaviours
• Multiplexity	• Attributes & Demographics	• Communication
• Governance	• Roles	• Leadership
• School Variations	• Participation in Shared Education	• Modes of Interaction
• School Size	• Identity	• Strength of Staff Ties
• Institutional Relationships	• Teacher Development	• Perspectives on Shared Education
• Impediments to Institutional Links	• Collaborative Intelligence	• Discourses of Participation
• Network Asymmetry	• Trust	• Collaborative Commodities
	• Staff Solidarity	• Pedagogy of Sharing

Connecting the Analyses

A sequential design was chosen, in which the two data types were connected with one another rather than converged. This entailed revisiting survey results to explore and build on them with the narrative data and themes. The primary means of connecting the two datasets was selection of interview participants according to their measured network positions. Participants were asked to review their network graphs with the intention of connecting their personal insights with the quantitative data. Corroborative logic was also applied, in which the two mutually informing analyses were used to triangulate and substantiate each other.

Results

Modes of Staff Interaction

Analyses of the four discrete interactions associated with the everyday collaborative activities of Shared Education were conducted. This included all 97 staff members in the partnership and measured the multiple cohesion measures of the four discrete networks.

Table 1: Multiple cohesion measures of the Shared Education partnership networks

Network Measures	<u>Network Interaction/Connection</u>				
	Overall Meta- Structure ^a	Exchanging Resources	Professional Knowledge	Discussing Personal Matters	Socialising Informally
Average degree ^b	9.948	5.691	4.361	2.907	3.546
Indegree H-Index ^c	15	11	9	7	8
Degree Centralisation ^d	0.160	0.099	0.103	0.075	0.122
Density ^e	0.104	0.059	0.045	0.030	0.037
Connectedness ^f	0.938	0.692	0.657	0.545	0.478
Fragmentation ^g	0.062	0.308	0.343	0.455	0.522
Arc Reciprocity ^h	0.709	0.424	0.322	0.447	0.448
Dyad Reciprocity ⁱ	0.549	0.269	0.192	0.288	0.288

^a The meta-structure represents the four collaborative connections combined and dichotomised, illustrated in figures 2 and 3(a).

^b Average degree: mean number of nominations received for the underlying graph

- ^c Indegree H-Index: the largest number x such that there are x vertices of degree at least x in the underlying graph
- ^d Degree Centralisation: Calculates the degree and normalized degree centrality of each vertex and gives the overall network degree centralization
- ^e Density: number of edges divided by the maximum number possible, note the diagonal is ignored
- ^f Connectedness: 1 minus the fragmentation (see below)
- ^g Fragmentation: proportion of pairs of vertices that are unreachable
- ^h Arc Reciprocity: The number of reciprocated arcs divided by the total number of arcs
- ⁱ Dyad Reciprocity: The number of reciprocated dyads divided by the number of adjacent dyads

Table 1 presents the multiple cohesion measures for the whole network and each of the observed interactions across five columns. In this particular partnership, staff members appeared to engage with one another more around exchanging resources, with the highest average degree (5.691) and density (0.059) of the four interactions. The interaction with the lowest average degree (2.907) and density (0.03) was discussing personal matters. This is not an indication that this interaction was any less important, but simply shows that the networks around discussing personal matters were accessed by fewer staff members, and potentially that these networks take longer to develop than less personal forms of interaction.

Staff Relationships

The multiplex network, which we term the partnership's meta-structure, is depicted in *Figure 1* representing the four overlapped interactions as one consolidated network. The average degree of staff members across the partnership was 9.948 (*Table 1*). There was also a perceived low level of centralisation within the meta-structure of 0.16, suggesting that shared decision-making processes were implemented. The centralisation of the network was important to analyse, as the staff members who occupied the more central positions appeared to bridge the separate schools. This

would have empowered these staff members with the regulation of knowledge and resources between each institution.

Figure 1. Partnership meta-structure of staff interactions (n=97)

Colour and shape of the nodes indicates either membership to School A to E, or the role of coordinator, whilst size is proportional to the number of nominations received (i.e. indegree).

The density of the overall network was 0.104 and indicated that a large proportion of the ties within the partnership were unrealised. This was expected given the large size of the network, the variation of internal school densities, and because direct involvement in Shared Education did not extend to all curricular stages of the school—Foundation Stage teachers for example had little or no opportunity to participate. The connectedness of the network was high (0.938). With no isolates and only two pendants on the periphery of the network (*Figure 1*), all the staff members had access to the partnership's system of knowledge in some way. Whilst these measures are useful for

gaining an insight into the overall patterns of collaboration, the caveat is that layering of the different network interactions can inflate measures of density and average degree.

Staff Participation in Shared Education

Forty-four staff members reported that they were formally involved in Shared Education; 38 respondents stated no involvement. This equated to almost half of all 97 staff members within the partnership and all year groups.

The average degree of the 44 staff members directly involved in collaboration was 8.591, whilst the average degree of the 38 not directly involved was 4.789. This revealed that staff members not involved in Shared Education maintained fewer relations based on the four collaborative interactions. Those directly involved had more opportunities to establish ties or access to a greater number of network members.

Institutional Relationships

The network data presented in *Table 2* exhibits the extent of ties between the five primary schools.

Table 2: Frequency of directed ties to and from each partner school

From\to	School A* (n=5)	School B† (n=10)	School C* (n=28)	School D† (n=33)	School E* (n=20)	Total Out-degree
School A*	-	2	6	1	7	16
School B†	4	-	5	7	6	22
School C*	7	4	-	30	11	52
School D†	1	4	22	-	3	30
School E*	9	7	9	3	-	28
Total In-degree	21	17	42	41	27	148

* Controlled schools

† Maintained schools

There were no values of zero, as each school had links with all others in the partnership. The network between the schools was therefore considered a complete structure, as all school-level links had been realised.

Figure 2. Extent of interschool links (n=96, multiplex, grouped by school)

Figure 2 depicts all interactions between the partner schools at a staff level, making the boundary crossing ties more visible. The coordinator and their ties were omitted from this visualisation.

The total number of 148 ties to and from each school reveals the partners who were arguably more involved within the partnership across all aspects of the measured collaborative interactions. In terms of the nominations made to each school, i.e. in-degree, Schools C and D received the most nominations of 42 and 41 respectively, whilst School B received the fewest nominations with 17. The staff members of School C also made the most nominations having an out-degree of 52. School

A made the fewest nominations and so had the lowest out-degree with 16. However, any interpretation of how involved a school was within the partnership has to take into consideration the number of staff members available to send and receive nominations. As School A had the fewest staff members of only 5, it was logical that it would have made fewer connections. The larger schools were able to devote more staff resources to the partnership and therefore had more capacity to establish links. The two biggest faculties, Schools C and D, had the most links in the partnership, with 52 directed ties. Conversely, the least amount of directed ties was between Schools A and D, with only two connections. Again, it is important to appreciate the differences in the size of the faculties when interpreting this statistic. If we assume that the link between Schools A and D was dyadic, or one teacher in each school, then it would account for 20% of School A's staff capacity. It would be difficult for them to commit any additional staff resources to the partnership.

Table 2 data suggests that the schools tended to have more links to partners of a size similar to themselves. Consequently, the partnership appeared to be subdivided into a dyad of Schools C and D, overlapped by a triad of Schools A, B and E, thus contributing to an asymmetrical network structure. Furthermore, the preference of partners seemed to transcend ethos and management type, or at least it did not appear to be limited by sectoral distinctions. The dyad of Schools C and D—Protestant controlled and Catholic maintained, respectively—exemplifies this.

A closer examination of the directed ties between the schools in the partnership revealed that 88/148 (59%) were boundary crossing, or cross-sectoral—that is, from one institution to another with a different ethos and management type. Schools C and D had the most with 34 and 27 cross-sectoral ties respectively, whilst School A had the fewest with 3.

Discussion

School networking in the best of contexts can be difficult, but in societies rebuilding after conflict or dealing with legacy issues, there can be additional challenges. Shared Education has provided a way in which, despite these hurdles, teachers can mobilise to overcome separation and offer network opportunities for themselves and their pupils. In the present study we observed a professional community of school staff members that had been reshaped into a more cohesive and interdependent system of relations through inter-school collaboration. The process brought together five separate schools located within a highly contested city, each with its own system of expertise, ethos and socio-cultural practices, for a prolonged period. As the activity between each of them intensified, albeit asymmetrically, a unique relational system amongst staff members emerged to form a bridging structure that allied them in partnership. This offered an environment in which staff could establish both professional and informal networks, which has arguably been lacking in Northern Ireland's parallel education structures.

If it wasn't for [Shared Education] that tie wouldn't be there at all. Because that's the only time we've collaborated with [school C] ... I do value and I do see that there were bonds made and friendships made, and connections made, that's fantastic, and they wouldn't have happened without this project. Teacher, School D

Schools had a preference of partner based on structural characteristics. Achieving balance across multiple layers of the school—pupils, staff, leadership, and overall size and capacity—was an important consideration for partner selection in the current study. Our findings suggest that preference of partner was influenced by the resources available to contribute to the partnership. Schools of a similar size experienced similar issues and aligning with partners in this way was perceived by participants as mutually beneficial for the schools concerning organisational learning.

...you're going through the same things, what you're finding or coming across is similar to what they're coming across and then you can share and help each other. Teacher, School B

Having similar staff numbers enabled the schools to deal with challenges interdependently and developed solidarity through the experience of shared issues. It is important to note that the network structure of two schools being identical is unlikely, so we can assume that there will always be some degree of incongruity. School networks in divided contexts can be more sensitive to asymmetries, especially when minority communities are involved. The ‘Northern Ireland Model of Shared Education’ (Gallagher, 2016) advocates balancing numbers of participants from different communities, in keeping with the contact hypothesis (Hughes et al, 2012), and to ensure equity, there have been conscious efforts to tailor pupil engagements between schools of different sizes.

Partnership sustainability was interpreted as an extension of social network adaptability. In divided societies, the sustainability of initiatives like Shared Education are affected by external politics and the status of peace. However, focusing on the properties of the teacher community and developing tie redundancy has been an important factor for maintaining Shared Education in this context. Schools in the observed partnership had developed multiple layers of connection, so that if one teacher disengaged, others could maintain the programme. We consider sustainability, not as maintenance of collaborative activities, but more precisely as determined by the capacity to preserve relationships between staff members and their social structures. These relationships consist of both personal and professional interactions, emboldened by a willingness to collaborate.

Much of the literature suggests that the right conditions need to be created to allow schools to develop effective and strong partnerships. We find that network adaptability may also be critical (Wenger, 1998). A school network must respond to the changes of the discrete network structures of each partner school. Appending this notion is the understanding that networks are never static, they are always in a state of flux. This suggests that vibrations are potentially felt across different

areas of a school network with relative frequency. Thus, we observed that the partner schools utilised their internal structures to act like shock absorbers and adapt according to changes in their partner schools.

Social networks as a conceptual lens for school networks in divided societies. Prior to this study, our understanding of the relational structures that underpin school networks in divided societies has been limited. We examined a Shared Education partnership in a more systematic and analytical manner, and in doing so provide a methodological template that offers potential for future studies in these contexts. SNA is an effective way of providing a multi-level perspective of school network activity, offering insights on emergent boundary crossing relationships and generating network graphs that can be powerful and intuitive evidential tools for further network development. Whilst illuminating the extent of boundary crossing, it importantly demonstrates that those staff members that bridge separate schools come to embody their school's boundaries and that support is needed for these individuals.

Adopting a network perspective can equip policy-makers with tools to implement school networks more efficiently. It draws attention to the nested character of schools within a divided context and has the potential to encourage network intentionality and systems-thinking, rather than considering schools as distinct silos. For example, although Shared Education was not preconceived as a network intervention in the purest sense, as described by Valente (2012), it has the potential to be utilised in such a manner. There is potential to use network data to target specific influential staff members and their instructional subjects, which could save time and resources for establishing cross-sectoral links at the embryonic stages of a partnership. Furthermore, in consideration of the staff members who have no involvement in Shared Education remaining largely disconnected from their counterparts in the other schools, there is potential to apply interventionist approaches—

segmentation, induction, and targeting individuals—to stimulate tie formation. In this way, network interventions could be applied to strengthen education partnerships and improve sustainability.

SNA remains a developing methodology with continued advances. The current study harnesses a limited amount of this potential as a consequence of time and resource constraints. Future research on school networks in divided societies should consider longitudinal approaches to track their collaborative evolution and how time might affect relationship building, collegiality, and interactions (Lima, 2010).

Retain a focus on boundary crossing relationships. Part of the challenge taken up by school networking in divided societies is to disrupt the social network trends typical of division within a system—separate components, lack of connection, few bridging ties, to highlight a few—and establish new trends of positive interdependence. Our results suggest that boundary crossing relationships are critical to the enactment, evolution and efficacy of school networks, particularly in divided contexts where separate schools are the norm. It was observed that 59% of all directed boundary-crossing ties were between Catholic and Protestant schools. The value of boundary crossing in this context is that it has the potential for improving social cohesion, bridging distinct knowledge communities shaped by socio-cultural practices, and providing exposure to different ideologies and teaching methodologies.

...the whole religion is the reason why we embark on it, isn't it? It's about pulling two extremes nearly, within a town, together. But I think something more grows out of it in the end. Teacher, School E

The reticulation of boundary crossing relationships also provides a substructure through which pupil-to-pupil interactions and contact opportunities are organised, and opens channels of communication that can mitigate ethnic tensions locally (Varshney, 2001). However, it is

important to recognise the nuances of this activity and the burden it places on individuals, as quite often it is forgotten, particularly in NI, that teachers may have witnessed political violence firsthand (Kilpatrick & Leitch, 2004).

...[it] really is huge to change or to open a door and let a teacher see something different. Because we have been shaped by 'the Troubles' and that is the reality of it all. There are people here as well from Belfast who would've come from around the Falls area [West Belfast] and things like that, and they are shaped by, and they did come through very hard times. Principal, School D

Given the perceived value of the relationships between these high impact teachers, adequate support is needed. In NI, policy direction has shifted towards improving the quality of teaching and school outcomes in a much more connected way. Yet, the challenges of ensuring that staff have time to develop relationships, and that their domains overlap unimpeded, persist. In support of solutions, research is required to better understand the different types of boundary mechanisms (Tilly, 2004) and the various layers of tie formation—e.g. availability, propinquity, homophily, balancing effects—which may amplify the impact of initiatives like Shared Education over longer term and support network sustainability.

Direct involvement in Shared Education was observed to be professionally beneficial. Our results show that participating staff members maintained nearly twice as many relationships than those who had no direct involvement (average degree 8.591 compared to 4.789). Therefore, participating staff members had more opportunities to develop professional capital through enhanced connectivity, access to new knowledge, and empowerment to participate in decision making, as brokers between schools (Hargreaves & Fullan, 2012). We observed boundary crossing relationships between staff members that overcame trends of professional isolation and myopia, by connecting to new knowledge systems that had previously been untapped.

...it was being able to widen that skill set of experience, being able to even see inside another school and see things like, I mean this is very silly, but see things like nice wall displays and go "oh that's a good idea," — just picking other people's brains. Teacher, School D

Participants reported having unique opportunities for professional learning and knowledge creation, through exploration and exploitation (March, 1991; Finnegan & Daly, 2012), particularly in relation to controversial issues and developing shared approaches to subjects like Citizenship.

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...real change to me is slow. It's not about revolutions, it's about evolution. I think that's what [Shared Education] did. Principal, School B

This paper demonstrates that initiatives like Shared Education can offer an alternative model of collegiality—vertical and lateral relations of value and worth between the leaders, teachers, parents, pupils, and the community—that cannot be realised by separate schools. Participation changed who the schools chose to engage with. Connecting Schools representing different communities can provide a way of changing perceptions of ‘difference’, address institutionalised ways of silo thinking, model alternative realities through education, and facilitate new and wider patterns of movement for faculty and pupils into other community areas.

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