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Strengthening education through collaborative networks: leading the cultural change

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Abstract: Educational partnerships with area-based approaches comprise an increasingly well-grounded and internationally extended strategy for equitable improvement. However, literature shows a lack of focused inquiry on the assessment of these educational collaborative programmes. This article aims to develop and validate an instrument to assess these types of programmes across countries. Two successful programmes were assessed in Spain and the USA in order to test the validity of the measurement model. Results confirm that the model provides a valid tool to assess the effectiveness of collaborative performance, helping school principals, district leaders and policy- makers to enact evidence-based decision-making.

Keywords: educational collaborative networks; educational leadership; social capital; innovation; collaborative culture

Introduction

The implementation of community-based partnerships that provide comprehensive social, educational and health services has become an emergent strategy in Western countries to tackle complex educational challenges in child development (Miller et al. 2012; Tough 2008; Ubieto 2012). These partnerships are mainly formed in low-income communities with a specific purpose that would likely be difficult for organisations to achieve alone (Díaz-Gibson and Civís 2011; Renée and McAlister 2011). The premise of initiatives is to build networks of formal collaboration between schools and multiple and interdisciplinary agents such as families, hospitals, community organisations, and neighbourhoods, among others, and in this way go beyond traditional school boundaries in transforming what is meant by an 'educational community'. In an attempt to address these interlocking elements in educational settings, there has been an increased interest in collaborative enquiry and networking as a basis for professional development and school improvement (Sammons et al. 2007).

Most of the core research around networked initiatives has been developed by the public management field, involving multiple social challenges such as health, employ- ment, social care and also education. Scholars from different disciplines have examined this collaborative practice with different foci, including *organisational networks* focusing on public management (Milward and Provan 2006), *governance networks* analysing democratic decision-making (Kickert, Klijn, and Koppenjan 1997), *collaborative net- works* examining the underlying collaborative processes (Mandell and Keast 2009),*community organising* (Shirley 2009) and *federations* (Chapman et al. 2010), both based on a comprehensive community perspective. However, the common thread in each of these descriptors is the comprehensive and collaborative community perspective to a particular pressing public issue. Thus, these extended practices address significant social problems and share a core focus on a networked approach, public–private collaboration and the engagement of community agents working together on a collective project.

The idea of networks in support of educational improvement, while still in its infancy, is

gaining momentum in education (Daly 2010). This research uses the term Educational Collaborative Networks (ECNs) to gather these networked collaboratives specifically facing educational issues at a community level. Hence, ECN are formal and long-term partnerships based on collaboration between schools and community organisations, claiming to create an interconnected approach to major educational issues such as persistent academic underperformance, students' transition from school to work or childhood obesity.

In the last several decades, scholars have observed positive ECN outcomes and outputs, for instance, increased student learning in low-income communities in England and the USA was reported (Carpenter et al. 2010; Gold, Simon, and Brown 2002; Tough 2008; Renée and McAlister 2011), as well as improved innovative capacities of the educational public sector in Denmark (Sorensen and Torfing 2011) and optimised organisational processes and educational resources in communities in Australia and Spain (Díaz-Gibson et al. 2010; Keast and Brown 2002; Ubieto 2012). Consequently, this success has impacted the governments' priorities for developing social and educational policies in this area; resources have been allocated to fund the ECN programmes, for instance, in the cases of *The Extended Schools* (2006) in the UK, the *CLIPS Project – Collaborative Innovation in the Public Sector (2010)* in Denmark, and *The Promise Neighborhoods* (2011) in the USA.

Thus, ECNs have established new perspectives on social and educational pro- grammes, as their key focus is not exclusively to develop strategies to solve problems but rather to achieve strategic alignment among community professionals that will eventually produce innovative solutions (Agranoff and McGuire 2003; Mandell and Keast 2009; Sorensen and Torfing 2009). Therefore, ECN claims to solve current educational challenges by empowering community connections and professional capacities. Scholars conclude that network collaborative processes empower community capacities to efficiently achieve goals, provide better-tailored solutions and allow the network to tackle large problems (Edelenbos and Klijn 2007; Kamensky, Burlin, and Abramson 2004; Moolenaar and Sleegeers 2010; Scearce, Kasper, and Grant 2010). ECN programmes are providing specific outcomes that empower the professionals and organisations embedded in a particular community. This new focus based on network collaboration is enhancing public value at the community level, resulting in improve- ments in social capital, learning processes and trust among professionals (Agranoff and McGuire 2003; Daly 2010; Gray 2000).

Moreover, there is an existing international debate regarding the effectiveness of these programmes. Beyond the success noted, several studies based on the accomplishment of final results have concluded that ECN programmes are largely ineffective in achieving their final goals (Benebou, Kramarz, and Farty 2009; Blasco and Casado 2011; Curto, Fryer, and Howard 2011; Halpin et al. 2004). In response, some authors have noted the limitations of ECN measurement, which consists only of the final outputs; those authors have concluded that the assessment of ECN programmes should be long-term oriented and must consider outcomes that are related to social capital and community change (Carpenter et al. 2010; Miller et al. 2012). Accordingly, some of the impact assessments applied showed qualitative evidence of certain outcomes related to community strength that were noted by professionals but were not well measured (Carpenter et al. 2010; Blasco and Casado 2011). Consequently, traditional assessment methods have become insufficient to describe ECN programme effectiveness. In addition, in the last few decades, we have witnessed the emergence of social capital studies that claim to measure community cohesion, which results from horizontal networks in the

voluntary, state and personal spheres and the density and networking between these spheres (Putnam 1993). Although a wide variety of instruments aim to measure social capital dimensions at the community meso-level (Díaz-Gibson and Civís 2011), accepted, comparable and repeatable dimensions and measures of social capital have been difficult to construct, due to cultural differences when establishing functional equivalence (Fucuyama 2001; Halpern 2005). Nevertheless, the assessment of ECN programmes demands specific social capital dimensions that are adapted to the features of social-educational environments, variables that could be generalised across modern Western societies. Finally, most of the efforts made to assess these programmes in a comprehensive manner, that is, in terms of both performance and impact, are based on social analysis tools (see Daly 2010; Sandstrom and Carlsson 2008). Network theory provides an accurate approach to analyse and track organisations' relationships in social and educative contexts. This theory departs from the view of the network as a unity of analysis by identifying the structural variables, such as density and centralisation, and the relational variables, such as trust (Borgatti and Ofem 2010), of a hypothetical network of organisations. However, the problem with the analysis of ECN programmes arises from the fact that network development is a key goal of these programmes; we assume that we already have a dense and decentralised network with a formally established and interconnected arena. Thus, we miss the leadership strategies that enable the organisa- tional outcomes and their specific incidences in the community. We understand that the current assessment methods and tools are failing to inform the effectiveness of the ECN programmes, ignoring their focus on organisational processes that enable social capital development. These initiatives face a crucial goal based on nurturing a collaborative culture oriented to innovation that strengthens the whole community. Accordingly, there is a need for measurement models that capture the ECN focus, providing accurate feedback to community leaders and policy-makers across Western countries and allowing organisations to lead social-educative improvements and implement evidence-based decisions regarding programme funding and support. This paper claims to develop a valid assessment model of ECN performance, providing double measures for network organisational performance and its impact on community social capital. Specifically, we pose two hypotheses:

Hypothesis 1 (H1) assumes that the ECN programmes studied have built dense and decentralised networks of organisations within communities;

Hypothesis 2 (H2) posits that the ECN measurement model is valid and reliable, including sub-models of both organisational factors (H2a) and social capital factors (H2b).

Variables of the measure

The validation process

ECNs' relational performances and their social capital focus entail a renewed approach to educational leadership and organisational performance at the community level (Chapman et al. 2010; Earl and Katz 2007). Indeed, there is currently a lack of research regarding how organisational contexts and climates can influence network outcomes (Coburn, Choi, and Mata 2010). Hence, it becomes important to determine the specific strategies needed to lead comprehensive issues across organisations to enhance organisational and community outcomes (Dering, Cunningham, and Whitby 2006; Daly 2010).

To build the measurement model, we developed an initial approach to the ECN's organisational strategies that were indicated by international literature. This effort ended with a

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comprehensive framework that linked the specific ECN leadership strategies to specific indicators of social capital at the community level (Díaz-Gibson and Civís 2011). Then we started a validation process in order to provide feedback to the initial approach with an international overview. The process was aimed at reworking a model adapted to educational scenarios and capable of leading a cultural change towards the enhancement of social capital and innovation.

The validation was conducted by a pool of seven experts in education with prior experience in ECN leadership (median = 7 years): five scholars and two network managers, from both Europe and the USA. The scholars had published papers on ECNs' impact in journals during the last few years and were working in research departments focused on network research with an international overview, as well as in managerial positions as professionals in ECN leadership, working on a recognised ECN with success in achieving objectives within the community.

The experts were asked to comment on the appropriateness and clarity of the variables and indicators, to identify additional indicators not listed, to underline irrelevant indicators and also to comment on the relations established between strategies and outcomes. The objective was to establish a common theoretical body from a practical perspective. In summary, if two or more reviewers considered an indicator to be confusing, it was modified according to their comments; if two or more reviewers agreed on an alternative wording for a variable, it was renamed; if two or more reviewers considered an indicator to be irrelevant, it was eliminated; and if one or more of the reviewers added an indicator, it was generally accepted.

In sum, all of the reviewers commented that the correlations between network strategies and the social capital outcomes were appropriate; most of the comments made suggested modifying an indicator, unifying two of them and adding others. Additionally, the main disagreements between the experts' perspectives were regarding the use of terminology. Thus, the variable *cooperation* was renamed as *collaboration*, while others were retained, including *co-responsibility*, which was listed in different ways, such as joint responsibility, shared responsibility and joint commitment. The strategy of *proximity* and several of its indicators were eliminated, as experts noted its low correlation with network leadership.

Additionally, we added several indicators regarding *conflict management*, *community engagement* and *collaborative innovation*. Some social capital variables were reformu- lated; for instance, *inclusion and diversity* became *participation and diversity*, and *community organisation* and *affiliation and voluntarism* were combined into the newvariable of *community connections*. Finally, *knowledge generation* and *collaborative innovation* were added as new social capital variables.

A comprehensive measurement: organisational and community outcomes

The results of the validation process showed a comprehensive frame of 43 items composing an ECN leadership approach that enhances social capital in the community (Table 2). Specifically, the 43 items inform about the five variables of leadership strategies completing the organisational approach, namely, *co-responsibility, transversal- ity, horizontality, collaboration* and *projection*. At the same time the items also inform around the six social capital variables of *trust*, *community connections*, *commitment with education*, *participation and diversity*, *knowledge generation* and *collaborative innova- tion* (Table 3) (see Díaz-Gibson and Civís 2011). Therefore, the comprehensive model intends to assess ECN effectiveness in terms of

both organisational performance and social capital impact in the professional community. Next we delve into the model, describing the leadership strategies and their relation to the social capital dimensions mentioned.

The strategy of *co-responsibility* intends to build a joint commitment and shared purpose across the network. Regarding member diversity, specific effort is needed to feed the common goal and to integrate individual perspectives (Mandell and Keast 2009; Renée and McAlister 2011). Additionally, scholars note the importance of nurturing a collective vision and purpose (Lipnack and Stamps 1994; Sorensen and Torfing 2009), such as framing a common focus based on what members share and their mutual obligations (Kamensky, Burlin, and Abramson 2004; McGuire and Silva 2009). Thus, explicit participation mechanisms are developed to improve trust and the social commitment of the community (O'Leary and Bingham 2009). Moreover, the enhance- ment of joint ownership of ideas and projects arising from the network is essential for engaging professionals in programme goals (Skelcher and Torfing 2010). *Coresponsi- bility* is partly linked to the social capital variable of *commitment with education*, as it claims to bring together a wide variety of actors.

Transversality aims to integrate diversity across project planning and implementation. Diversity becomes an important organisational asset, and its inclusion empowers the whole community's potential action. However, to develop a networked and comprehens- ive approach, the establishment of interdisciplinary collaborative teams is needed (Miller et al. 2012; Mediratta, Shah, and McAlister 2009). Thereby, other efforts are focused on environmental or political management (Moore 1995; Milward and Provan 2006; Paletta, Candal, and Vidoni 2009) by integrating parallel projects within a territory, searching for community alliances and linking with new partners (Carpenter et al. 2010; Gold, Simon, and Brown 2002), such as working highly interdependently with local policies (Agranoff and McGuire 1999). Consequently, *transversality* is directly related to the social capital variable of *participation and diversity*, based on the idea that associations with more heterogeneous memberships constitute platforms for forming ties between socio-economic cleavage lines (Marshall and Stolle 2004; Putnam 2000).

The strategy of *horizontality* pursues equity through democratic governance and a shared leadership across network members. To build a common project based on members' trust and commitment, democratic governance is needed, with an equal distribution of power (Hjern 1992; Kickert, Klijn, and Koppenjan 1997; Milward and Provan 2006; Sorensen and Torfing 2009). Sorensen and Torfing (2009) use the concept of *metagovernance* to describe deliberate attempts to facilitate, manage and direct relatively self-regulating processes of collaborative interaction without reverting to traditional hierarchical styles of government. Additionally, the strategy involves the capacity for building a dynamic role of leadership, based on the added value and resilience provided by the existence of multiple leaders throughout the network process (Earl and Katz 2007; Kamensky, Burlin, and Abramson 2004; Lipnack and Stamps 1994; Mandell and Keast 2009). Accordingly, *horizontality* is also thereby linked to the social capital measure of *trust*. Scholars added that trust and commitment among professionals, in turn, reinforce and facilitate the organisational efficiency of the programme (Klijn, Edelenbos, and Steijn 2010).

In addition, the strategy of *collaboration* intends to build collaborative relationships among members. A growing body of network research suggests that nurturing collaborative relationships within a system is important for enacting change (Daly 2010). Critical to the development of creative responses and innovation is a supportive organisational climate that stimulates opportunities to engage in discussion and collaboration (Ainscow and Howes 2007;

Chapman and Fullan 2007; Moolenaar and Sleegers 2010). To that effect, this strategy is connected to the social capital variable of *collaborative innovation*. Scholars share the idea that a collaborative culture is needed for network objectives to be achieved (Kickert, Klijn, and Koppenjan 1997; Milward and Provan 2006; Renée and McAlister 2011; Sorensen and Torfing 2009). Cigler (1999) defines *collaboration* as the existence of intense links, including actions, as the foundation of increases in shared resources, common tasks and collective purposes. Therefore, it becomes highly important that positive conflict management occurs (O'Leary and Bingham 2009), as conflict is common in network discussion; thus, managers need to understand and manage such conflicts as constructive processes (Milward and Provan 2006).

Finally, *projection* promotes a strategic and innovative approach, providing a preventive component that drives the network to sustainability and continuous improve- ment. *Projection* is also directly related to the social capital variables of *knowledge generation* and *collaborative innovation*, providing tacit value to community professionals (Dering, Cunningham, and Whitby 2006) and enhancing the network's capacity to solve current problems. Hence, an increase in the cohesion and connectivity of social relationships among professionals may facilitate the generation, application and diffusion of new knowledge and evidence, as well as shape an innovative climate (Moolenaar and Sleegers 2010). Sorensen and Torfing (2011) suggest that the establishment of proactive spaces to share new ideas and projects between network members is necessary to enhance innovation and promote qualitative changes in a particular context. Shirley (2009) adds that training processes and the development of research committees within the network to analyse community needs and triangulate data on performance are also important.

Method

The sample

To validate the ECN-Q as a cross-cultural tool, we required two sustainable ECN programmes from different regions. We focused our search on Europe and the USA, as both regions are current references in ECN development (see Miller et al. 2012; Tough 2008; Ubieto 2012). The participants chosen were the *Interxarxes Program* in the district of Horta-Guinardó in Barcelona, Spain (Europe) and *The Schools of Hope Project* in Madison, Wisconsin (USA), both with sufficient experience in the area to show sustainable influences on organisational and social capital outcomes. Also, the programmes are located in two urban cities that prioritise collaborative networks and partnerships in their City Strategic Educational Planning units (The Educational Institute of Barcelona and the Madison Metropolitan School District).

These ECN initiatives are both formal and long-term partnerships aimed at achieving social-educative goals at the community level, taking action based on public–private collaboration through joint strategic planning (Díaz-Gibson and Civís 2011). Specifically, both networks (1) face educational inequalities within their communities; (2) have undergone more than 10 years of development in the area; (3) comprise more than seven organisation members from both the public and the private sectors; (4) serve communities with similar population sizes (around 200,000); and (5) receive funding from diverse agencies, including governmental and non-governmental sources (local, state and federal agencies).

The educational collaborative network questionnaire

The Educational Collaborative Network Questionnaire (ECN-Q)[1] is aimed at capturing

professionals' perceptions of the entire programme's performance and impact at the community level; thus, the ECN-Q addresses all of the professionals involved in collective performance. The ECN-Q intends to obtain data regarding the variables of the model using 31 items. The questionnaire structure is divided into two parts: a Likert scale and multiple-choice items with four response options each. The Likert items focus on the participant's level of agreement with perceptive indicators (ranging from strongly disagree to strongly agree), and the four-option multiple-choice items involve several dichotomous indicators.

The ECN-Q was initially constructed in Spanish and was reviewed by two methodological experts to validate its content consistency. Later, it was translated into English by a bilingual expert and revised by two English-speaking scholars. The reviewers introduced a few changes related to the items' wordings and the order of the multiple-choice responses. The main disagreements concerned the order of the items; two of the reviewers opted to place the Likert scale items before the multiple-choice section, arguing that the original organisation would be more difficult for respondents to understand. We reworked a final version in both languages and initiated a final review to adapt the vocabulary to the two specific contexts studied. This part was performed by six ECN managers; three were from the *Interxarxes Program* and three were from *The Schools of Hope Project*. The managers were asked to revise the vocabulary to ensure clarity of the wording. The most important changes between the English and Spanish versions involved contextual wording referring to the types of social-educative organisations, governmental structures, the names of various positions within the network and the concept of ECN, as *The Schools of Hope* program is considered to be a partnership, while the *Interxarxes Program* is a network. Finally, the ECN-Q was converted into a soft format to be sent and completed over the Internet, facilitating greater response volume and data recruitment.

Procedures and statistical analysis

The data were initially collected in Madison, Wisconsin and later in Barcelona, Spain, between May and September 2011. Identical procedures were used, and the professionals were first informed of the process by programme managers in a global meeting. They then received the surveys by email, with an institutional letter attached and signed by the directors of their educational districts.

H1 assumed that organisational performance in sustainable ECN programmes has a dense and rough network structure. The sample used to test H1 included all the members of the governance committee of each programme: 7 from *The Schools of Hope Project* and 11 from the *Interxarxes Program*. As the social network analysis claimed to study organisational connections, we needed professionals that could individually respond representing their institution. In governance committees within ECN programmes, all the organisations are represented by one professional that ensures that his organisation takes part in discussions and final decisions. These professionals have a key position in the ECN and are usually involved in the board of directors of their own organisation. Also professionals were specifically asked to provide an institutional view in their responses, encouraging them to share and discuss the items with their organisation colleagues that were also participating in the ECN. However, we understand that while the limited participation of ECN professionals on the social analysis survey restricts a wider community vision, it also provides a more institutional and less individual analysis. Thus, these committees form a representative sample that can qualitatively inform about the wide institutional interactions between community members.

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H1 was tested by applying the PARTNER tool as a social network analysis survey. The tool is specifically addressed to community collaboratives; it visualises networks in terms of the strength and direction of relationships (Varda et al. 2008). We analysed each general network's scores on measures of network density, degrees of centralisation, and trust. Here, density refers to the percentage of ties present in the network in relation to the total number of possible ties. The degrees of centralisation score show similarities between members in terms of their numbers of connections with others. Finally, trust refers to how much members trust one another and is reported as percentages.

H2 examined the validity of the ECN measurement model. The sample included all of the professionals involved in the ECN programme. The ECN-Q was sent to 50 professionals from *The Schools of Hope* of whom 46 responded; additionally, 55 were sent to *Interxarxes*, obtaining 44 responses, forming a total sample of 90 surveys. To test H2, we conducted a confirmatory factor analysis (CFA) using SPSS.20 statistical software. To study the consistency of the organisational (H2a) and social capital factors (H2b), we conducted two independent CFAs on the sub-models. To support H2 and the concurrent validity of the models, we examined the internal correlation among factors. Additionally, to ascertain the models' fits, different complementary measures were conducted to guarantee their acceptability (Lévy, Martín, and Román 2006). We used three absolute indices: the adjusted goodness of fit index (AGFI), the Bentler-Bonnet normed fit index (BBNFI) and the Bentler-Bonnet non-normed fit index (BBNNFI). Furthermore, three increasing adjustment indices were used: the goodness of fit index (GIF), the standardised root mean standard error of approximation (SRMSEA), chi-square; and also the ratio between chi-square and the degrees of freedom and the last, the Comparative Fit Index (CFI) to test the improvement in the fit of each model in relation to the null model. Finally, two criteria were used to decide which sub-model best fit the data (Jöreskog and Sörbom 1993): Akaike information criterion (AIC; Akaike 1978) and Bayesian information criterion (BIC; Schwarz 1978). All the parameters were estimated by Maximum Likelihood (ML) technique following the usual Newton–Raphson algorithm in EQS software. The modification indices or other adjustment improvement systems were not used to increase the adjustment values of the proposed models.

Table 1.

Network Measures

Measures	**Schools of Hope project**	**Interxarxes program**
Density	100,0%	85.5%
Degree Centralization	0,0%	17.8%
Trust	81,5%	77.7%

Table 2

Structural Matrix of the Organizational Measurement Model (λ_{ij})

Co-responsibility: *Promoting a Shared Commitment*

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1. Shared vision and approach to community problems (CE)	.744
2. Joint ownership of new ideas and projects	.658
3. Sense of unity among members	.721
4. Commitment to network goals (TR) (CE)	.883
5. Perceiving education as a community shared responsibility (CE)	.722
6. Voluntarism and affiliation mechanisms (CC) (CE)	.661
7. Communication channels to inform the community (CC)	.523
Transversality: *Integrating Diversity*	
8. Involvement of members from public, private and societal sectors (CE) (DP)	.657
9. Participation by politicians, social-educative professionals and citizens (CE) (DP)	.823
10. Involvement of professionals from different disciplines (CE) (DP)	.921
11. Involvement of members from different educational arenas (CE) (DP)	.547
12. Involvement of representatives from different levels of public administration (local, state, and federal) (DP)	.882
13. Identifying the citizen at the center of the network's action	.654
14. Comprehensive analysis of community needs	.444
15. Inclusion of potential members of the community (CC)	.567
16. Integration of parallel programs implemented in the community (CC)	.491
17. Interdisciplinary work lines (DP)	.558
Horizontality: *Building equity*	
18. Consensus on decision-making processes (TR) (DP)	.644
19. Government/funding representatives with equal power in decision-making (TR) (DP)	.832
20. Focus on decisions affecting network interests	.477
21. Distribution of resources based on needs (TR)	.652
22. Empowerment to lead activities and actions (TR)	.721
23. Acceptance of asymmetric responsibilities (TR)	.823
24. Democratization of social-educative decision making within the community (TR)	.745

Collaboration: *Feeding Discussion*	
25. Discussion of different perceptions of problems (TR)	.569
26. Conflict as an opportunity to grow (TR)	.732
27. Connections among members (CC)	.667
28. Mutual understanding between members (CC)	.832
29. Information flow among members (CC)	.673
30. Exchange of new ideas (CI)	.845
31. Resource sharing between members (CC) (CI)	.567
32. Use of community public resources as an asset to face common objectives (CC) (CI)	.722
33. Community collaborative professional culture (TR)	.739
34. Community collaborative inter-organizational culture (TR)	.662
Projection: *Promoting Systematic Improvements*	
35. Systematic assessment mechanisms of results and processes (KG)	.882
36. Training of members (KG) (CI)	.645
37. Learning collaborative strategies (KG)	.732
38. Learning social-educative content knowledge (KG)	.721
39. Learning opportunities for families and/or other members of the community (KG)	.647
40. Applying lessons learned from the network in their own organizations (KG)	.833
41. Ideas implemented in actions or projects (TR) (CI)	.672
42. Space and time to share new ideas (CI)	.564
43. Applied research sheared with the community (KG)	.751

Note: Trust (TR), Community connections (CC), Commitment with education (CE), Participation and diversity (PD), Knowledge generation (KG), and Collaborative innovation (CI)

All cases $p < .001$

Results

The social network analysis confirms H1. As is shown in Table 1, both programmes show highly relevant densities of interactions and numbers of ties between educational organisations in the community, ranging from 85.5% to 100% (with 100% being the highest level possible). In addition, we observed a significantly low degree of centralisation, with high similarities on the

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number of members' connections to others (between 0.0% and 17.8%), suggesting that non-organisations have strong influences on others. Additionally, the results show that relevant levels of trust among individuals have been achieved by these ECN programmes, ranging from 77.7% to 81.5%. Community organisations have noted that, in addition to the dense structure, professionals' interactions are also based on and sustained by high levels of trust.[2]

These results therefore demonstrate that both the ECN programmes have built dense and decentralised network structures within the professionals' community. Thus, this results note that their performances have been widely capable of building a stable educational network in the community.

Table 3

Structural Matrix of the Social Capital Measurement Model (λ_{ij})

Trust	
4. Commitment to Network goals	.732
19. Government/funding representatives with equal power in decision-making	.554
21. Distribution of resources based on needs	.549
22. Empowerment to lead activities and actions	.611
23. Acceptance of asymmetric responsibilities	.628
24. Democratization of social-educative decision making within the community	.681
25. Discussion of different perceptions of problems	.566
33. Community collaborative professional culture	.553
34. Community collaborative inter-organizational culture	.499
41. Ideas implemented in actions or projects	.582
Community connections	
6. Voluntarism and affiliation mechanisms	.554
7. Communication channels to inform the community	.661
15. Inclusion of potential members of the community	.601
16. Integration of parallel programs implemented in the community	.551
27. Connections among members	.499
28. Mutual understanding between members	.602
29. Information flow among members	.611
31. Resource sharing between members	.521

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32. Use of community public resources as an asset to face common objectives	.553
Commitment with educational affairs	
1. Shared vision and approach to community problems	.628
4. Commitment to Network goals	.611
5. Perceiving education as a community shared responsibility	.621
6. Voluntarism and affiliation mechanisms	.711
8. Involvement of members from public, private and societal sectors	.702
9. Participation by politicians, social-educative professionals and citizens	.599
10. Involvement of professionals from different disciplines	.648
11. Involvement of members from different educational arenas	.594
Diversity Participation	
8. Involvement of members from public, private and societal sectors	.602
9. Participation by politicians, social-educative professionals and citizens	.611
10. Involvement of professionals from different disciplines	.549
11. Involvement of members from different educational arenas	.621
12. Involvement of representatives from different levels of public administration (local, state, and federal)	.638
17. Interdisciplinary work lines	.663
18. Consensus on decision-making processes	.609
Knowledge Generation	
35. Systematic assessment mechanisms of results and processes	.543
36. Training of members	.654
37. Learning collaborative strategies	.506
38. Learning social-educative content knowledge	.605
39. Learning opportunities for families and/or other members of the community	.662
40. Applying lessons learned from the network in their own organizations	.599
43. Applied research shared with the community	.607
Collaborative Innovation	
30. Exchange of new ideas	.721
31. Resource sharing between members	.673

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32. Use of community public resources as an asset to face common objectives	.599
36. Training of members	.432
41. Ideas implemented in actions or projects	.539
42. Space and time to share new ideas	.551

All cases $p < .001$

The H2 results found that, more specifically, in terms of the relationships between constructs and indicators, the factor loadings obtained from the sub-models analysed (organisational and social capital) were globally significant (see Tables 2 and 3). These values should be interpreted as the saturation that each observable indicator has in relation to the corresponding factor. Tables 2 and 3 show the values of each factor loading coefficient defined as free values in each of the indicators of the whole model, including the reliability estimation under the Bentler-Satorra algorithm. All of the results obtained were statistically significant ($p < 0.001$). Specifically, in the case of the organisational model, these coefficients fluctuated between 0.444 and 0.921, whereas for the social capital model they oscillated between 0.432 and 0.732.

The results related to the relationships between factors on the organisational model (Table 4) showed that almost all of the correlations comprising the model were positive and therefore significant ($P < 0.5$). We only found a slight correlation between the factors of co-responsibility and transversality (0.22). These results suggest the non-existence of relevant orthogonal relationships between the latent variables. Moreover, the relationships between the factors of the social capital model suggest a high number of correlations

Table 4. Factors of correlation matrix of organisational model (φ_{ij}).

	Co-responsibility	Transversality	Horizontality	Collaboration	Projection
Co-responsibility	1.00				
Transversality	0.22*	1.00			
Horizontality	0.12	0.11	1.00		
Collaboration	0.05	0.09	0.08	1.00	
Projection	0.11	0.08	0.04	0.08	1.00

*$p < 0.05$.

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Table 5. Factors of correlation matrix of social capital model (φ_{ij}).

	Trust	Community C.	Commitment E.	Diversity P.	Knowledge G.	Collaborative I.
Trust	1.00					
Community C.	0.32*	1.00				
Commitment E.	0.42*	0.31*	1.00			
Diversity P.	0.35*	0.39*	0.48*	1.00		
Knowledge G.	0.41*	0.45*	0.39*	0.51*	1.00	
Collaborative I.	0.55*	0.48*	0.44*	0.47*	0.44*	1.00

*$p < 0.01$.

(Table 5). These findings can be explained by the fact that social capital factors share some of the indicators, a situation that does not occur in the organisational model.

Indices of goodness of adjustment were performed to examine whether our entire proposed model was adjusted to the data collected (Table 6). The absolute indices used (GFI, RMSEA, χ^2 and Ratio χ^2/df) determined the degree of accuracy with which the global models satisfactorily predict the correlation matrix. As seen in Table 6, the GFI index surpassed 0.90 in both models, reaching 0.93 in the organisational model and 0.92 in the social capital model. The index based on residual RMSEA reached values below 0.5 (0.002 and 0.002), indicating that the results derived from the model's adjustment were a close fit. The χ^2 values obtained exceeded the maximum value necessary to claim that the estimated models had reached perfect adjustment, as a significant χ^2 would indicate an unacceptable fit of the model to the data. Additionally, the ratio (χ^2/df) index showed remarkable results; the organisational model had a highly significant value (1.84, <2), and the social capital model showed a moderately adjusted value (2.11).

The coefficients obtained for AGFI, BBNFI and BBNNFI indices were, in all cases, over 0.90, indicating good adjustment. Specifically, the organisational model had some values between 0.94 and 0.95, while the social capital model's values fell between 0.91 and 0.92. Taking into account the BBNNFI, the general values varied along a continuum of 0 to 1; values > 0.90 are typically considered to be reflective of an acceptable fit, with values greater than 0.95 being ideal. Therefore, the organisational model showed an especially significant value (0.95), whereas the social capital model obtained an acceptable value (0.92).

Table 6

Global fit Measurement Model

Indicator	**Estimation Organizational M.**	**Estimation Social capital M.**

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Goodness of Fit Index GIF	.931	.922
Adjusted Goodness of Fit Index GIF	.945	.921
Bentler Bonnet Normed Fit Index	.942	.911
Bentler Bonnet Non Normed Fit Index	.951	.921
Standardized Root Mean Standard Errors	.002	.002
χ^2 with df = 240	441.01 (p = .11)	548.22 (p = .08)
Ratio χ^2 / df	1.84	2.12

Table 7

Comparative Models

Models	**Akaike Information Criterion**	**Bayesian Information Criterion**
Organizational	-234.23	- 278.44
Social Capital	-221.12	-211.49

Finally, Table 7 shows the results regarding the comparison of the two models. The AIC and the BIC information criteria noted that, although both models obtained close fits to the data, the organisational model was more adequate.

Conclusions

First, the empirical results allowed us to conclude that sustainable ECN programmes are inherently dependent on the development of a dense network of educational professionals in the community. These results were expected in terms of the collaborative nature of the programmes added to their maturity and enable us to ascertain that ECNs' organisational displays in communities are a topic of great interest regarding their effective capacities to build dense, decentralised and trustworthy networks of relationships between community organisations. Additionally, we confirm that to better examine programme effectiveness, specific assessments that embrace an organisational approach are needed beyond social network analyses in order to conduct in-depth investigations of strategies that lead organisational efforts and promote specific outcomes within communities.

Second, based on our statistical results, we conclude that the ECN-Q is a valid and reliable instrument for assessing the effectiveness of ECN programmes, in terms of their

incidence on nurturing a collaborative culture oriented to innovation that strengthens the whole community. Thus, the measurement model proposed provides valid information about its organisational performance and the social capital outcomes enhanced. The questionnaire becomes a specific tool that addresses the noted lack of operational directives within ECNs, providing an approach to improving the effectiveness of these programmes.

This model provides an international asset to inform technicians and politicians in various countries about ECN programme effectiveness. First, the model notably contributes to providing information for educational leaders and policy-makers in communities, as well as a specific and accurate guideline for efficiently developing and assessing their tasks as they work towards systematic enhancement of ECN effectiveness. Also, politicians and funders can obtain accurate information regarding ECN effective- ness, and decisions regarding programme support and funding can be sustained or complemented by the grounded evidence provided by our model.

The empirical validation process and sample were both set in two unique contexts, Barcelona and Madison, posing inherent limitations related to the wide extrapolation of results. Thus, although the two contexts offer diverse representations, a wider replication of the results is needed to enrich and generalise the assessment approach. Indeed, our next challenge is to involve other ECNs from different countries in the assessment process, to provide an operational and formative use of the ECN-Q. Also, in order to capture contextualised data to analyse specific differences across networks, the future of the model must consider the inclusion of qualitative items.

In sum, this research provides an instrument that can play a significant role in the paradigm shift promoted by ECN programmes. Thus, school principals, community leaders, policy-makers and politicians can facilitate and encourage network collaboration and educational innovation processes, which are meant to improve social and educational results at the community level. However, more research is needed to improve the ECN-Q's international and comprehensive capacities.

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