



Developing adaptivity and responsiveness in organisations through human network structures: a management strategy

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Abstract

Networking is promoted as vital for contemporary organizational development, yet little research exists on how networks can be designed within organizations to strengthen the infrastructure toward agility and responsiveness. In this article, we examine findings from an ethnographic study to explore the application of networking as a management strategy to foster adaptability and responsiveness to both emerging internal and external needs.

Keywords Leadership · Networks · Sustainable · Quality

1 Introduction

Building sustainable organizations in the complex and rapidly changing environment of today is demanding bold new management strategies from leaders. Many suggest this will require both a mind shift and new structures within organizations (Rill 2016) to create conditions for continuous adaptability and responsiveness (Deleryd and Fundin 2020). The new organisational models and strategies need to meet the growing complexity of customer needs while being grounded and stable for building the kinds of healthy work environments that invite innovation and creativity to support sustainable development (Fundin et al. 2021). After decades of promoting systems thinking and the interdependency of work systems¹ (Snyder et al. 2008), we (the authors) now perceive that the next level of organizational development theory is network thinking. This view is also supported by researchers in quality management who recognize networking as a key ingredient in contemporary organizational development (Fundin et al. supported this view 2021).

Distributed functions, services, processes, and people characterize the network model when applied as an organisational form. Mohrman et al. (2003) and McGrath and

Krackhardt (2003) have studied the importance of networks for organisational change illustrating how loosely connected ties between people and functions lead to greater change and development as compared with traditional hierarchical structures. This change benefits innovation through increased knowledge sharing. However, research has predominantly focused on inter-agency networks, rather than organisations as network structures. Studies show that networks exist to the degree that people are interested in connections (Clarke 2005; Mohrman et al. 2003) raising questions about sustainability. In a Delphi-dialogue study, Fundin et al. (2021) identified a need for further research to study and learn from best practices on how to help leaders combine and balance self-organization with traditional leadership. Building on this, we explore the application of networking as an organisational structure and management strategy to foster adaptability and responsiveness to both emerging internal and external needs.

Over the last five decades, we (the authors) have been researching leadership for developing and sustaining quality in organisations in an era of globalization. This work is based on a systems perspective (Snyder and Anderson 1986), along with a lens from chaos theory and quality management (Snyder et al. 2008) to develop an organization's resilience and innovative practices to adapt to emerging and challenging conditions. As part of this work, we define sustainability in organisations as “the responsiveness of a living system to changes in the environment” (Snyder et al. 2008). Creating

¹ In this article, the term system and networks are distinct. The term system is used to refer to a set of activities and tasks that are designed and carried out to support the work in an organization. The term network refers to the interconnection of multiple activities or systems.

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sustainable conditions for work requires a departure from isolation in any form, which assumes a fundamental shift toward systems thinking. We are now interested in exploring how leaders can use and develop human networks as a management strategy within an organization to foster agile, resilient, responsive sustainable infrastructures.

1.1 Purpose

In 2021, we introduced the concept of the Human Networked Organisation (Snyder and Snyder 2021a) as a management strategy to enable leaders and their organizations to become responsive and adaptable to complex conditions. We derived the prototype from phase one of an ethnography of an independent school in Tampa, Florida, USA. In this current article, we extend the ethnographic analysis to examine how the human networked organization infrastructure created the conditions necessary for the school to reimagine and redesign the delivery of education during the pandemic while maintaining a high level of quality. The study is based on a single case site and it is not possible to generalize to all organisations. However, the in-depth exploration of the case through an ethnography provides a unique opportunity to study the value of human networked structures for organisations.

1.2 Structure of the article

This article begins with a theoretical background of network theory drawn from the natural sciences to lay the foundation for exploring and describing the case site as a human networked organisation. Results from the ethnography are presented in two parts: (1) describing the school as a human networked organisation based on findings from the first phase of the ethnography, which was presented in a more comprehensive conference paper; and (2) illustrating the value of the human networked organisational model to create conditions for organisational responsiveness and adaptability during the COVID pandemic. We present a discussion of the findings as it relates to the overarching questions addressed in this article: In what ways can the human networked organization model add value and support organizational responsiveness and adaptivity? We have represented portions of this data in a conference paper (Snyder and Snyder 2021a) and a book chapter (Snyder and Snyder 2021b). Data presented in the current article have not been published in their current form elsewhere.

2 Background: network theory and organisations as living systems

Networking has been the basic building block of communities since Sumerian times, thousands of years ago (Kramer 1963). Everyone naturally accumulates personal networks

of family, friends, and professional connection systems. Leaders and managers naturally build external partnerships and coalitions for advancing their organization's products or services. And, as the demands on organizations become increasingly complex, leaders often create their own professional networks to add resources and opportunities to the challenges they face.

A network, simply defined, "is nothing more than a collection of objects connected to each other in some fashion" (Watts 2003, p. 27). There are a variety of network types including technological and human (Buchanan 2002; Watts 2003). Central to all networks are nodes, connectors, and hubs, which are the points at which ties are made to exchange resources (Ibid). When resources are exchanged, a relationship is formed. Ties "connect pairs of actors by one or more relations" and can be based on multiple ties (i.e., multiple resource sharing) or single sharing. Relations refer to resources that are exchanged between two or more entities. According to Garton et al (1999), "the more relations in a tie, the more multiplex is the tie... [and they are often found to be] more intimate, voluntary, supportive, and durable".

Early theories about networks assumed that networks were static structures. As Watts (2003) reports, later findings disproved this notion: networks are dynamic objects, not just because things happen in networked systems, but because the networks themselves are growing and changing in time, driven by the activities or decisions of those very components. This finding suggests that it is energy and synchrony that matter, not the structure of a network, which is generated by the members and their connections. The opportunity for leaders is to create systematic processes that draw on this energy to sustain continuous improvement and innovation.

The science of complexity (Gleick 1987) now searches for patterns in networks that make them vital and sustainable. Scientists are examining networks (Barabasi 2016; Watts 2003) as the new structures for the global age, where networking is fast becoming a primary leadership skill. Through continued developments in physics, six fundamental ideas have been identified, which are an essential foundation for leading growth and change in organizations (Snyder et al. 2008). Among them are:

- Energy builds from connections.
- Systems thinking fosters interdependency around a common purpose.
- Chaos stimulates change over time in natural systems.
- Complexity emerges from dense connections.
- Networking is the interconnectivity of natural systems.
- Complex adaptive systems evolve from networks of interconnectivity.

If one accepts the premise that the organization is a living, growing system, which needs to be fed continuously

to enable its people to work across the organization, the question emerges: What are useful strategies for building more agile and yet accountable cultures of work without a free-for-all resulting, where the organization progresses from chaos (a healthy state) to turbulence (where systems fall apart)? We contend that networking is a promising strategy for unleashing talent, maximizing resources, encouraging innovation, and increasing resilience and responsiveness to changing conditions.

According to Barabasi (2003), the twenty-first century is likely to concentrate on complexity and the network, which he predicts will have the following characteristics:

- A network is a rapidly evolving dynamic system of interconnectedness.
- The scale-free network idea is built around hubs of interest.
- Networks are self-organizing and based on the strength of hubs.
- Hubs have many nodes and links internally.
- Hubs connect to other hubs through weak links, thus forming the network.
- Large hubs define the direction and shape of the network.
- Two laws govern networks: growth and preferential attachment.

Scientists observe that networks create their own energy system and expand as interests and needs emerge (Buchanan 2002). Recent studies reveal that purpose-driven organizations tap into the basic interests of their workers to create energy for innovation and continuous improvement (Quinn and Thakor 2018). A scale-free network is a complex cluster of interconnections that includes hubs that dominate network activity, along with smaller clusters of work that support and are connected to hubs and many other clusters (Barabasi 2016). Links that connect clusters and hubs are vital to the stimulation of a network's growth. Without links, there are no connected hubs or clusters, making links the distinguishing element for integrating many work systems to form a growing network. In many organisations, systems (i.e., teams, production, recruitment, communication, technology) support work, but they are disconnected or connected by weak links (Snyder 2008). The presence of multiple leaders is also a major characteristic of networks, where power comes from the unifying purpose and a specific function that advances the organization.

A surprising find is this: the more complex the network, the fewer fluctuations there are in its performance and growth; the most stable type of network is complex (Buchanan 2002). More simple networks are found to be more vulnerable and less sustainable in performance and growth. We can now surmise from the knowledge of networks that sustainability over time emerges from healthy,

growing networks of human activity around a unifying purpose, along with independent and voluntary links, and with multiple leaders. The unifying purpose, systems of work, processes, values, and procedures are all central to consistency across the network. These vital features prompt new pathways to open and enhance life within the network and have the potential to advance organizations and leaders into a new paradigm for leading complex systems.

If the network pattern for work will become a dominant feature in the twenty-first century, what are the implications for management, network development, and institutions of all kinds? Uhl-Bien and Arena (2018) suggest one of the biggest challenges for leaders today is how to “position and enable organizations and people for adaptability in the face of increasingly dynamic and demanding environments” (p. 1). Kim and Mauborgne (2015) argue that the organization itself is no longer the unit of analysis, rather it is the strategic moves, with managerial actions and decisions involved in making moves, that determine how well an organization adapts continuously to rapid and complex change. Evidence is now emerging about the power of the human network as an important ingredient to help build adaptive, responsive systems that are fluid, interactive, and transparent to meet the complexity that surrounds organizations.

In this article, we explore how the presence of a human networked organisational structure enables the leaders and staff to reimagine and redesign the delivery of education during the pandemic and still maintain quality in work culture and learning. This example illustrates the power of the network structure to position the organisation and its staff to adapt and respond to stakeholder needs during extreme circumstances.

3 Methodology

This study is based on an ethnography (LeCompte and Schensul 2010) conducted at an independent day school in the US between 2016 and 2021. The study was conducted in two phases. During phase one (2016–2018) we explored the application of network theory as an organizational design to describe and understand the interdependence between the schools' structure, culture, and identity. The impetus for the study was to understand how the school continuously achieves its high levels of involvement and performance with a strong sense of culture and identity. During the initial stages of the research, it became evident that current ideas of school organization were no longer adequate for understanding the complexity and leadership that drove the school; human networking was central, as were strong values to connect the people, process, and performance. A complete analysis of the findings from this phase has been presented at a conference (Snyder and

Snyder 2021a). In phase two (2019–2021) we continued to study the school, this time remotely during the pandemic, to examine the impact of the network structure on the school's ability to adapt and respond rapidly to the needs of its stakeholders during the pandemic.

The school is known for its hands-on, child-centred philosophy based on best practices in education and knowledge gained from leading-edge brain research to accelerate learning. The school has been recognized locally and internationally for its innovation, professional development, and continuous improvement efforts, partnering with many national and international organizations. It is also an international site for research studies initiated by among others Yale and Harvard Universities regarding pedagogical practice and well-being.

As of the 2021–2022 school year, the enrollment was 520 students and a faculty and staff of over 130 equating to a student-to-teacher ratio of 8:1. The school is in a suburban area and includes students predominantly from middle to upper-class families where parents have a diverse mix of careers, some in medical and litigation fields, as well as many others. The student body is made up of 77% White, 8% Black, and 6% Hispanic, as well as others. The school is also well known (and often chosen) for its approach to social and emotional learning and well-being for its whole community.

The school is dedicated to regular professional development. This includes multiple in-service days per year, as well as weekly meetings dedicated to building a professional learning community around the areas of International Baccalaureate, Global Learning, Brain-Based research, Gifted Education, and Cooperative Learning. Notable is the team-teaching approach employed by its educators and a culture of continuous improvement throughout the school. During phase one of the ethnography (2016–2018) the school was under the leadership of a Headmaster who had been in the role for 25 years. In 2019, a new headmaster transitioned into the role taking full leadership in the spring of 2020. More details are provided below about the school.

This study was initiated from a long-term professional relationship between us as researchers and the school's headmaster, which originated in the 1980s as colleagues at a local university. This professional relationship continued through a partnership project to develop schools as global learning centers. In 2019, a joint doctoral program was initiated between the school and the university of one of the authors, in which additional research is now being conducted. This well-established relationship provided us with access, trust, and credibility among the staff and leadership team, which was paramount to exploring the organisational system and culture in depth. Permission to conduct this study was given by the leadership of the school, including the Board of Trustees. Access to key

informants was established through the leadership team, and consent to participate was secured prior to embarking on the ethnography.

3.1 Data collection and analysis phase one: 2016–2018

Data were first collected between 2016–2017 by one of the authors who lived and worked near the campus of the school. Primary data were collected through observations, interviews, and focus groups. Secondary data were collected through documents. Interviews were conducted with the leadership team of the school consisting of a headmaster, associate headmaster, and five division leaders (identified as Hubs below). *The interviews* lasted from one to one and a half hours using an open-ended interview protocol. The questions focused on understanding the structure of the school's work processes, the flow of communication, decision-making processes, work organization, and leadership. *Focus groups* were conducted with each of the teaching teams identified in the five hubs. The number of participants ranged from five to seven teachers. The focus groups lasted one hour in length. Questions explored, among others, included the ways in which team teaching was designed and practised in the school, the design of cross-curriculum development, continuous development, and professional development. *Observations* were made over the course of one year and included in-class observations, division team meetings, professional development days, and general observations of daily activity around the school. The researcher was on campus between 1–2 days a week from September to May. Informal dialogues with students, teachers, and parents who were on campus also provided a natural data source as part of the ethnographic methodology.

Data were analyzed by the two authors in two steps. In step one, the author who collected the data applied network theory to categorize the data. A process map was generated to identify and place the data into one of three main categories based on network theory: Hubs, Clusters, and Links. The second author participated in step two of the data analysis in which social network theory (Garton et al. 1999) was used to further examine, understand, and illustrate the complex fabric of life in the school. Social network analysis is a process of understanding the connections between sets of people (hubs and clusters) that are connected by a set of social relationships (links-ties). Social network analysts “seeks to describe networks of relations as fully as possible, tease out the prominent patterns in such networks, trace the flow of information through them, and discover what effects these relations and networks have on people and organizations” (ibid: 1).

3.2 Data collection and analysis phase two: 2019–2021

During phase two (2019–2021) of the ethnographic study, our research was conducted primarily online due to the pandemic. As part of this development, our ethnographic approach expanded to include visual ethnography (Pink et al. 2016; Markham 2018). Data were gathered through interviews, focus groups, and document analysis using the internet as the primary medium for communication. Additionally, net-based social communication through the school's Facebook page became an invaluable source. The particular focus of this phase was to explore how the school responded and adapted to the needs of its stakeholders during the pandemic.

The Focus groups and interviews were conducted by both authors. Two interviews were conducted with the new head of the school and deputy head to describe and examine the challenges, decisions, and strategic planning used in adapting to the pandemic. Interview questions were provided prior to the interviews via email, and the interviews were conducted through Zoom. Two focus groups were conducted via zoom with four teachers in the school. Two of the teachers were also program coordinators in the middle school, and two other teachers represented the primary grades. Document analysis was conducted of the school's newly formed strategic plan (2020) which included the "back-to-school plan" and the "Family Remote Learning Plan". These documents provided background information about the hybrid learning model. Additionally, we were able to observe the direct result of strategic planning through videos and Facebook postings that were managed by the school administration.

Data from the second phase of the ethnography were analysed together by both authors. Data from the interviews and focus groups were transcribed and analysed based on qualitative text and interview analysis procedures (Creswell 2018) to identify themes and patterns. Two primary procedures were followed: (1) Simultaneous data analysis and Winnowing of the data (see Creswell 2018), using questions of inquiry to guide the analysis.

4 Results

In this article, results are presented in two sections. First, the case site is presented as a Human Networked Organisation, based on findings from phase one of the ethnography. Since these data have been presented in an earlier conference paper (Snyder and Snyder 2021a), the findings are summarized to provide the reader with an overall understanding of the networking structure identified in the case site. Following this, findings are presented from phase two of the ethnography to illustrate and describe how the Human Networked Structure

enabled the school to respond to the needs of its stakeholders during the Covid pandemic and maintain quality.

4.1 Part one: Corbett Preparatory School as a human networked organization

Based on Network Theory (Barabasi 2003), we can illustrate how the school can be viewed as a *Human Networked Organization*. In Fig. 1, the school's activities, structures, and academic programming are grouped in hubs, clusters, and links.

Hubs: In the center of the figure are the school's five core hubs: Early Primary, Upper-Primary, Intermediate, Middle school, and Specials. The hubs are defined based on grade level, except for the Specials hub, which includes the arts (music, dance, drama, and art). The primary purpose of the hub's activities is to "develop the whole child", a purpose that every professional can easily verify. Students are organized into both multi-age and age-specific groups, which generate a fluid system for connecting between and among hubs for academic purposes, school-wide. Team-teaching dominates the elementary school hubs, while ability grouping is pre-dominant in middle school.

The academic programming in the hubs is supported by a variety of scientifically based theories and values that are grounded in pedagogical philosophy, human development, social relations, leadership, and global citizenry. The values have developed over time and form the school's central guiding document: *More Options for Results in Education (a MORE Approach)* (Cohen 2003). These core learning systems build the tapestry for teaching, learning, and work culture. All hubs integrate core values from mindfulness, team teaching, global learning, social-emotional learning, cooperative learning, etc. in their pedagogical praxis and curricula. While the academic content differs for each grade level, the core values are present at all levels. As well, the staff serves as role models for students in the behaviours, attitudes, and language to reflect the values, while students in turn coach one another based on the shared values.

Clusters: Surrounding the hubs are six primary clusters, which are utilized by each of the hubs to support academic development with programs that enhance student growth. Four of the clusters provide added dimensions for learning and social development (arts, music, physical education, and international programming, including language and partnerships). In the school, there is close collaboration between the art and language clusters and the work of the main hubs to reinforce the pedagogical values and theories present in the Links (see below). For example, arts projects, drama and dance are used to help kids explore math, science, cooperation, empathy, and understanding. The language cluster is used to support the development of cultural sensitivity and awareness of global issues that are also explored in the

NETWORK ACTIVITY OVERVIEW

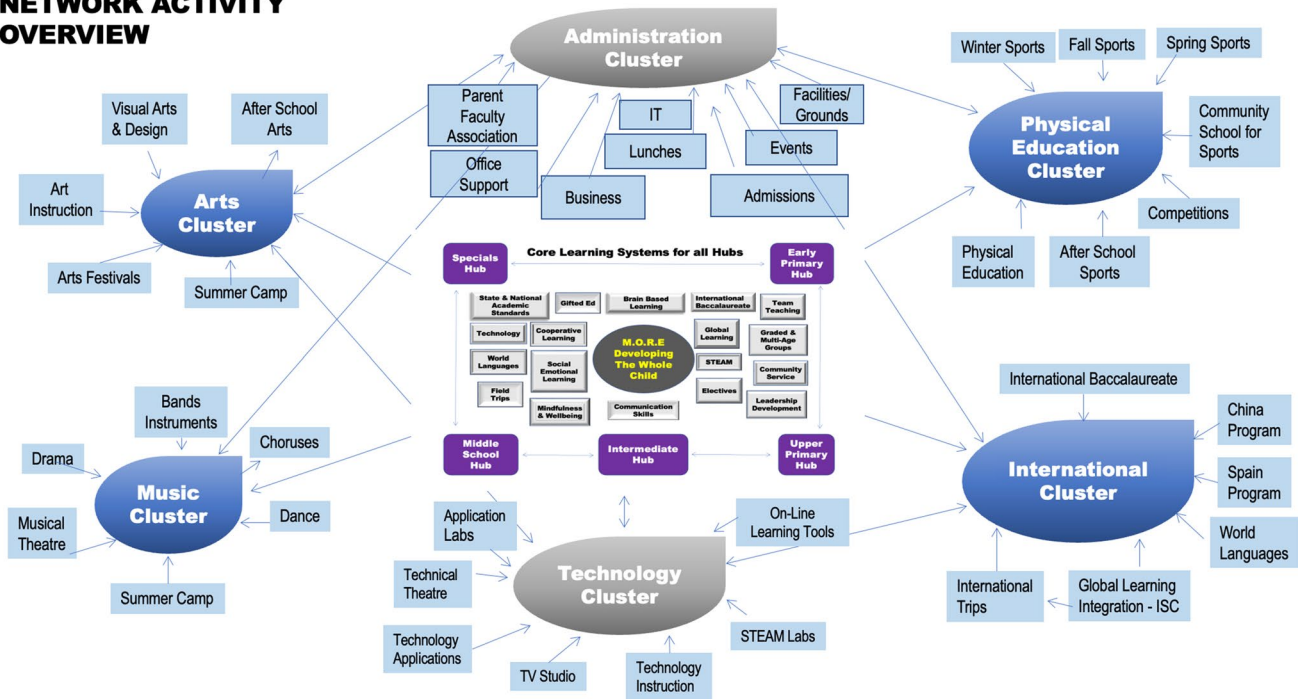


Fig. 1 The living network at Corbett Preparatory School

standard academics. The other two clusters (technology and administration) provide a support system to help the school to thrive.

Links: The final component of the networked model is the links that connect the cluster activities and hubs. The 16 network links identify existing school-wide programs at Corbett Prep that function under the leadership of one or several teachers. Examples of the links include skills in social-emotional well-being, global learning benchmarks, and international baccalaureate competencies. The program links are integrated into all Hub curricula activities and teachers participate in regular competence development to maintain the presence of the links. The links are developed by selected teachers who receive extensive training (up to a year) in their area and return to provide competence development to the whole staff, including guidance, supervision, and accountability for the success of their program school-wide.

Links in the case site network create the connection system through which knowledge, resources, and feedback is shared and distributed (both internally among staff and students and externally to parents). The ongoing feedback systems serve as an energy that was vital to keep the network (school) open and expanding over time. The links were made by the teacher leaders who worked in teams, and who approached curriculum development from an interdisciplinary and systems perspective. Many of them also assumed additional responsibilities for the whole school as knowledge

experts in the links (i.e. IB program, global learning benchmarks, wellness program).

The presence of many links in the school challenged teachers at times to find time to incorporate all of them into the curriculum. Some of the links were given more time than others. For example, the well-being program based on the Four Pillars of Well-Being had an established committee that was designed to support applications in the different hubs. Whereas the global learning links did not have a well-established group that was available to support the hubs. The strongest, and most highly developed link was the international baccalaureate competencies that were present in all grade levels, clusters and hubs.

4.2 Networks as a management strategy

It is often the case that human-based networks are the result of loosely coupled connections around a common interest or purpose. In this case, the networks form over time and are dependent upon the individual actors and their desire to build a connection. Applying network theory as a management strategy implies that the network structures are formalized and become the organisational structure, replacing traditional hierarchical relationships and shifting to shared leadership and shared practice. In the case site, we found strong evidence that the network structures were consciously designed as a natural outgrowth of the team-teaching and

multi-age classroom model that was fundamental to the school's pedagogy and organising.

While on paper there was an identified head of school, associate head and division leaders, the working model reflected an integrated network of roles and responsibilities in which leadership was shared. This was a strategic decision made by the school's head that was based on the warp and woof (Snyder and Anderson 1986) design for leading schools from a systems perspective. The warp-and-woof is akin to a tapestry of threads. The tighter the overlap between the threads on the parallel and perpendicular the stronger the weave. Connecting the different aspects of the school at all levels in a network structure strategically was intended to strengthen the fabric of connections across all units.

In the case site, each hub (division) is led by a teacher from a specific grade level. The hub leaders are responsible for holding weekly meetings with the teaching staff in their hub. As well, they meet with other hub leaders and the school leadership (two principals and the headmaster) weekly. Decisions are made collaboratively. This model of shared leadership provides a structure through which the needs of classroom teachers are made visible at the highest level of leadership and ensures that school-wide decisions are needs-based. This structure also creates a sense of cohesion among all units in the school. The clusters are led by the Special hub division. The links are led by all faculty members who regularly participate in professional development about the different elements and implement them in their classes. It becomes a school-wide connection that is reinforced in staff meetings, training days, and curriculum development. The school leader's role shifted over time from supervising individuals, teams, and programs to managing the systems of work throughout the network, along with the health of the school's culture and its impact on every learner.

The interconnectivity of hubs and clusters is vital for developing a complex, cohesive, and strong network for sustainable growth. A network grows when the communication channels are open between and among programs and services, and where there is clarity of purpose that drives the learning and work for everyone. In the school, teachers are responsible for everything that occurs within their learning communities while mentoring and coaching each other to "Olympic" performance. Many teachers take on additional major responsibilities for the entire school, which strengthens the school's connection system, its purpose and values, and its sustainability potential. Vital for the educators is the weekly professional development event that is led by the headmaster and involves teacher experts and visiting experts with the focus on "What is best for kids".

Professional dialogue is a dominant feature during these events, which spills over into the daily life of their work with students. In addition, many teachers are sent every year for specialized training to become the school's experts in

various initiatives, and then assume responsibility for the success of that program throughout the school. New teachers are trained in every core program of value to the school prior to their teaching debut. The administrative teams appear to have one purpose, and that is to support the work of teachers in achieving high success levels for each student. What now exists is a complex web of life, with its energy for learning, where every student is cherished and nurtured, and which is apparent to every student and parent, as well as to over 400 national and international visitors to the school each year.

4.3 Part two: exploring the human network model in action

In this section, portions of data from phase two of the ethnographic study are presented to illustrate how the human network structure provided the conditions for the school leaders and staff to create a new model of schooling to adapt to the pandemic.

When the Pandemic hit Florida in March 2020, schools began to face the question: should we close, or should we stay open? During the spring, the case site school remained open as a virtual school following the same weekly schedule as on-campus schooling. By late June, it was apparent that the Pandemic was not over. If the school was going to remain open in the fall, the model of schooling needed to be reimagined to retain the school's core values in a safe and nurturing environment for everyone. Over the course of the summer, the leadership team and faculty rolled up their sleeves and reimagined their school based on a hybrid model. As the headmaster described,

It's like we are trying to build a plan while we're flying: just keep building, because the puzzle keeps moving depending on what angle you are going at. We were asking big questions, such as how do I get the parents to trust? How do I get the teachers to get out of silos and communicate? How do you make sure that communication doesn't fall through the gaps? And how do you know that your communication strategy is clear enough so that messages through social media don't get misrepresented and create another crisis?

Evident from the focus groups, interviews, and document analysis was how the leadership team and teaching staff were able to address these questions quickly because of the well-established network of shared leadership, continuity of purpose, and culture of collaboration. At first glance, the headmaster perceived that the network structure was a disadvantage. He shared,

Originally, when I came, I thought we needed a couple of the traditional roles because we are so flat. But soon I began to realize the power of the model and saw

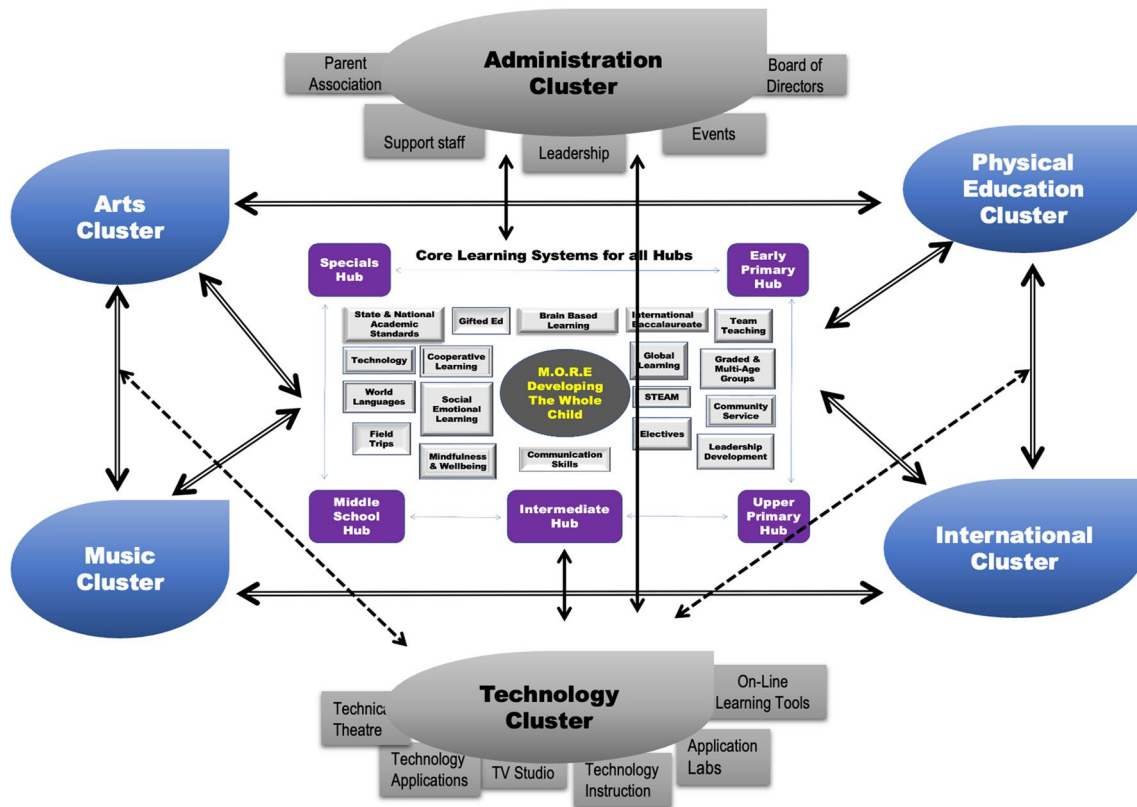


Fig. 2 Illustration of the Human Network Structure prominent during the adaptation phase of the school

that the division of leadership between the Hubs was a benefit, since the leaders were also classroom teachers. When we need to make decisions at the classroom level, there is immediate respect because the division leaders know first-hand what the needs of the classroom are. This has been critical to our ability to build a new puzzle without knowing the parameters more than safety and kids first.

Figure 2 is a reconstruction of the original Human Networked organisational structure that illustrates the different kinds of connections that served the educators as they re-imagined and redesigned the school during the Pandemic. The solid lines labelled (No. 1) indicate the first layer of connections that served as the foundation for re-imagining, re-designing, and articulating a hybrid model of schooling. For example, decisions were made based on the pedagogical principles of the school and new structures were made possible through the presence of teaming. The double lines (No. 2) that connect the clusters also indicate new structures and relationships between the classrooms, teachers, and students within the hubs that emerged during the redesign of the school to a hybrid model. For example, planning and curriculum development were redesigned. The dotted lines (No. 3) illustrate the relationship between technology

that was used to support programming in the clusters and hubs. For example, the school leaders began the question with “how can we get creative with the technology we have to support learning?”, rather than asking “what technology do we need?”.

4.3.1 Hubs, clusters and links provide the structure for adaptation

Adapting to a hybrid model began by grounding the remote-learning plan in the values and pedagogical principles of the school. Critical to this phase was the interplay between the five Hubs and the core values supporting the learning environment with the technological and administrative clusters. Decisions were made from pedagogical principles of team teaching and cooperative learning, and social interaction, rather than driven from technology. The result was a clarity of purpose illustrated in the message on the school website: “the school is closed, but we are open for learning”, and the newly formed hashtag: #onecommunity. These two phrases became the guiding light for shaping decisions that resulted in the Remote Learning Plan. They are grounded in the school's pedagogical and community philosophy that

is identified in the core values (links) surrounding the five hubs.

The school's structure for team teaching and regular division meetings within and across hubs enabled the staff to engage immediately in re-imagining their school. As one of the teachers shared, *“when we began to meet as a planning group everyone volunteered ideas for what was needed to be accomplished. Each teacher and aide spontaneously volunteered to take on tasks for the whole division.”* Collaboration at all levels became significant for the school to succeed in achieving its goal. In addition to the teaching staff, the entire school office staff, as well as buildings and grounds staff, were included. As were parents, and school board members, many of whom were lawyers, medical doctors, and academics. These additional persons provided vital network links to the Center for Disease Control (CDC) guidelines, and health guidelines from Harvard University, each of which became fundamental to re-designing the school according to the vision and goals.

The re-imagined model of schooling was articulated in a guide for “Teaching Remotely” which was designed to assist teachers and parents in transitioning to the hybrid model. The plan reinforced one of the school's core foci on professional development and the importance of participation and community building. The plan also served as a link between the hubs and clusters to ensure that the guiding principles of the school's new model would be successful.

One of the biggest innovations in the school related to scheduling and the flow of students. The redesign originated from the close relationship between the hubs and clusters that opened possibilities for re-thinking teaming between classes. Rather than moving students from class to class, the teachers moved to the classrooms. This stimulated many new developments in team teaching and cross-curricular planning that were supported by the 16 links representing the core learning values of the school.

Moving the school's daily life online impacted planning and communication between teachers, students, and staff. Classroom planning documents changed from paper to digital and enhanced access to information and communication between parents, teachers, and the teaching staff. This was important to foster the school's commitment to parent involvement and informed decision-making. As one teacher shared, *“for us, it was important to make connections with students learning from home and students in the classroom. With the technological solutions, we were able to form a resemblance of simultaneous learning with both groups”*.

Continuous feedback and communication both internally and with parents and the community were both critical and supported by the established network structure of the school. According to the interviews, the school's leadership team sought regular feedback from parents and teachers throughout the implementation phases to ensure continuous quality.

The data collected enabled the school to adjust its policies and procedures to begin the school year. Open lines of communication were vital if the school was to keep its finger on the pulse of a polarized community. Throughout the year, the school created return points for families to decide whether to move from remote to in-person or remain at home.

Findings from well-being data and student achievement scores (Snyder et al. 2021) indicate that the redesign and delivery of education during the pandemic was successful. Achievement data showed that almost all grade levels exhibit the same or higher mean achievement scores compared with the previous year. This is significant because of the complex nature of the hybrid teaching and learning that took place throughout the school year. In August 2020, the school began arguably the toughest year of teaching in the school's history, according to interviews with teachers. Managing the high level of necessary engagement of students both online and in-person took a toll on the overall personal well-being of the teachers and staff, especially according to survey data, in the areas of diet, sleep, immune system, emotional well-being, purpose in life, self-gratitude, and growth mindset. At the end of the school year 2021, the faculty and staff recorded their highest-ever overall well-being score of 72.49 on the Contentment Foundation Well-being scale.

5 Discussion and conclusions

In this article, we explored the question, “In what ways can the human networked organization model add value and support organizational responsiveness and adaptivity?” The need for research toward this end has been identified by a range of research that calls for new management strategies and structures that are both stable and flexible to meet the complex needs of customers today. What is evident from the research presented in this article is that it is possible for leaders to design organisational structures using a network model. This advances insights from earlier studies about the value of network theory to support organisational change (for example, Clarke 2005; Mohrman et al. 2003; McGrath and Krackhardt 2003). This study was based on a single case site and cannot be generalized to all settings. However, given our long-term relationship with the school, we were able to explore the case site in-depth to offer insights that hold potential for other sites and future research.

In the case site, we found strong evidence of an existing network structure consisting of hubs, clusters, and links that blurred the lines between traditional hierarchical structures and the principles of self-organisation. On paper, leaders were identified at all levels of the organisation, from the headmaster and principal to the division leaders (hubs) and classroom leaders (teachers), each of whom had clearly articulated responsibilities within their units. The school's

focus on team teaching, cross-curricular learning, and integration of the arts and language in all subjects transferred the hierarchical traditions of leadership into a network structure.

Developing the network takes time and requires continuous refinement and reinforcement of the common purpose and connectors (Watts 2003). Left unintended, networks die. Designing human network structures as a management strategy in the case site was reinforced continuously through the school's guiding principles, which served as the core connector for all units and hubs. The links also became central to keep the network alive and functioning. Maintaining and fuelling the human network was vital and required that planning meetings included a clarity of purpose and a clarity of connection to the school's guiding principles, which were found in the links.

Research demonstrates that networks are as strong as their links; and that they grow with energy and have a common purpose (Barabasi 2016; Quinn and Thakor 2018). Studies on the sustainability of networks for organisational development often found weak links, resulting in the eventual death of the network (Clarke 2005). Regular professional development, shared leadership, and a commitment to the common core strengthened the network in the case site. This is in line with research on complex adaptive systems (Ulh-Bien and Arena 2018) that point to the importance of common values that promote loosely coupled partnerships (Rigby 2020) to generate sustainable programs and innovation within a growing complex environment.

Findings contribute insights into the importance of both teaming and the presence of guiding principles for organisations to become adaptive. Teams are typically designed around a task and purpose and have a structure for working (Snyder et al 2008). In the case site, teaming was used as a structure for meetings, teaching, differentiated roles, professional development, and shared leadership. While this list of functions might not be new, it was the structure of the teams within a network model that contributed to how responsive and adaptable the organisation was to changing conditions. The network structure connected the teams, empowering them to make decisions and contribute to the organisation's continuous growth; a finding supported by other research as well (see for example: Snyder and Snyder 2021b; Hawkins and James 2018; McGrath and Krackhardt 2003). Through their regular connections during daily and weekly meetings, teams created a new structure embedded within the hierarchy of the school that functioned as a network.

The schools guiding principles, and their role as links in the school's network structure, were a second significant factor for how the school responded and adapted during the pandemic. Network theory reinforces the importance of links to hold together a network (Barabasi 2016). During the pandemic, the core principles surrounding the hubs and clusters were used to reimagine the school in the face of

the pandemic, ensuring that decisions were grounded in the principles of the school. The application of the principles in the various hubs and clusters in the school created the glue and stability that was needed to adapt to the delivery of education. This is an important insight for leaders, who often find it difficult to develop a sense of shared ownership of the company's values, mission, and goals (Snyder et al. 2018).

Ideas about networking within organizations are only beginning to take shape. In the Human Networked Organisation, human networks become the organisational infrastructure that connects human activity, values, and customer needs with organisational goals and processes. Designing organisations based on a network system of interdependent roles, functions, and activities creates a natural, organic, dynamic, fluid, and stable structure (Quinn and Thakor 2018). We suggest that leaders can benefit from understanding how to design human networks to balance the equation between self-organising principles with traditional leadership. As networks are connected by a common purpose, the human networked organisation, is driven by a systems perspective, grounded in values, goals, and customer needs, and at the same time adaptive and resilient enough to meet complex external challenges, such as global sustainable development.

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Declarations

Conflict of interest The second author of the paper is on the Board of Directors for the case site. The researcher is a retired professor of educational leadership and school development with an established relationship with the school's leadership team. The primary author had an established relationship to the head of the school through previous employment at the University of South Florida.

Informed consent Informed consent was secured from participants prior to interviews and focus groups. All data were collected, managed and analyzed following ethical guidelines.

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