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The energy that drives human networked organizations: a model for leading schools to thrive in complex times

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Purpose: Developing organizational adaptability to address sustainable development requires bold new management in education, school leaders are challenged to meet this paradigm shift amidst traditions of Newtonian views of organizing and industrial-based bureaucracy. Using Quantum physics as a theoretical lens, the authors introduce a model for leading schools as human-networked organizations, enabling them to become more responsive and adaptive to the evolving needs of students, businesses, and society.

Methods: The model is derived from an ethnography study of a private school in the United States, in which an existential-phenomenological approach, inspired by the work of Heidegger, was used to examine how educators describe the experience of working in a Human Networked Organization. The aim was to explore the phenomenon of magical energy that exists within this type of organizational structure to support its growth and sustainability over time.

Results: Findings highlight the critical role of teamwork, strong relationships, continuous professional development, trust, and respect with shared leadership for sustaining a culture of interconnections that can help schools thrive and be responsive in complexity. The model for leading schools as human networked organizations integrates six main features that are visualized using energy from the atom as a metaphor to reflect the interconnections between functions and culture to promote adaptability and responsiveness.

Discussion: Helping educational leaders shift from a Newtonian View of organizing to a System's View requires knowledge about energy systems. Quantum physics contributes insights that will assist educators in acquiring the knowledge and skills for leading in the 21st century.

KEYWORDS

educational leadership, Systems Thinking, network organizations, teaming, collaboration, sustainable schooling

1 Introduction

It is becoming abundantly clear that schooling worldwide is being challenged at its very foundation by the global upheaval on every scale (Sachs et al., 2021). The United Nations (UN) has identified three major overall transformations essential for global sustainability, and the number one priority is Education (Unesco, 2017). Included in the UN charge, is an overhaul in the quality of teachers and leaders, class size, and the working and learning environments (Sachs, 2015). When considering the challenges of global sustainability, and the rapid evolution of innovations, it is easy to understand why education has become the top UN area for global renovation. Education plays a vital role in advancing the quality of human life while solving the inequities of society and global environmental problems. The quality of life on our planet in the future depends on the quality of relevant preparation that the next generations receive in schools and universities worldwide. The challenge for educators is to develop schools that foster learning in keeping with the rapid business-organizational and societal developments so that students are prepared for successful working and living.

Building sustainable organizations within every sector requires bold new management strategies. Along with this comes a mindshift that is guided by an understanding of the interlinkages between organizational practice and sustainable development, including systems thinking and long-term thinking (Barnett et al., 2017; Jonker, 2000; Mårtensson et al., 2019; Mårtensson and Snyder, 2023). Leading and organizing work systems in the 21st century will be grounded in the very essence of organizational life. New systems and approaches are critical for becoming more adaptive and responsive to mounting complexities in industry, service delivery, and customer needs (Uhl-Bien and Arena, 2018). A primal leadership orientation is all about shifting from honoring bureaucratic structures to embracing Systems Thinking and networking (Hodgson, 2019; van Kemenade and Hardjono, 2019), in which teaming (Edmondson, 2012; Lilja et al., 2022) and self-organizing teams (Laloux, 2014) are central. Voulvoulis et al. (2022) argue a Systems Approach to organizations is necessary to transform the core of society and embrace sustainable development goals. The outcomes orientation of business and the policies that divide humans and keep change captive to an outdated paradigm must change.

While many educators and researchers have promoted Systems Thinking for decades, little progress in schooling has been realized within and across nations (Bozkurt and Bozkurt, 2024; Snyder and Snyder, 2023). Presently, educational systems worldwide remain caught in a paradigmatic chasm between the traditional bureaucratic models of the 20th century based on Newtonian physics and compliance practices with a Systems orientation that fosters collaboration and teaming, adaptability, and innovation (Snyder K. J., 2023). Despite almost a century of promoting the Systems Approach, the basic traditions in schooling have yet to be altered. International research initiatives repeatedly reveal that the standards-based accountability models of compliance and inspections continue to dominate schools, holding educational systems prisoner to a bureaucratic orientation (Brodin et al., 2015; Ehren et al., 2013). Even national policy directives in the United States, United Kingdom, and Europe aiming to redesign education from a Quality Management perspective, in which

Systems Thinking is central, have yet to ignite the necessary paradigm shift for addressing sustainability goals (Ehren et al., 2013; Snyder K. M., 2023).

A few exceptions to this pattern do exist. For example, in Finland the national curriculum of schools was recently transformed across the country, involving members of every community using Systems Thinking practice. The UN sustainability goals are one of four major national curriculum goals addressed daily in Finnish school practice (Halinen, 2017, 2023). In Sweden, several school municipalities have developed a systemic approach to school development by applying Quality Management principles and processes, which is supported by a national educational policy (Bäckström et al., 2024). Similarly, several school districts in the United States, and Canada developed systems of engagement and support for all schools based on Systems Thinking to achieve amazing results (Fitzgerald, 2023; Mann, 2023). However, these examples are few and far between and remain merely beacons of light for education to rise to the challenges of these times.

Why are so few schools and education systems adopting a Systems orientation to progress? Perhaps it is the lingering power of tradition and the politics of education (Acker-Hocevar, 2023; Snyder K. M., 2023). Educators like Sarason (1990), Hargreaves and Goodson (2006), illustrate how the converging forces of large-scale economic and demographic shifts coupled with waves of reform, continue to catapult advances back to square one. Weber (1922) observed a century ago that a monocratic bureaucracy is superior to all other forms of organization because it relies on rules, regulations, training, supervision, and evaluation of work. This bureaucratic system of control is now being challenged by many organizational theorists and practitioners who argue that the complexities of today require adaptable organizational structures and new approaches to innovation built on co-creation, teaming, participatory practices, and networking (Lilja et al., 2022).

Leaders are now exploring how to create more powerful energy systems through teaming and networking structures (Uhl-Bien and Arena, 2018). The idea of energy being generated through connection systems is grounded in the laws of the universe and how it grows, as revealed in Quantum Physics, Systems Thinking, and Chaos and Complexity Theories (Snyder K. J., 2023). We also know from recent studies of organizational development that purpose-driven organizations tap into the basic interests of their workers, which creates another kind of energy for innovation and continuous improvement (Quinn and Thakor, 2018). This fundamental change in work cultures and societal infrastructures is the backdrop for educators to consider when addressing emerging challenges. To meet the complex task of leading schools in the 21st century calls for a deeper understanding of Systems Thinking in action and how networking structures and the art of teaming can be used to advance education toward the UN sustainability goals (Hawkins, 2018; Holms et al., 2013; Shaked and Schechter, 2017; Snyder and Snyder, 2023).

Helping educational leaders shift from a Newtonian View of organizing (fixed and predictable) to a System's View (emergent) requires knowledge about energy systems. Quantum physics contributes insights that will assist educators in acquiring the knowledge and skills for leading in the 21st century (Acker-Hocevar, 2023; Snyder and Snyder, 2021). The excitement of the atom's electrons and their power to get the attention of the neutrons and protons

in its nucleus is central for connecting with other atoms; the fundamental activity generating life and growth in all living systems. Capra and Luisi (2016) summarize the phenomenon by suggesting that modern physics views matter not as passive and inert, but as being in a continuous dancing and vibrating motion whose rhythmic patterns are determined by the molecular, atomic, and nuclear configurations. There is stability in this dynamic dance. The message? Connections are essential for creating energy, both positive and negative!

This article illustrates how Systems Thinking in action and the role of teaming and collaboration are central features for creating energy in school work cultures to prepare students for 21st-century living and working. During the last decade, the authors have researched the case site school, studying its organizational structures, leadership, quality management systems, and culture. What has emerged through the studies to date is knowledge about how the school evolved naturally, with its Systems Thinking history, into a Human Networked Organization (HNO) (Snyder and Snyder, 2023). The power and role of teaming surfaced as central to developing responsive systems for adaptability (Snyder and Snyder, 2021). Included in the mix is the central role of values, customer focus, long-term thinking, collaboration, and self-organizing for developing high-performing schools (Mårtensson and Snyder, 2023), and the ability of the school to continue to sustain its core through changes in leadership and crises (Snyder and Snyder, 2021).

The next level of research into this human networked structure is to explore and understand how energy for growth is generated and sustained by the networking approach. The term “magic” is used as a metaphor for the energy that appears to be central to this growth. The idea grew out of the school’s own description as “The Real Magic Kingdom” because of its amazing results with students year after year, and the experience parents, kids, teachers, and community members have when they are on the campus. Magic is a phenomenon that occurs when we experience the unexpected without understanding how to explain it. This is akin to the concept of entanglement in quantum physics, which Albert Einstein called “spooky action at a distance” (Isaacson, 2018). He found that when the heat from electrons in an atom is sufficiently strong, certain particles become extremely excited and are propelled into fast action forming a connection that endures over time and space. Entanglement is a unique and powerful energy force, almost a spiritual connection that remains binding over time and space. What is interesting in the context of this article is the magic experience that is generated from quantum entanglement energy and how that experience stimulates growth in the organization. Much like the idea of surprise and delight that stimulates attractive quality (Johnson et al., 2022) magic is the experiential essence that moves individuals and groups forward. It is defined as a concept to describe “a way of thinking that looks to invisible forces to influence events and effect change” (Britannica.com). Magic in this paper is identified as “the edge of possibility,” which requires a fundamental mind shift about schooling and the preparation of youth for success in the growing transformation of living on a global scale. This kind of magic energy pushes the boundaries to new realities for schooling today, which we suggest contributes to sustainable living and schooling.

The purpose of this article is to understand and describe the magical energy that is created in a human networked organization that drive continuous improvement. Findings are presented from an ethnographic study of a school whose work with Systems Thinking and team teaching for over 30 years has led to the development of internal networking structures that enable it to become continuously responsive and adaptive to change. The central questions explored in this article are: How does the school generate energy continuously, with high levels of engagement from adults and students alike, which is often accompanied by *surprise* and “magic”?

2 Background

2.1 Sustainable development as context for educational change

Now more than ever, education has a responsibility to be in gear with 21st century challenges and aspirations, and to foster the right types of values and skills, that will lead to sustainable and inclusive growth and peaceful living together. UNESCO’s former Director General, Irina Bokova, issued a challenge to educators: *A fundamental change is needed in the way we think about education’s role in global development, because it has a catalytic impact on the wellbeing of individuals and the future of our planet* (United Nations, 2014). This is inline with Brundtland Commission definition of sustainable development as the ability to “meet the needs of the present without compromising the ability of future generations to meet their own needs” (World Commission on Environment and Development [WCED], 1987).

In support of this agenda, the World Economic Forum (2016) advanced three clusters of 21st century skills as a new vision for education, increasing the complexity of school learning and assessment in fundamental ways. The *first skills cluster* is the foundation knowledge capacities of literacy, numeracy, and scientific and cultural literacy, which reflects the subject-based curriculum of the 20th century. The *second skills cluster* is a set of essential thinking and communication competencies that include complex problem solving and critical thinking, along with creativity, and collaboration. The *third, and newest skills cluster* to the schooling curricula, identifies essential character qualities, which include curiosity, initiative, persistence, adaptability, leadership, and social awareness.

In response to emerging work requirements, the United Nations (UN) declared its fourth global sustainability goal as *Quality Education*: to ensure inclusive and equitable education and promote lifelong learning opportunities (United Nations, 2017). The UN has created many programs that empower educators to change the way they think and work together toward a sustainable future that integrates the emerging global drama into the curriculum. The pressure to transform the content of school learning has led to another initiative by OECD (Organization for Economic and Community Development) articulated in Education2030 Agenda to find answers to two questions: (1) What knowledge, skills, attitudes, and values will today’s students need to shape and thrive in their world in 2030, and (2) How

can instructional systems be designed to facilitate development effectively in these comprehensive sets of knowledge, skills, attitudes, and values? In an age of sustainability, a systems view, in which the three pillars of sustainable development (planet, economy and social systems) are interdependent, provides a backdrop for addressing such pressing questions.

The idea of a universe that is living, growing, and dynamic as posited through sustainable development theory (Sachs, 2015) needs to be embraced so that schooling can be transformed from static organizational structures, graded and subject-based curricula, and prescribed learning activities. We need a Living Systems Approach for educating youth where people work together around emerging patterns of globalization, climate, water, digitalization, and the human condition, as well as around the careers and work systems that are rapidly evolving. From a 50 years perspective on promoting Systems Thinking in education, and working with educators around the world, it appears that Schooling as it exists in most places today is unsustainable for preparing the next generation either to resolve the global sustainable development challenges, or to advance innovations that will benefit the entire human community. Schooling as we know it is basically out of step with the rapidly emerging complexities of life.

2.2 Systems thinking in education

Systems Thinking in education is not new and has been promoted by researchers and educators for decades (Murgatroyd and Morgan, 1993; Snyder and Anderson, 1986). It is defined in this article as the interrelationships and interdependencies of everything around a common purpose. Quantum physicists observe that the emergence of Systems Thinking is a profound revolution in modern history, for it causes us to shift our approach from fixing problems in machines to promoting growth in living systems (Capra and Luisi, 2016). The major challenges of our time cannot be understood in isolation from everything else, for life emerges as connected systems. For schools, Systems Thinking offers a way of life, in which workers focus on a common purpose, a vision, and a few operational goals, and work together in teams or work groups that function interdependently (Shaked and Schechter, 2017; Snyder and Anderson, 1986; Soderquist and Overakker, 2010).

The Systems Thinking idea promoted by Snyder and Anderson in 1986 was that teams of people work together to create interdependencies and interrelationships among them, strengthening the school as a living system. The model represented a paradigm shift from the traditional, closed culture of the bureaucracy, to an open energy exchange system based on co-involvement, teaming, and continual improvement. Schools were taught how to develop and expand the practice of team teaching by adding permanent and temporary teams that span the organization. In this environment, everyone works collaboratively toward common organizational priorities, assuming that schools are living, growing systems.

Systems Theory enables professionals to respond to the uniqueness of their own school by naturally using many resources, professional talent, and community interests. Common improvement goals tend to be shaped by all professionals and

reflect a reading of what the school's particular student populations need for success (Snyder et al., 2008; Ndaruhutse et al., 2019). Professionals are accountable to their work teams and also for ongoing knowledge development that stimulates change and continuous improvement. The interdependent nature of Systems Thinking enables organizational members to tear down barriers to progress and to integrate work functions toward common purposes (Snyder and Anderson, 1986).

Leading schools from a Systems Approach leads to an understanding that organizations are not built from structure and standard processes as promoted by bureaucratic thinking. The human dimension of a work culture is equally important (Snyder and Anderson, 1986; Snyder and Björkman, 2016). Within the culture of work values and behaviors support growth and development (Schein, 2009). This shift from mere structure to understanding organizational culture is a core feature of a Systems Approach to school development; one that has continued to expand over time and is now argued to be critical to address the sustainability challenges for living and working in the 21st century. After decades of promoting *Systems Thinking* and the interdependency of work systems, and now by witnessing what happens to a school's structure and culture of work over time, we argue that the next level of organizational development is *Network Thinking*.

2.3 Networked organizations: an outgrowth of systems thinking

At the turn of the 21st century, Castells (2000) reported that networking is a natural outgrowth of Systems Thinking along with the rise of connection capabilities found with digital systems. A decade later Everett (2011) projected that networks are the future of organizations, which boast resilience, innovation, and multiple leaders. Networking in human societies has existed for thousands of years (Kramer, 1963), while networking science is a recent development that began in the 1960s around *six degrees of separation between people in Random Networks*. As scientists continued studying networks, they learned there is a more reliable structure in their origin and development; they are not random at all. The concept of the Scale-free Network was born in the 1990s (Watts, 2003) after scholars studied how large computer networks and human networks emerge. Lacking a hierarchical function, scale-free networks are dominated by hubs that stimulate a network's growth. In time the strongest hubs influence the direction of the network as it serves a function for the whole (Barabási, 2003).

A network-based social structure is a highly dynamic, open system organization for capital, management, and information, whose access to technological know-how is at the roots of productivity and competitiveness (Castells, 2000). New qualities of work-life are found in networked systems with teaming, which include high engagement, high degrees of creativity, invention, low staff turnover, better work-life balance, collaboration, scalability, and natural growth (Kates et al., 2021; van Kemenade and Hardjono, 2019). Self-organization becomes the life force and driver of change in work environments as employees learn to adapt

and thrive together at the edge of chaos (Uhl-Bien and Arena, 2018; Laloux, 2014).

In a previous study, Snyder and Snyder (2023) explored how Network Theory could be used to explain new *intra-organizational practices* they found in our case school to support responsiveness and agility in complex times. Based on an ethnographic study of the research site school, a new prototype, called the *Human Networked Organization* (HNO), was proposed to reflect a more stable, resilient infrastructure for becoming responsive during the COVID-19 pandemic. The prototype argues that HNO “connects human activity, values, and customer needs with organizational goals and processes. . . As networks are connected by a common purpose, the human networked organization is driven by a Systems Perspective, which is grounded in common values, goals, and customer needs, and at the same time adaptive and resilient enough to meet complex external challenges, such as global sustainable development.” (p. 10). This application of Network Theory is distinct from most studies of inter-organizational networks that connect different organizations around a common need or purpose (Östberg and Eriksson, 2023).

The HNO model is based on multiple characteristics of networks (Barabási, 2016; Mohrman et al., 2003) including a rapidly evolving dynamic system of interconnectedness, hubs, self-organization, links, clusters, and continuous growth. The study also identified elements of a purpose-driven organization (Quinn and Thakor, 2018) through the culture of engagement that stimulates energy for improvement. These qualities also reflected important features found in Chaos and Complexity Theories that many suggest are essential for organizations to achieve the needed mind shift in the age of sustainability (Uhl-Bien and Arena, 2018; van Kemenade and Hardjono, 2019). In our search of writings in Chaos Theory, we identified six distinct stages of growth that are found in living and growing systems: (1) Growing systems respond to environmental changes; (2) Disequilibrium promotes long-lasting change; (3) Energy builds through connections, (4) Natural systems self-organize, (5) New systems evolve from complete prototypes, and (6) Change is a dance of life and death (Snyder et al., 2008; Snyder and Snyder, 2021).

Acker-Hocevar (2023) projects that in network relationships, the power to act, decide, and influence is found in shared values and beliefs. Shared power contributes to the actions of the network as a whole system. She observes that schools organized around network structures provide opportunity power for everyone to learn more openly and democratically. Network growth leads to continuous sustainability. Smith Rouse (2022) found that the energy generated by a networked organization also creates sustainable organizational cultures through *staying power*. In her exploration of why workers, students, parents, and grandparents remain involved with our case school's active life, long after graduation and decades of work (Smith Rouse, 2022). She found that a sense of “belongingness,” as well as empowerment, were generated by the networked structure of teaming in the school.

2.4 Leading in networks

The power of networking for organizations has led to growth in new leadership theories based on Quantum physics that include

networking leadership and fusion leadership. These theories reflect how human energy systems can be fostered when people, functions, and resources are combined, rather than maintained in separate units, and build responsiveness in complex systems (DiCesare, 2023; Kowch, 2013; Nilsen and Gausdal, 2017). Harris et al. (2023) refer to networking leadership as a “coordinating process of many people from different institutions” (p. 921). This is distinct from the concept of the Human Networked Organization (Snyder and Snyder, 2023) which examines the inter-relationship of people and processes within an organization. Nevertheless, the concept of leading people and processes in networks is the same. As Harris et al. (2023) report, network leadership involves creating conditions for interaction between people through different processes, and informal and formal meetings to facilitate learning. Further, leadership is multiple and simultaneous building on various types of leaders and roles. This finding points to the importance of developing more complex structures of teaming in which leadership is both emergent, distributed, and shared to build resiliency and responsiveness (Johnson et al., 2022).

Fusion leadership suggests another fresh approach to leading that embraces both human factors and structural features to facilitate change and growth. Fusion is a concept in Quantum physics that describes nuclear energy that emerges when two smaller atoms merge and become one larger atom, which generates more energy. Daft and Lengel (2000) use the term Fusion leadership by including passion, heart, and values that become integrated into objective rationale systems.

In education, Hargreaves (2011) explored the concept of Fusion leadership as significant for helping a school transform itself from near extinction to thriving. In his definition, Fusion leadership is based on integrating many different styles of leadership, which are employed at various points of the transformational journey. An essential idea for both ideas about leadership is the recognition that organizational growth is best achieved when human energy is fostered from a place of participation, passion, and interest, and integrated into a community that facilitates connections. As Hargreaves (2011) writes, “Fusion leadership is more than a repertoire or array of multiple skills. It is not confusion or delusion. Instead, it is the psychological integration of personality and a community combined with the knowledge, empathy, and strategic capability to know what parts of one's own and one's colleagues' leadership are the right ones, for the right time and for the challenges at that moment” p. 239.

2.5 Sustaining networks: perspectives from quantum physics

Developing and sustaining organizational networks is a contemporary quest (Miles and Snow, 1992; Moretti and Zirpoli, 2016; Östberg and Eriksson, 2023). When the ties are weakened, the sustainability of a network is threatened (Rohe and Chlebna, 2022). Tunisini and Marchiori (2020) identified many factors that impact the success or failure of networks, including individuals, structure, legitimacy, interaction, and governance. Among key interpersonal variables were trust, shared purpose, and mutual benefit. Ryan et al. (2012) argue that understanding human connections through dyadic relations is central to sustaining

inter-organizational networks. Their theory is derived from the premise that learning and dialog are central to organizational transformation, which when understood, can support sustainability in networks.

In this article, we suggest that there may be another dimension to network success that can be described and understood using Quantum Physics as a theoretical lens. This lens is the very basis from which Network science is derived, rendering the concepts of energy and fusion central to understanding the sustainability of networks. Energy and synchrony matter to a network's growth, for energy is generated by the members and their connections. Scientists have learned that a network grows from within itself, rather than from external forces, as it responds continuously to changing conditions and opportunities (Barabási, 2003). The Science of Complexity now searches for patterns within networks that make them vital and sustainable. Scientists are examining networks and their energy as the new structures for the global age, where networking is fast becoming a primary leadership skill (Kates et al., 2021).

Quantum physics is about energy and matter at the most fundamental levels. It aims to uncover the properties and behaviors of the very building blocks of nature. Consider the atom, which features a nucleus of positively charged protons and neutral neutrons, which is 99.9% of the atom's mass. The bands passing through and around the nucleus are negatively charged electrons that excite the mass, acting as an electromagnetic force on the nucleus. When the nucleus is sufficiently excited, atoms connect with other atoms, becoming molecules and compounds that generate all life forms on this planet. Connections make the difference!

2.5.1 Fission, fusion and entanglement

Nuclear energy is stored in two different forms: Fission and Fusion (Moynihan and Bortz, 2023), which has implications for understanding the metaphor of the atom for organizations. Fission is a nuclear reaction in which large nuclei are forced to break apart (smashed) and release energy. Fission occurs on Earth in colliders when a sub-atomic particle is slammed into a uranium atom splitting it. This crash releases neutrons that collide with other atoms, setting off a nuclear chain reaction and releasing tremendous amounts of energy, although with large amounts of fallout.

Contrary to this is *Fusion*, which is formed by merging (not smashing) two small atoms into one larger atom, resulting from the addition of *hydrogen and helium*. Fusion occurs when small nuclei combine to release more energy, without any fallout; a sustainable form of energy. It is based on the theory of kinetic energy expressed in “mass of the body” “M,” equating to size and number of connections, and the velocity of movement “V,” equating to the number and frequency of connections and activities that increase proportionally.

In some instances the connections from Fusion kinetic energy are so strong they remain binding over time and space, creating an *entanglement of energy* (Jones, 2017). Initially, Einstein referred to entanglement as “spooky action at a distance” (Isaacson, 2018). He found that when the heat from electrons in an atom is sufficiently strong, certain particles become extremely excited and are propelled into fast action forming a strong connection that endures over time and space. Researchers are now

exploring entanglement and its application for human systems and organizations (Swayne, 2024; Yibin, 2024). Applying Fusion kinetic energy to schooling can help to understand how energy is built and sustained in a human networked organization. The challenge for educators is to stimulate strong connections within a school that can endure over time and space; this is sustainability! And, entanglement for those who remain connected to the school over time and space.

Consider Fission as a metaphor for schooling. The natural order of growth and development is smashed routinely by leaders who use external rules, regulations, training, supervision, and evaluation practices to control workers. This *smash* has resulted in much fallout from a recent mass exodus of teachers and school leaders (Scanga and Sedlack, 2023). If we consider *Fusion kinetic energy as a metaphor for schooling* (growing naturally from a networked system of life) energy multiplies from the interconnection of teams across the school. Leaders at all levels of the organization's hub, clusters, and links can use Fusion power to connect workers to increase their energy and adapt, create, and adjust schooling practices to internal and external requirements and opportunities.

This Fusion kinetic energy metaphor, when operationalized, provides a sustainable energy source, without fallout, for continuous development of schooling. Excited electrons (people working and learning together) that connect with the nucleus (Preparing students for success in this global age) can generate sufficient energy for sustainable living and growth. Let us be clear, however, that connections create both positive and negative energy, and either of these is a human choice. A choice can be made for creating ONLY positive environments, which build naturally toward sustainability (another law of physics). *Sustainability is defined here as the positive responsiveness of a living system to changes in the environment.*

3 Methodology

This article is based on an ethnographic study in which an existential-phenomenological approach, inspired by the work of Heidegger (Vagle, 2018), was used to examine how educators describe the experience of working in a Human Networked Organization. Specifically, the aim is to explore *the phenomenon of magical energy* that exists within this type of organizational structure to support its growth and sustainability over time. Phenomenology is a qualitative research approach that aims to understand and describe how people experience and make use of a phenomenon in everyday life (Dowling, 2007). Heidegger distinguishes phenomenology as ontological, suggesting that the essence of any research is to understand how people experience being a part of a phenomenon. Central to his approach, is a belief that individuals are interconnected with their environment, and understanding a phenomenon is thus embedded in the interaction between people and their environment. Unlike other approaches to phenomenology, Heidegger reinforces the belief that research is not merely about putting forth themes that have the potential for generalizing to other contexts (Pham, 2022). Rather, understanding the true essence of experience requires the researcher to explore

and expand the data concerning the historical context in which the experience occurs. This temporality gives rise to a deeper understanding about the present in relation to the past, and the anticipation of a continuance in the future (Pham, 2022).

To understand the essence of what drives sustainable energy in the case site's networked structure, we draw on our experience with the school as part of the hermeneutical process. As a research team, we have been engaged in a long-term ethnographic study of the case site since 2018 examining various aspects of leadership and quality management in the schooling environment. Over the years, we have developed a strong working knowledge of the school's structures and identity during which the model for the Human Networked Organization was born (Snyder and Snyder, 2023; Mårtensson and Snyder, 2023; Snyder and Snyder, 2021). Building on this research, we now seek to understand the magical energy in the network structure that drives the growing culture and performance of the school.

3.1 The case site

CPS is a private school in Tampa, Florida USA with about 550 students, pre-K through middle school, which recently celebrated its 50th anniversary. Members of the student body and teaching faculty are international, bringing global perspectives naturally to school learning. The professional staff and students are organized into learning communities, with many additional special programs offered during the school day, evenings, weekends, and summers to accelerate learning. The curriculum is guided by the International Baccalaureate Program, as well as the values found in the *MORE Model (More Options for Results in Education; Cohen, 2003)*, which encourages brain-friendly learning and social/emotional development. In addition, the International School Connection's *Global Learning Benchmarks* are used to integrate the UN Sustainability Goals with core curricula and pedagogical practice. The professional staff participates weekly in professional development workshops at the school, as small groups and individuals also engage in other programs to advance their knowledge and strategically strengthen the school's performance. State, national and international student, staff and team awards are common, as is the recognition of the school's continuous high levels of performance.

The school has embraced Systems Thinking for 30 years, and because of having the same leader for 25 of those years, the school grew in its teaming and collaboration capacities. These new levels of skill and competence with the system's way of thinking eventually led to interconnections between and among teams, moving beyond interrelationships, which added strength to the complexity of the school's organization.

This CPS school became the prototype for the Human Networked Organization model, which features its structure as the interconnection of Hubs, Clusters, and Links. The primary and central work units are *Learning Hubs* that are supported by *Clusters of services and programs*. Additional *Links* add resources and richness to the learning environment and become the binding agent for Hubs and Clusters to form the Network. Teaming is the dominant work model that exists at all levels of the network

organization (Hubs, Clusters, and Links) from school leaders to students in the classroom. In this network organizational structure, the learning hubs are the focus for all support systems, including administration, which is contrary to the bureaucratic model where rules and regulations guide the administration of learning systems.

As we continued observing *Network Living* at CPS, we became curious about its continuous high degrees of intensity, engagement, commitment, and amazing outcomes. This networked school exhibits higher levels and kinds of energy than we had ever seen in a school as its educators constantly push the boundaries of quality and possibility. But how does the school generate energy continuously, with high levels of engagement from adults and students alike, to new *levels of wonder, surprise, and delight*?

3.2 Data collection

Qualitative data were collected through a whole-school workshop focus group, semi-structured interviews, and observations of the school's daily life. The data collection began with the whole school workshop focus group to gain an understanding of the factors that teachers and administrators perceived to be central to their school's success. The second round of data were gathered from two separate school-wide events that were organized by a lead team in collaboration with the whole staff. These events were chosen to explore more in depth how the concept of teaming took place and was used to generate new energy for growth. The final data collection involved individual interviews with school partners to gain insights from their perspective about how the school generates the energy to sustain the human networked model. Table 1 provides a summary overview of these data followed by a more detailed description.

A focus group was conducted on site for two hours with the entire school faculty and staff ($N = 160$). Participants were asked to reflect on what factors they experienced to be important to keep the school dynamic and continuously growing. Participants were given four questions upon which to reflect that were generated from current doctoral studies taking place in the school about how to develop adaptive and responsive practices to support students. These four areas served as broad themes:

1. *Attractors*: what are the attractors that connect with your work and stimulate the school's magic?
2. *Sticking Power*: what is the glue that creates the holding power for you and your parents?
3. *Teaming*: what is central to your teaming that supports the magic?
4. *Systems alignment*: what organizational systems are important to help sustain and develop the magic of CPS?

The focus group was led by two researchers and a third researcher was an observer. Participants were invited to self-organize into groups of 6–8 persons, resulting in a total of eight groups, and given 30 min to generate a list of factors in each of the four categories below. Following the individual group dialog, each group presented their lists to the whole group and participated in a 1 h whole-group reflection and debriefing session.

TABLE 1 Overview of data collection.

Data collection	Purpose of data collection	Respondents	Time
Whole school workshop focus group	To gain insights into the factors that school staff perceive to be important for developing and sustaining schooling to meet the needs of kids and society; and to understand how their work together sustains the human networked model.	160 participants Face to face on campus	2 h
Group interview 1: FCIS Accreditation team	To explore how the team worked together and with the whole school in a networked model and gain insights into the magical energy that was shaped through different actions: further to explore the role of shared leadership as an important dimensions for sustaining human networked organizations.	3 participants Face to face on campus	1 h
Group interview 2. Voice of Joyce Event	To explore how the team worked together and with the whole school in a networked model and gain insights into the magical energy that was shaped through different actions: further to explore the role of shared leadership as an important dimensions for sustaining human networked organizations.	3 participants Face to face on campus	1 h
Individual interviews	Two external educators who had partnered with the school in the last 5 years were interviewed to gain insights from their perspectives about how the school functions as a human networked organization and what factors contribute to its growth and sustainability.	2 interviews via Zoom	1 h each
Observations	Data were gathered from a variety of contexts in the school overtime including Classroom teachers, division leader meetings, teacher workshops.	Multiple settings with different people	Drawn from observations over time

Group Interviews were held with five leaders from two separate school-based initiatives, in which one involved three teachers/leaders and the other involved two teachers/leaders. These school initiatives were identified to examine the essence of magical energy they experienced and we observed before data collection. The group interviews were conducted face-to-face by the three-member research tea.

Two individual interviews were conducted with external educational leaders who had partnered with the school for many years. Both respondents were known to two of the researchers and were identified based on their personal knowledge and experience in working with CPS. The individual interviews were conducted via Zoom by the researchers. All interviews lasted 1 h and were recorded and transcribed using Microsoft 365.

Observations of daily life have occurred over the last 7 years, including informal conversations with leaders at various levels about life in this network, classroom observations, and participation during network meetings. Notes and reflective journals were kept during the observation processes.

3.3 Data analysis and reflexivity

An interpretative phenomenological approach was used to derive meaning from the data (Pham, 2022) using a layered method, combined with reflexivity. Data were analyzed following a hermeneutic circle that began with a reflective dialog following each interview. During this process, we shared our understanding of what we heard and derived from the experiences shared by the participants. The reflections were embedded in a reflexive dialog involving our knowledge of the school's history, and our potential bias as pseudo-members of the school community. This was a

double hermeneutic (Smith and Eatough, 2012) of empathy and affirmation combined with suspicion about our understanding.

The second hermeneutical stage of the data analysis involved interpreting text from the interviews, following three steps: naïve reading, structural analysis, and comprehensive understanding (Lindseth and Norberg, 2004). During the first round, each researcher read through the transcriptions and workshop documents to grasp the meaning of the magical energy system in the school. Each researcher posted their initial ideas and observations on a Mural (online collaboration tool) that served as the basis for a deeper interpretative dialog, in which reflexivity and temporal aspects of the school's history were included. The second round of data analysis involved returning to the data sets to identify themes and patterns, and key quotes to examine meaning. Data were then compared across data sets to identify major themes to understand how the magical energy system functions to foster and sustain this human networked organization for the final stage of comprehensive understanding.

3.4 Ethics

The case site has a mandate to engage in new research to support growth and development. Within this mandate, they invite researchers to pursue data collection that can be further used for school development purposes, hence an ethics review was not required. The researchers followed the standards for Ethical conduct of research. All participants were informed prior to data collection and gave informed consent to participate. Respondents could cancel the interviews at any time, and also leave the teacher workshop should they not wish to continue in the study. The school permitted us to use their name as part of their goal to share

knowledge about how to lead quality in education. No personal data were collected and all data are used at an aggregate level to explore the phenomenon of energy that is needed to grow and sustain human networked organizations. Researcher bias is built into the phenomenological approach using reflexivity.

4 Findings: describing the magical energy that drives networked organizations

We have been told many times over the years that when visitors walk onto the campus of CPS they experience an energy that distinguishes this school from many others. Time and time again parents share this experience with staff as a kind of wonder and excitement; a surprise and delight. They can see it in the smiles of kids, their inquisitive nature when engaging with one another and their surroundings, and the empathy they show for each other, no matter if they are in the same grade. The staff refers to CPS as the “Magic Kingdom,” where experience is the heart of learning, and caring and empathy with dignity and respect are shared values from the youngest to the oldest.

When we walked the halls of the school, we could see these same experiences echoed in the kids. On one visit, we were guided by a 10 year student who was taking us to the early childhood classrooms. Along the way, we passed a 6 years-old child who was crying. Our student guide stopped and asked the child if they were ok. After a brief exchange, our guide turned to us and said, “I really need to help this child, can you please wait here for a few minutes. I will be right back.” We stood speechless for no one had asked our student guide to stop and help the younger child; it was just a part of their culture, which we experienced first-hand. This added to the depth of our understanding of the sense of empowerment and agency that is fostered throughout the school; it’s not just a word, it is part of the lived experience that adds to the magic. For each human exchange, these acts of kindness spread like wildfire and create an energy of engagement that is hard to deny. We felt it ourselves.

4.1 Interview A: leadership team—preparation for a state accreditation visit

During our interview with one group of teachers/leaders tasked to prepare documents for the school’s State accreditation visit, we gained deeper insights into how they experience the energy system at CPS. Their stories reinforced the importance of trust, mutual respect, shared responsibility, and open communication which were key to creating a work environment that is stimulating, responsive, and continuously evolving. We saw how their words played out in the dynamics between the three teachers/leaders whose respect for one another was evident in both the words they used and their open body language as they spoke, often turning to one another with affirmation. As they described their secret to the magic at CPS it was evident that the micro context of the

accreditation event was a mirror to the full-scale culture of the school. During the interview, they shared the following:

“We are a new team that was created by the new Head of the School. He is so good at making partnerships; we call ourselves the “F4 Dreamteam.” We have very different strengths and we all believe in this school. We looked at the State accreditation standards and divided our work around our strengths and interests. There was no division of power. “There’s so much mutual respect. Our first task was to figure out how to engage the rest of the school in the process because we couldn’t do this alone; So, we decided it had to be fun and engaging. We made a game to get people acquainted with the accreditation standards. This helped us as a school to create a common purpose, shared knowledge, and excitement about the FCIS Accreditation task.”

While listening to their story of whole school engagement, we asked them to describe what they think is vital for creating the energy and engagement to which one responded, “*Enthusiasm. It affects everyone and when someone is enthusiastic, they get on board. It’s contagious. Everyone at our school has a talent or a gift and being involved gave each person an opportunity to contribute their gifts and talents.*” This quote is an example of the role that encouragement plays in developing a culture of creativity and innovation that is central to helping networks grow. “*At our school there is an underlying encouragement of creativity, speaking your mind, and bringing new ideas to the table, whereas in other environments things are done in a certain way because that’s the way they have always been done. The innovation at our school is consistent; it’s continuous. We want to change because it’s what is sustainable.*”

The school was awarded the highest honors by the Florida Accreditation Agency for its documented performance as an independent day school, with praise for the outstanding report prepared by the faculty and staff.

4.2 Interview B: leadership team—the “Voice of Joyce” event

In 2023, the school lost its former Headmaster of 25 years. To honor her, they arranged a life celebration event that took place both on campus and digitally for international friends. The event was designed within 3 weeks for over 1,000 visitors, with features of her life and the school’s growth being featured throughout the school campus and via Zoom and videos. During the interview with the two coordinators, one shared, “*Wow, it’s a tough event to capture in words. It was a magical tribute to honor our friend and all the lives she impacted as an educator. It was a true effort to invite everyone to be included in her life celebration.*”

Her colleague added, “*It needed to happen for that full circle experience of gratitude. There were so many different people around the world that she touched and in so many different ways that we felt it was necessary to provide a space for anyone and everyone to be able to share their gratitude for her in whichever way we could possibly fathom.*” As researchers, having studied schools for years, it was difficult to understand how this event could be imagined and pulled off in such a short time. How could it be organized, designed, and delivered? We didn’t even finish our thought when one of the

respondents chimed in “*Teaming! That’s what it is. It’s a huge team of people.*” She continued:

The current Head of our school realized that many people wanted to be involved in organizing and contributing to the event. And so, he asked us to host the first meeting to get ideas started. We created a time when everyone could meet. People had the chance to say, yeah, I’d really like to be involved and I can meet, or I’d like to be involved peripherally... once everybody was together in the same space. The ideas started to roll. This became the catalyst for getting others involved. Everyone felt inspired to do something. As we continued hosting meetings, we lost a few members and gained a few, and the ideas kept coming. The question became how to include ideas in a way that honors Joyce, and is both logistically and humanly possible?”

Central to the success of this event was a sense of community involvement, with an open invitation to participate; and a sense of shared ownership that evolved. People were given space to act from a place of passion. “*It was important that everybody was enabled to do something and create something in the space. We coordinated the development and helped leadership roles emerge with communication in every form. We were lucky because we have mutual respect, admiration, and deep love for each other. Maintaining respective boundaries was important because this was a very intense time for many people.*”

Digging deeper behind this event, we asked the coordinators what factors they experienced to be significant for teaming during this event. Among them were brainstorming and knowing how to transfer ideas into action, decision-making, taking lots of notes, and in particular having a shared purpose and set of values. “*At our school, we say It’s all about the kids, and with this event, we realized that it was all about honoring Joyce and giving space for people to be involved. We relied on our traditions: the roots of who we are and what we have achieved together over time.*”

4.3 Interview C: two external school partners

Curious about how outsiders perceived the schools, we interviewed two external school partners about how they perceived the school functions as a human networked organization. One is a principal from a school in Europe who has been engaged in a partner project with CPS for 5 years. The other is a former local public school district administrator who has collaborated with CPS for decades. Both respondents identified these key features of the school’s culture: the presence of shared values and trust, collective decision-making based on input from everyone, and a culture of continuous improvement with an Olympic mentality. One respondent shared how the staff was open to new ideas, which fostered trust and the valuing of each member: “*Everybody seems willing to have a connection to others. They are always finding ways to connect their curriculum with other parts of the school. Like connecting the arts back to the curriculum.*”

As researchers, we observed this as well. The arts are structurally a part of the Learning Hubs system in the school’s network to connect curriculum themes across grade levels. This is

made possible in part by the common purpose and consistency in the ways of working that is recognized across the school. As one of the external partners observed, “*They balance the structures that allow people to do the work of educating with shared goals and a consistency of purpose. In the process, they are open to individual voices and perspectives, just like they are with visitors. It doesn’t mean that they all do things the same way or always agree, it means that they feel they belong; they feel a certain level of safety to express ideas new or different, and that there’s a sense that together we’re stronger.*”

4.4 Focus group: a total faculty and staff workshop/focus group

During a whole-school workshop with all teachers and administrative staff ($N = 160$), we explored the question “What creates the conditions for sustaining the “magic” in the school over time”? What became clear from the workshop data was that *the magic behind the human network organization at this school lies in the interplay between the culture and structure of teaming that creates the gateway for relationships and connections to emerge and flourish.*

Included in the attitudes and behaviors reinforced by all groups were trust, respect, dignity, valuing relationships, differentiation, flexibility, autonomy, and a sense of empowerment. Teachers identified several values that added to the attractiveness of the school, including such features as “kids first,” a growth mindset, a community sense, empowerment, positivity, an Olympic mentality, plus a strong sense of belonging. A culture of high expectations, “doing-whatever-it-takes” (DWIT), and going “above-and-beyond-the call-of duty” (A.B.C.D.) kept the energy moving in a cycle of continuous growth and improvement that was grounded in the values.

The glue that binds the network is a shared purpose creating a learning environment where all kids can thrive. These characteristics of the culture appear to generate the energy that is central to the shared experience of magic. Teachers described how they felt respected and trusted by every person in the school, and the sense of empowerment and autonomy that was created. This agency was so strong that you could feel how each person had a clear sense of belonging that contributed to magic in the school.

Magic in this school is supported by a system of teams, which creates the pathway for connections and relationships to form and grow. Relationships are built around a common purpose and a language is developed with a shared vision, behaviors, and attitudes to stimulate the kinetic energy for working together. Communication, participation, clear work processes, expectations, professional development, and an administrative infrastructure are among the factors that keep the energy aligned across the teams and school.

The abstract phenomenon of magic behind the networked structure is human connections that have become interconnections over time. To reinforce Teaming as a highly valued practice, *Teaming among students* became a school goal in the 2024–2025 academic year. A member of our research team observed the Middle School Principal work with the entire student body, along with the faculty, on ways they can improve their teaming

skills by learning basic differences in how they function as individuals while teaming.

5 Analysis: the magical energy system model

The essence of the magical energy at CPS was described and reinforced by the connections and interconnections between people that spawned creativity and innovation and the teaming structure that facilitated the connections. The magic behind sustaining the Human Networked Organization is based on relationships and teaming that converge around a common interest, need, or passion. In the different scenarios described in the results section, an identified need or event was the catalyst that spawned the initial kinetic energy force. Teaming created the pathways through which energy moved throughout the organization, strengthening the energy from Fusion and reinforcing the bonds of the network structure.

Key values that were important for building and strengthening the relationships included a common purpose, language, shared vision and goals, empowerment, shared traditions, trust and respect, communication, curiosity, openness to ideas, multiple opportunities for involvement, and loving with passion and inspiration. The constant movement of energy through relationships carried out in activities spawned constant kinetic energy that sustains the Human Networked Organization. The interplay between this school's capacity to invite and

facilitate connections and then transform idea generation into practice was central to helping the human networked structure sustain and thrive.

In our analysis of all data sets, six major themes emerged as central to the continuous magic generated in this Human Networked Organization.

1. Commitment to the shared purpose, beliefs, and values connects individuals and teams
2. High levels of engagement and accountability in teams generate energy
3. Continuous professional development builds shared knowledge
4. Attractive quality drives continuous improvement
5. A caring culture builds trust, respect, pride, and commitment
6. New leaders help the organization respond to emerging challenges

In [Figure 1](#), these six themes are presented using the atom as a metaphor to represent the interplay between and among all six features and their collective magnetic force to influence the nucleus. The themes are not isolated, but rather live dynamically together, and are central to the continuous magic generated in this HNO. Using Fusion as a metaphor, the performance and magnetic power of the Human Networked Organization becomes an atomic force. This mass or core of the atom contains 96% of the network's strength is stimulated by the interconnection of the six electrical magnetic bands. Many schools use some of these six features, but the interconnection system of these particular six themes as a living



FIGURE 1

The magical energy system for growth in human networked organizations (author's design) (Snyder and Snyder, 2023).

system generates the powerful atomic force of Entanglement. CPS is an entangled energy system because of the growth and power of its strong and complex interconnection system over time and space.

Commitment to the shared purpose, beliefs, and values connects individuals and teams: Examples from the stories shared in the different interviews and workshops illustrated how a shared purpose was central to connecting participants, as was a shared belief about the importance of the activity for their community. The values of respect, trust, and open communication are but a few of the values that underpinned the relationship. The stories also demonstrated how a culture of engagement and accountability to one another was fundamental. The school's shared knowledge of facilitating, planning, idea generation, and execution provided a backdrop that enabled the teams to align quickly. A culture of continuous improvement was supported by a desire to meet and exceed expectations building on the notion of the "Olympic mentality" and attitude "do whatever it takes." Most central to the relationships was an established culture of trust, respect, pride and commitment that created a short-cut to building *ad hoc* teams for the events. As well, the opportunity for distributed leadership to emerge from within the organization reinforced the sense of empowerment and shared ownership that is vital to fostering growth.

6 Discussion

In this article, we explored how a Human Networked Organization can become sustainable over time through the dynamic power of its human connection system. Distinct from other studies examining the sustainability of organizational networks (Kowch, 2013; Rohe and Chlebna, 2022; Tunisini and Marchiori, 2020), this article focused on a network as a structure within a single, non-distributed organization, as distinct from other research on multiple organizations forming a shared network. As presented in the HNO model (Figure 1), some factors reflect the system of energy for sustaining Human Networked Organizations. Like other studies in network organizational theory, a common and shared purpose is a critical starting point (Miles and Snow, 1992; Moretti and Zirpoli, 2016; Östberg and Eriksson, 2023). This becomes the beacon from which and toward which all continuous improvement efforts and decisions are made.

6.1 A culture of continuous improvement and teaming

A strong culture of continuous improvement and values such as trust, dignity, and respect were also highlighted as norms in the case site that also shaped behaviors. While this finding is supported by numerous other studies on the value of organizational culture for organizational growth and excellence (Schein, 2009), the data illustrate how the culture created flexibility and adaptability as new teams were formed to address immediate challenges or needs. This speaks to the importance for leaders to continuously reinforce the values and behaviors of the organization such that they become the

backbone to set free responsiveness and innovation (Johnson et al., 2022; Snyder et al., 2008).

A culture of teaming was another key feature identified in this study as vital to sustaining the school. "Teaming" is used here rather than "teams" to reflect the act or processes of collaboration rather than the structure of working in teams (Edmondson, 2012; Lilja et al., 2022). The literature is filled with tips on how to develop work teams, both *ad hoc* and permanent. Fewer studies focus on how organizations can create a culture of teaming, such that connections become a way of life and serve as a springboard for igniting new energy in response to changing needs (Kates et al., 2021). This perspective is an important contribution to the ongoing dialog about teamwork in contemporary organizations that shifts the focus from structure to culture.

6.2 The importance of continuous professional development

Establishing a culture of teaming was made possible through the continuous professional development in the school in which every person, from kids in the classroom to school leaders, works in a variety of teams that meld and bend with the organization over time. A culture of trust and respect supported the growth and emergence of new teams, which is in line with Edmondson (2012) who found psychological safety to be a key factor in successful teams. Professional development was also central to creating shared knowledge and skills that free workers to be both autonomous and empowered to work on behalf of the whole.

6.3 Leading in a networked organization

Leadership in the case site reinforced messages from earlier studies in Fusion leadership and Network leadership about the multifaceted nature of leadership (Harris et al., 2023), and also yielded new insights. Unlike Hargreaves (2011) who found that Fusion leadership was characterized by assigning leadership types for responsibilities, this study illustrates how leaders were continuously identified based on emerging needs. Rather than having a traditional formal leadership role, classroom teachers are often asked to lead a school-wide process or an event. Leaders are constantly emerging, based on their passion and interest in the task at hand, a finding that is supported by Daft and Lengel (2000). This was in addition to the traditional leadership roles of principal, assistant principal, curriculum director, classroom teacher, and division leaders that had an amoeba-like effect on the school from which new constellations of leaders formed regularly.

Systems Thinking in education is not new, but as Voulvoulis et al. (2022) point out, its lack of application may be due to a lack of training. This article provides additional insights that can inform training and professional development in Systems Thinking. In earlier models of Systems Thinking in education, administrative teams were informing instruction on "what to do and how to do it." In a networked organization, Systems Thinking focuses more on the interrelationship between people,

functions, and needs. In this case, the Hubs are the primary teams (instruction and learning teams), with the clusters (all administrative teams) supporting the primary work of the school in Hubs. The links are additional resources and programs or projects that tie together and strengthen hubs and clusters. This interconnected network structure becomes increasingly complex, far beyond that which occurs within the interrelationship model of a school. The increased complexity of the school as an HNO creates a stronger system of learning and other work, with a greater capacity to ward off threats from both the inside and outside. And, work in the HNO, because of this interconnectivity, is more agile, spontaneous, and adaptive. Why? Because everybody is involved in the interconnection that generates a sustainable school as a living system.

7 Conclusion

This article illustrates how the energy of a human networked school can be reflected in its flexibility, creativity, and learning capacity that resides in communities of practice. New knowledge increases flexibility and responsiveness to demands, for it empowers workers at all levels to function with confidence and skill. A sustainable school is built over time on two basic principles: (1) by employing people who strengthen the school's work culture, and (2) by developing its professional staff continuously with new knowledge, values, and skills for sustaining the school's development journey. Professional learning is continuous and occurs in workshops, study groups, conferences, coaching, on-the-job learning, and eventually, the staff begins training professionals in other schools. Cooperative work systems generate the energy for a school's growth and responsiveness. Eventually, the whole school transforms into a learning community, where everyone is engaged in development activity, forming a network of relationships. This professional energy system generates sustainable conditions for growth over time. A high-performance culture emerges because of its continuous attention to professional learning.

The idea of energy being generated through connection systems is grounded in the laws of Quantum Physics and Systems Thinking. Leaders can create processes that build energy through connections that sustain continuous improvement and innovation. The CPS story about energy as a life force can be illuminating for educators to affirm that schools are not machines to be run and fixed when needed. The Atom's structure is the source of life itself; energy is ignited within the atom. When the electronic dance is sufficient to excite the nucleus to connect with other atoms, generating new energy, the right conditions exist.

Change in natural living systems evolves from continuous connections, both from the external environment and from within the system itself. The quality of connections matters. Negative and positive connections promote different kinds of energy and outcomes, where negative connections build negatively, and positive connections build positively. Where there are no connections, little energy is generated, and virtually no growth. When the connections become dense, the system develops its energy system and direction for growth. Positive connections

promote growth, while negative connections promote decline. This is a law of physics!

Each age throughout human history has designed its approach to educating youth. The idea that the universe is a living, growing, and dynamic system needs to be embraced so that educators are free to transform schools from graded structures with single subject-based curricula and prescribed learning activities to schools that develop strong interconnection systems and cultural norms where students are invited to explore, team, network, and invent together within and across age groups. The atom's function in generating life may encourage educators to toss out the idea of "absoluteness" altogether and adopt a more life-affirming approach to schooling through connection systems. The idea of adding Fusion kinetic energy to the mix, of promoting successful teaming practice with stronger than usual connections nurtures the school's sustainability potential. Magic? Connections provide the initial energy for growth, and when these connections become strong and positive, the school is able to move beyond minimum standards of excellence and into a new magic paradigm altogether. There is no fallout!

Educators can adapt fresh perspectives to explore schools as natural living systems that grow and adapt routinely to changing conditions. Using Fusion kinetic energy as a metaphor can be useful to help teams understand their connections and how the connections facilitate/promote/stimulate the movement of ideas, tasks, and accomplishments. For the energy to move freely, people need to be empowered, to work autonomously enough to make decisions to move, and to be clear about how the movement helps the organization move forward. Kinetic energy can be an important source for building a work culture that fosters connections: trust, respect, dignity, etc. The stronger the kinetic energy in an organization the more agile and adaptive it will be to meet changing dynamics in a landscape of complexity. When the speed of kinetic energy is sufficient, the reaction time to change is minimized.

Data availability statement

The datasets presented in this article are not readily available because the data are from individual interviews and focus groups that are specific to the case site and are not available for sharing. Requests to access the datasets should be directed to kristen.snyder@miun.se.

Author contributions

KJS: Conceptualization, Data curation, Formal Analysis, Investigation, Methodology, Project administration, Validation, Visualization, Writing – original draft, Writing – review and editing. KMS: Conceptualization, Data curation, Formal Analysis, Methodology, Project administration, Validation, Visualization, Writing – original draft, Writing – review and editing.

AM: Conceptualization, Data curation, Formal Analysis, Investigation, Writing – review and editing.

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