Theses and Dissertations

2023

Examining K-12 school leadership through a complexity theory lens

Mandi Lehnherr
mandilehnherr@gmail.com

EXAMINING K-12 SCHOOL LEADERSHIP

THROUGH A COMPLEXITY THEORY LENS

A Research Project

Presented to the Faculty of

The Graziadio Business School

Pepperdine University

In Partial Fulfillment

of the Requirements for the Degree of

Master of Science

In

Organization Development

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by

Mandi Lehnherr

March 2023

This research project, completed by

MANDI LEHNHERR

under the guidance of the Faculty Committee and approved by its members, has been

submitted to and accepted by the faculty of The Graziadio Business School in partial

fulfillment of the requirements for the degree of

MASTER OF SCIENCE
IN ORGANIZATION DEVELOPMENT

Date: March 2023

Faculty Committee

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Committee Chair, Gary Mangiofico, Ph.D.

_____

Committee Member, Miriam Y. Lacey, Ph.D.

_____

Deborah Crown, Ph.D., Dean
The Graziadio Business School

Abstract

Observing the connection between complexity theory and the K-12 education field, I conducted an extensive literature review to discover much research had already been undertaken. However, given the pervasive, wicked problems that still exist, there may be gaps in the operationalization of the findings. The purpose of this research is to determine how school leaders understand the complexity of their school system and if examining school leadership from a complexity lens may uncover practices that could create more effective school operations in dynamic environments. Ten school principals and leaders were interviewed. Five major themes were derived from the data: a) Leadership Style; b) Centering Connectedness and Relationships; c) Shared Vision and Culture Practices; d) Collaborative and Distributed Practices; and e) Flexible and Adaptive Practices. While there is evidence of complexity theory elements, there are other elements that were not discovered. In particular, self-organization and autonomy, equilibrium and disequilibrium, and aspects of shared culture were not identified throughout the study.

Keywords: complexity theory, school leadership, distributed leadership, connectedness, relationships

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Chapter 1: Introduction

The emergence of the COVID-19 pandemic created new levels of complexity across the globe at staggering rates, which resulted in both loss and opportunity for entire countries, communities, and individuals. While the last three years of the pandemic have created a dynamism not yet seen on such a large scale within public education, one could argue the state of public education has always existed within complexity given the nature of its human-centered core in preparing the next generation; education is increasingly becoming a complex profession, teetering on the edge of chaos (Baran & AlZoubi, 2020; Després, 2008; Khanal et al., 2021; Lambert et al., 2020; Morrison, 2002; Reigeluth, 2008). There are shifting competitive education models, an increasing number of teachers not just leaving the classroom, but leaving the profession entirely, and a lack of high-quality and well-trained leaders. Furthermore, the systemic injustices that plague our country are the foundation upon which modern schools were built resulting in stifling segregation, a school-to-prison pipeline, and perpetual oppression for historically marginalized populations (McQuillan, 2020).

The urgent need for change throughout the K-12 education system impacts the quantity and quality of the change that may occur. As Bower (2008) states, "The current climate of school improvement is characterized by a push for quick results. Schools must improve now if not yesterday; change must be immediate; and there is little time for dialogue and reflection" (p. 129). This need for immediacy has resulted in education reform movements surfacing at breakneck speeds across the country, most of which have failed for a variety of reasons, including producing simple solutions for complex problems (McQuillan, 2020) and focusing those solutions on the wrong aspects:

"…school reform changes have lacked sustainability because of their exclusive emphasis on change in instructional methodology and classroom practice while ignoring the organizational structures and culture that provide the support systems crucial to their survival" (Alsbury, 2008, p. 82). Ultimately, all students, particularly those from underserved backgrounds, deserve better; they deserve access to quality education, to a variety of opportunities, and to choose their life trajectory.

However, there is still hope; hope for the opportunity of what school could be for students, but also all stakeholders. McQuillan (2020) states, "in theory, schools embody what should almost be unlimited potential: empowering for students enriching for faculty, satisfying for administrator, reassuring for parents, welcoming for visitors, and a benefit to society overall. They exist in a never-ending state of challenge and opportunity…" (p. 96). This balancing act between challenge and opportunity is one that school principals and their teams face every day. For example, when the COVID-19 pandemic hit the U.S. in March 2020, schools had to reimagine the possibilities of what school could be for students. Speaking from experience, some schools saw this as a challenge: students lost learning momentum, staff was unhappy, and leaders were disillusioned. On the other hand, some schools leaned into this situation as an opportunity: they explored new ways for students to access their learning, new approaches to staff engagement, and considered what it means to be a school. Reigeluth (2008) discussed a similar change: "Just as the industrial revolution made the one-room schoolhouse obsolete, the information revolution has made our current factory model of schools obsolete. Our educational systems must transform themselves to better meet the dramatically changing needs of our children and communities" (p. 36). Our world is changing and the K-12 education field cannot remain

static; ultimately, it must transform for the sake of our students, and school principals and leaders are the ones who can foster this change within our schools. To do so, it is likely that a new type of leader, alongside a new approach, will be required. It is possible that leading through a complexity lens could not only shape the possibilities of what school could be for students, but also advance schools toward eradicating, or at the very least reducing, the pervasive wicked problems of the current educational system throughout entire communities and perhaps even the country.

Complexity theory has its roots in the biological sciences and, in the second half of the 20th century, it was directly applied to the study of organizations and organization theory (Burnes, 2005). Stemming from General and Open Systems Theory applications, complexity theory suggests that organizations must evolve and adapt in nonlinear progressions and networks (Burnes, 2005; Morrison, 2002; Turner & Baker, 2019). Further, complexity theory is grounded within relationships and connections: organisms impact each other and their environment and, in turn, their environment impacts them and others. Over the last 50 years, there have been numerous studies that have shaped the field of complexity theory, particularly within the area of leadership practices (Burnes, 2005; Daneke, 1997; Dolan et al., 2003; Griffin et al., 1999; Keene, 2000; Lichtenstein & Plowman, 2009; Rosenhead et al., 2019; Uhl-Bien et al., 2007). Such studies have explored and uncovered numerous aspects of the application of a complexity theory lens to leadership practice within management and organization theory. In initially comprehending complexity theory, I saw direct connections between it and the K-12 education field, particularly in the aftermath of COVID-19. In particular, I was curious about what role, if any, complexity theory might play in school leadership. After an

extensive literature review, I was surprised by how much research had already been conducted on complexity theory in K-12 education over the last 20 years (Alsbury, 2008; Bower, 2008; Davis, 2008; Davis & Sumara, 2006; Després, 2008; Kershner & McQuillan, 2016; McQuillan, 2020; and Reigeluth, 2008). However, given the extensive challenges that still exist within the K-12 education field, I wondered if there may be gaps in the operationalization of these findings. Further, despite the number of studies within the field, organization development from a complexity theory perspective still appears largely underutilized when considering factors for effective school leadership.

While the implementation of such Organizational Development (OD) practices could have benefits for leaders and teachers (Kershner & McQuillan, 2016; McQuillan, 2020; McQuillan & Kershner, 2018; Morrison, 2002), there is an opportunity to positively impact the outcomes of students. This leads me to question: "Would examining school leadership from a complexity lens, including how principals understand the complexity within their systems, reveal dynamics that would be beneficial to the successful operation of a school, including student outcomes, in complex environments?"

We know that schools find themselves in dynamic environments and leaders need to explore alternative approaches to their leadership to navigate these complexities because current strategies and structures are not producing the results students deserve. One such alternative is the operationalization of a complexity lens for school leaders based on organizational complexity theory. This study contributed to a growing field of research on the topic of effective school leadership in dynamic environments. Through structured interviews with principals and school leaders, this study explored school leaders from a complexity perspective in order to identify what leadership practices

would support the effective operation of schools within dynamic environments. The field of education has shifted substantially over the last century and it continues to evolve at a rapid pace. Reigeluth (2008) maintains that even though our current education systems are doing more than was previously thought possible, our ever-changing world is calling upon them to shift outside of their design: "Therefore, our educational systems must coevolve to meet the changing educational needs of society" (p. 25).

This thesis is divided into five chapters. Chapter 2 includes a review of existing literature on complexity theory and leadership practice and complexity theory and the K-12 education field. Chapter 3 describes the methodology undertaken to conduct this study, including protocols and analysis procedures. Chapter 4 discusses the findings of the study in the scope of five major themes. Finally, Chapter 5 interprets these findings, makes recommendations, details limitations, and identifies areas for future research.

Chapter 2: Literature Review

Complexity Theory: History, Key Concepts & Application

Complexity theory has its foundation in the building blocks of human life:
biology, chemistry, physics, ecology, and mathematics (Davis & Sumara, 2006). While
numerous scientists and mathematicians spent much of the early 20th century studying
complexity within their fields, Ralph Stacey is often credited with recognizing the
application of complexity theory to the study of organizations (Burnes, 2005). Building
upon General and Open Systems Theory, complexity theory is about survival, evolution,
and adaptation; it is organic, holistic, and nonlinear (Burnes, 2005; Morrison, 2002;
Turner & Baker, 2019). Viewing the world through a lens of complexity theory involves
seeing past cause-and-effect and linear predictability and instead allowing for the
emergence of systems that are constantly changing and functioning at the edge of chaos
(Burnes, 2005; Morrison 2002). Ultimately, life, and all that encompasses it, "…is
holistic and profoundly unpredictable" (Morrison, 2002, p. 9). Finally, at its core,
complexity theory is about interrelationships of multiple dynamics. From an etymological
standpoint, the word itself comes from the Latin root 'to entwine' and, within complex
systems, there exists a deep connection between organisms, networks, and their
environments (Morrison, 2002). Wheatley (2006) states, "It's always about *critical
connections*" (p. 45, italics in original), indicating that the significance of these
connections cannot be overstated. Organisms moving within complex systems impact
each other and their environment, just as their environment has an impact on them;
however, these impacts are unpredictable and cannot be known before the occurrence. As
Keene (2000) suggests, "The key message of the theory of complexity is that our world is

not subjective, but it is the result of our interactions with each other and with our environment" (p. 16). The importance of relationships within complex systems has led me to believe this lens may be beneficial across social systems, particularly education.

Several characteristics result in a complex system. However, given the detailed and in-depth nature of complexity there, only the key characteristics that are directly relevant to this research study will be discussed. Complex adaptive systems (CAS) are an essential concept within complexity theory. According to Uhl-Bien et al. (2007), "Complex adaptive systems (CAS) are the basic unit of analysis in complexity science" (p. 229). Related to the critical connections discussed previously, heterogenous agents, or organisms, interact with and affect each other, resulting in a novel, adaptive behavior for the entire system (McQuillan, 2020). A key aspect of CAS is that order often emerges through these interactions, although it cannot be predicted what that order may be. Further, "It is this self-organizing ability which allow such systems to adapt to their environment in order to survive…" (Burnes, 2005, p. 79). A second relevant concept is that of equilibrium and disequilibrium. Equilibrium calls forth a vision of stability, consistency, and balance. Individuals, groups, and organizations often strive toward equilibrium as the end goal: the status quo is typically a comfortable and safe context (McQuillan, 2020). However, within the scientific field, equilibrium is generally the end state of a system; all the energy within the system has been utilized and the system moves toward entropy (Wheatley, 2006). Essentially, if this system remains in equilibrium, it will die as there is no transformation. Thought of in this manner, remaining in equilibrium can become a scary thought for individuals and organizations.

Disequilibrium, on the other hand, which may be viewed with a negative connotation, indicates the potential for change and growth and can ready a system for transformation (Kershner & McQuillan, 2016; Wheatley, 2006). Disequilibrium offers the opportunity for an individual or organization to move toward the edge of chaos and disrupt the status quo of their lives and functioning. A system that remains in equilibrium, albeit stable and safe, will eventually die; disequilibrium is crucial for transformation and survival (Morrison, 2002; Wheatley, 2006). As a third key concept, dissipative structures are directly related to the state of disequilibrium. In dissipative structures, the disorder can birth new order when an organism loses its energy, but a new structure is created from this loss (Wheatley, 2006). The growth is a result of the disequilibrium of the system. During this time, dissipative structures may reach critical points in which they must reorganize into different structures, which are unable to be predicted (Burnes, 2005). These new structures may be referred to as self-organizing systems because they were able to adapt and reorganize in a way that ensures the survival of the system.

These self-organizing systems have emerged through this process (Burnes, 2005; Wheatley, 2006). The self-organized system has emerged from the interaction between the system and the environment and is now better equipped to navigate the challenges it faces (Morrison, 2002). Further, this process is spontaneous and cannot be mandated. According to Griffin et al. (1999), no individuals or groups determine new structures or patterns of behavior; rather, these are produced "…without any comprehensive, prior, system-wide blueprint for the evolution of the network" (p. 302).

There appeared to be a divide within the literature regarding the application of complexity theory. Some authors argued for the direct transfer of complexity theory,

some were vehemently opposed to this for a number of reasons, but most fell somewhere in between, particularly in the use of complexity theory as a metaphor that could be applied to organizations (Burnes, 2005; Daneke, 1997; Kershner & McQuillan, 2016; McQuillan 2020; Wheatley, 2006). This is unsurprising as Rosenhead et al. (2019) detailed three reasons why complexity theory "…could be said to want to have its scientific cake and eat it: 1) challenges with evidence and authority, 2) the discrepancy between real-world complexity and model-based complexity, and 3) equivalence between natural and social systems" (pp. 16-17). Similarly, Barnes (2005) indicates that a direct application of complexity theory to organizations eventually becomes an assortment of vague ideas, as well as the lack of hard evidence to support the prescription of complexity theory into organizational and leadership practices.

In place of any prescriptive practices, Barnes (2005) suggests that although complexity theory does not offer an exacting account of the current or present state, it does offer leaders the opportunity to ask what might be possible for their organizations. Further, Rosenhead et al. (2019) argue for the value that complexity theory holds as a metaphor for leadership practices as many leaders may be able to observe parallels between the theory and their organization to foster innovative ways of thinking and being: "…complexity theory holds significant value for differentiating leadership from management, and for stimulating thought about how leadership can be exercised creatively" (p. 20).

In considering the application of complexity theory as a metaphor, it has been suggested that complexity theory may be useful for social sciences as a means to address wicked problems (Duffy, 2008; McQuillan, 2020; Turner & Baker, 2019). Turner and

Baker (2019) share three types of problems: simple, complex, and wicked. Simple and complex problems both have an identifiable and agreed-upon problem and differ in that simple problems generally have easily identifiable solutions whereas complex problems may have a variety of solutions. Wicked problems, however, do not have an agreed-upon problem or solution; further, each proposed solution may result in a changed problem (Duffy, 2008; Turner & Baker, 2019). Turner and Baker (2019) state, "…wicked problems consist of irreversible characteristics due to complexity, which adds to the complications caused by constantly changing variables, and each wicked problem is each unique in its own context and structure" (p. 15). Wicked problems are usually named as large social ills including climate change, environmental and economic sustainability, terrorism, world hunger, illiteracy, and education reform failures (Duffy, 2008; Turner & Baker, 2019) among others. Wicked problems cannot be resolved using traditional problem-solving practices and protocols.

Within education, Duffy (2008) shares, "The complexity of systems combined with external pressure to change created wicked problems that cannot be dissolved using traditional linear problem-solving techniques because the ways in which problems are perceived and understood evolves with each new proposed solution" (p. 20). Instead, these wicked problems could be considered through a complexity lens that allows for collaboration, participation, and functions across fields, resulting in systems that emerge into complex adaptive systems that are better able to traverse these problems. Uhl-Bien et al. (2007) suggest, "…it takes complexity to beat complexity – a system must possess complexity equal to that of its environment in order to function effectively" (p. 301).

Complexity Theory and Leadership: Themes

Furthering the discussion of the application of complexity theory, one of the areas within organization development to which complexity theory is often applied is leadership theory and practice. A recent review of leadership and complexity literature by Rosenhead et al. (2019) revealed over 3000 references, which they were able to reduce to the top 20 most-cited papers. This indicates not only the significance of the topic but the curiosity surrounding the implementation of complexity theory in modern organizations. Top researchers in the field have shared their perspectives, several of those suggesting complexity theory as a lens through which to practice leadership to achieve different and better outcomes. Uhl-Bien et al. (2007) state, "Complexity science suggests a different paradigm for leadership – one that frames leadership as a complex interactive dynamic from which adaptative outcomes…emerge" (p. 298). Similarly, Lichtenstein and Plowman (2009) highlight that "Complexity science reframes leadership by focusing on the dynamic interactions between all individuals, explaining how those interactions can, under certain conditions, produce emergent outcomes" (p. 1). Throughout the review of complexity theory and leadership practice, multiple themes emerged including distributed leadership, self-organization and autonomy, connectedness and relationships, the significance of shared vision, values, and culture, and a facilitative and supportive style of leading.

Distributed Leadership

One of the first themes to surface from the literature was the idea of distributed leadership. This includes shared control around decision-making processes. Much of the literature focuses on the impact of sharing leadership, rather than exerting control over

employees. Barnes (2005) states, "…top-down change cannot deliver the continuous innovation which organizations need in order to survive and prosper" (p. 84), which indicates that leaders cannot mandate change simply through top-down methods. Wheatley (2006) suggests that top-down leadership or a detailed plan is no longer needed to develop an effective response to challenges. Further, Keene (2000) recommends that distributed leadership could increase the success of the employees: "The art of leadership is the ability to release the potential of those within the organisation" (p. 17), which could create the conditions for self-organization. In shifting the locus of control, leaders will need to exercise new and different skills. Barnes (2005) states that managers need "…to destabilize their organizations and develop the skill of managing order and disorder at the same time. Managers will need to encourage experimentation, divergent views, and even allow rule-breaking…" (p. 82), as well as operate on democratic principles to ensure that leadership and control are truly distributed throughout their organizations. Such practice of leadership skill will allow people to "…become self-managed, productive co-creators which will also release their inherent creativity as individuals as well as that of the whole system" (Keene, 2000, p. 17).

Self-Organization and Autonomy

Once the authority in an organization is accessible to its people, they may now have the freedom to self-organize to support the organization in innovative and meaningful ways. Dolan et al. (2003) highlight the importance of this freedom: "Such autonomous, flexible, and committed workers are capable of articulating their own values and translating them into creative initiatives. A professional without autonomy is not a real professional" (p. 28). This requires leaders to trust people with greater degrees of

authority and allow them the freedom to make decisions based on their professional expertise, capacity, and values. Further, leaders must facilitate certain conditions in order for this self-organization to occur, which can dramatically increase the overall organizational impact. Wheatley (2006) suggests that people must have a clear purpose and intention for their work, set standards for collaboration, and work together as learners and colleagues to co-create their environment: "…if people are free to make their own decisions, guided by a clear organizational identity for them to reference, the whole system develops greater coherence and strength" (p. 87). To address the fear of relinquishing control and allowing self-organization, Wheatley (2006) states that such a system does not need to fester in a sea of disequilibrium due to uncertainty, but rather, "Its stability comes from a deepening center, a clarity about who it is, what it needs, what is required to survive in its environment" (p. 83).

Connectedness & Relationships

One of the core tenants of complexity theory is that of connection and relation. From a leadership perspective, this is the connection between individuals, groups, teams, departments, organizations, and their environment; therefore, leadership is about relationships. As Uhl-Bien et al. (2007) state, "Leadership, however it is defined, only exists in, and is a function of, interaction" (p. 302) and it often transpires in the space between people; "…it originates in the struggles among agents and groups over conflicting needs, ideas, or preferences; it results in movements, alliances of people, ideas, or technologies, and cooperative efforts" (p. 306). It appears this is a crucial perspective for leaders to harness if they hope to build adaptive organizations within dynamic environments as leaders can aid their people in navigating those conflicting

needs. Further, Wheatley (2006) reminds us that, within complexity science, we are meant to participate in our world and we are never alone: "We are constantly called to be in relationship – to information, people, events, ideas, life. Even reality is created through our participation in relationships" (p. 145). It seems this is an essential mindset upon which leaders can build their skills in distributing authority and creating the conditions for self-organization amongst their people. To foster this, leaders must remember, "In this world, the "basic building blocks" of life are relationships, not individuals…We are all "bundles of potential." Relationships evoke these potentials" (Wheatley, 2006, p. 170).

Shared Vision, Values, & Culture

Leaders must play a significant role in creating a shared vision and values in their organization: "The role of leadership will…be one of creating and determining the purpose of the organization – what does it want to be known for, what is the overriding vision and purpose?" (Keene, 2000, p. 17). Leaders must ensure there is a clear and shared vision and values which may contribute to an overall shared culture. The significance of this cannot be underscored because, not only can it create conditions for self-organization, but it can allow the organization and the people within it to move through times of challenge with greater ease. Wheatley (2006) says that "…leaders need to ensure that there is strong and evolving clarity about who the organization is…Even in chaotic circumstances, individuals can make congruent decisions. Turbulence will not cause the organization to dissolve into incoherence" (p. 131). When people within organizations have internalized their north star, making decisions and navigating times of chaos can become less fraught with fear. Dolan et al. (2003) similarly discuss values as "…the glue that holds an organisation together when confronted with chaos and the need

for change" (p. 34). Additionally, Wheatley (2006) implies that if an organization fully comprehends its identity, strengths, and overall purpose, only then will it be a truly adaptative system that can thoughtfully respond to environmental changes. Furthermore, when there exist non-useful adaptations, leaders can support their people in self-referencing organizational vision and mission through the clear articulation of this mission (Uhl-Bien et al., 2007). Finally, instead of perceiving chaos as dire, Dolan et al. (2003) insinuate that in working with organizations, one should recognize an equation that should be cause for hope, not turmoil. The observance of chaos and evidence of transformational leadership with shared values can evoke potential and opportunity.

Facilitative & Supportive Leadership

Wheatley (2006) states that in a chaotic world, leaders, not bosses, are required. Wheatley (2006) emphasizes effective leadership through guiding visions, sincere values, and organizational beliefs. Leaders need to embody a different type of leadership, one in which they are exercising leadership, not management. To illustrate the need for a new type of leadership behavior, one that depends upon relationships, Wheatley (2006) provides a list of novel metaphors to describe leaders: "gardeners, midwives, stewards, servants, missionaries, facilitators, conveners" (p. 165), which all reference the helping and supportive role leaders must play in this process. In turn, leaders may support their people in developing such skills as well. With an emphasis on the importance of relationships, Keene (2000) indicates that leaders must be willing to teach their people a new set of skills to build relationships through open and honest dialogue, cooperation, and embracing differences. If people in organizations embrace, enact, and live these skills daily throughout their work, "Leadership has more to do with *being* than *doing*" (Keene,

2000, p. 17). In this sense, leadership is less about one person in one role, but instead

"…a dynamic of interdependent agents (*i.e.,* CAS)" (Uhl-Bien et al., 2007, p. 307).

Leadership, as an act throughout the organization, can emerge from the conditions

created by the leader.

Complexity Theory and K-12 Education

In first learning about the application of complexity theory to organizations, I

observed parallels between complexity theory and the K-12 education field, particularly

in the aftermath of the COVID-19 pandemic which caused great upheaval throughout the

education system. While a great deal of research exists on complexity theory within

organizational theory and development, I was pleasantly surprised to discover a

substantial amount of research also within the K-12 education field over the last 15 years.

However, upon further reflection, such findings make sense as the current state of

education can be described as a massive social wicked problem that has only intensified

over the years, with repeated failing reform efforts (Alsbury, 2008; Bower, 2008;

Després, 2008; McQuillan, 2020; Reigeluth, 2008).

While numerous social wicked problems exist within the world today, the current

state of education could be considered even more wicked than other organizations given

its very nature. As Després (2008) states,

> …unlike other social organizations K-12 education is rendered even more
>
> complex by the additional factors of adolescents, student-to-instructor and person-
>
> to-space ratios, the relationship of school architecture to learning, funding, timed
>
> scheduled, curriculum development, parental involvement, the perceptions of the

participants and stakeholders concerning education purposes, and the disparity

between research and the field. (p. 251)

While there have been attempts to address these social ills through education reform

efforts, many of these have failed; reasons for these failures are varied but are generally

related to the challenges associated with wicked problems shared previously and the

nature of the reform efforts. Kershner and McQuillan (2016) suggest education reform

efforts fail because they place a large emphasis on the symptoms of systemic failure and

not the causes that underlie it. McQuillan (2020) furthers this by sharing that education

reform efforts often fail "…because the change process is assumed to be a predictable,

linear matter of technical precision. It is not. All educational change involves systems and

systems changes is complex" (p. 95). Similarly, Alsbury (2008) detailed several reasons

why education reforms fail: lack of district support, stakeholder buy-in, finances, and

culture development; however, most studies show that school systems need to take a

more "…systemic approach to reform development and implementation" (p. 78).

Therefore, it appears the type of approach to change has hindered any real

transformation. Despite the varying perspectives on how to approach, much less resolve,

this wicked problem, it is imperative that change must occur. As Reigeluth (2008) states,

"Just as the industrial revolution made the one-room schoolhouse obsolete, the

information revolution has made our current factory model of schools obsolete. Our

educational systems must transform themselves to better meet the dramatically changing

needs of our children and communities" (p. 36).

Schools as Complex Adaptive Systems (CAS)

Within the realm of complexity theory, the concept of entropy is often stated that an organism or system will either evolve or die. School systems will not necessarily die (outside of the dire circumstances that drive schools to shutter), but instead will become "highly dysfunctional" (McQuillan, 2020, p. 108). McQuillan (2020) maintains:

> To thrive and promote robust and equitable outcomes for all…schools, and the larger systems of which they are a part, need to become complex adaptive systems (CAS), systems that can deftly adjust in humane, inclusive, and thoughtful ways to emerging shifts in priorities, practices, and student populations, among multiple other factors. (pp. 95-96)

Instead of continuing the same course, if leaders view their schools as CAS, this may create conditions in which schools can adjust and adapt to internal and external disturbances, develop new responses that are aligned with the changing environment, and endure these challenges (Kershner & McQuillan, 2016). Within the framework of school systems such as CAS, McQuillan (2020) and other researchers (Davis & Sumara, 2006; Després, 2008; Morrison, 2002) have indicated many solutions, which tend to align with leadership themes stated previously. What follows here is a description of these themes within the K-12 education system: the role of the leader, equilibrium & disequilibrium, distributed leadership and self-organized networks, and shared school culture.

Role of the Leader

Much of the research around the role of the leader within the K-12 education field has shifted to support this new perspective as challenges of a complex world suggest a need for a new approach to leadership (Bower, 2008). McQuillan and Kershner (2018)

reinforce this point and name the principal as a critical leverage point, particularly in supporting the school system's flexibility when facing challenges and opportunities. Leaders play a large role in shifting their school systems to become CAS, as opposed to remaining the same, particularly as the style of leadership now shifts from command and control to a more human-centered, interconnected approach (Morrison, 2002). Therefore, a leader has the opportunity to support individuals, teams, and groups through improvement and renewal (Bower, 2008). In this new approach, the leader must be willing to share their authority and control across networks of individuals and teams, be willing to disrupt the status quo for the sake of the organization, and develop a shared culture around which the organization can rally.

Further, the leader must be willing to support people in facing complex and unknown situations. As Pratt and Stringer (2008) state, "A leader in complex, dynamical interactions acts as a facilitator by asking questions to which the answer is not yet known and inviting different perspectives, all the while promoting ownership for everyone who has influence in affecting change" (p. 143). Overall, research has demonstrated the positive impact a strong leader, skilled in the aspect of complexity, may have on their students, their teams, and overall organization (Kershner & McQuillan, 2016).

Equilibrium & Disequilibrium

One of the most meaningful roles a leader can play within a school is to create conditions for disequilibrium to occur (Kershner & McQuillan, 2016; McQuillan, 2020). Kershner and McQuillan (2016) suggest that even though "…equilibrium and the status quo are comfortable states…" (p. 6), schools must be prepared to self-organize in innovative ways that increase adaptivity as "…if system elements continue doing what

they had always done, there is no transformation" (p. 6). Therefore, disequilibrium is vital for an organization's survival and its coevolution (Morrison, 2002; Reigeluth, 2008). Further, this type of equilibrium is required for transformation and external turbulence already enhances this readiness (Kershner & McQuillan, 2016).

Additionally, disequilibrium may also develop from internal perturbations that are implemented to foster change (McQuillan, 2020). McQuillan and Kershner (2018) observe, "Disequilibrium often arises as challenges emerge. Yet challenges also represent opportunities to reconceptualize one's work and generate more satisfying and effective outcomes" (p. 7); consequently, leaders must seek out consequential ways to reframe these challenges as opportunities instead of allowing them to overwhelm their team. Functioning at the edge of chaos can be panic-inducing for people within organizations, but for educators who have grown accustomed to dynamism, disequilibrium is a means to "…eliminate the opportunity gap" (McQuillan, 2020, p. 100) by propelling the organization toward solutions to address underperformance and achievement.

Distributed Leadership & Self-Organized Networks

CAS in dynamic environments requires distributed leadership as it is collective self-leadership and is more about practice than it is a position (Morrison, 2002). The importance of distributed leadership through self-organized networks cannot be understated for an organization, schools in particular. Schools are complex organizations and the locus of this control must shift "…leadership from the "hero leader" to the collective" (Bower, 2008, p. 125). This shift can foster the movement of power from one person, or a few people, to the entire organization. McQuillan (2020) suggests that distributed leadership has the opportunity to not "…only ease the tension on the

principals, but it can make work more meaningful for everyone else" (p. 110) wherein the work undertaken becomes more sustainable because it is shared.

Additionally, the idea that the whole is greater than its parts is relevant, as Davis (2008) suggests: "The fact of the matter is that we have all witnessed the emergence of collective possibilities that exceed the capacities of any individual present" (p. 245). In redistributing leadership across the school, responsibilities are shared throughout the organization, which demonstrates the value of collective decision-making processes (Bower, 2008). This can also create newfound freedom for most educators within the organization, who now have the opportunity to make their own decisions about the change process (Reigeluth, 2008). Research has also demonstrated the benefits of distributed leadership; Alsbury (2008) shared, "Researchers have begun to debate whether teacher leaders, rather than principals, are most effective in leading school reform, raising the question, "Does it matter where leadership comes from" (p. 79). Alsbury (2008) discovered that when leadership was allocated more evenly throughout the school, student improvement increased. Allowing the professional expertise, authority, and capacity of those working most closely with students could have substantial results in classrooms. Therefore, it appears "…the who of leadership may be less important than the what" (Alsbury, 2008, p. 81).

Another important aspect of shared leadership is that it includes all voices, not just those who are aligned with the leader. Rather, divergent thinking, resistance, and disagreement are valuable for self-organization and emergence within a school. In other words, both thesis and antithesis are required to achieve synthesis (Morrison, 2002). Finally, such shared authority and self-organization can support individuals as they build

connections with others throughout the organization. Pratt and Stringer (2008) state, "In the back and forth, ebb and flow, movements between strange attractors, where no one is in control but rather in relation, in this space, we can seek moments to recreate the heart" (p. 148).

Shared School Culture

The benefits of shared vision, values, and culture within an organization were described and are just as important within schools, if not more so, given the very human-centered nature of the work. Alsbury (2008) discovered that shared culture was one of a few crucial conditions for effective reform measures. When people are invested in the organization and are inspired by its vision, they can develop a sense of ownership: "Ownership describes personal connections to the organization, the powerful emotions of belonging that inspire people to contribute… "people support what they create"" (Wheatley, 2006, p. 68). This shared culture aids people in times of chaos in their organizations and can help them own the change process. Reigeluth (2008) indicates that these ideas, beliefs, values, and culture must be a crucial aspect of the individual and collective mindsets during the transformation process. Further, according to Dolan et al. (2003), values can function as disorder organizers within turbulent environments; having shared values (or principles) can support positive outcomes in the long-term (p. 27). Similarly, McQuillan and Kershner (2018) observe, "…shared values lay a foundation for subsequent change and for enacting those changes in ways that maintain fidelity to the overarching vision" (p. 8).

Leaders allow for divergent thinking and perspectives when there is a common culture in which this inclusivity is valued, so long as it is aligned with the vision

(Kershner & McQuillan, 2016). Overall, a leader should prioritize the development of shared vision and values alongside staff. This develops congruency within the organization and allows the leader to walk the talk, so to speak: "…visionary messages match by visionary behavior" (Wheatley, 2006, p. 56).

Definition of Key Terms

Principal and School Leader

These are used synonymously throughout this school as this varies by school type. In particular, traditional districts and private schools are more apt to use the word "Principal" to describe the leader of the building, whereas the phrase "School Leader" is more widely used in charter networks. Both Principal and School Leader refer to the person managing and leading the overall school. This generally includes all administrative and pedagogical functions within a school including, but not limited to, academic programming, finances, operations, and human resources.

Vice or Assistant Principal

The Vice or Assistant Principal is often the second-in-command and serves as part of a leadership team within the school. Some schools have formally identified Vice or Assistant Principals and other schools elect not to have this role or contain these responsibilities within other roles at the school.

Grade and Content Teams

These teams consist of teachers within the same grade level or content subject who meet at regular intervals (weekly or monthly) to discuss students, plan lessons, and collaborate. For example, teams may meet by grade level (e.g., 2nd-grade team, 3rd-grade team) and/or content areas (e.g., math teachers, English teachers, science teachers).

These may sometimes be referred to as Professional Learning Communities (PLCs) in which the individuals gather to analyze student work, learn a new skill, or engage in problem-solving protocols.

Summary

This literature review presented a brief overview of complexity theory, relevant leadership themes, and a synopsis of complexity theory within the K-12 education field. As this review has illustrated, our complex world calls for emergent and innovative approaches in which organizations can adapt and respond intelligently; in particular, we need a different type of leader. This facilitative leader must be able to create the conditions for individuals to continuously evolve through disequilibrium, be compelled by a shared vision and culture, and have the ability to self-organize in emergent ways to take ownership over their work and organization.

Given this information, I am curious if there may be gaps in the operationalization of the findings described in this review. This research seeks to understand how K–12 school leaders understand the complexity within their school system and if examining school leadership from the complexity perspective may reveal the effectiveness of current practices and new practices that could result in stronger school leadership. Further, through the use of one-to-one interviews with principals and school leaders, this research will explore the actual implementation of these leadership themes. Finally, as there appears to be a discrepancy between the research written and what is operationalized within schools, this research will further add to this body of literature by exploring principals' understanding of leadership from a complexity perspective.

Chapter 3: Methodology

Qualitative Research Design

Qualitative research has its roots in anthropology, sociology, and the humanities (Creswell & Creswell, 2018). There are many characteristics of qualitative research design, outlined in Creswell and Creswell (2018), the following of which were utilized throughout this qualitative research study:

- This research study occurred in a natural setting as interviews were not conducted within a laboratory setting. Participants were located at their workplace, in their homes, or in another location.

- In this study, the role of the researcher is that of being a key instrument in collecting and interpreting the data.

- This research study utilized both inductive and deductive data analysis, beginning with inductive analysis which used specific coding procedures to categorize the data into themes.

- The meaning participants made of their role in complexity theory consisted of a large part of this research study.

- While this research study focused on structured interviews with participants, there also existed space for emergent design. For example, while there was a specific list of interview questions that all participants were asked, follow-up questions were asked throughout the interview, which was dependent upon participants' responses.

- The reflexivity of the role of the researcher certainly played a role in this study. I discuss how my background, experiences, and beliefs shaped my

role in this research and the interpretation of the data.

- Finally, this research attempted to explore and discover a holistic account of participants' understanding of and experience with complexity within their school systems. As Wheatley (2006) suggested, to comprehend a system, one must observe both the parts and the whole; these cannot be observed in isolation from each other.

Phenomenological Approach

This research study utilized a phenomenological methodology using one-to-one interviews. The phenomenological approach "…describes the lived experiences of individuals about a phenomenon as described by the participants" (Creswell & Creswell, 2018, p. 13). This research study sought to explore participants' experiences as school leaders in dynamic environments using open-ended questions to uncover how school leaders understood and reflected upon the complexity within their systems.

The Researcher's Role

Given the nature of this qualitative study, I was the primary data collector and interpreter; therefore, identifying personal experiences, values, and biases was crucial so readers may understand how these characteristics have shaped the approach and interpretation (Creswell & Creswell, 2018). My perceptions of the K-12 education field have been shaped by nearly 15 years of professional experience within it, along with my personal experience of attending K-12 public schools in Wisconsin, Texas, and Pennsylvania. I began my career as a special education teacher and have since served as a coach, instructional designer, administrator and, most recently, chief of staff at public and charter schools in New Orleans, Nashville, and Europe. I have also worked within

education nonprofits that focus on training, developing, and supporting K-12 teachers and served as an education consultant for public school districts, charter networks, and education research organizations. Throughout my career, I have worked closely with several school principals and system leaders, which has resulted in a strong understanding of the K-12 education system and a keen awareness of the inner workings of the school principal role. I also recognized my role and understood that I am deeply entwined within this system. Furthermore, I have interviewed several participants that I have worked with previously or am currently working with. So, while I aimed to be as objective as possible, I was cognizant that my experience with these participants may have shaped my interpretations of the data collected. This study began with the understanding that schools exist within complex, dynamic environments and that a different type of leadership may be required to achieve positive outcomes for students.

Bounding the Study

This study was conducted virtually, via recorded Zoom interviews. All communication before the interview, including the consent form, occurred virtually.

This research study utilized purposive sampling as the participants were recruited from my K-12 education networks. Recruitment outreach was conducted via e-mail utilizing the recruitment letter (Appendix A). Participants were school principals or leaders who served for at least one year in a public, private, or charter school. While no geographical considerations or limitations existed, most school principals worked and lived in the greater New Orleans region. Candidates for participation were also sourced through nationwide education organizations, professional networks and associations, and school districts. Additionally, participants made referrals to other school principals who

were available and interested in participating in this research study.

Data Collection and Analysis

Data was collected through one-to-one virtual, recorded interviews during November and December 2022. Given the recruitment outreach methods, participants signed up for a 60-minute time slot via the private Calendly link included in the recruitment letter (Appendix A). Once the participant scheduled the interview, a calendar invitation with a unique Zoom link was automatically generated and sent to the participant and me. The participant consent form (Appendix B) was sent to the participant the day before the interview via DocuSign electronic signature software for the participant to review in advance of the interview. As part of the interview protocol (Appendix C), the participant consent form was reviewed with the participant during the introductory part of the interview. All participants signed the consent form prior to the interview or during the consent form review.

The interview protocol consisted of 11 questions, two of which were informational (about the school principal's role, responsibilities, and school). The questions were adapted from Morrison's (2002) self-assessment questionnaire to judge the school's fitness for complexity and addressed features of complexity theory from an educational leadership perspective. Approximately five minutes were spent sharing the aim of the research and complexity theory background. The purpose of this was to build participants' understanding of complexity theory.

The data analysis process utilized the categorizing strategy of thematic analysis of the interview transcripts following a general approach to data analysis for qualitative research (Creswell & Creswell, 2018). This included preparing the data for analysis,

reviewing the data, coding the data, generating themes, and representing the themes. Further, Tesch's eight steps in the coding process were utilized (Creswell & Creswell, 2018).

Protecting human subjects is a crucial aspect of qualitative research (Creswell & Creswell, 2018; Maxwell, 2013). Participants' identities were protected from the beginning to the end of the study as each participant was assigned a number in documentation such that their names were not associated with the study. This also included keeping calendar invitations private and creating unique Zoom links for each participant. Participant emails, interview notes, video recordings, and other identifying information were stored in password-protected files on a password-protected laptop. Further, the data analysis was reported in aggregate by sharing high-level trends through a thematic analysis of interviews. No individual identities were established in the findings from this research. Further, direct quotes were not attributed to an identified participant; only overarching themes were shared and discussed throughout this research study.

Chapter 4: Findings

This research study collected data to examine K-12 school leadership through a complexity theory lens to explore two research topics: 1) how school leaders understand the complexity of their school system and 2) if examining school leadership from this lens could reveal practices that may create more effective school operations in dynamic environments.

Overview

Ten participants, identified as school leaders or principals, were interviewed for 45 – 60 minutes via Zoom. Upon transcribing and conducting an initial review of the data, numerous possible codes were discovered. To further analyze the data, each question's responses were coded separately (i.e., reviewing and coding all 10 responses to Q2, then reviewing and coding all 10 responses to Q2). This process initially produced 94 distinguishable codes; additionally, the number of instances in which the code had been mentioned and discussed by each participant was counted. Upon further observation, there was an overlap amongst several codes and these were further condensed into wider categories of 27 codes. In a final analysis of these codes, the 27 fell within five major themes: 1) Leadership Style, 2) Centering Connectedness and Relationships, 3) Shared Vision and Culture Practices, 4) Collaborative and Distributed Practices, and 5) Flexible and Adaptative Practices. These five themes, along with their associated codes, can be viewed in Table 1.

Table 1

Five Major Themes and Associated Codes

Themes	Associated Code (Times Mentioned)
Leadership Style	Leaders demonstrate a distributed and democratic leadership style (17)
	Leaders demonstrate a variety of other styles and qualities (9)
	Leaders demonstrate a situational leadership style (7)
	There are internal and external factors that impact the complexity of the leadership style (5)
Centering Connectedness and Relationships	The leader manages stakeholder relationship (24)
	There are high, positive family and community relationships (19)
	Leaders facilitate sensemaking in challenge change processes through emotional processing (13)
	Feedback facilitates relationships (7)
Shared Vision and Culture Practices	Informal and formal feedback processes are utilized (20)
	School teams are organized in formal structures by expertise, content, and/or grade level (19)
	Technology is utilized to facilitate immediate communication (15)
	Leaders and the administrative team make decisions (12)
	The Northstar (vision) guides the school system planning approach (9)
	Communications are logistical and serve to facilitate awareness (7)
	The Northstar (vision) has significance in the complexity of the school system (4)
Collaborative and Distributive Practices	School teams demonstrate high collaborative functioning (29)
	Learning occurs through self-reflection and collaborative reflection with others (25)
	Communications are collaborative, and positive, and serve to support relationships (17)
	Decision-making processes are collaborative and grounded in feedback, with clear roles for individuals and teams (17)
	Problem-solving approaches are collaborative and distributed across individuals and teams (14)
	People cope with and respond to change collaborative (6)
Flexible and Adaptive Practices	The school system planning has a flexible approach (plan tight, hang loose) (11)
	People cope with and respond to change flexibly (10)
	The level of flexibility in the response to the external environment fluctuates (8)
	Decision-making responsibilities depend upon the nature of the decision (5)
	Problem-solving approaches depend upon the nature of the problem and possible impacts (4)

Themes

Leadership Style

Principals were asked directly to describe their leadership style, but this also arose in other questions throughout the interview. A leader's style was discussed in 38 instances with 17 of these falling into the distributed and democratic style of leadership:

- "My leadership style is fairly distributive, collaborative, and inclusive."

- "Accountability is huge to me…working together for the betterment of our students and the community."

- "Teachers are given full responsibility for pedagogical practices."

- "I empower people to make decisions within their locus of control."

Principals also described the use of situational leadership, depending upon their work with individuals, teams, and across organizational circumstances. In nine instances, other leadership qualities were discussed, including "visionary," "top-down and assertive," and "passionate and energetic." Finally, principals explored how other factors may impact the complexity of their leadership including the environment in which their school exists, their background and experience prior to school leadership, and personal relationships.

Centering Connectedness and Relationships

Many principals ascribed to the value of centering relationships within their schools; this was mentioned in 63 instances across five interview questions. In 24 instances, principals identified themselves as the primary manager of relationships across all stakeholders, including supervising administrative teams, operations and human resources staff, and instructional staff, as well as managing external relationships with families, the school board, and the wider community. Relatedly, in 19 instances,

principals discussed positive family and community relationships:

- "We are rooted in our communities…You cannot extract community from school and school from the community."

- "The school is the hub of the community; it is the community."

Another aspect of relationships concerned the principal's role in facilitating sensemaking change processes, particularly in how they make space for their teams:

- "It's just creating space for and validating those feelings even though they are separate from the reality of what needs to happen."

- "The true challenge is to make sure that people see the bigger picture - when they see it, we don't do so badly with change."

- "It's sensemaking with people…slowing the rate of change and the size of change."

Finally, principals identified that feedback processes can help people be in relationships with each other in productive ways:

- "Restorative practices are used to get to know each other better, build trust and relationships, and teach healthy conflict in giving feedback."

- "We make an effort to check in with people, building those relationships so feedback can be easier to give when it's not so great."

Shared Vision and Culture Practices

This theme represented the second highest number of instances mentioned (93), and the associated codes are derived from many aspects of school functioning that may contribute to and provide evidence of a shared vision and culture, including organizing structures, decision-making processes, logistics, problem-solving processes, and

communication. 100% of principals shared that their schools were organized in structured teams that were organized by expertise (e.g., leadership/administrative teams), content area (e.g., math, English, science), or grade level; in nearly all cases, these were formally organized structure as determined by the principal and/or administrative team. In approximately 50% of the interviews, principals revealed that temporary cross-organization teams were formed for a specific purpose, but these staff members would also belong to their more permanent teams as described above. The shared culture was also evident in the description of formal and informal feedback structure, which all 10 participants shared were implemented at their schools:

- "The formal process of teacher evaluation: it is set up by the college of teachers…we see our responsibility to each other as giving feedback and speaking openly; speaking the truth and having ideals."

- "We have formal structures for [feedback] and intentional culture building…but also an informal structure to normalize how we give feedback…Staff development rubrics are a formal opportunity for feedback."

- "[We] solicit feedback through surveys and general input. [We] make a public response time about how we'll implement it."

Principals provided further statements in 22 instances about the use of communications as a method to facilitate awareness and provide information immediately through technology. Next, in 13 instances, principals shared their school vision guides their strategic planning processes and is important when considering the complexity of a school system. Finally, in seven instances, the principals recognized their role as managing the culture and logistics of their school, including making decisions aligned to

the vision in 12 instances.

Collaborative and Distributed Practices

Collaborative and Distributed Practices had the greatest number of responses at 108 mentions across all 10 participants. Similar to a shared vision and culture, these practices were demonstrated across many functions of school operations: team and group structures, communications, decision-making processes, problem-solving approaches, organizational learning, and responding to change. First, in 29 instances, principals shared that their teams demonstrated collaborative functioning, with high inter-team and cross-school collaboration:

- "When we're at our best, there's a rich collaboration about great projects."

- "[There is] a lot of inter-team collaboration daily…it is a hallmark of the school because the expectation is to do so much, to be successful you have to divide and conquer."

- "[It was] obvious who was successful because their data was public. The strongest data person became a magnet for collaboration. This happened more organically…Teachers get tired of admin saying [to collaborate] but when other teachers say it, they do."

Second, in 25 instances, principals identified the use of collaborative practices for helping the organization learn:

- "What is expertise if not lived experience? Habits were created to survive whatever we were going through. [It's a] growth opportunity instead of "I can't do this," …There's your self-awareness, now how you can get past it."

- "After that incident we immediately debriefed - I always want to learn. What do

we need to do differently and what can we learn from it?"

- "We are trying to give teachers the autonomy to try things and learn from them."

- "Staying in communication and listening to each other and being willing to know that I don't have all the answers, be open to what others say."

In particular, three principals highlighted the importance of the historical knowledge of people within the organization:

- "People who have so much knowledge: [they are] gems of people who could help us learn from mistakes and where we need to go."

- "[We use a] standard feedback protocol after we do anything…what went well or do better. [We are] trying to build institutional memory."

Principals also described collaborative and distributive processes for decision-making (17 instances), communicating across the organization (17 instances), and problem-solving (14 instances). Finally, in six instances, principals described supporting people with changes through direct collaboration.

Flexible and Adaptative Practices

In response to their approach to strategic planning considering an uncertain future, approximately 60% of principals subscribed to a flexible approach of "plan tight, hang loose." This indicated the need to create a plan, yet also allow for adjustments. One principal shared, "Why would you look at the situation that's already on edge and then be like, 'We have to meet this deadline?' We set the deadline given the information we had at the time, now that the information has changed, we should say we can pause on this one because it's not as important as this new one." Further, in determining how to make decisions, solve problems, and respond to change, 19 principals responded that it

depended upon the nature of the decision, problem, or change challenge:

- "I try to think beyond the initial decision and show it will continue to impact beyond today…how it will impact or not as the days go on."

- "Context matters so much - some of it is about fundamental systems. Technical and adaptive problems - stuff that has a solution, some clear and some unknown."

Finally, in response to how flexible and adaptable to the external environment their schools were, principals' responses were split evenly between high and low flexibility for a variety of different reasons; while there was not much commonality between these responses, they seemed to be dependent upon the perceived locus of control.

Summary

This section has illuminated the five major themes that were discovered in collecting data through qualitative interviews with school principals. This section has also given context for each of the five themes, including alignment with the overall themes from the literature review. Based on this analysis, this research study will next offer conclusions, recommendations, and other considerations in Chapter 5.

Chapter 5: Summary, Conclusions, and Recommendations

This research study was an exploration of K–12 school leadership from a complexity theory lens and sought to investigate how school leaders understood complexity within their school systems. This study sought to answer the question: "If school leadership is examined from a complexity theory lens, could practices be uncovered that create more effective school operations in dynamic environments?" In interviewing 10 school principals and leaders, five major themes were ascertained from the qualitative data of their interviews. The remainder of this chapter consists of a discussion of conclusions derived from the research study and their relevance to existing literature, recommendations for K–12 school leaders, limitations of the study, suggestions for future research, and a concluding summary.

Discussion of Conclusions and Recommendations

A complexity theory perspective has direct application to the K–12 education field. As previously discussed, the current state of education in the U.S. (and throughout much of the world) is a dire wicked problem that calls for a different approach. If the current state of education is considered a wicked, complex problem, then it must be addressed by embracing the complexity already inherent within and utilizing that to develop solutions not formerly considered.

There were five major themes derived from this research study: 1) Leadership Style, 2) Centering Connectedness and Relationships, 3) Shared Vision and Culture Practices, 4) Collaborative and Distributed Practices, and 5) Flexible and Adaptative Practices. There was a connection and, in some cases, direct alignment between all these themes and the existing research. However, there also exist gaps in themes as theory and

discrepancies in the application of themes into practice. Therefore, while there is evidence for elements of complexity theory within the current sample, they are not fully enacted on a regular basis, nor are they enacted with a sense of cohesion. In particular, the concepts of self-organization and autonomy, equilibrium and disequilibrium, and aspects of shared culture were not identified throughout this research study; this leaves room for the opportunity to explore and apply these aspects in the future, which is an exciting possibility for the field. Finally, it is important to note that one participant interview yielded results most closely aligned with the application of a complexity theory perspective to K–12 school leadership, but it remains an outlier in this data.

Opportunities in Self-Organization & Autonomy

One crucial aspect of complexity theory is the self-organization and autonomy of individuals and groups, including distributed practices. In the literature review, evidence for the importance of distributed leadership practices was found within general leadership practices and those described specifically for the K–12 education field.

Research (Alsbury, 2008; Barnes, 2005; Keene, 2000; Pratt & Stringer, 2008; Wheatley, 2006) has discovered that distributed leadership has several important benefits, particularly when leadership is seen as an act that can exist across the organization, as opposed to one person in a role. When people are able to self-organize, their leader has empowered them to make decisions aligned with their expertise and values and indicates that the leader is willing to distribute their control across the organization. Leaders facilitate the conditions for self-organization to exist and be acted upon, which can great cohesion across the organization (Wheatley, 2006).

It was discovered that within the interviews, there may be self-organization and

autonomy lacking across most schools. Collaborative and distributed practices were a crucial theme derived from this research that spanned several school operations, including leadership, communications, teams, structures, and processes. However, despite having the highest concentration of instances mentioned (108), these collaborative practices were largely determined and implemented by school leadership in formal structures. For example, while there existed collaboration and a degree of distributed leadership in many teams, very few of these teams were actually self-organized and/or self-selected by employees. Rather, nearly all participants identified that teams were determined by school leaders by expertise and formal role (e.g., administration, leadership), content area (math, English, science), or grade level. Self-organized groups did appear, but only to serve a temporary purpose or school focus and then were dissolved. Therefore, this may suggest that principals could more carefully consider how they might empower their staff through self-organization, more fully distributed leadership and decision-making abilities, and greater autonomy in school operations.

Further, this cannot occur if the leader's approach is one of control; rather, the leader must be willing to focus less on their formal role and more on facilitating acts of leadership throughout their school. This could also support the principal in lightening their load, as well as creating more meaningful opportunities in which staff can engage in stewarding the vision of their school. If an organization is able to self-organize, this will allow it to better adapt to both its internal and external environment, which can result in stronger organizational outcomes (Burnes, 2005).

Opportunities in Shared Vision & Culture

In reviewing the literature for both leadership practice and the K–12 education

field, the significance of shared vision and culture cannot be understated. In both areas, a shared vision and culture can support cohesion and productive forward movement within the organization (Alsbury, 2008; Keene, 2000; Kershner & McQuillan, 2016; Uhl-Bien et al., 2007; Wheatley, 2006). As discovered in this research, there are many ways in which a leader enacts a shared vision and culture throughout their schools; in fact, this was the second highest concentration of instances mentioned by principals (93).

Across seven of 10 participants, principals identified themselves as managers of culture within their schools, and all principals pinpointed operational aspects of school functioning aligned to their culture, including school teams, communications, feedback processes, decision-making processes, and planning approaches. This indicates that all principals implicitly recognized the significance of shared vision and culture practices, yet, surprisingly, not one principal explicitly identified their role in creating and fostering a shared vision and culture alongside their school teams. Research has demonstrated this is a crucial aspect of school operations and transformation processes and, if the leader is able to model this visionary behavior, can lead to greater congruency throughout the entire organization (Alsbury, 2008; Wheatley, 2006).

Further, developing a shared vision and culture can create conditions for self-organization, which not only inspires belonging and a sense of ownership, but can also support the organization when it experiences turbulence (Wheatley, 2006). Therefore, something schools and principals could consider is reframing how they approach this aspect of their leadership role; based on interview data, several principals may consider their responsibility alone. However, while principals may own this project, they could thoughtfully engage their employees, and other relevant stakeholders, to develop this

vision and culture alongside them, such that all stakeholder voices are included, hopefully resulting in greater investment and ownership of the vision. Further, principals can identify champions at all levels within their schools to provide ongoing advocacy through behavior modeling and refinement through feedback loops.

Opportunities in Facilitating Equilibrium & Disequilibrium

One of the most interesting findings in the review of existing literature was the idea of equilibrium and disequilibrium; in particular, leaders could create conditions for disequilibrium to facilitate the evolution of their organization. Usually, disequilibrium may be viewed negatively with fear, but leaders may shift their perspective when they realize that when an organization remains in equilibrium, it will eventually die, even though it was safe and stable (Morrison, 2002; Wheatley, 2006). This means that there is the possibility for the transformation of a system within disequilibrium (Kershner & McQuillan, 2016; Wheatley, 2006). Leaders can disrupt the status quo of organizations to not just help their organizations survive, but to evolve into something greater.

As a concept, equilibrium and disequilibrium were not directly asked about or identified independently throughout the interviews as the questions focused more generally on flexibility and adaptability. Flexibility and adaptability were mentioned in 38 instances, specifically around response to the external environment, response to change, and problem-solving and decision-making processes. Six of the 10 principals emphasized an approach to planning that allowed them to develop a solid plan and adjust as needed. There appeared to be a certain amount of control that is exercised within the role of a principal, and while that was also evident in the former two categories, it is most obvious here. Is it apparent from the interviews that principals generally subscribe to a

flexible approach for many aspects of school operations, which could be viewed as balancing disequilibrium, but there was also an inferred need to return to equilibrium as quickly as possible. This control response could stem from a variety of factors, including the traditional approach to school, a principal's background and education, and the overall philosophy of the school system in which they work.

Principals could adopt a more dynamic perspective of their schools to welcome states of disequilibrium. For example, one principal shared a sentiment that deviated from the traditional perspective of schools as systems: "It's a living experience…it's an organism, rather than a system. The system indicates a mechanistic approach. Living organisms are how we view the work we do in our school." However, as this is not necessarily an easily understood or enacted concept, more research could be conducted on what the "edge of chaos" looks like in a K–12 school setting, particularly considering that many school leaders and staff may already feel as though they have been at this edge throughout the COVID-19 pandemic. In considering this theme, schools can be considered CAS; schools can leverage the edge of chaos to learn from and adapt to their external environment as well as address internal disturbances and chart new pathways aligned to their dynamic environment (Kershner & McQuillan, 2016).

Limitations

This research study had several limitations.

1. Small sample size. Only 10 participants were included. While a wide breadth of information was gathered, a larger sample size could garner greater diversity of perspectives.

2. Participant demographics. Nine of the 10 participants fell within the age range of

35–50 years, with one participant above 50 years of age, indicating that the level of experience of participants was not very diversified. Only two participants were male-identifying. While gender role research will not be discussed here, one must consider that this could have an impact on the outcomes of this study.

3. Geographic location. Eight of the 10 participants worked in schools in the Southern geographic region of the United States, primarily Louisiana and Texas; another participant worked on the West coast and the final participant on the East coast. The geographic location, particularly if participants had only worked in these locations for the duration of their careers, could impact the results.

4. Type of school. Six participants worked at charter schools, three participants worked at traditional public school districts, and one participant worked at a private school. While there are similarities between the three types of schools, there are enough differences that could skew the data in one direction.

Suggestions for Future Research

Future research could focus on different areas. First, this data could provide a foundation upon which other studies could be constructed. The findings could be utilized to develop studies in which tests are conducted within school environments across much larger sample sizes, especially on school interventions. Second, there appears to be an opportunity to translate theory into practice by implementing some basic interventions with a focus on the themes identified here and in existing research, particularly on the role of the principal, aspects of self-organization, developing a shared vision and culture, and creating conditions for disequilibrium. Future research may first need to focus on the role of the principal within their school as mindset and practice shifts will likely need to

occur to enact the subsequent changes in the school. The positive aspect of this is that it seems as though principals already enact some of these aspects to varying degrees; this indicates that opportunity, knowledge, and skill are present, but they perhaps need to be cultivated in a more cohesive direction.

Summary

Our increasingly global world has resulted in new complexities that remain misunderstood and under-addressed. The K–12 education field is no different and considering the COVID-19 pandemic, faces new and dynamic challenges. There have been numerous education reform efforts over the past decade, but many have failed for the reasons described supra, in particular because the symptoms are the focus instead of the causes (Kershner & McQuillan, 2016). The challenges faced by the education field are not technical, predictable, or linear; rather they are complex and require complex responses (McQuillan, 2020). Those complex responses also require a different perspective and a different type of leader, which is perhaps the most important learning for me in this research study. This leader must be innovative and creative, and be willing to foster that in others, as well as being unafraid of what emerges throughout the process. Instead, the leader should be willing to embrace the possibility of the unknown and leverage this to support their organization and people towards evolution. In this sense, leadership is not necessarily about one person who was hired into a formal role, but about cultivating acts of leadership throughout an organization to leverage opportunities.

The importance of the role that the leader plays in not only understanding the complexity of the school system and external environment but also in how they may lead their schools toward becoming more like a CAS. This can allow schools to better respond

and adapt to the dynamic environment in ways that result in effective school operations and ensure students can be successful, both in and out of the classroom. The school leader must enable leadership throughout their school, disrupt the status quo of the school for its own sake, and foster a deep sense of shared culture that is owned by all staff. Only then do I believe that we may truly transform the education system for the sake of our students.

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Appendix A: Recruitment Letter

Dear [*Insert Candidate Name*],

My name is Mandi Lehnherr, and I am a graduate student in the Graziadio Business School at Pepperdine University. I am conducting a research study in which I explore school leadership from a complexity theory lens, in particular how school leaders understand complexity in their system and how such a lens may help reveal practices that support a more effective school. I need your help! I am seeking volunteer study participants who have served as school principals/leaders for at least one year in public, private and charter schools to share their leadership experiences as it relates to complexity theory via zoom interviews. No prior understanding of complexity theory is necessary. Your participation in the study will be recorded and is anticipated to take no more than 45 – 60 minutes.

Participation in this study is voluntary, and your identity as a participant will be protected before, during, and after the time that study data is collected. Strict confidentiality procedures will be in place during and after the study. All documents and recordings will be stored in password protected files on a password protected laptop. Further, during the analysis phase, all data will be rolled up into high-level themes and trends; nothing will be attributed back to you and your identity will remain anonymous.

If you have any questions or would like to participate in this study, please feel free to contact me at your earliest convenience.

Thank you for your participation,

Mandi Lehnherr
Pepperdine University
Graziadio Business School
MSOD Candidate
Mandi.lehnherr@pepperdine.edu
615-417-7653

Appendix B: Participant Consent Form

IRB#:

22-10-1969

Participant Study Title:

Examining K-12 School Leadership Through a Complexity Theory Lens

Formal Study Title:

Examining K-12 School Leadership Through a Complexity Theory Lens

Authorized Study Personnel:

Principal Investigator: Mandi Lehnherr, (615) 417-7653, mandi.lehnherr@pepperdine.edu

Key Information:

If you agree to participate in this study, the project will involve: Any gender over the age of 18 School principals/leaders with at least once year of experience leading a public, private, or charter school No prior understanding of organizational complexity theory is necessary; a brief introduction and definition of terms will be shared during the interview Procedures will include a zoom interview that will be recorded and kept confidential This will take no more than 45 – 60 minutes There are no greater than minimal risks associated with this study You will not be compensated for your participation You will be provided a copy of this consent form

Invitation

You are invited to take part in this research study. The information in this form is meant to help you decide whether or not to participate. If you have any questions, please ask.

Why are you being asked to be in this research study?

You are being asked to participate in this study because you are a school principal/leader with at least one year of experience in a public, private or charter school.

What is the reason for doing this research study?

Schools today find themselves in dynamic environments and leaders need to explore alternative approaches to their leadership to navigate these complexities because current strategies and structures are not producing the results students deserve. One such alternative may be the operationalization of a complexity lens for school leaders based on organizational complexity theory. The purpose of this research is to determine (1) how school leaders understand the complexity of their school system and (2) if examining school leadership from a

complexity lens may uncover practices that could create more effective school operations in dynamic environments.

What will be done during this research study?

You will be asked to participate in a 45 – 60 minute zoom interview that will be recorded. You will be asked a series of questions about your leadership experiences and perspectives.

How will my data be used?

Your data will not be shared outside the scope of this research study.

What are the possible risks of being in this research study?

While this research presents no greater than minimal risks to the participants, there is no research that can be considered totally risk-free. This research presents a risk of loss of confidentiality, the potential to become disinterested during the interview and difficulty in scheduling around full schedules.

What are the possible benefits to you?

You are not expected to get any benefit from being in this study. You will not be compensated or receive any compensation for participating in this study.

What are the possible benefits to other people?

Examining school leadership from a complexity theory lens may reveal practices that could benefit the effective operation of schools in dynamic environments.

What will being in this research study cost you?

There is no cost to you for being a participant in this research study.

What should you do if you have a problem during this research study?

Your welfare is the major concern of every member of the research team. If you have a problem as a direct result of being in this study, you should immediately contact one of the people listed at the beginning of this consent form

How will information about you be protected?

Reasonable steps will be taken to protect your privacy and the confidentiality of your study data. The data will be stored electronically through a secure, password protected server on a password protected laptop and will only be seen by the research team during the study and for three (3) years after the study is complete.
The only persons who will have access to your research records are the study personnel, the Institutional Review Board (IRB) of Pepperdine University, and any other person, agency, or sponsor as required by law. The information from this study may be published in scientific journals or presented at scientific meetings but the data will be reported as group or summarized data and your identity will be kept strictly confidential.

What are your rights as a research subject?

You may ask any questions concerning this research and have those questions answered before agreeing to participate in or during the study.
For study related questions, please contact the investigator(s) listed at the beginning of this form.
For questions concerning your rights or complaints about the research contact the Institutional Review Board (IRB):

Phone: 1(310)568-2305
Email: gpsirb@pepperdine.edu

What will happen if you decide not to be in this research study or decide to stop participating once you start?

You can decide not to be in this research study, or you can stop being in this research study ("withdraw') at any time before, during, or after the research begins for any reason. Deciding not to be in this research study or deciding to withdraw will not affect your relationship with the investigator or with Pepperdine University.

Documentation of informed consent

You are voluntarily deciding whether or not to be in this research study. Signing this form means that (1) you have read and understood this consent form, (2) you have had the consent form explained to you, (3) you have had your questions answered and (4) you have decided to be in the research study. You will be given a copy of this consent form to keep.

Participant Name (please print)	
Participant Signature	
Date	

Investigator certification:
My signature certifies that all elements of informed consent described on this consent form have been explained fully to the subject. In my judgment, the participant possesses the capacity to give informed consent to participate in this research and is voluntarily and knowingly giving informed consent to participate.

| Signature of Person Obtaining Consent | |
| Date | |

Appendix C: Interview Protocol

Examining K-12 School Leadership Through a Complexity Theory Lens
Interview Protocol & Questions

1. **Introduction & Consent Review (5 - 10 minutes):** Researcher and participant briefly introduce themselves and researcher engages participant with opening question to put participant at ease. The researcher shares information about the graduate program and reviews the consent form with the participant, answers any questions from the participant and asks the participant to digitally sign the consent form if they agree.

2. **Purpose of Research & Complexity Theory Overview (5 minutes):** Researcher shares overview of research purpose, including researcher question, as well as a brief overview of complexity theory. Researcher asks participant if they have any questions about the research or process before beginning the interview.

3. **Interview Questions (40 – 50 minutes) –** adapted from Keith Morrison's (2002) *A self-assessment questionnaire to judge the school's fitness for complexity*
    a. Please share information about your role and responsibilities.
        i. How would you describe your leadership style (what are qualities and characteristics of your leadership)?
    b. Please share information about your school, including type (public, private, charter), grade levels and any relevant information about students/staff and/or the overall organization.
        i. How is your school connected with its external environment (i.e., families, school board, wider community)?
        ii. How flexible and adaptable to the external environment is your school?
    c. What is the organizational structure of your school? How are teams/groups organized?
    d. How do your employees collaborate within the same team and across teams and with the broader environment (families/community)?
    e. How do your employees communicate and share information within and outside of your school? How is feedback implemented at your school?
    f. Who makes decisions at your school and what is the process for making them?
    g. How does your school solve problems and address challenges?
    h. How does your school cope with unexpected or unpredictable change?
        i. How does the school respond to change?
    i. How does your school learn from its experiences?
    j. How do you approach strategic planning in light of an uncertain and unpredictable future?
    k. Is there anything else you think would be useful for me to know or understand about your leadership and your school's complexity