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Creating a collaborative culture: can online learning circles spark innovation and promote intrapreneurship?

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CREATING A COLLABORATIVE CULTURE: CAN ONLINE LEARNING CIRCLES SPARK INNOVATION AND PROMOTE INTRAPRENEURSHIP?

A dissertation submitted in partial satisfaction

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Doctor of Education in Learning Technologies

by

Christian Deveaux Greer

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Margaret Riel, Ph.D. – Dissertation Chairperson

This dissertation, written by

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under the guidance of a Faculty Committee and approved by its members, has been submitted to and accepted by the Graduate Faculty in partial fulfillment of the requirements for the degree of

DOCTOR OF EDUCATION

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DEDICATION

This dissertation is dedicated to my future self.

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VITA

CHRISTIAN D. GREER

SUMMARY

Senior nonprofit executive, change leader, and community connector with nearly 30 years of 100% relevant work experience. Results-driven certified project manager (PMP, CSM) able to lead collaborative teams and complex projects from conception to completion. Evangelist for empathy-based experience design and increasing the public value of informal STEM learning across multiple demographics. Mission-focused with a passion for measurable impact, amplified brand awareness, and sustainable philanthropic support.

EXPERIENCE

	Michigan Science Center	**Detroit, MI**
2019 – pres.	*President & CEO*	
	Saint Louis Science Center	**St. Louis, MO**
2014 – 2019	*Chief Officer for Science + Education + Experience*	
	Chicago Architecture Foundation	**Chicago, IL**
2013 – 2014	*Vice President of Learning*	
	Chicago Community Trust + DePaul University	**Chicago, IL**
2011 – 2013	*Program Director, Hive Chicago Learning Network*	
	Project Exploration	**Chicago, IL**
2010 – 2011	*Senior Director of Teaching & Learning*	
	Shedd Aquarium	**Chicago, IL**
2003 – 2010	*Senior Director of Education*	
	Denver Museum of Nature & Science	**Denver, CO**
2000 – 2003	*Manager, Theater Programs*	
	Shedd Aquarium	**Chicago, IL**
1999 – 2000	*Manager, School and Outreach Programs*	
1998 – 1999	*Coordinator, School Programs*	
	Brookfield Zoo	**Brookfield, IL**
1997	*Science Instructor (concurrently with other positions)*	

	Adler Planetarium & Astronomy Museum	**Chicago, IL**
1997 – 1998	*Coordinator, Visitor Programs*	
1995 – 1997	*Project Manager, Museum in the Classroom Technology Project*	
1994 – 1995	*Science Educator*	
1993 – 1994	*Astronomy Department Intern*	
1991	*Astronomy Department Assistant (while in school)*	
	SciTrek: The Science and Technology Museum of Atlanta	**Atlanta, GA**
1992 – 1993	*Science Interpreter (while in school)*	

CONSULTING

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EDUCATION

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2021	*Ed.D. Learning Technologies*	
2005	*M.A. Learning Technologies*	
	Northwestern University, Kellogg School of Management	**Evanston, IL**
2010	*Executive Scholar, Nonprofit Leadership and Management*	
	DePaul University	**Chicago, IL**
2009	*Academic Certificate in Project Management*	
	Loyola University	**Chicago, IL**
2007	*Academic Certificate in Project Management*	
	Tulane University	**New Orleans, LA**
2007	*Master Certificate in Business Management*	
	University of Colorado	**Boulder, CO**
2002	*Academic Certificate in Museum Management*	
	Morehouse College	**Atlanta, GA**
1993	*B.S. Physics*	

CERTIFICATES

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2016	*Business Model Generation Master Class License #CVTrust-3556012296*	
	Scrum Alliance	**Indianapolis, IN**
2013	*Certified CSM® (Certified ScrumMaster) License #300823*	
	Project Management Institute (PMI)	**Newtown Square, PA**
2010	*Certified PMP® (Project Management Professional) License #1310032*	
	American Management Association (AMA)	**Chicago, IL**
2010	*Certified Practitioner, Myers-Briggs Type Indicator System (MBTI®)*	
	Human Capital Institute (HCI)	**Washington, DC**
2010	*Human Capital Strategist (HCS®) Designation*	
	Palladium Group	**San Diego, CA**
2010	*Certificate Strategic Balanced Scorecards and Business Metrics*	
	Prosci® Change Management Learning Center	**Peaceful Valley, CO**
2009	*Certificate in Change Management (ADKAR® Methodology)*	

NONPROFIT/PBC BOARDS

	Association of Science & Technology Centers (ASTC)	**Washington, DC**
2018 – pres.	*Nominations, Conference Planning, COVID-19 CEO Task Force*	
	DreamUp	**Houston, TX**
2018 – 2020	*Advisory Board (K-12 projects aboard ISS through Space Act with NASA)*	
	Kids Rock Cancer at Maryville University	**St. Louis, MO**
2017 – 2019	*Leadership Board*	
	Collegiate School of Medicine and Biosciences (CSMB)	**St. Louis, MO**
2017 – 2019	*Advisory Board (Leader, Strategic Planning Task Force)*	
	Diversity Awareness Partnership (DAP)	**St. Louis, MO**
2016 – 2019	*Nonprofit Board (Strategic Planning and Program Committees)*	
	National Science Teachers Association (NSTA)	**Arlington, VA**
2016 – 2018	*Chair, Aerospace Advisory Board (2016-2018)*	

LEADERSHIP

	***FIRST*® Robotics Competition**	**St. Louis, MO**
2015 – 2016	*Competition Judge Committee, FRC St. Louis Regional*	
	Chicago Public Schools, Student Science Fair Inc.	**Chicago, IL**
2000 – 2014	*President, Board of Directors (2012-2014)*	
	Illinois Science Teachers Association (ISTA)	**Peoria, IL**
2009 – 2011	*Director, Chicago Region (7)*	
	Chicago Community Trust (CCT)	**Chicago, IL**
2009 – 2010	*Fellow, Nonprofit Leadership Experienced Leader Fellows Program*	
	Association of Zoos and Aquariums (AZA)	**Silver Spring, MD**
2009 – 2010	*Advisor, Conservation Education Committee*	
	Western Illinois University	**Macomb, IL**
2007 – 2010	*Adjunct Instructor, Graduate Course in Zoo and Aquarium Leadership*	
	Institute of Museums and Library Services (IMLS)	**Washington, DC**
2008 – 2009	*Member, National 21st Century Skills Task Force*	
	Museums in the Park (MIP)	**Chicago, IL**
2007 – 2009	*Chair, Directors of Education*	
	Chicago Community Trust (CCT)	**Chicago, IL**
2007 – 2009	*Supervisor/Mentor, Diversity Fellowship in Arts and Culture*	
	National Aeronautics and Space Administration (NASA)	**New York, NY**
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ABSTRACT

Traditional organizational structures can be stubbornly inflexible and woefully under-optimized for cross-departmental project collaboration. Leaders seeking to innovate within the confines of these structures often have to empower themselves to create ad hoc agile teams that foster creative problem-solving, unlock social capital, and generate value early and often. As the President & CEO of a nonprofit science center in the Midwest, I have discovered that some of our most valuable ideas have sprouted and bloomed because distributed leaders, operating essentially as intrapreneurs, discovered ways to use their informal social networks to break through silos and successfully collaborate across departmental lines. But I have often wondered, what would happen if our distributed leaders could go one step further and collectively redraw the existing lines of organizational structure to foster better collaboration? The following action research study, facilitated during the outbreak of COVID-19, honors distributed leadership and explores how online learning circles can be used as intentional structures for agile project work in virtual spaces to transform traditional organizational frameworks from being hierarchical and siloed, to being flat and flexible, while sparking innovation, promoting intrapreneurship, and creating a collaborative culture in the workplace.

Keywords: agile, collaborative culture, distributed leadership, innovation, intrapreneurship, online learning circles, organizational network analysis (ONA), organizational silos, organizational structure, project management, social network analysis (SNA), social capital.

Chapter 1: Problem, Practice, and Purpose

Overview

This chapter provides an overview of the problem, practice, and purpose of my study. In it, I derive a theoretical framework from the research literature and identify distributed leadership as the lens for my study. I discuss my strategy and approach to facilitating my investigation, and I make the case for why action research was selected as the preferred method for my research process. Included is my overall action research question, which guided my work, and I present online learning circles as an intentional structure for collaboration, which serves as both a vehicle for facilitating distributed leadership and a platform for fostering a collaborative culture. Additionally, my assumptions, limitations, and delimitations are outlined from the perspective of a practitioner-scholar facilitating research within a dynamic and rapidly evolving work environment. Finally, I discuss the significance of my study from the perspective of my role as a first-year president & CEO of a popular science center in the Midwest, having successfully led a financially challenged nonprofit through the COVID-19 pandemic.

Background

Innovation is not always something that can be produced directly by a single person (Nijstad & Paulus, 2003). In today's complex and rapidly evolving business climate, innovation is a phenomenon that often emerges from groups of people working together, sharing ideas, building trust, and committing themselves to go beyond the status quo (Cancialosi, 2017). Although establishing a competitive advantage by employing new technologies or integrating more efficient processes can make organizations better, it is a collaborative culture that typically helps organizations sustain innovation long term (Beyerlein et al., 2009).

Throughout my career, I have often wondered what it takes to create a truly collaborative culture. Does it take a concerted effort to connect professional expertise across functional areas so as to break down silos to form new organizational networks? Does it take leaders who are willing to distribute authority and share the reins of power to foster innovation and change? Does it take the establishment of safe spaces where individual leadership and group responsibility can peacefully coexist? Few would argue that creating a collaborative culture is an easy task, however, it is certainly not an impossible one. In fact, aspects of collaborative culture likely exist within every organization (Rosen, 2007). I found during my study that the real challenge is uncovering it.

Like many CEOs, I have the unenviable job of refereeing the clash of ever-evolving business models and inflexible structures that exists in many organizations (Foss & Saebi, 2015). Organizational structures represent activities within an organization that are directed toward the achievement of organizational goals (Pugh, 2007). For leaders who are going against the grain, breaking down silos and fostering organizational change for innovation within inflexible organizational structures can be extremely arduous (Leslie & Canwell, 2010). In these environments, the silo mentality often emerges. Organizational silos and their associated mentalities, or mindsets, come about when functional departments do not wish to share information with their counterparts in the same organization (Gleeson, 2013). To foster innovation and sustain growth, leaders need to learn how to equip their teams to be both nimble and responsive, even across departments with rigid organizational structures not yet ready for change (Brown, 2009).

Organizational Inflexibility

Something I experience regularly, and one of the most challenging aspects of leading in today's business environment, is the phenomenon of organizational inflexibility, which becomes irrefutably evident when organizational structures resist even the slightest changes to their systems (Koontz & Weihrich, 2015). Inflexibility can place traditional hierarchies under incredible stress and strain, especially when they are accompanied by ill-defined roles and a lack of clear and consistent communication among workgroups. This can greatly limit an organization's innovation potential. As organizational structures, both functional and matrixed, are forced to bend and stretch in an attempt to embrace change, informal social networks among employees often spontaneously sprout out of necessity (Burt, 2004). Much of this bending and stretching is a byproduct of increased collaboration—a practice where two or more individuals work together with a common purpose to solve a problem, achieve a benefit, or affect a result (Schuman, 2006). Although informal networks can pose a more complex challenge for top-down managers to monitor and control, they can be a welcome opportunity for project team leaders in need of new resources. Like many leaders in similar positions, when facing a growing need for more collaboration and innovation across internal teams, I have to continually redefine roles and realign organizational structures to better support organizational flexibility as business needs change (Rosen, 2007).

So, how much flexibility does an organization need to achieve its innovation potential? Quite a bit. Sylvestri (2012) points out that an organization's leaders have to learn to deal with ever-increasing complexity in the workplace because more flexible structures often seem to seek a balance between both multidimensionality and simultaneity in the workplace, particularly when they need to support collaborative environments for innovation. Organizations that grant their

leaders the autonomy and flexibility required to alter lines of communication, while reconfiguring processes on the fly, can have a considerable advantage. However, the notion of how much structure is appropriate is still the quintessential question facing CEOs and senior leaders who operate organizations and researchers studying how organizations adapt and change over time (Davis et al., 2009).

Boundaries and Silos. Simply put, organizations are constructed primarily around formal connections (Daft, 2001). These connections are typically outlined in organizational charts, which are used to display the positions and reporting relationships among staff members in one or more business units within an enterprise. Formal connections are almost always recognized as legitimate connections, whereas informal connections—although sometimes more accessible and productive—are generally not officially recognized or valued. A lack of legitimate connections between individuals and workgroups within an organization can have the potential to create a slew of invisible boundaries. If these boundaries are too rigid, they can greatly attenuate communication, isolate employees, and reduce opportunities for culture change and innovation (Jones, 2013).

Two of the most common structural barriers within organizations that affect legitimate connections are vertical and horizontal boundaries (Ernst & Chrobot-Mason, 2011). They exist naturally within organizations and can both help and hurt innovation. Vertical boundaries can act as both ceilings and floors and tend to separate employees from one another and reduce opportunities for communication (Jones, 2013). Vertical boundaries are primarily based on rank and privilege within the organization. They are commonplace in functional organizations, which are organizations that are oriented around related departmental activities. This top-down/bottom-up approach creates a natural separation between business unit leaders, managers, and teams of

organization employees on the ground floor who are doing most of the heavy lifting. In this model, business strategy and strategic direction tend to flow downward through the chain of command.

I have witnessed horizontal boundaries appear almost instantaneously when two or more organizational structures merge into one unit or project. A common term used to illustrate the effect of horizontal boundaries is organizational silos. Silos exist for many different reasons and can emerge completely by accident or default (Lencioni, 2006). They can be designed and created with intent and be used to organize business units by like kinds. Silos serve as invisible walls separating groups according to their functions and expertise and can contribute to fierce conflicts between groups if one group is favored or if resources are unfairly distributed (Stone, 2004). When you add cross-departmental projects to this mix, particularly projects that require high levels of collaboration, the limitations of traditional top-down structures become amazingly apparent.

Many CEOs find that one of the simplest methods for organizing people is the functional organizational structure, in which expertise and activities are grouped departmentally. Functional structures can have both vertical and horizontal boundary layers and are quite easily identified in stratified hierarchical organizational charts. On the opposite end of the spectrum is the projectized organizational structure, which can be defined and redefined on a project-by-project basis as requirements change and increases the need for improved collaboration. Like many of today's tech startups, projectized structures tend to be more open and flat (Giang, 2015).

Relationships Between and Among People. It is almost universally recognized that organizations are fundamentally based on relationships between and among people (Jones, 2013). Organizations utilize project structures to help people, or employees, capitalize on those

relationships and work together better to bring innovative ideas to life. Although resources and processes are extremely important in the process of managing projects and creating deliverables, many project managers view people as a project's most valuable asset. However, people can also be a project's greatest challenge. Daft (2001) asserts that when people gather together and interact to perform functions that help them to achieve one or more goals, an organization is effectively established. Daft (2001) considers organizations as "social entities that are goal-directed" (p. 12). The social aspect of an organization is perhaps its most dynamic variable, and it expresses itself directly through the connections between and among people.

Cross-departmental Collaborative Projects. The Project Management Institute (2017) defines a project as a temporary group activity designed to produce a unique product, service, or result. These three important outputs, when produced, are often the best indicators that a project was undertaken. Nokes and Newton (2007), referencing the Project Management Body of Knowledge (PMBOK), define project management as the practice of initiating, planning, executing, monitoring, controlling, and closing out the work of a team to achieve specific goals and meet specific success criteria at a specified time in the future. Although the discipline of project management has evolved significantly over the years, the basic concept of a project has not (Verzuh, 2016). From conception to completion, every project has the potential of creating something new and useful. Projects are often thought of as vehicles for innovation that create value for an organization (Kerzner, 1998).

The internal connections between and among people within an organization are often revealed during cross-departmental projects. These projects are created after a new business need or major strategy gap that affects two or more departments within an organization has been identified (Project Management Institute, 2014). Strategy gaps often call for large-scale strategic

initiatives to be developed that may impact multiple business units. New projects can be launched from these initiatives to bridge gaps and create highly visible innovations that help to further the objectives of the organization (Verzuh, 2016). Project team leaders, managers, team members, owners, and sponsors, each play a significant role in these projects. Project activities do not have to be simultaneous, but they do have to be carefully coordinated as the project progresses. Cross-departmental projects can allow for the work to be done in series, where deliverables get handed from one group to the next after they are completed. However, this approach requires heavy configuration management on the part of the project leader to ensure that everything fits.

Project team leaders are often responsible for the human dimensions of a cross-departmental project and not just mundane project elements such as schedules and deliverables. Cross-departmental projects, although complex, can be extremely collaborative. Many of the most notable products and services we see today—brought to us by innovative for-profit organizations such as Google, Amazon, Tesla, UBER, Zappos, and others—facilitate projects that are both cross-departmental and collaborative, with small capable teams of talented individuals. These projects often live or die based on how well project team leaders can motivate a given set of diverse team members to work in harmony with each other.

Because innovation projects require such intense interaction among team members, project team size and meeting frequency are often limited (Verzuh, 2016). CEOs and high-level project team leaders have to ensure that team members are incessantly open to change and able to adapt to and integrate diverse workplace cultures as the project is being executed. In environments like these, collaboration takes center stage and becomes an extremely significant factor in project success (Rosen, 2007). The success of cross-departmental collaborative projects

ultimately rests on how well project team leaders and team members can work together across organizational silos to ensure that their jobs get done (Martin, 2010).

My Problem - From Silos to Social Networks

This leads me to my primary concern. Facilitating cross-departmental projects often means finding creative ways to successfully navigate the complex confluence of ever-evolving business models and incredibly inflexible organizational structures. For CEOs, this work can be amazingly abstract and hard to translate into real-world implementation. Project team leaders seeking to innovate as they adapt to volatile market conditions and dynamic business environments can also have a difficult time.

In my organization, a nonprofit science center in the Midwest, we are just beginning a relatively dramatic shift from traditional, more methodical, methods of project management to more agile, value-based, empathy-driven approaches to getting things done. When this shift occurs in organizations it can lay the groundwork for enterprising individuals to openly dismantle departmental silos and traverse functional areas to find new ways to successfully collaborate (Wysocki, 2009).

As our internal silos are slowly breached, informal and social networks have begun sprouting spontaneously. They have been largely hidden from view. Their lack of visibility has reduced the opportunity for them to be effectively recognized as sanctioned pathways for organizational change (Cross & Parker, 2010). Our traditional meeting structures have been defined and organized around formal functional groupings, such as departments or projects. The emerging informal networks that are powering most of our current innovative practices are starting to make their presence known, but they are still nascent and nearly invisible.

Project team leaders often find themselves under extreme pressure to maintain the delicate balance between prescribed formal meeting structures, all too often rooted in leadership hierarchies, and informal social networks, which tend to be more distributed, democratic, and flat (Daft, 2001). As President & CEO, I feel this pressure daily. However, if we are ultimately going to expand and scale, we will need to facilitate a formal transition from a state of organizational inflexibility with rigid departmental boundaries, to a more open, flat, and socially networked structure that allows for greater autonomy, agency, and the freedom to foster a collaborative culture.

My Practice - A Nonprofit Organization

An Average Science Center. My practice is situated at the Michigan Science Center (MiSci), where I work. It is one of the foremost cultural organizations in Southeastern Michigan. On the border of the United States and Canada, and located in Midtown Detroit, we are a 501(c)(3) nonprofit organization, funded generously by foundations, corporations, philanthropists, supported by members, and visited by guests who pay general admission. Although MiSci is unsupported by the local tax base, the center is still valued and recognized by its audiences, communities, and partners as the region's home for informal learning in science, technology, engineering, and math (STEM) and engages multigenerational audiences through its innovative hands-on exhibits and events, as well as onsite, offsite, and online programs. Our facility has several theaters that serve as our primary drivers of visitation. We have a four-story IMAX Dome theater, a digital planetarium, a 4D theater, an electricity demonstration theater, an early childhood dress-up theater, and a science demonstration stage. MiSci is part of a larger historic cultural district composed of several sister organizations that serve the region's families, schools, and communities in various topics of interest. Under my leadership, and in partnership

with our Board and leadership team, MiSci has been gradually transforming the way it does business. Since accepting the position, my objectives have been to reframe the mission of the organization, develop a new strategic framework, evolve our business model, galvanize our internal team, and reimagine our brand.

History of the Science Center. On November 20th, 1970, the Detroit Science Center was incorporated as a nonprofit corporation under provisions of the State of Michigan Public Act 327 of 1931. As a nonprofit, the Center operated under the United States Internal Revenue Service Code 501(c)(3) Tax Exempt Organization and Sec. 509(a)1 Non-Private Foundation, where all contributions, bequests, and other gifts are tax-deductible as provided under the IRS Tax Codes and Regulations.

Before 1970, only a modest amount of progress had been made toward the establishment of a science center to serve the nation's sixth-largest city at the time, despite the interests and efforts of many Michiganders and the city government. A true breakthrough for the Center came in February 1970 when the Dexter M. Ferry Jr. Trustee Corporation agreed to provide incubation funding for the development of a major science center to be located in Midtown Detroit's Cultural Center.

Planning began with meetings involving at least a dozen of America's leading science center experts. Plans were outlined for raising the funds necessary for the design, construction, and operation of the first stage of the Center's permanent home. In the summer of 1970, a storefront at E. Forest was leased, quickly renovated, and used as a pilot science center. During this period, the architectural firm of William Kessler & Associates was commissioned to develop preliminary designs and plans for a permanent science center consisting of a half-million square

feet to be located on seven and a half acres of land bounded by Warren on the south, John R on the west, Farnsworth on the north, and Brush on the east.

For the next eight years, the storefront operation provided opportunities for city youth and others to engage in the unique experience of constructing scientific exhibits and participating in scientific demonstrations. During this time, the staff also developed the skills required to run the day-to-day operation of a science center. The storefront center served the general public and was toured by thousands of K-12 students from public and private schools.

On January 23rd, 1976, the official groundbreaking occurred for the 45,000-square-foot building. This unique structure consisted of three levels: ground, plaza, and exhibit hall. A primary feature was the IMAX® Dome Theatre with its 67.5-foot dome. The dome was conceived as a tilted hemisphere where large frame 15/70mm IMAX® films are projected over most of its surface. When the completed Detroit Science Center opened in 1978, the IMAX® Dome Theatre was only the third dome and eighth giant screen theater in the world. Today, the IMAX® Dome Theater remains the sixth oldest still operating.

Plans to transform the Center into a leading institution for science education began in mid-to-late 1998. In December 1999, the Center broke ground for a $30 million expansion and renovation of the original permanent building. The New Detroit Science Center reopened in July 2001 as the centerpiece of the Detroit 300 festivities. The building expanded to more than 110,000 square feet and housed a variety of new exhibits including a Science Stage and Sparks Theater where live science shows were presented. The new Dassault Systèmes Planetarium opened slightly later in December 2001.

In September 2008, the IMAX® Dome Theatre was renovated and renamed in honor of Chrysler's million-dollar donation to the organization. In March 2009, the Toyota Engineering

4D Theater opened and featured a 166-seat interactive experience to science center visitors. In the fall of that same year, the Thompson Foundation funded a new four-story, 80,000+ square foot building attached to the Center. The addition provided a new main entrance, store, group space, and the 480-student University Prep Science and Math Charter Middle School.

Unfortunately, in September 2011, an internal financial crisis forced the unexpected closure of the Detroit Science Center. In the spring of 2012, a group of former board members and philanthropic community leaders worked together to found a new nonprofit called the Michigan Science Center (MiSci). This organization purchased the former Detroit Science Center facility and reopened it as a new science center affectionately known as MiSci.

Mission, Vision, and Values. MiSci has retained its current mission statement, which focuses on inspiring curious minds of all ages to discover, explore, and appreciate STEM in learning environments that are creative and dynamic. However, a new core value proposition, We put YOU at the center of science, is something that, as President & CEO, I proposed to the Board of Directors in 2020 at the beginning of the COVID-19 crisis, shortly after we were forced to close the science center to the public and staff. I believed that, given the potential challenges ahead, as a struggling nonprofit amid a pandemic, we might need to simplify our focus since we were finding ourselves under enormous pressure to reduce our budget through furloughs and unpaid leave that affected nearly two-thirds of our extremely hard-working and dedicated staff. Although this new value proposition is easily stated and envisioned, it is not necessarily something that will be easily achieved. To continue to facilitate lifelong and life-wide learning at MiSci and positively impact the people of our local community, our region, and our state, I believe that a new conceptual strategy is required: one that integrates science education programs and gallery experiences in onsite, offsite, and online spaces. Currently, these modes of operation

are not very well integrated internally, adding to the difficulty of effectively engaging audience segments in participatory STEM learning.

Our Internal Structure. When I arrived at MiSci in 2019 as the new President & CEO, one of the first things I noticed was that our current organizational structure, like many other science centers across the country, was siloed, extremely inflexible, and under-optimized for the execution of innovation projects. This was not just my opinion. It was a perspective shared by many at the organization, and by several members of our Board of Directors. I found the issue became even more pronounced in cross-departmental collaborative projects, making the process of leading innovation and change a struggle for our project leaders who often needed to work outside the vertical lines and standard reporting structures to achieve success. However, I was very pleased to learn that we had several project leads who were willing to take risks to create something new and of value for the organization. I thought of them as intrapreneurs, adventurous leaders who frequently go against the grain, impact internal culture change, and challenge an organization's status quo (Goldberg, 1986). Given the state of the organization at the time, however, and our considerable lack of resources, it was difficult to fully support their efforts.

Intrapreneurial Leadership. Upon closer inspection, I quickly discovered that many of our intrapreneurial leaders had created ad hoc teams and task forces that regularly tapped the hidden expertise of our informal social networks. In many organizations, teams built from these networks are rarely sanctioned. They spontaneously emerge when there is an identified need to create workarounds or promote backchannels of communication for project coordination (Jones, 2013). It became incredibly obvious to me early on that several of the most successful and intrapreneurial project team leaders at MiSci succeeded by courageously going outside of departmental lines and silos to help produce the innovative exhibits, events, and learning

programs that were making a difference. The success of these ad hoc task forces and off-grid projects underscored the critical need for our science center to adopt more flexible and adaptive organizational structures with improved clarity regarding leadership roles on collaborative project teams.

How I Got Here. This situation, although challenging, was not new for me. In my prior position as Chief Officer for the division of Science + Education + Experience (SEE) at the Saint Louis Science Center, I was responsible for providing leadership and strategic direction for the division. I also served as a coalescing agent for cross-departmental projects and promoted efficient, effective, and responsive approaches to both the onsite guest experience and community engagement. I oversaw several key areas including science, education, exhibitions, production, programs, strategy, design graphics, research and evaluation, collections, community engagement, and museum planning. Immediately after accepting the position in 2014, I determined that it would be valuable for the SEE division to reframe the organization's mission and use it specifically as a value proposition rather than just a guiding principle. With this in mind, I decided to facilitate several strategic-thinking exercises themed around creatively achieving the mission—to ignite and sustain lifelong science and technology learning—using the effective integration of multiple departments in the division of SEE to foster lifelong learning for our audiences. These exercises were implemented with groups of task forces composed of department leaders and managers. Each task force met for about six to eight weeks to address several important topics such as mission interpretation, igniting and sustaining lifelong learning, and STEM education.

Toward a Collaborative Culture. After the task force meetings, the task force members suggested that cross-departmental collaboration might be best facilitated through organizational

realignments, redesigned team structures, and revamped meeting formats. It was also recommended that these changes be made incrementally and be continually evaluated for their effectiveness. More specific needs were expressed for cultivating social capital, promoting individual leadership autonomy, and creating safe spaces for learning and growth to spark innovation. The expectation was that, if we truly committed ourselves to change, smarter, more innovative ways of working together internally should eventually emerge and that a new class of SEE leaders would come to the forefront. These leaders would have the agency to express their leadership enterprise-wide and at all levels within the organization, which would ultimately establish a more collaborative culture in the workplace. These leaders did ultimately emerge and many of them led innovative exhibit projects and programs that reshaped our visitor experience and enhanced our public value to the community.

Understanding Social Structure. Over time, my interest in this concept increased and by the following year, during the summer of 2015, I decided to facilitate a social network analysis (SNA) to probe the extent of the effect of leaders on unsanctioned teams working outside of the lines to innovate on cross-departmental collaborative projects. SNA is a process of understanding social structures through the use of networks and graph theory (Otte & Rousseau, 2002). Using several free cloud-based digital solutions, e.g., Socilyzer created by Jakob Poulsen, and Gephi, an open-source SNA and visualization tool, I was able to uncover several informal innovation networks within our organization (see Appendix A). The results of the SNA clearly showed that many of our project team leaders were consistently working outside the confines of their department and divisional structures to accomplish complex project-related tasks that required resources that were completely unavailable in their respective departments.

I was also able to determine that the leaders themselves were working together asynchronously and in distributed ways. This type of offline project work had been previously invisible to me. The increased social interaction and network activity visualized by the SNA were not present in our regular project meetings. It soon became clear that the use of informal networks was subtly becoming the preferred way for leaders to work out difficult project problems and generate new ideas. The effect of the informal social network-powered task force led to the near obsolescence of our standard project team meetings, given that critical project work was occurring outside of them. This effect was all but ensuring that crucial conversations would likely not happen in our standard, sanctioned project team meetings because the key issues and problems were being resolved elsewhere.

Facilitating Organizational Network Analysis. Curious about these findings and the implications of the SNA, I decided to facilitate an additional set of network analyses in early 2016. These would take the form of more complex organizational network analyses (ONAs) with an enterprise-wide domain. By implementing network mapping, my objective was to determine just how far outside the lines our intrapreneurial project team leaders went to tap into internal team expertise and obtain additional resources for their cross-departmental collaborative projects. However, facilitating ONAs meant taking on the arduous task of tracing the pathways within and across formal and informal social networks to map the strength of individual social capital throughout the organization.

Using a tool in private beta called SYNAPP, produced by a consulting company called Philosophy IB, based in New Jersey and now owned by Heidrick & Struggles, I was able to digitally map the Saint Louis Science Center's complex organizational networks. The dynamic social interactions of cross-departmental collaborative project teams suddenly became

transparent, and I began to realize that leaders, distributed throughout our organization, were regularly collaborating behind the scenes to foster innovation and affect culture change. The SYNAPP results revealed that while silos existed on the organizational chart, several project team leaders were able to regularly transcend the formal organizational structure using their informal social networks. These distributed leaders successfully worked cross-departmentally and sometimes autonomously to facilitate critical project activities. The ONAs facilitated by SYNAPP demonstrated that project team leaders were crossing both vertical and horizontal boundaries to break through silos to connect and collaborate. The result was the emergence of a very loosely bound collaborative culture that was highly effective and considerably influential.

My Purpose - Creating a Collaborative Culture

Shortly after facilitating several ONAs in the latter part of 2016, I became extremely fascinated by informal social and organizational networks and very interested in how I might cultivate and scale the emerging collaborative cultures within them. I wanted to use the benefits of collaborative culture within project teams as an incubator for sparking innovation and promoting intrapreneurship. Over the past few years, this concept has become a passion of mine, and it serves as the impetus for this study and influences its overall purpose.

Now, as the President & CEO of the MiSci, I am incredibly motivated by the need to break down similar internal silos and invisible barriers at my new organization. There is a fantastic opportunity before our team to connect people with science and to work collaboratively internally on the cross-departmental projects in support of our mission and vision. Creating a culture of collaboration as a means to achieve them can lead to greater innovation and enable our intrapreneurial and distributed project team leaders to spread their culture far beyond their individual business units.

Theoretical Framework

My previous SNAs and ONAs at the Saint Louis Science Center provided compelling evidence that effective cross-departmental collaborative activity was occurring, and they hinted at the possibility that distributed leadership was being exercised and demonstrated during project activities. This distribution was characterized by shared decision-making and problem-solving on projects, along with the ability for teams to collectively adapt to changing conditions within the work environment (Spillane, 2006). When working together, our distributed leaders had discovered creative ways to transcend many of our inflexible structures to share ideas and collaborate effectively. Team leaders often remarked that when they were working together it was as if they were working as a single unit or unified mind, despite pre-existing conflicts and disagreements. Cognitive science research describes models of this unified mind phenomenon as distributed cognition, which, as an approach, takes as the fundamental unit of analysis a collection of individuals and artifacts and their relations to one another in a particular work practice (Rogers & Ellis, 1994). Distributed cognition has incredible utility when analyzing the effects of distributed leadership within an organization (Brown et al., 1989). With distributed cognition as a general direction for focusing my study, I selected distributed leadership as my lens for it and employed it as my theoretical framework.

Distributed Leadership - The Analytical and The Practical

Distributed leadership is a perspective on leadership that views leadership practice as the work of many leaders within the work environment, not just the activities of one heroic leader (Spillane, 2006). Distributed leadership can be thought of in both analytical and conceptual terms, and it can also be viewed from a normative or practical perspective. From the analytical perspective, leadership activities are viewed as a product of the interactions amongst leaders,

followers, and the situation. This view illustrates the connection of distributed leadership to distributed cognition, which is often framed by activity theory (Engeström et al., 2007). When viewed from a normative or practical perspective, distributed leadership is concerned with leadership optimization to improve organizations and their internal systems and structures (Spillane & Diamond, 2007).

Three Types of Distributed Leadership. Spillane (2006) describes three types of leadership distributions with a given practice: coordinated distribution, collective distribution, and collaborative distribution. My study investigated all three types as I sought to understand how these types manifest themselves with project teams on innovation projects. I was particularly interested in how the work of two or more leaders, working together in the same place and time to facilitate similar leadership routines, could be facilitated. Studying this co-practice became a useful way to uncover how intrapreneurial leaders helped each other and modeled effective ways to achieve success through collaboration and innovation.

Facilitating Distributed Leadership Through Online Learning Circles. My early observations of distributed cognition and distributed leadership occurring between the lines of organizational boundaries and silos, and outside of the structure of the project meeting, suggested to me that our existing meeting formats and platforms were essentially incompatible with effective cross-departmental collaboration. I hypothesized that this activity was inadvertently causing increased organizational inflexibility and resistance to change. Our team meetings often lacked focus and seemed to be disconnected from the general culture of collaboration that exists offline, behind-the-scenes, and outside the margins of our standard project meeting environment. I wondered if taking action to reframe and perhaps redefine our platform for collaboration, the standard project meeting, would allow me to break down the

invisible barriers that were attenuating innovation and making teams often inflexible and resistant to change. I decided to try a different model for project collaboration and introduce the concept of learning circles to my organization as an intentional structure for collaboration that recognizes the social capital that resides in our informal social networks and makes the invisible lines of communication and cross-departmental collaboration visible, sanctioned, and supported (Riel, 2014).

Riel and Polin (2010) describe the online learning circle model as defined by a formal set of dimensions, which include a diversity of participants, distributed leadership, knowledge-building dialogue, the centrality of project-based work, phased structure of interaction, and a final shared group work-product. Online learning circles include an informal set of expectations or norms, such as trust, and an open and flexible approach to thinking that involves individual responsibility. I thought that this model could provide a vehicle for change and a contextualized platform for collaborative work by distributed, intrapreneurial project team leaders. I could then use the social and organizational network insights from the SNAs and ONAs to suggest possible peer groupings for the circles.

The Case for Action Research

With a deep desire to enhance my leadership skills in the process of implementing the online learning circles during my study, I chose to use an action research approach as my preferred methodology to recognize informal networks, facilitate distributed leadership, spark innovation, promote intrapreneurship, and foster a collaborative culture. Paramount would be the exploration of strategies for implementing online learning circles and effective collaborative interactions among circle members. Moving from silos to social networks to create a collaborative culture within an organization is not trivial. It is an enormous undertaking that

requires both intense focus and active reflection. Although there were many other research methodologies to choose from for this study, I was confident that action research offered the greatest advantage in that it represented research done in collaboration with others, as opposed to research done on others (McNiff & Whitehead, 2011). The action research process would provide a participatory and highly reflective environment for facilitating distributed leadership within my organization. Though the object of my research was to create an effective platform for facilitating distributed leadership and creating a collaborative culture, the subject of my research was my ability to effect this change as a new President & CEO through a direct intervention focused on improving my practice. This means that I, as the researcher, had a dual role, which included also being a practitioner during the study (Riel, 2010).

Research Question

Like all other action research projects, my research was facilitated in cycles, or iterations, with evolving research questions directing my inquiry for each successive cycle. My investigative questions were generated based on assumptions that emerged from the SNA and ONA data that I collected and analyzed before my study. Action research cycles were guided by my overall action research question, which was stated as: How might I create an intentional structure for project work at MiSci that sparks innovation, promotes intrapreneurship, and creates a more collaborative culture in the workplace? This question encapsulated my line of inquiry, shaped my process of reflection, and incorporated my desire to address the need to improve innovation at my organization through greater collaboration. The development of subsequent cycle questions would help me to better define new problems to be solved, delineate actions I intended to take, and prompt my reflections on improving my practice as a new President & CEO.

Significance of the Study

The potential significance of this study is broad and has implications for both for-profit and nonprofit leaders alike. However, the findings may be particularly significant for nonprofit science centers both locally and nationally, perhaps even internationally. Organizations like mine face similar problems when attempting to optimize cross-departmental collaborative projects. With the critical need for greater collaboration and enhanced leadership distribution among staff on complex innovation projects, the value of this study may be considerable. Insights and recommendations that emerge can be used to sift out design principles for establishing online learning circles within similar organizations. In addition, MiSci staff, having participated in the study by contributing their ideas and perspectives as circle members, may later assume other leadership positions within the organization and spread their new brand of collaborative culture to departments that are currently isolated. Participants may also view their experiences as members of the online learning circles as transformative, leading to a desire to share what they learned with others throughout the organization over time.

This study may find significance in the field of action research, as it provides a case where action research and online learning circles are being applied to organizational learning within a nonprofit science center setting. Although online learning circles are far more commonly used in K-12 environments, higher education, and in some for-profit businesses, a science center setting may break new ground and illustrate challenges unique to the field. There may be interest in replicating online learning circles in science centers, as they generally have similar internal structures, departments, and missions.

For those interested in advancing online learning circles through a creative application of social or organizational network analysis as a way to map collaborative interaction, this study

may serve as an illuminating guide to facilitation. There is significant research in the fields of social and organizational network analysis, distributed leadership, and online learning circles respectively; however, there is very little literature on how the subject areas can be combined to explore, map, and capitalize on connections between and among the people, processes, and programs within a nonprofit science center. I hope that my study will inspire other leaders to test the ideas of distributed leadership and employ the concept of online learning circles in their practice.

Finally, this action research study may find increased significance in the fact that it was facilitated during the onset of the novel Coronavirus and the significant impacts of COVID-19 on our professional and personal lives. After MiSci closed its doors to the public on Friday, March 13th, 2020, and later had to be closed to staff as a result of the Michigan governor's executive order, I decided to furlough and put on unpaid leave more than two-thirds of our staff. As President & CEO, this was a very difficult but necessary decision to make, but it paved the way for our online learning circle to be successfully launched given that nearly all of our work immediately went remote. Since it is now almost certain that remote work will become part of a new normal and shape the future of workplace culture, this study may offer a unique approach to fostering collaboration virtually with an international structure for facilitating work on innovation projects.

Definition of Terms

This list of operational terms includes several key ideas that are explored in detail in my Chapter 2 literature review and Chapter 3 methodology:

- *Collaboration* - a practice where two or more individuals work together with a common purpose, to solve a problem, achieve a benefit, or affect a result (Schuman, 2006).

- *Culture* - represents the social behavior and norms that can be found in human societies—groups of people exhibiting persistent human interaction (Macionis, 2011).
- *Distributed Leadership* - a conceptual and analytical approach to understanding leadership as a social process practice at the intersection of leaders, followers, and the situation (Spillane, 2006).
- *Innovation* - a novel way of "doing things differently" (Hansen & Wakonen, 1997, p. 350).
- *Intrapreneurship* - the act of behaving like an entrepreneur, innovating and testing boundaries, while working within a large organization (Pinchot, 2000).
- *Leadership* -

  > Leadership is the interaction between two or more members of a group that often involves a structuring or restructuring of a situation and the perceptions and expectations of the members. Leaders are agents of change—persons whose acts affect other people more than other people's acts affect them. Leadership occurs when one group member modifies the motivation or competencies of others in the group. (Bass & Stogdill, 1990, pp. 19-20)

- *Online Learning Circles* - flat and flexible frameworks for collaboration that serve as highly participatory structures for organizing group work in online environments (Riel, 2014).
- *Organizations* - intentional structures made up of people and their relationships to one other (Daft, 2001).

- *Organizational Network Analysis (ONA)* - a structured way of visualizing how knowledge, information, communication, and decisions flow through an organization (Perrucci & Potter, 1989).
- *Organizational Structure* - defines how activities within an organization are directed toward the achievement of organizational goals (Pugh, 2007).
- *Project* - a temporary endeavor to create a unique, product, service, or result (Project Management Institute, 2014).
- *Project Management* - the practice of initiating, planning, executing, controlling, and closing out the work of a team to achieve specific goals and meet specific success criteria at a specified time in the future (Nokes & Newton, 2007).
- *Silo Mentality* - an effect or mindset present when functional departments do not wish to share information with others in the same organization (Gleeson, 2013).
- *Social Capital* - an aggregate set of resources linked to networks of relationships with a mutual acquaintance and shared recognition (Bourdieu, 2002).
- *Social Network Analysis (SNA)* - a process of understanding social structures through the use of networks and graph theory (Otte & Rousseau, 2002).

Assumptions

It should be noted that this study made several assumptions that were considered to be invariant throughout each phase of the project and each iterative cycle of the action research process. They are listed below:

For this action research study, I assumed...

- that staff from diverse backgrounds and departments within my organization would want to join the online learning circles and view them as an exciting opportunity for their professional development.
- that the previously implemented SNAs and ONAs would provide valuable insights about the informal interactivity among members of cross-departmental teams that would help make decisions about how to design and assemble the online learning circles.
- that participating staff would appreciate distributed leadership as a framework for fostering intrapreneurship.
- that collaborative culture could be fostered within online learning circles.
- that there would be interest in replicating the online learning circle model in other areas of the organization.
- that the action research process would help me to enhance and evolve my ability to facilitate distributed leadership and create a collaborative culture within my organization.

Limitations

This action research study focused on how my evolving *leadership* practice influenced the existing social system and *organizational structure* within my organization. The limitations and delimitations delineated for this study were issues that I expected might adversely affect my methods and/or restrict the analysis of the research data I collected during the process. Limitations are representative of the identified influences I considered to be beyond my control as an action researcher within the system and structure, and are acknowledged in the following categories, but not limited to:

- features of the digital tools and software selected for facilitating the circles.

- changes on the roster of the staff members who participate during the project.
- scope changes in the online learning circle themes as affected by outside stakeholders.
- time constraints for the cycles as dictated by competing internal projects.

The delimitations for this action research study reflect the boundaries that were set for the proper facilitation of this study within MiSci's existing organizational structure. Delimitations as identified indicate that my study acknowledged but did not necessarily focus on the following:

- how staff managed their schedules while serving as a member of a circle.
- how science center STEM programs were facilitated with or without the circles.
- the specific nature of the innovative work-products created from the circles.

Summary

This chapter establishes that organizational structures can be incredibly inflexible and woefully under-optimized for the execution of cross-departmental collaborative projects. However, unsanctioned task forces led by intrapreneurs and sprouted from informal social and organizational networks can spontaneously emerge as a result. This can be an advantage. Several of the MiSci's most successful projects have succeeded because distributed leaders found ways to empower themselves to break through barriers and existing silos to produce innovative exhibits, programs, and events.

This action research study intends to offer an approach for how an organization's structure can be transformed from being hierarchical and siloed, to being flat and flexible, so as to create a more collaborative *culture* in the workplace. With *distributed leadership* selected as the study's theoretical framework and *online learning circles* employed as an intentional structure for *collaboration*, I set out to spark *innovation* and promote *intrapreneurship*

throughout my organization. For me and my participants, this took place almost exclusively online in virtual spaces while teleworking during the height of the COVID-19 pandemic. My leadership ability and skill development while employing online learning circles as a new CEO was the subject of this study. Reflective practice was consistent, and the outputs served as inputs to successive action research cycles.

In the following chapter, I present a literature review of existing research on several relevant topics and terms including, innovation and intrapreneurship, organizational structure, *social capital* and network analysis, distributed leadership and individual agency, online learning circles, and collaborative culture. I also explore how together these concepts can be effectively combined. This can potentially reduce horizontal and vertical barriers, eliminate silos, and create a more collaborative culture even in virtual workspaces.

Chapter 2: Literature Review

Overview

This chapter provides a comprehensive review of the relevant research literature pertaining to my study's problem of shifting organizational structure and culture from rigid formal organizational silos to flat and flexible informal organizational networks. This shift creates an opportunity to establish a solid foundation to foster a collaborative culture in my workplace while sparking innovation and promoting intrapreneurship. Additionally, this chapter establishes a line of inquiry and a theoretical framework for exploring my overall action research question: How might I create an intentional structure for project work at MiSci that sparks innovation, promotes intrapreneurship, and creates a more collaborative culture in the workplace?

The research literature in this chapter is divided into five sections. Each section features research aligned with the relevant intersections and adjacencies associated with the key terms contained within my overall action research question. An overview and analysis of collaborative culture, innovation, and intrapreneurship, as well as online learning circles, are included. These concepts are presented within the context of my inquiry and are congruent with the stated problem. The five sections are:

- Innovation and intrapreneurship
- Organizational structure and function
- Social capital and network analysis
- Distributed leadership and individual agency
- Collaborative culture and online learning circles.

The first section examines the conditions and processes that have been found to support the promotion and spread of innovation within *organizations*. Organized historically, it describes multiple forms of innovation and the role of leadership in creating and sustaining it at an organizational level. The concept of intrapreneurship and the impact of intrapreneurs in facilitating innovation within large organizations is also explored.

The second section presents the most common types of organizational structures and outlines how invisible boundaries and barriers within these structures can create silos. This section explores the concept of organizational networks and describes how a greater understanding of these networks can be used to unlock latent social capital and hidden expertise while fostering collaboration within groups.

The third section explores formal and informal organizational networks and the human pathways that foster the flow of social capital in the forms of knowledge, expertise, and resources among individuals and groups in organizations. This section delves into how organizational network analysis, mediated by computational tools, can make invisible social capital visible. How collaborative culture arises within social and organizational networks is also considered.

The fourth section compares and contrasts organizational structure and individual agency and analyzes the conceptual and theoretical ideas associated with distributed leadership. Special emphasis is placed on how distributed leadership practices can positively impact social capital. Historically, heroic leadership paradigms have challenged distributed autonomy among a collection of leaders.

The fifth section introduces the concept of the online learning circle, a highly interactive and participatory structure for organizing the work of groups. This section illustrates how the

effective application of learning circles, within a range of contexts, suggests their utility in fostering a collaborative culture.

These five sections provided insight into my study's problem and laid the groundwork for addressing my action research question through informed cyclical actions. Successive action research cycles were framed by many of the concepts presented in this literature review.

Section 1: Innovation and Intrapreneurship

Sparking innovation and promoting intrapreneurship are challenging propositions for any organization. Change can be difficult, and there is often an unspoken expectation that high-performing leaders within organizations should be able to easily bypass bureaucracies and break through internal silos, all while exercising self-efficacy and working collaboratively with others (Bandura, 2017). If success is to be achieved, leaders need to find new ways to expose the invisible horizontal and vertical barriers within organizational networks that can attenuate an organization's innovation potential (Jones, 2013). Those who visibly overcome these barriers have the power to influence and motivate others to follow their lead as they spread their innovative strategies far beyond their individual business units and increase innovation throughout the enterprise (Rosen, 2007). Entrepreneurial leaders of innovation and change who work comfortably within the confines of an organization are called "intrapreneurs," and they are a critical element in igniting and sustaining organizational success (Goldberg, 1986).

The Innovation Paradigm

The onerous task of distinguishing between what is innovative and what is not typically rests with senior leadership. Part of the difficulty senior leaders face with parsing innovation lies with understanding the phenomenon of how innovations actually emerge, evolve, and externally impact both business and society. An aspect that is often undervalued is how innovation can be

the prime mover in obtaining and maintaining a competitive advantage in a dynamic market (Tushman & O'Reilly, 1996). The competition to be the first to incubate, develop, and launch something new and unique in the marketplace drives much of the research and development that occurs within organizations. This is a critical business need, and it influences how organizations challenge their employees, particularly those who are charged with leading innovation projects, to quickly learn how to work outside of established boundaries of organizational structure (Jones, 2013).

Schumpeter's Creative Destruction. Even a cursory review of innovation literature can reveal diverse, divergent, and even overlapping definitions of the concept (Keeley et al., 2013). Innovation-related descriptors abound, and they can be found used in parallel with the term innovation or referencing the acquisition of new knowledge. Some descriptors reference unbridled creativity, unexpected change, or even genius. Many of the very first writings on the modern concept of innovation from the 1920s illustrate the difficulty found in trying to pin down an extremely elusive term that only approximates a progressive and successful change in business. Joseph Alois Schumpeter (1883-1950), an economist, was an early pioneer of innovation studies. He is still considered to be one of the greatest intellectuals of his time and is perhaps best known for his controversial book *Capitalism, Socialism, and Democracy*, published in 1942 (Swedberg, 2007). Schumpeter is also often cited as the person who coined the term innovation. He considered innovation as simply a novel way of "doing things differently," and proposed a lesser-known theory of dynamic economic growth known as "creative destruction" (Hansen & Wakonen, 1997, p. 350). Although no longer widely used, creative destruction accurately describes the very essence of the innovation phenomenon (McCraw, 2010).

Innovation at the Center. Research that focuses on the economic impacts of innovation supports the idea that innovation resides at the center of our competitive economy (Ernst, 2002). Competition in the marketplace presents a convenient, underlying rationale for innovation, and this can create an immediate need for both organizational change and business adaptation (Kotter, 2009). However, managing and maintaining a competitive edge in business through these functions can sometimes require a monumental effort to continuously produce new ideas internally (Kim & Oh, 2002).

Years before Schumpeter articulated his ideas about innovation, Gabriel Tarde (1903), in outlining how decisions around new ideas get made, defined the process as a series of groundbreaking steps. These steps included acquiring knowledge, forming the right attitude, deciding to adopt or reject the idea, implementing the idea, and confirming the decision itself. Offered as a useful guide by which internal ideas could be properly initiated, the steps represented an internal logic for driving new ideas within an organization. Tarde's stepwise process was an attempt to bring order to what was then viewed as a chaotic and unfocused method for creating value.

Defining Innovation. How innovation is defined can make an enormous difference in how it is facilitated (Keeley et al., 2013). Many innovators would agree that innovation needs to be understood internally unambiguously and straightforwardly to be successfully implemented within an organization (Bessant, 2003). However, building consensus around a single agreed-upon definition for innovation can be a herculean effort. Shared understandings, knowledge creation, and clarity around common concepts used in organizations can reduce the burden on communication and can make it easier for project team leaders and managers to launch innovation initiatives within an organization (Mitchell & Boyle, 2010).

Maranville (1992) describes innovation as an applied endeavor and states that innovation is the application of better solutions that meet new requirements, unarticulated desires, or existing market needs. Frankelius (2009) defines innovation as a process of employing new and existing tools and techniques to produce novel technologies, products, processes, and services that can be marketed. McFarthing (2016) underscores the intrinsic value of innovation and describes it as the introduction of new products and services that add value to the organization. But perhaps the most elegant way to understand innovation is offered to us by the Department of Trade in the UK (DTI, 1998), which describes innovation simply as "the successful exploitation of new ideas" (p. 76).

The Bifurcation of Innovation. The most common, and perhaps the most basic, way to describe innovation is to think of it as bifurcated: incremental and disruptive. Incremental innovation focuses on taking existing processes, products, or services and making them continuously more competitive (Brown, 1997). This can be accomplished by adding new features to a product or service, by reducing the costs of production and deployment, or by taking an existing process and modifying its logic. Incremental innovation is much more ubiquitous because it is generally considered easier to execute. Incremental improvements from innovative practices often open the door to mass adoption (Technologies, 2015). Taking an incremental approach can also lower the risk of lost relevancy in the market because it can buttress an organization's ability to effectively fight off competitive pressure (Ghosh et al., 2017).

Disruptive innovation, a term coined by Clayton Christensen in the mid-1990s, takes Schumpeter's idea of creative destruction and adapts it to today's digital economy (Schneider, 2017). Disruptive innovation creates new markets and reframes pre-existing value networks (Lettice & Thomond, 2008). By its very nature, disruptive innovation can dismantle mundane

business models and make well-traveled market spaces irrelevant (Johnson et al., 2016). Disruptive innovation's biggest impact is that it changes both people and paradigms within organizations (Brown, 2009). It functions, in many ways, as the archenemy of the status quo (Markides, 2006). Disruption can happen deep within the bureaucracy and red tape of organizations as well, with new internal innovation processes replacing outmoded methods (Christensen, 2016).

The Fuzzy Front End of Innovation. Discerning between what is considered disruptive or incremental continues to be a barrier to classifying innovation appropriately. Within the framework for how innovation gets expressed within organizations lies the more pronounced complexity of understanding when innovation is occurring. Old ideas often die hard, and new ideas are not always generalizable for diversified or hybridized organizational structures (Adams et al., 2006). This makes the business of innovation within organizations incredibly tricky because the process itself can be unpredictable (Christensen & McDonald, 2016). Where innovation actually begins, and how innovative ideas are incubated and developed, is often called the "fuzzy front end" of innovation (Koen et al., 2001, p. 46). This early stage of the innovation process represents a period that is undeniably uncertain, but not necessarily uncontrollable or unmanageable. It is just a little fuzzy.

Knowledge Systems In Innovation. There are many best practices for how to generate innovative ideas at the beginning of a process, but there is no single idea generation model that works perfectly for all business environments and situations. Idea selection and concept development are universally recognized as essential front-end processes for innovation (Cooper, 1990). However, people who participate in these processes often have trouble staying in their lane and observing the speed limit during the "fuzzy" period (Koen et al., 2001, p. 46). This is

primarily because ideas can quickly connect with other ideas and create new knowledge systems along the way, further complicating the start of the innovation process and creating massive scope creep on projects. Although there is an incredible amount of knowledge that can be gained through the process of innovation, if the scope progresses beyond the limits of the original intention, that knowledge can become even more critical to the future success of an organization (Zahra & George, 2002). Enter the world of knowledge management, a process that is used to help articulate how new and existing knowledge is communicated within an organization (Gloet & Terziovski, 2004). Understanding how the implicit and explicit aspects of knowledge can be optimized to power internal innovation can be a valuable exercise for an organization seeking to reinvent the way it innovates.

Entrepreneurs vs. Intrapreneurs. Innovation often starts in a conceptual space that is as underdeveloped as a dirt road. However, when disruptive, innovation can quickly go from a dirt road to an eight-lane superhighway. Innovation can originate with just a single person or a group of people. Those with enterprising spirits and truckloads of creative ideas usually see only open roads ahead. As their new ideas work their way through the organization, or enter directly into the market, they often gain momentum. But even the most innovative ideas can easily be brought to a halt if they run into bureaucratic red tape or market resistance (Close & Zinkham, 2007).

Leaders who are unable to overcome organizational inertia tend to leave and take their creative concepts elsewhere if their organizations are unwilling to provide adequate support for their ideas. Emerging entrepreneurs are very often tempted to take the off-ramp and leave an organization in search of more accepting environments. They may not all be fearless, but they readily embrace risk as they strike out on their own to acquire endorsements for their ideas.

Schumpeter considered entrepreneurs as the heroes of his creative destruction concept and the pivot upon which everything in the economy turns (Reisman, 2008).

However, on the other end of the spectrum is intrapreneurship—the act of behaving like an entrepreneur, innovating, and testing boundaries, while working from within a large organization (Pinchot, 2000). Intrapreneurship can be as risky as entrepreneurship for individuals, but intrapreneurs are challenged to work within established organizational systems and structures and in concert with others to get things done. These internal innovators use their enterprising spirit to break down internal barriers and neutralize organizational inertia as they disrupt the status quo through cross-departmental collaboration.

Internal silos and invisible barriers are ubiquitous on the organizational landscape, and bureaucracy's penchant for attenuating an organization's innovation potential is well understood (Jones, 2013). However, leaders with an intrapreneurial spirit vigorously search for creative ways to overcome bureaucratic barriers and change-resistant cultures (Kotter, 2009). They openly exercise self-efficacy and articulate a tenor of confidence that inspires others to participate in challenging existing paradigms (Bandura, 2017). They freely reach out to coworkers who have a shared interest in fostering innovation and change because they see their organization as a suitable place to champion their new ideas (Pinchot & Pellman, 1999).

Section 2: Organizational Structures and Networks

Beyond a brand, facade, or website representing a for-profit or nonprofit business, the structure of the organization behind it can be difficult to see. According to Daft (2001), "organizations are made up of people and their relationships to one another" (p. 12). These relationships can be both formal and informal, and heavily influence the goals that are set, the decisions that are made, and the way work gets done. Hidden structures, policies, and processes

often govern how people collaborate and innovate (Cross & Parker, 2010). The internal functions in an organization that create and sustain the production of value and the drive to innovate are a direct function of the people that run it (Mozota, 2008).

Designed Hierarchy

Organizational structure is characterized by the designed hierarchies of the people who work within organizations. This structure consists of both implicit and explicit rules and policies that outline how a variety of employee roles and responsibilities are controlled, delegated, and coordinated (Aquinas, 2008). There are many ways that organizations can be structured, and these structures are designed to relate functions, assign responsibility, and ensure accountability (Mohr, 1982). They can be used as frameworks for establishing operational procedures or workflows, and can even be used to facilitate strategic decision-making, while guiding the implementation of operational objectives.

The organization itself represents a "set of tasks or activities that put appropriate relationships between people, means, and actions in place" (Dam, 2016, p. 3). A formal organizational structure defines what an employee's job function is and where that function fits in the system. A chart representing organizational structure can be used to provide a visual representation of the hierarchy and where each employee's role resides. The flow of information, knowledge, expertise, and decision-making is effectively channeled through a wireframe of organizational structure. All organizations use some form of organizational structure as an integral part of their strategy and their framework for facilitating management.

Types of Structures. There are various types of organizational structures, ranging from highly functional or centralized departments to loosely organized or decentralized project-based business units (Dam, 2016). Organizations do their best to adopt structures that suit both their

business needs and organizational goals. Traditional organizations typically have functional structures, where knowledge, skills, and expertise exist with a group of employees who perform essentially the same function. This traditional structural type can be found in branches of the military, large corporations, and government agencies. Conversely, non-traditional organizations are much more project-based, where groups and resources are organized around specific, highly valuable, but temporary activities (Project Management Institute, 2017). Non-traditional structures can be found in community organizations, tech startups, and consulting firms that seek a more decentralized, adaptable format with employees who have high degrees of personal agency.

Structural Challenges and Inflexibility. When put under pressure, organizational structures can become inflexible and present resistance to even minor changes to their systems (Argyris, 1993). This inflexibility places traditional hierarchies under both stress and strain and can limit an organization's innovation potential. Whether functional or matrixed, organizational structures often need to bend and flex in response to change (Daft, 2001). From the perspective of top-down managers, this flexing can prove to be quite difficult to monitor and control. Leaders within the organization are often forced to modify lines of communication and redefine team member roles when addressing internal and external business needs.

Flexible structures can maintain a balance between both multidimensionality and simultaneity in the workplace, particularly when these structures support collaborative cultures for innovation. However, ever-increasing complexity in the business environment is a formidable challenge to structure selection (Sylvestri, 2012). Davis et al. (2009) contend that it is often difficult to gauge the level of structure needed within an organization even when the work is well-defined. Determining how much structure is too much, and how little structure is too little,

is the quintessential question facing researchers who study how organizations adapt and change (Daft, 2001). Leaders need to have some ability to alter lines of communication, reconfigure internal processes, and adapt to changing environments regardless of the level or type of structure (Jung et al., 2003).

Invisible Boundaries and Barriers. Organizations are often built around formal connections between people (Jones, 2013). These connections can be visualized in organizational charts. As visual references for displaying positions and reporting relationships among staff members in an organization, these charts are essential for assigning responsibility and coordinating project work. Legitimate connections within organizational charts represent formal relationships. Informal relationships are often more flexible and productive, but they are generally not known or recognized officially by organization leadership.

A lack of legitimate connections within an organization can create invisible boundaries. Vertical and horizontal boundaries are two of the most common invisible structural barriers within organizations, and they can impact legitimate connections associated with formal relationships (Ernst & Chrobot-Mason, 2011). Although these boundaries exist naturally within organizations, they can be major challenges for innovation. New ideas can get trapped within the structure itself, thereby limiting opportunities for potential breakthroughs.

Functional Structures. When activity and expertise are grouped departmentally, functional organizational structures are formed. The functional approach to structure is considered to be one of the simplest methods for organizing people. Functional systems can have both vertical and horizontal boundaries and are easily identified in stratified hierarchical organizational charts. Vertical boundaries in functional organizations produce virtual ceilings and floors, which tend to separate employees from each other and reduce opportunities for

communication (Jones, 2013). Emphasis is placed on rank and privilege and oriented around thematically related departmental activities. Business strategy and decision-making tend to flow downward in these structures, with more efficient production and disruptive innovation bubbling up to the top of the structure.

The Silo Effect. When two or more organizational structures, typically in functional organizations, overlap or merge into one unit, horizontal boundaries can appear. The phenomenon is more commonly known as the silo effect. Silos exist for many reasons and can emerge by accident or default (Tett, 2016). Silos act like invisible walls separating groups according to their functions and expertise and can contribute to fierce conflicts between groups if one group is favored over another, or if resources are unevenly distributed (Stone, 2004). People who work in silos can be stubbornly resistant to the cultural changes that collaboration demands (Bundred, 2006). Functional silos often have to be completely dismantled to foster enterprise-wide innovation and intrapreneurship.

Matrixed Structures. The natural barriers and inherent inflexibility related to functional structures opened the door to alternative arrangements such as matrixed approaches, which were a dramatic shift away from traditional functional systems (Mintzberg, 1989). Matrixed structures focus on interdepartmental communication and collaboration at varying levels within the structural hierarchy. Complex projects often require interdepartmental resource sharing. The matrixed approach is a diagonal structure that focuses on shifting *project management* and coordination from high-level directors and managers to lower levels in the organization and across functional groups, creating better flexibility when facilitating cross-departmental projects (Bartlett & Ghoshal, 1990). Within the matrixed structure, project team leaders can work cross-departmentally to coordinate project work. Resources from several separate business units can be

accessed directly in this scheme. Although vertical and horizontal project coordination can be difficult to manage in a matrixed environment, the project manager has increased flexibility to autonomously access resources without always having to have approval from a higher-level departmental manager.

Projectized Structures. On the opposite end of the structural spectrum from functional structures are projectized organizations. These structures can be thought of as independent and compartmentalized. Here, resources and activities are arranged into programs, or portfolios, that are implemented through the projects themselves. This, in effect, makes the projectized organization a temporary and evolving one, allowing for the organizational structure to be customized to the individual project's objectives, needs, and timeline (Hyväri, 2006). Like many of today's tech startups, projectized structures tend to be more open and flat, effectively doing away with the hierarchy of functional structures. In projectized organizations, the project manager is in charge of the project and its organization and typically has complete authority over it. Everyone on the project team reports directly to the project manager, rather than a functional department head. One of the primary benefits of a projectized organizational structure is that the steepness of the hierarchy can be variable and adaptive. Horizontal and vertical reporting relationships can be easily realigned based on changing project requirements. Autonomy is usually given to the project manager by the project's sponsor, and project team members can roll in and out of the project as needed.

The Rise of Flatarchies. Beyond the shadow of functional, matrixed, and projectized organizational structures is an emerging approach that is situated within the intersection of the predictable order of hierarchies and the controlled chaos of flatter organizations. Anderson and Brown (2010) assert that the test of the utility of hierarchies is not found in their level of

frequency, but whether groups function more effectively when they have a hierarchical structure as opposed to a flatter structure. Do organizations with a steeper hierarchy, and asymmetries in the power, status, and influence of team members exhibit higher levels of performance, cohesion, interdepartmental coordination? Do lower levels of intragroup conflict exist in organizations with a flatter structure? The researchers pose these questions because heavily projectized organizations, such as tech startups, large established consulting and business solutions-oriented firms, retail stores, and manufacturers are simply becoming flatter, and the social structures relating to collaboration in these organizations are changing the very fabric of business culture.

Seeking the best of both worlds, many new enterprises, as well as established ones in need of better competitive business advantages, are employing what are known as flatarchies as a way to merge both traditional structure and progressive workplace culture (Morgan, 2015). Flatarchies are relaxed structures that are incredibly flexible and can support hierarchical as well as ad-hoc teams. Organizations that use flatarchies as a basis for their structure are opting for more agile workplace environments that shun the more traditional or formal elements of functional teams and embrace amorphous structures with no consistent barriers to collaboration (Beedle, 2014). Flatarchies are ever-changing, often temporary, and can be found in organizations that employ internal incubators or business/product innovation teams. This type of workplace environment and organizational structure allows for employees to operate semi-autonomously, bound only by the constraints of the project. When creative ideas emerge, team leaders are given the authority to move them forward and even establish new project teams with the autonomy to bypass existing bureaucracy. Flatarchies do add a higher level of complexity to the system, which can make communication and informal social relationships much more complex.

Beyond Organizational Structure. A step above, and also perhaps beyond organizational structure, is the concept of an organizational network. Networks are used to describe the pathways along which something flows (Borgatti & Foster, 2003). Formal networks are relatively rigid structures used for organizing people or actors within a network (Scott, 2012). These networks are often hierarchical and familiarly depicted in a common organizational chart. Formal networks are constructed and managed by an organization's management or leadership team. The organizational chart lays out a chain of command and often signifies accountability, responsibility, and how decisions are made within teams or workgroups (Daft, 2013). Formal structures are used to group people together in a department or business unit to support the core components of an organization.

Although all structures, even flatarchies, have some formal aspects, an informal organizational structure typically establishes the impetus for organizational change, collaboration, and innovation (Cross & Parker, 2010). This type lies far beyond hierarchies, flatarchies, and matrices. An informal organizational structure greatly influences how people interact and work together (Hawe, 2004). Starting with relationships between and among people, these informal relationships appear in the form of invisible networks and can be composed of one-on-one relationships or relationships among groups of people who form partnerships, collaborations, and alliances within the organization to exchange and share valuable resources (Borgatti & Cross, 2003).

Informal networks are often more democratic and ad hoc than formal ones. They can sprout organically and can be established by people at all levels within the organization. Informal networks can be used to initiate workarounds, share best practices, or even facilitate social activities among employees. Informal networks are self-established and autonomous and can be

classified as either sociocentric or egocentric (Marsden, 2002). Sociocentric networks are considered whole networks. They form the totality of relationships and actors, which is illustrated in how they are clustered and distributed within a sociogram. Egocentric networks, on the other hand, are personal networks. They are used to identify many standalone networks of smaller groups of actors.

The complex interplay between formal and informal organizational networks is a critical factor in understanding the performance of people situated within organizations (Soda & Zaheer, 2012). Consistency between formal and informal networks exerts differing effects on organizational performance. Developing and testing network consistency, as the overlap between the informal network of information with formal structures and processes, allows researchers to better understand informal networks as unexpressed parts of formal structures.

Section 3: Social Capital and Network Analysis

Although informal, highly networked, knowledge-sharing relationships can be extremely difficult to see with just a formal structural lens; they can be empirically investigated. Through a thorough analysis of the often-invisible social structures that undergird both the formal and informal aspects of the organization, evidence of capital can be uncovered. Bourdieu (2002) identifies three fundamental forms of capital: economic capital, cultural capital, and social capital. He considers social capital intricately tied to both economic and cultural capital and asserts that social capital is an aggregate of the resources linked to durable networks of relationships with mutual acquaintance and shared recognition. His research suggests that the deliberate construction of sociability within networks by actors is expressly to create these resources.

Social capital ties people together in organizations and stitches its way through the very fabric of organizational structure and networks. Functionally, social capital exists as a multiplicity of separate entities with two common elements: the social structure itself and the individual actions of people or actors within the structure. Therefore, social capital can be conceptualized as a facilitator of individual and collective action generated by networks of connected relationships, which include reciprocity, trust, and socio-cultural norms (Coleman, 1988). This view of social capital defines it as a natural resource that facilitates a specific manner of action and value to many actors within a given community.

Trust and Reciprocity

Putnam (2000) purports that social capital can be quantified by measuring the level of trust and the amount of reciprocity present among actors within a network. Jong (2010) contends that social capital can be used to positively impact the people who make up a community and provide platforms for them to work toward a common good, such as learning and adapting to new problems and challenges through continuous improvement in knowledge-based communities. The process of doing so is called knowledge productivity, and it is a valuable benefit of extracting the social capital embedded within organizations (Harrison & Kessels, 2004). Theoretical frameworks are increasingly being developed to provide better insight into how the characteristics of social capital impact this type of productivity within networks (Habisch, 2004).

In functional organizations with well-established silos, the threads of social capital can quickly get knotted, and thus are unable to be made freely available to members of the network. This is a direct result of the built-in vertical and horizontal seams of siloed communication. As such, influence may be limited in these organizations by the boundaries of subject matter

expertise. In contrast, matrixed organizations and flatarchies allow social capital to weave its way through the spaces between functional groups, minimizing snags. Workplace communities such as flatarchies can rely heavily on social capital when there is a need to create social ties amongst like-minded people and create loops across networks that stitch together diverse groups. These ties are essential to fostering appropriate norms of reciprocity among actors across networks. Social capital is a major reason why informal networks emerge and why startups try to stay as flat as possible to take full advantage of innovation's reliance on it (Cohen & Prusak, 2002).

Knowledge in Networks. Social capital can be used to unlock one of the most valuable assets an organization can have, which is the knowledge held by its employees. Knowledge capital is an extremely important competitive advantage to consider. The decisions that leaders in the organization make, how they solve problems, use their creativity, and collaborate within organizations are powered by knowledge capital (Davis et al., 2006). Considered a form of intellectual capital, knowledge capital is not easily measured, but its value as an organizational asset makes it a critical success factor. As a facet of human capital, it results from the experience, information gathering, skills development, and prior knowledge of employees. Unlocked by social capital, knowledge capital can provide an incredible competitive advantage (Putnam, 2000).

Organizational Network Analysis (ONA). To better visualize, analyze, and model the social capital contained within organizational networks, social network analysis (SNA) is often used. Researchers and practitioners who use SNA and apply it to the study of organizational structures use a set of methods collectively known as organizational network analysis (ONA). ONA is a structured way to visualize how knowledge, information, communication, and

decisions flow through an organization (Perrucci & Potter, 1989). At their most basic level, organizational networks consist of people and relationships, known respectively as nodes and ties. They help form the foundation for understanding how social capital within organizations can or should flow. ONA employs mathematical and analytical techniques along with instruments for measuring informal social relationships. The method also explores how people interact as individuals within groups and illuminates the informal networks where they collaborate.

ONA has its origins in the 1960s and early '70s. It developed as an interdisciplinary methodology used primarily by social psychologists who focused mainly on individuals and interactions, and sociologists who focused largely on the social interactions of society as a whole (Laumann & Pappi, 1976). Since then, understandings of social networks have evolved considerably along with the integration of computers and databases for data collection and analysis (Scott & Carrington, 2011). Many of the techniques used in ONA today focus on "who-to-whom" (Carrington et al., 2005, p. 8) relationships using a type of graph called a sociomatrix. Using this tool, individual people, known as actors, can be categorized in terms of their relationships.

There are two basic ways that a sociomatrix can be designed. It can be formed with a sociocentric frame of reference or an egocentric frame of reference. Sociocentric approaches primarily focus on whole networks of interrelated objects and participating actors representing people situated within bounded social collectives, whereas egocentric approaches are often built around a primary actor or object and its relationship within a specific locality (Hawe, 2004). Both represent informal networks, and their shape can have a great influence on how well social capital flows within an organization, thus influencing an organization's potential to

innovate. Leaders who employ ONA recognize its power to uncover the value creation process. By visualizing and quantifying informal interactions between and among actors and objects within the nodes and ties that bind people together within organizations, they learn how the process can be improved (Cross & Parker, 2010).

Data Collection in an ONA. Data collection in ONA is commonly facilitated through simple survey instruments (Borgatti & Molina, 2005). ONA surveys are distinct from typical workplace surveys. Rather than focus on the individual employee, they focus almost exclusively on the interaction of people with their colleagues. Included are questions on the frequency of the interactions, reasons for the interactions, and the nature of the interactions. Responses can be binary and indicate a connection or lack thereof. Some questions include scales indicating a range of engagement levels such as frequency of interaction, such as once per day, week, or month. ONA surveys allow respondents to indicate the network connections that they would like to have but do not currently have, along with connections outside of the organization. ONA surveys also map the flow of social capital within an organizational network, shedding light on the often-hidden resources that exist in siloed organizations but are extremely difficult to access (Cohen & Prusak, 2002).

Like most surveys, ONA surveys are sensitive to low response rates. Some of the ways researchers address this is to incorporate secondary data sources, such as data collection methods that use information from email servers as a way to measure interaction among actors. Physical tracking of actors can be another data collection method, although this technique may be less desirable in some workplace cultures because of apparent or perceived violations of privacy. As a result, physical tracking is not very common to ONA because of the potential ethical issues associated with tracking employees.

Network Analysis Terminology. Learning the terminology associated with ONA can be somewhat daunting for the uninitiated. The range and dynamic nature of connections between and among actors add to the complexity. From bonding and bridging to centrality and clusters, ONA derives its jargon from relationships that form from informal conversations (Hoppe & Reinelt, 2010). There are a few key terms that are central to the work of most ONA practitioners, and many of these concepts include ideas associated with graph theory (Hawe, 2004).

The most basic terms are: actors, nodes, lines, ties, clusters, structural holes, informal networks, and formal networks. Although within the social sciences these terms can vary, typical network roles include connectors, bridge builders, bottlenecks, isolates, and influencers (Scott, 2012). These roles can coexist in clusters of actors who share social capital. Clusters within organizational networks can be easily identified within sociograms—a term that represents directional graphs that allow researchers and practitioners to visualize network data collected from online surveys. Both SNA and ONA techniques employ sociograms, which represent graphical visualizations of network data based on a given sociomatrix.

Digital Tools for ONA. Several distinct patterns are easily visible in sociograms, and they represent the informal structure of a social or organizational network. Researchers exploring organizational network data use digital tools to better organize inputs, calculate connections, and display the outputs. The complexity of organizational networks may increase significantly with size, making the process of analyzing them rather arduous. Many of the most sophisticated digital tools used for ONA employ algorithms to more easily analyze and manipulate the data for further study (Scott, 2017). A tabular matrix representing social and organizational network data integrates the data collected using sociometric methods that measure the interpersonal

connections and relationships between and among actors. Sociomatricies resemble simple data tables and relate one set of network data with another for graphical interpretation.

Clusters with only a few actors are relatively easy to map. With maps, researchers can measure the location and distribution of actors within the network to assess their roles, relations, and access to social capital (Knoke & Yang, 2008). However, with larger numbers of actors, the process can quickly become unwieldy. The number of possible informal ties between actors increases dramatically each time a new actor is added or recognized within the network. Without digital tools and analytical techniques, it would be nearly impossible to map large distributions of actors and their associated connections within a given organizational network.

Nodes, Ties, Clusters, and Structural Holes. Nodes, and ties to nodes, are found within all social and organizational networks (Burt, 2004). These elements represent informal relationships among actors within the network where social capital can be found. Nodes are represented by dots within a sociogram. Each dot is a node, and each node is an actor or person who resides within the network. Researchers often use color to differentiate between groups of nodes. A different color is assigned to a given attribute, such as an individual department, business unit, or project team. The locations of nodes within the network are based on their relative connections with other nodes. Nodes with lots of connections or ties are placed near the center of the sociogram. Nodes with few connections are placed on the edges.

Ties connect actors within a sociogram and are drawn as lines indicating relationships. Two-way-directed ties are considered more balanced and are known as reciprocal ties. Clusters are groups of actors who are highly connected locally but have fewer connections with the rest of the network and are somewhat isolated on the sociogram. When clusters are disconnected it

indicates that there is a structural hole between them. In other words, structural holes illustrate missing ties among actors within a network.

The Centrality of Influencers. Bonacich (1987) argues that one of the most valuable benefits of ONA is its power to map the influence of specific actors within a network. Influence can be approximated by applying a network analysis concept, known as centrality, which is borrowed from graph theory. Centrality is used to measure the most important vertices or points where two or more lines meet, contained within a given graph. Actors with more ties, or defined relationships with others, have more vertices. This makes them central figures within a sociogram representing the organizational network. There are several types of centrality measures, but the three most basic measures are degree, betweenness, and closeness (Freeman, 1978).

Degree. Of the three measures, degree is perhaps the simplest. This measure counts the number of direct connections to a node or actor within the network. These direct ties can be divided into groups, those leading toward an individual actor, often called in-degrees, and those leading away from an actor, known as out-degrees (Freeman, 1977). Individuals with high numbers of in-degrees are seen as super-connectors or hubs. Those individual actors with high in-degrees often indicate an individual who is preferred or sought after as a valuable resource within the network.

Betweenness. Actors with only a few connections can still be central to the network and regarded as important resources given that they also tie together disconnected actors who may be isolated on the edges of the network. These actors are often seen as bridges or gatekeepers, making them extremely important when connecting different departments within an organization. These actors, by virtue of their positions, can be very influential as they broker the

ability to tap resources within silos or across silos. However, they can also be viewed as bottlenecks if they become resistant to collaboration or exchanges of information and expertise across a given network. Not an independent quantity, betweenness is measured based on a comparison of the centrality of other actors.

Closeness. The closeness centrality, also known simply as closeness, is calculated by taking the sum of the length of the shortest paths between a given node and all other nodes contained within a sociogram (Bavelas, 1950). This means that the closer a given node is to all other nodes within the network, the more central it will be. Closeness centrality measures how simple it may be for a single actor to access the entire network. Individuals with very high closeness ratings can take the fewest number of steps to connect with any other person within the network. An actor with a high closeness is more likely to be fully aware of the activities of the network, how to best access resources, or influence change (Borgatti & Foster, 2003).

Intangible Assets. The measures of degree, betweenness, and closeness uncover the hidden relationships within an organizational network and reveal how people connect, collaborate, and get things done. Analyzing the network positions of actors, relative to one another, allows for paths of inquiry that can reveal intangible assets manifested in various forms of human and structural capital within the organization (Knoke & Yang, 2008). This may include hidden capital within the organization, namely its culture, internal structure, organizational systems; all of which can be sources of competitive advantage. Organizations with an interest in fostering change and shifting paradigms have to recognize both the intrinsic and extrinsic value of human, structural, and organizational capital to achieve their business objectives.

Section 4: Distributed Leadership and Individual Agency

Leadership success within an organizational network often has a strong correlation to the centrality of the individual actor (Burt, 2004). Adequately supporting leadership roles can help drive innovation and change and possibly open new avenues to access hidden social capital. It is important to note, however, that not all leaders within an organization's leadership structure occupy formal leadership positions. Determining the optimal role of leadership within an organization can be a challenging but incredibly valuable exercise. Formal and informal leadership roles merit consideration. McCauley and Van Velsor (2004) stress the importance of optimizing leadership and characterize the value of organizational leadership as the capacity for aligning resources, setting direction, and establishing a commitment to generate results. Informal leadership networks also exist and are present in nearly every enterprise. They express themselves in an array of leadership practices and relationships among actors. These practices can comfortably exist in parallel with formal structures and contribute to an organization's innovation potential. They also play an important role in supporting better efficiency and productivity, while enhancing communication and collaboration across departments (Borgatti & Cross, 2003).

Classifying Leadership Networks

Hoppe and Reinelt (2010) outline a leadership network classification framework that can be used to foster better internal collaboration. The framework consists of four basic types: peer, organizational, field-policy, and collective. Peer leadership networks are systems of social ties among leaders where the connections are based on common interests. Organizational leadership networks are sets of social ties that emphasize increased performance and productivity through advice-seeking. Field-policy leadership networks center on common interests within a particular

field of practice. Collective leadership networks are made of people with a common cause. Each of these network types models the collective attention among actors and can be influenced in ways that mobilize resources and inspire other actors within the organization to participate (Hannum et al., 2007).

Leadership in Two Camps. There is a tendency for traditional thinking around leadership within networks to fall into two opposing camps (Gronn, 2000). The first camp conceptualizes leadership as a direct consequence of individual agency, where the leader, as a hero, overcomes monumental obstacles and confronts the most difficult challenges to achieve success. The second camp conceptualizes leadership as a function of organizational systems and roles within structures, where the leader's identity is determined simply by his or her position. This is a clear dichotomy, and it creates an incredible dilemma. Gronn (2002) asserts that the solution to this dilemma is the proposal and acceptance of a new unit of analysis that offers a more holistic view of leadership, rather than one that focuses on simple aggregate quantities of individual contributions within the leadership practice.

Changing Paradigms. In a world where post-heroic leadership models are proliferating, it has become increasingly acceptable to see leadership as something beyond what can be done by a single person to other people (Badaracco, 2014). Spillane (2006) states that "Letting go of the myth of individualism is difficult even when leadership tales venture beyond the single hero or heroine to acknowledge the part played by two or more supporting players" (p. 2). However, we now have new paradigms that replace the heroic concept of leadership with models that conceptualize it as a group activity that manifests itself through relationships between and among people (Preedy et al., 2012). These changing paradigms represent critical shifts that are powering new thinking about how leadership practice is changing and who gets to lead in the workplace

(Lipman-Blumen, 2000). A formal reconstruction of leader-follower identities is unfolding, and it is powered by the incredible rise of cross-functional teams, increased job complexity, and the need for greater agility to respond to market changes through innovation (Conger & Pearce, 2003).

Shared Leadership. Another way to understand this paradigm shift of leadership in practice is to accept a more fundamental notion of shared leadership within leadership networks. Shared leadership allows us to reframe the heroic leadership paradigm and move toward a leadership practice that involves more than a single individual. Shared leadership can exist in both formal and informal organizational networks, and there are many types of viable shared leadership models, such as collective leadership, collaborative leadership, co-leadership, and emergent leadership. Each of these models recognizes that leadership is not just the work of one person. Leadership involves multiple people, at multiple levels, within the total leadership practice (Pearce et al., 2007).

Aspects of Agency. Gronn (2000) contends that shared leadership practice is actually "fluid and emergent, rather than a fixed phenomenon" (p. 324), where leadership is viewed as a collective social process. Leadership as an emerging variable in this context implies that multiple actors facilitate leadership and interact with each other within their work or community. In this context, leadership is situated squarely within the practice and involves at least two aspects of agency, which Spillane (2006) calls the leader-plus aspect and the practice aspect. Spillane and Diamond (2007) describe the "leader-plus" (p. 7) aspect as the work of all the individuals who have an impact on leadership and management practice. This is, of course, not just those individuals who occupy formal leadership roles within the organizational structure, but also people who exercise leadership across both vertical and horizontal boundaries within an

organization. The “practice aspect” (Spillane, 2006, p. 85) is composed of the product of the interactions of leaders, followers, and specific aspects of their situation. This view not only allows for an analytical understanding of leadership in the everyday community or work environment, but it deemphasizes the formal structures, functions, and roles that can typically be found in an organizational chart. When exploring the leader-plus aspect, researchers must take into account everyone within the practice space, recognizing the work of all who demonstrate effective leadership and management, not just those who occupy specifically designated formal leadership roles within the organization.

Conjoint Agency. Gronn’s (2002) research suggests that there is a critical need to go beyond the dimensions of a simple aggregation of individual contributions, with “concertive action” (p. 423) being a viable option to counter the traditional dichotomy. Additionally, he offers three alternative forms of engagement: spontaneous collaboration, intuitive working relationships, and institutionalized practices. Each of these, he asserts, should be considered as separate manifestations of “conjoint agency” (p. 424). This concept clearly frames leadership as a group activity, rather than a collection of individual actions. Emphasis is placed on the collective relationships among actors as leaders within a given network. Conjoint agency is couched in these relationships as joint interactions between leaders, followers, and their situations.

Situated Practice. Expanding on this idea, Spillane (2006) proposes the concept of situated leadership practice, which acknowledges that the leader does not operate in a vacuum. This assumes more than just a shared component of leadership and involves more than one individual. It extends beyond even responsibility and accountability and delves into leadership routines that operate informally within organizational networks to form a daily practice. Spillane

describes a distributed perspective incorporating three elements essential to understanding leadership as situated in practice. The first defines one's practice as central to the concern of leadership. The second views leadership practice as emergent from the interactions of leaders, followers, and their situations. The third positions the situation itself as having a direct impact on the form and function of the practice.

Terms like shared leadership, collaborative leadership, co-leadership, democratic leadership, situational leadership, and distributed leadership are often used interchangeably. However, they have different meanings depending on the context and how they are applied to various workplace situations and environments. Bass and Stogdill (1990) assert that:

> Leadership is the interaction between two or more members of a group that often involves a structuring or restructuring of a situation and the perceptions and expectations of the members. Leaders are agents of change whose acts affect other people more than other people's acts affect them. Leadership occurs when one group member modifies the motivation or competencies of others in the group. (pp. 19-20)

Leadership routines largely depend on the role of the leader within formal and informal organizational leadership networks. Who accepts responsibility for the work, or who prioritizes and orders the responsibility, may determine who is accountable. Social and other forms of capital can be distributed through these channels and situated in leadership practice (Spillane et al., 2003). How work is divided among leaders within an organization can be thought of as a situated activity and a product of multiple reciprocal and mediated interactions (Pearce & Conger, 2007). When applied to the leadership practice, social capital becomes currency in these interactions. Shared leadership, often distributed across departments and workgroups within the network, can foster increased collaboration and collaborative decision-making.

Interdependence. Leaders and followers are mutually dependent on each other, and differentiation between their roles is not always clear in shared leadership environments. In organizations with flat hierarchies, leaders can quickly become followers and vice versa. Attempting to determine the interdependence between leaders and followers requires a detailed analysis of the situation. Lundberg and Thompson (1967) identified three types of interdependence between related leadership activities: reciprocal, pooled, and sequential. Reciprocal interdependence is where each activity requires specific inputs from another set of activities. In pooled interdependence, activities may share a common set of resources but are for the most part separate. Finally, sequential interdependence is where a given set of activities depends directly on the completion of other activities. These interdependencies represent the often-invisible spaces between leaders and followers that are difficult to measure in complex work environments. Interdependencies are often the source of the emergent phenomena associated with shared leadership situations.

Shared Thinking. As an artifact of the interdependence of leaders and followers, a new environment or culture can emerge from within the leadership practice itself that fosters shared thinking. The interlocking agency between leaders and followers fosters conjoint activities that are situated in shared leadership, exposing the role of shared thinking as part of leadership practice. Vygotsky argues that the mind cannot be separated in isolation from the surrounding society (Vygotsky & Cole, 1978). Vygotsky offers a holistic view as a theoretical framework for understanding many of the most common cognitive processes, such as perception, memory, and language.

In a statement made more than 100 years ago, Dewey (1887) hints at the idea of distributed thinking, “The idea of the environment is a necessity to the idea of the organism, and

with the conception of environment comes the impossibility of considering psychical life as an individual, isolated thing developing in a vacuum" (p. 285). Traditional understandings of cognitive processes treat the concept of thinking as something that is possessed by individuals and resides solely in their head, a view that is almost devoid of the influence of social and cultural factors. However, research that includes aspects of social and environmental factors as not only having an effect on thinking but being a critical part of the cognitive process provides a different view of cognition (Brown et al., 1989). The notion that people can appear to think in partnership with each other, through culturally supplied tools, shifts the locus of control around thinking in a way that is distributed.

Distributed Minds. The idea of a distributed cognition is not new, but the recent acceptance of a more constructivist view of human cognition as being situated and distributed, rather than decontextualized tools of the mind, has seen further adoption (Hutchins, 2001). Resnick et al. (1991) states that it needs to be acknowledged that social and other situational factors have a direct impact on the cognitions of the individual and should be treated as cognitions themselves. Vygotsky's cultural-historical theory supports this idea and illustrates that situativity applied to cognitions associated with interacting social-cultural dynamics provides a wider view with which to conceptualize shared thinking (Lave & Wenger, 1991). Cole et al. (1997) offer that a proper unit of analysis should be joint, socially mediated, activities that are situated in a cultural context. Pea (1994) also disagrees with widely held conceptions of intelligence being wholly a property of the mind. He argues that intelligence is something to be accomplished rather than something to be possessed, and his view supports the idea of distributed intelligence and directly influences our assumptions of what an individual needs to know.

Distributed Leadership. Conjoint agency, shared thinking, and distributed cognition lay the groundwork for hypothesizing leadership as a function of distribution. Harris (2014) makes the point that as long as leadership is considered to be confined to those individuals who are in formal leadership positions, then we are missing out on an opportunity to recognize the informal leadership, expertise, and talent that supports the leadership practice as a whole. As a concept, distributed leadership is chiefly concerned with leadership as a practice, as opposed to leadership as defined by specific roles within an organization where leadership is formally designated (Spillane & Diamond, 2007). It is within this school of thought that a capacity for greater collaboration, change, and innovation within an organization can be facilitated, or at least recognized.

One might postulate that every organization contains expertise that is hidden or leadership that goes unnoticed. The concept of distributed leadership emphasizes leadership as a practice facilitated by the many rather than the few. It takes into account both formal and informal leadership roles and highlights the activities and interdependencies between leaders and followers. This approach creates opportunities for non-designated leaders within a community to lead, or be recognized for their leadership, rather than remain hidden within the limitations of a heroic leadership paradigm (Gronn, 2000).

Consensus Around Distributed Leadership. Researchers who study the nature of distributed leadership agree on three key points. The first is that leadership is an emergent property of a group of interacting individuals (Spillane, 2006). The second is that openness to the domains of leadership, within distributed leadership environments, enables the distribution (Gronn, 2002). The third is that expertise and ability are distributed across many leaders within an organization and not just one heroic leader (Harris et al., 2007).

Harris (2014) presents distributed leadership as a productive way to reframe our current understanding of the practice of leadership and challenges the conventional wisdom regarding formal and informal leadership practice. However, she also cites both the positive benefits and negative consequences of distributed leadership, insisting that taking a silver bullet approach to incorporating distributed leadership is not without risk. Harris (2013) indicates that many of the most successful examples of distributed leadership in workplace environments are ones that sprouted organically and were unplanned.

Common Myths of Distributed Leadership. Spillane and Diamond (2007) make a point to dispel some of the common "myths of distributed leadership" (p. 149). The first myth is that distributed leadership is a blueprint for leadership and management. This is not true, as distributed leadership is an emergent phenomenon. The second is that CEOs, executive directors, C-level staff, and business unit managers, and other potentially heroic leaders, are no longer necessary. This is also untrue, given that accountability for strategy, direction, decision-making, and resource management, are still important elements across leadership paradigms. Lastly, it is said that in distributed leadership environments, everyone is a leader, and distributed leadership is only for collaborative situations. This is also a myth. Although leadership practice can be spread out and shared, not everyone in the practice identifies as a leader or even consistently functions as one (Harris, 2013).

Distributed Leadership Frameworks. Researchers have developed several frameworks to describe and explain the phenomenon of distributed leadership. Although the frameworks differ in their interpretation of distributed leadership and the terms used to describe various aspects, many of them share concepts and verbiage. It is important to note, however, that the concept of distributed leadership is still in the early stages of development. Frameworks for

understanding the idea continue to evolve as more research is conducted. Real-world applications of the distributed leadership concept continue to proliferate (DeFlaminis et al., 2016). The recent social acceptance of more democratic and collaborative social structures in the workplace, such as structural flatarchies and holacracy, have raised the profile and increased the utility of a distributed theories of leadership (Morgan, 2014).

Modes of Distributed Leadership. Gronn's (2002) framework proposes several modes of distributed leadership in practice: spontaneous, intuitive, and institutionalized. Spontaneous collaboration is where groups of individuals, possessing different knowledge, capabilities, or sets of skills, join together to execute a particular task or project. They later disband after the project is complete. Intuitive working relations happen when two or more individuals develop close working relations over the course of an activity or project until their "leadership is manifest in the shared role space encompassed by their relationship" (p. 657). Finally, institutionalized practice is where longstanding organizational structures, mostly formal, are established to facilitate greater collaboration.

Emergent Properties of Distributed Leadership. Leithwood et al. (2006) take a different approach and employ a conceptual framework to illustrate emergent properties that describe the planned, unplanned, aligned, and misaligned aspects of distributed leadership. The framework starts with planful alignment, where project resources and leadership responsibilities are deliberately distributed to those in the best position to lead a given function or project. Spontaneous alignment opposes the planned approach, but still retains elements of planned intent. This component of the framework is where leadership functions and tasks are distributed in unplanned ways. However, unwritten, unexpressed, and intuitive decisions about who should perform a given set of leadership functions result in a fortuitous alignment of

leadership functions. Spontaneous misalignment is still unplanned; however, leadership is distributed in less fortuitous ways. Finally, anarchic misalignment is where leaders pursue their own individual goals and actively reject the direction of organizational leaders creating their own "sphere of influence" (Leithwood et al., 2006, p. 344).

Forms of Distribution of Leadership. Macbeath (2005) takes a more comprehensive approach to describe forms of distributed leadership and provides six forms of distribution: formal, pragmatic, strategic, incremental, opportunistic, and cultural. In formal distribution, leadership is assigned with intent and delegated accordingly. Pragmatic distribution divides leadership among different actors. In strategic distribution, new leaders, based on skills or expertise, are acquired to meet a specific leadership need. Incremental distribution is where leadership responsibilities are progressively assigned as the leaders gain more confidence and experience. With opportunistic distribution, leaders willingly take on ad hoc responsibilities that are above and beyond their normal workload. Lastly, in cultural distribution, leadership roles and responsibilities are assumed naturally within the group and organically shared among leaders.

The Leadership Environment as the Context. Spillane (2006), on the other hand, takes a more foundational approach. He believes that the leadership environment establishes the context of interactions between and among leaders and followers and contends that "leadership practice typically involves more than one person—if not by design, then by default and by necessity" (Spillane, 2006, p. 26). Spillane identifies types as well, but he first starts by delineating three basic aspects of distributed leadership. The first aspect views the leadership practice in and of itself as essential. The second aspect maintains that the interactions between leaders and followers are key to understanding the dynamics of the leadership practice. And the third and final aspect positions the situation as a critical element in defining leadership in

distributed environments. In this perspective, leadership is viewed as the sum of interactions between and among leaders, followers, and their specific situations within the leadership practice.

The types are not mutually exclusive, but they are differentiated by how the leadership is practiced and situated in the work environment. Each type represents a different set of leadership routines. Interdependencies between leaders and followers can influence each type and shape the leadership practice and situation. Spillane (2006) uses sports analogies to describe types of distributed leadership practices among leaders, followers, and their specific situations. He offers three basic types: collaborated distribution, collective distribution, and coordinated distribution.

Collaborated distribution characterizes a leadership practice where the work is shared between two or more leaders working together in the same space and time to execute the same leadership routine. Spillane describes this type of distributed leadership practice as similar to playing the game of basketball, where players interact and engage with one another by passing the ball to fellow teammates to set each other up to shoot a basket and score. The practice associated with this activity is said to be collaborated. Project team meeting facilitation, with multiple project leads and agile design sprints, can be an example of collaborated leadership.

Collective distribution involves two or more leaders facilitating a given leadership routine where the work of the leaders is done separately but also interdependently. Spillane likens this type of distribution to the game of baseball where the players each take turns at-bat in an attempt to hit the ball and run to a certain position on the field. The collective actions and interactions with the pitcher are what produce the practice. Collective distribution may involve team members proverbially touching base. This can be analogous to how project team members

handle workflow using Kanban, emphasizing leadership at all levels on a project (Project Management Institute, 2017).

Coordinated distribution describes leadership activities that need to be performed in a specific or well-defined sequence. This type relies on interdependence and is likened to that of a relay race in the sport of track. The co-performance of the leadership practice in a relay race is dependent upon the game being played by the players in a particular ordered sequence. This leadership distribution type is somewhat consistent with the waterfall approach to project management, where the sequencing of tasks and dependencies are created to facilitate the production of deliverables.

Each type of distribution—be it collaborated, collective, or coordinated—challenges existing paradigms and shifts the focus from individual leaders acting on their own in what can be described as heroic situations to a leadership practice that is shared within a group or community (Spillane & Diamond, 2007). Depending on the type of distributed leadership, a leader may serve as a leader in one situation and a follower in another as the situation evolves and the leadership practice affects the outcomes. Distributed leadership types and their routines can greatly influence how social capital moves through the organizational network and demonstrates how leaders in both formal and informal roles can innovate and get things done (Spillane et al., 2003).

Section 5: Collaborative Culture and Online Learning Circles

The specific type of leadership distribution in a workgroup, organization, or community may be of little or no consequence if the leaders and followers themselves are unable to work together effectively (Burt, 2004). Individual and collective talents, experiences, and skills need to be identified, assembled, and positioned to facilitate proper communication and collaborative

decision-making. Interpersonal relationships, which can be easily measured and analyzed through social or organizational network analysis, influence how various types of distribution can work and how social capital can flow. However, the amount of social capital that can be uncovered, liberated, and shared within formal and informal networks is often critically dependent on one very important factor—organizational culture.

But why is something that is often intangible, difficult to describe, and challenging to characterize so important? Because organizational culture represents the sum of the values, behaviors, and norms that create the social and psychological underpinnings of the environments in which people work (Needle, 2004). Additionally, organizational culture can be both an enabler and an attenuator of the flow of social capital. Shared attitudes, long-held beliefs, and internal customs, along with written and unwritten rules developed over time, all contribute to an organization's culture (Daft, 2001). What freedom do I have to create new ideas? How much latitude do I have for personal expression? Am I allowed to work across departments to get things done? These are all questions that employees ask themselves when learning to navigate the culture of a new organization. The distribution of leadership up, down, and through the chain of command creates vertical and horizontal boundaries within an organization and is one of the reasons organizational culture is extremely difficult to change (Burt, 2004).

The unique personality of an organization, often characterized by its culture and how that personality changes over time as influenced by both internal and external environmental factors, can be best described as an organization's climate (Beckhard, 1972). Changing beliefs and attitudes among employees make the organizational climate dynamic and influence the behavior of both leaders and followers. In many ways, the organizational climate represents the mood of an organization. Internal factors such as poor employee satisfaction and persistent workplace

stress can negatively affect organizational climate. External factors like favorable economic conditions and upticks in earned revenues can positively affect it.

Collaborative Environments

Organizational climate has a direct influence on how employees work together (Daft, 2013). Does this mean that employees need to be in the mood to collaborate? The answer is, it depends. Collaboration can represent the way an organization chooses to challenge itself as it addresses needs or responds to events. Collaboration may be especially important to foster in organizations with rigid formal structures, where the flow of social capital and the ability of employees to share opposing perspectives and radical ideas in safe spaces can be severely impeded (Bourdieu, 2002).

Collaboration, by definition, is a practice where two or more individuals work together with a common purpose, to solve a problem, achieve business benefits, or affect a result (Schuman, 2006). Fostering environments that include workgroups, task forces, and project teams, where collaboration takes place, can spark innovation and help mitigate challenges related to change-resistant organizational culture or environmental uncertainty (Kotter, 2009). Collaboration can also reduce the negative impact of communication bottlenecks that affect the flow of social capital (Cohen & Prusak, 2002). Freeing up the lines of communication can open new channels to collaboration and energize a more empowered employee base, improving collaborative decision-making and decreasing unnecessary internal conflicts that can disrupt workflow and productivity (Carney & Getz, 2010).

Collaboration is a voluntary activity, and participants have to decide to collaborate and want to work together for it to work (Friend & Cook, 1990). Collaboration is based on a kind of parity, where titles and department affiliations are often removed in favor of allowing people to

wear different hats in the room. Identifying mutual goals and fomenting group reciprocity through interdependence is prime, particularly for shared decision-making and consensus-building. This does not mean that employees within collaborative environments are not allowed to argue or talk through their differing opinions, however, a shared commitment to a collaborative process is paramount.

Because of their ability to break down barriers and increase the flow of social and organizational capital, collaborative environments have become increasingly commonplace (Grant et al., 2016). They are often regarded as incubators for innovation and can exist within just about any type of organizational structure (Bessant, 2003). Whether established as a response to a competitive threat in the market, a critical community need, or just a desire for a safe space for sharing radical ideas, collaborative environments are go-to spaces for next-level thinking and doing (Waber et al., 2014). Groups of intrapreneurs with a burning desire to collaborate on something of strategic, managerial, or operational importance often do so without a formally recognized leader. The result is a flat, non-hierarchical, power dynamic that offers a more flexible way to manage innovation projects while breaking down formal silos (Bundred, 2006).

The Case for Collaboration. The case for collaboration can perhaps best be made based on the cultural benefits of allowing employees from different backgrounds to come together and collectively share social and organizational capital (Quicke, 2000). Teams often benefit from an ability to welcome diverse personalities and a working commitment to understanding and accepting each other's differences. Friend and Cook (2017) argue that effective collaboration is demonstrated when members of a team feel that they are respected, their contributions are valued, and trust is present. Diversity of thought, opinion, perspective, and mindset can all play

important roles in the generation of creative ideas. When people of different backgrounds and varying skill sets put their minds together and can release their unique social capital into the network, the whole can become greater than the sum of its parts (Mattessich et al., 2007).

This is particularly important when organizations are employing a user-centric design thinking process as part of their collaborative endeavors. Many innovations are sparked, not as a result of the brilliance of a single individual, but as a result of the interactions of many people with varying perspectives (Brown & Katz, 2011). Design thinking is one of the more popular ways to facilitate collaborative processes. By activating a designer's mindset and a toolbox of methods, organizations can better match the needs of an audience or market in ways that make a desirable product or service technically feasible and also viable as a business strategy. This human-centered approach to problem-solving is based on a collaborative process and inspires people and organizations to strive to be more innovative and creative.

Collaboration Overload. However, as with many business and organizational processes and tools that garner wide acceptance very quickly, the dangers of collaboration overload in the workplace can be all too common. Research suggests that, for many organizations, the costs associated with instant messages, emails, and other more sophisticated forms of online workforce collaboration are starting to outweigh the benefits (Mankins, 2017). Both increased organizational complexity, and collaboration for the sake of itself, can create a culture of groupthink, which stifles creativity (Janis, 1991). In this state, organizational culture may, in effect, manufacture consent by force or seek to achieve complete conformity to group norms, ethics, and values (Janis, 1982). An organizational culture where meetings to plan even more meetings become regular events, and where collaboration is assumed but not necessarily

practiced, can signal the death knell for innovation. For organizations to stay competitive, this practice must be avoided.

Elements of Collaboration. Leaders may be unable to move the needle of innovation forward and leave the station if an organizational culture, committed to effective collaboration, is not also along for the ride. Effective collaboration can allow for new ideas and strategies to be incubated and shared without the risk of groupthink. The process of creating a collaborative culture to ensure that collaboration is effective is, in essence, a form of integrative negotiation (Trötschel et al., 2011). And, it is this type of negotiation, along with other factors, that can help members of a collaborative community make good on their underlying commitment to working together effectively (Halvorsen & Neary, 2009).

Rosen (2007) views collaboration as indispensable and makes the case that establishing a collaborative culture is a crucial step in the process of sparking innovation and promoting intrapreneurship. But he stresses that the process is not without difficulty and risk and offers up a set of 10 cultural elements of collaboration to consider when attempting to foster a collaborative culture. These 10 elements provide a useful framework for contextualizing collaboration as part of a networked organizational structure or within a learning community. Rosen's 10 elements of collaboration include:

- Trust
- Sharing
- Goals
- Innovation
- Environment
- Collaborative chaos

- Constructive confrontation
- Communication
- Community
- Value

Each one of these elements provides valuable insights into the phenomenon of collaborative culture. However, Rosen's first element, trust, is perhaps the most important. Trust establishes the foundation on which many other collaborative activities are based. If the members of a collaborative community do not feel that they can trust each other fully, they may be much less likely to communicate freely and openly or share innovative ideas (Rosen, 2012). During inevitable periods of collaborative chaos, an unstructured exchange of ideas, trust becomes the vehicle for transporting members of a collaborative community to a place where creative ideas can be safely explored without immediate judgment. Judgment can be temporarily suspended to allow for more creative exploration during collaboration, fostering innovation, and deepening trust.

Circles as Centers for Collaboration. From lean startup to agile scrum, to design thinking, there are a variety of approaches to facilitating collaborative work in organizations to improve products, processes, quality, and performance. Each comes with its own set of goals and expected outcomes, as well as its own set of difficulties in ensuring consistent implementation over the long run. However, one of the simplest approaches to fostering collaboration in organizations, and arguably one of the easiest to implement, is a learning circle. Learning circles offer a flat and flexible framework for collaboration and serve as highly interactive and participatory structures for organizing group work (Riel, 2014). Unlike other collaborative

learning structures that are primarily knowledge-based or practice-oriented, learning circles are task-based and are built on trust among the members (Riel & Polin, 2004).

Learning Circle as a Term. The use of the word learning in the term learning circle is fitting, given that an outcome of the process is growth in both the individual knowledge of the members and the collective wisdom of the larger learning community. Likewise, the word circle is equally important and functions as a descriptive metaphor suggestive of the learning circle's characteristic lack of hierarchy. The geometry of a learning circle is extremely flat from the point of view of organizational structure. This allows it to be an effective leveling platform in the work environment. The members of the circle are often prompted by the circle sponsor to, colloquially, check their respective titles at the door before they begin the collaborative activity. This encourages trust-building and helps to free up the hidden social capital in the informal networks of circle members.

Collective Efforts and Common Goals. Learning circles exist comfortably within the conceptual framework of collaboration, at the intersection of collective efforts and common goals, where a horizontal organizational structure gives rise to flexible leadership (Rogoff, 2014). These small ad hoc teams complement existing projects. They can also exist on their own, reflecting the informal aspects of formal networks. When structurally independent, learning circles can operate at the proverbial 30,000-foot level, providing a collective view of the big picture (Horwath, 2014). Intentionally informal, learning circles balance individual ownership with collective responsibility, providing a safe space for both innovative thinking and organizational learning (Riel, 2014). Additionally, they can be a useful platform for consensus-building, helping to derive common goals for individuals or groups with differing interests.

Evolution of Learning Circles. The concept of the circle as a metaphor for learning, sharing knowledge, and honoring wisdom have been used throughout human history (Riel, 2006). From King Arthur's mythological Knights of the Roundtable to the Grand Council of the Iroquois Confederacy, wisdom-focused learning circles can be found in the literature of many different cultures and have been practiced by many tribal societies since the dawn of civilization (Garfield et al., 1998). Although it is difficult to determine exactly how old the concept is, it is likely that humans in early societies routinely gathered together, working in concert with one another, to generate creative ideas to solve shared problems.

From Socratic circles to literature circles, learning circles have taken many forms over the years. In high school, postsecondary, and continuing adult education, the learning circle is the study circle, composed of a group of students whose activities mirror some of the same elements of learning circles. The principles of equality in participation, reciprocity among students, a common or shared goal, and the honoring of collective knowledge, echo many accepted democratic principles (Larsson, 2001). Study circles can be both peer-directed and distributed. They are founded on the idea that all members of the circle have both something to contribute and something to learn (McNichols & Whittaker, 2015).

The term quality circle was defined by Kaoru Ishikawa (1991). Themes and advanced concepts from his work permeated Japanese industry beginning in the early 1960s. The Nippon Wireless and Telegraph Company was the first to officially introduce quality circles as a practice. By 1962 there were at least 36 companies that had implemented the concept. The goal was to encourage everyone to develop a strong sense of ownership over the process and products of the group (Aguayo, 1991). This provided greater transparency and supported enhanced continuity as they remained virtually intact from project to project. Vertical and horizontal

hierarchical boundaries between workers and managers are flattened out in quality circles to encourage more participatory and inclusive management and team leadership (Omachonu & Ross, 2004).

Quality circles share similarities with learning circles in that they are tools for facilitating participatory management and collaboration and invite employees to openly share ideas. They are composed of groups of workers who do similar tasks and meet regularly to identify and solve work-related problems within organizations (Cole, 1999). Quality circles are typically very small in size, and although they may have a manager or supervisor dedicated to help lead the group, the workers themselves are challenged to improve performance and motivate one another on their own. Extremely popular in the United States and abroad primarily during the 1980s and early 1990s, particularly in the field of manufacturing, quality circles were developed as a collaborative meeting format designed to ensure better quality through incremental changes.

Platforms for Collaboration and Professional Development. Today, learning circles are employed as platforms for collaboration and can be found in the fields of social services, community development, and other endeavors associated with social change and education. Churches, neighborhood interest groups, local school councils, and schoolteachers form learning circles to foster vibrant and healthy learning communities. Collay et al. (1998) promote the use of learning circles for collaboration and professional development for teachers. They offer six key conditions that foster healthy communities of learners: (a) building communities with other learners, (b) using personal experience to construct knowledge, (c) supporting the reflective practices of others, (d) documenting the reflections of personal experiences, (e) properly assessing the expectations of teachers, and (f) improving collaborative culture in the classroom.

These conditions can be a useful framework for facilitating learning circles in formal education settings.

The Learning Circle Model. Learning circles can reside within both formal and informal networks and can effectively demonstrate a non-formal way to employ distributed leadership. The learning circle model is framed by (a) an established set of dimensions that define the format, (b) an agreed-upon set of norms that support the collaborative interaction; and (c) an optimized phase structure that guides the overall process (Riel, 2014). One outcome of a learning circle is collaborative knowledge sharing, which authentically emerges from the circle in the form of a deliverable product. The activities needed to produce the product are shared. Circle members are required to each lead an aspect, element, and/or set of tasks associated with the work needed to produce the product. Effective collaboration within the group is often needed to complete a given task.

Learning circle size can vary. A small circle can be between four to five members. Larger circles can range between seven to 12 members. There is no ideal size for a learning circle, but rather a balancing of the need for diversity and scale of the circle projects. A larger circle optimizes the diversity of skill sets, expertise, backgrounds, and perspectives. When considering the level of group activity, which includes the number of circle themes or projects to be led by circle members, there can be a tendency to keep the number of circle members small. Put another way, the larger the group, the more diversity of ideas brought to a multifaceted task resulting in a larger investment of time. Conversely, a smaller group narrows the spectrum of diversity but allows for a more focused group effort on the smaller number of projects. Riel (2006) recommends learning circles with four to six active participants.

Leadership Distribution in Circles. Learning circles allow participants, or members, to approach opportunities, challenges, and issues facing a community through the lens of distributed leadership. The work is divided up into small tasks with individual circle members each volunteering to lead a manageable component of the process of addressing a problem or finding a solution. Rather than engage a single large, shared group task together—a process that benefits the leader of a group—learning circles focus on sets of smaller intersecting tasks that can be led by each member of the circle, but co-performed by all. The process gives each circle member a voice in defining the group task and allows each member to lead. Different from the way design thinking is often positioned, where the focus is typically on developing a discrete empathy-driven innovative solution for a user or customer, learning circles can have the additional benefit of fostering empowerment in ways that support the development of a broader learning community, where shared norms can give rise to reciprocal relationships that help to build trust and support collaborative culture.

Parallels with Learning Organizations. Learning circles serve as an effective demonstration of how groups of individuals can work together to build, share, and express knowledge, all while accomplishing important tasks that are relevant to a community (Riel, 2014). Conceptually, learning circles are in keeping with the notion that an organization can learn. Senge (1990), credited with popularizing the concept of learning organizations as a paradigm shift in how organizations should be run, describes them as places where collective aspirations are set free, and people are empowered to continually learn how to best learn together. Senge's (1990) research suggests that learning circles can be used as mechanisms for knowledge expansion and action-oriented team collaboration, something that he found to be necessary for learning organizations. He proposes five corresponding component technologies,

which include: systems thinking, personal mastery, mental models, shared vision, and team learning (Garvin, 2014). Although learning circles are not by definition considered to be professional learning communities or communities of practice, both of which are appropriate vehicles for establishing and maintaining a learning organization, they can be included as a component of either to foster greater collaboration.

OpenAgile Circles. Agile project management's relatively recent growth in popularity has sparked new ways of thinking about learning circles and collaborative systems for task-based work. OpenAgile is one of the many varieties of agile project management and is composed of three foundational ideas, which include truthfulness, consultative decision-making, and the integration of learning circles (Berteig, 2013). In the OpenAgile system, a project team with a focused learning circle utilizes a simplified, yet practical method for effective learning in the work environment. The system itself is composed of a four-step process that supports effective guidance on project decisions. Each step in the process has a prerequisite activity, which helps circle members develop important capacities within themselves. The most prominent capacity in the OpenAgile system is guidance. Guidance advances the mutual support of learning circle members. Users of the OpenAgile system focus on advancing the value of guidance, believing that guidance improves the coachability of individuals and teams by supplying directions and offering advice, ultimately improving the work environment and team productivity.

Online Learning Circles. Most of the models for learning circles that can be found in the research literature exclusively feature face-to-face collaborative formats. However, establishing a learning circle in an online or digital space is not inherently different from facilitating one in a face-to-face environment. In the digital age, technology bridges distance, allowing for learning circles with participants being able to connect in real-time with

counterparts on the other side of the globe. Learning circles can translate well in digital spaces and can operate in two different modes, or even in combination. The two modes are:

- Synchronous - where learning circle members interact in real-time in virtual spaces such as online meetings, instant messaging, text messages, or via videoconferencing,
- Asynchronous - where the interaction of learning circle members happens discontinuously, in and out of sync with corresponding real-time interaction.

This flexibility in the facilitation is evident in organizations where the learning circle members collaborate regularly, even when they are not collocated (Gilson et al., 2014).

However, perceived distance and lack of true face-to-face interaction can be a challenging constraint when trying to build trust or share collective wisdom through the affordances of digital technology. Not everyone on a given project team may be adept in participating in online learning circle formats, and it may take some getting used to even with teams who work together often face-to-face and in the same space. This can potentially affect the motivation to participate in virtual collaborative environments, especially when team members are charged with solving complex problems together or facing difficult design challenges that require deep collaboration (Rodriguez et al., 2016). The lack of research in this area illustrates that there is still much to be explored regarding how individuals can more rapidly adapt to virtual collaborative environments such as online learning circles.

Making the mental shift from listening and talking collocated in a physical space to facilitate the same engagement in conversation through a camera and screen can be awkward (Gilson et al., 2014). Even with today's ultra-high-speed broadband technologies and smart applications such as WebEx, ZOHO, Go-To-Meeting, Skype, Google Hangouts, Zoom, FaceTime, and others, there are still social barriers to using these tools to facilitate learning

circles. When members of an online learning circle are required to participate in the practice of critique, examining ideas or designs as part of a group assignment, the challenges can become even more complex. Critique requires a delicate balance of truth and trust. If the circle members have yet to establish trust before participating online, the process of getting them to effectively adapt to a format of open and honest communication may be difficult. Video conferencing tends to extend the lag times between responses, even with high-speed connections. The dreaded choppy digital video conference can be incredibly frustrating and can threaten a circle member's faith in the process (Hutt, 2017). This means that the technology can, in some cases, end up hurting rather than helping the establishment of an online learning circle.

The good news is that new norms and higher expectations of quality are continually being set for online collaborative environments as organizational cultures, slowly being populated with generations of employees who are much more comfortable in digital spaces, continue to evolve. To keep up with the speed of today's fast-paced business environment, working remotely and collaborating through mobile devices beyond the four-wall meeting room is almost a necessity (Samuel, 2015).

Dimensions of Learning Circles. Riel (2014) describes six key characteristics that should be considered when establishing an online learning circle:

- Diversity of participants
- Distributed leadership and collective responsibility
- Project-based work and individual ownership
- Phased structure for circle interaction
- Knowledge building dialogue
- Final group shared product.

Diversity of Participants. It is important to recognize that collaboration does not require a diversity of participants to work. It can function comfortably, as a practice, in work environments where the participants are relatively homogeneous. However, in an online learning circle, this is not recommended. Although diversity in perspective, background, and expertise may not always be necessary for collaboration, having a rich dialogue with people of differing opinions and world views can increase the innovation potential of an organization, specifically as it relates to disruptive innovation (Banovetz, 2018). Team members with diverse ethnicities and backgrounds may benefit from a greater variety of perspectives. Honoring differences and valuing diversity can result in deeper connections among members and more meaningful construction of knowledge. Working in collaboration with diverse colleagues can take team members out of their everyday mindset and allow them to avoid groupthink and exercise divergent thinking. Members who are put in a position to understand the perspectives of others can stretch the thinking of each member of the group. Some groups of collaborators have been shown to think differently when they work on a diverse team. This is because they expect, and perhaps even take comfort in, the idea that there will be greater challenges to their ideas (Freeman & Huang, 2014).

Distributed Leadership and Collective Responsibility. By their very nature, learning circles and their flat structures lean toward a more distributed format. Leaders who participate in learning circles may be more comfortable with sharing the leadership load knowing that the flatter structure tends to overlook a member's roles and responsibilities outside of the circle. In an online learning circle, each member agrees to be a leader of the group at some point during the process and to co-perform leadership with others. Distributed leadership, as recognized within a learning circle, is a way to allow each member to participate fully and to not feel that

rank and privilege is the determining factor in how decisions will ultimately be made (Spillane, 2006). This effect can create a sense of collective cognitive responsibility among the members, with the idea that each member of the circle will share in the fruits of the knowledge-building process (Goldman & Scardamalia, 2013).

Project-based Work and Individual Ownership. Project-related work is integral to the online learning circle process. Projects are predominantly used in organizations to address specific business needs. Verzuh (2016) states that these needs are addressed through the production of deliverables, which can come in the form of products, services, or results. Although learning circles that meet face-to-face are employed for consensus building, knowledge construction, and wisdom sharing, online learning circles tend to be project-based and task-oriented. Tasks can cascade down from higher-level objectives, which represent sub-projects that circle members might individually champion.

When choosing a circle theme or a charge for the circle, it is important to select projects that are large enough that their parts can be broken down efficiently for task distribution. Each member of a learning circle is required to take on a leadership role and essentially serve as the project manager for an aspect of the project. This approach empowers each member to take on individual ownership of an objective or set of tasks supporting the completion of the project.

Although circle members can be assigned a particular set of tasks based on skills or experience, in most cases, members get to choose how best to contribute. This supports distributed leadership within the circle and also serves as a productive way to allow new leaders with limited project experience to design a more manageable learning curve. As a result, a project-based learning environment is created for the members, which allows real-world on-the-job training for new leaders. In addition to the co-performance of distributed leadership, online

learning circles can also foster distributed knowledge, an idea consistent with the concept of distributed cognition, and supports the outcome of multiple people effectively sharing a broader understanding of the phenomenon, innovative idea, or challenge facing the group (Hutchins, 2001).

Phased Structure for Circle Interaction. Unlike other forms of community development collaborative interactions, learning circles have three distinct phases: a defined beginning, middle, and end. The first phase is focused on the orientation of the circle members and the organization of the circle itself. This first phase opens the world in which the circle members are going to operate and is usually focused on trust-building and group cohesion. The second phase is the part where the shared work is framed and set up for distributed leadership to occur and where the tasks needed to facilitate the project get defined. The final phase is where the distributed tasks get done and the sharing of the completed work, or deliverables, get exhibited. Timelines and deadlines in an online learning circle are consistent with project-based work and are typically aligned for the sake of efficiency. The online learning circle still retains a well-defined overall objective to produce a set of outputs and outcomes, however, those outputs and outcomes are generated by the circle members, and the value of those is determined by consensus. This can reinforce group cohesion and the trust-building continues throughout the cycle.

The three-part phase structure can be further subdivided if more specificity is needed. Riel (2006) offers a six-part phase structure that can be used when facilitating an online learning circle. This structure is quite simple. Even those new to online learning circles should be able to easily use this method. The six sub-phases are, (a) getting ready or preparing to launch an online learning circle, (b) opening the circle, (c) defining the projects and project leadership, (d)

working collaboratively on all projects and producing the deliverables, (e) sharing the outputs, outcomes, and results, (f) and finally, closing the circle. This is where inventory is taken regarding what was learned, what was produced, and what can be shared beyond the circle.

At the end of an online learning circle, it is common for the participants to join a new circle, continuing their process of knowledge building and distributed leadership. This effect acts sort of like a chain reaction that spreads the internal collaborative culture of an online learning circle to other parts of the organization, allowing the organization to be more collaborative in ways that might increase or enhance an organization's ability to spark innovation and promote intrapreneurship.

Knowledge-building Dialogue. The work of knowledge building within the circle is not just relegated to new ideas to be stored away in a conceptual file cabinet, but it rather exists as a place where those ideas can be openly shared and challenged (Bereiter & Scardamalia, 2005). Collective cognitive responsibility can be found in many work environments that promote collaboration. It is no different with online learning circles, where the context is such that each new component of knowledge has shared ownership and is not exclusive to the individual member. Learning circle members are encouraged to share their thinking and challenge one another to higher levels of understanding. Talking through ideas and challenging assumptions is an effective way of deriving innovative solutions in collaborative work environments. Online learning circles can become safe spaces to do just that, creating environments for knowledge-building dialogue that support the objective of distributing the work on task-based projects.

Final Group Shared Product. Finally, the shared product or products generated by the group immediately become the property of the group. These outputs and outcomes represent the collective work of the circle members and illustrate what they learned through the process. The

final product from an online learning circle is an authentic assessment of the circle members' overall experience. It allows members to share with outsiders what was explored or discovered during the process. These outputs and outcomes are considered conceptual artifacts representing the collective consciousness that was exhibited through distributed cognition by the members of the circle.

Online Learning Circles in Project Management. Finally, although online learning circles share many features with other reflective practice techniques, informal discussions, and community-based learning groups, they differ in very specific ways. In contrast to a practice-based or knowledge-based environment, facilitating within a task-based environment is a distinguishing feature (Riel & Polin, 2004). Employing an intentional structure for collaborative group work instead of having a more general and less defined shared group task makes online learning circles inherently more efficient when integrated with projects. The tasks led by the individual circle participants build trust, helping to develop a set of shared norms that allow the group to function collaboratively without fear of being judged or feeling unsupported during the process. This, in turn, supports openness to participation and enables reciprocity, where each individual focuses on his or her responsibility to the group, knowing that shared reciprocity becomes one of the benefits of working collaboratively with others on issues or opportunities that affect the entire community.

Summary

This comprehensive review of relevant research contributes to a foundational understanding of the problem of shifting organizational structure and culture from rigid silos to flexible networks (Bundred, 2006). The literature cited, spanning several decades, provides insight into establishing collaborative culture. Sparking innovation and promoting

intrapreneurship is a business driver and a competitive advantage, as well as a priority for this study. Innovation has an intrinsic value to an organization, as it contributes to the design and development of new products and services (McFarthing, 2016). Internal silos and invisible barriers typically do not deter intrapreneurial project team leaders who want to innovate. Their self-efficacy and passion often inspire others to challenge existing paradigms and transcend the status quo (Bandura, 2017).

The complex interplay between formal and informal organizational networks represents a critical factor in understanding the performance of cross-departmental project team members situated within the organization (Soda & Zaheer, 2012). Measuring the degree, betweenness, and closeness in sociograms illustrates the hidden relationships in internal organizational networks, including exactly how employees collaborate and tap into various forms of latent human and structural capital (Knoke & Yang, 2008).

The concept of conjoint agency frames leadership as a group activity rather than a collection of individual actions. With this idea, the emphasis is placed on the collective relationships among actors as leaders within a given network. The shift can be made from leadership as a heroic action to more of a function of distribution, with joint interactions between leaders, followers, and their situations (Harris, 2014). Therefore, leadership should not be confined only to those individuals who are in formal leadership positions (Spillane & Diamond, 2007). Online learning circles can support distributed leadership and effectively be used as intentional structures for collaboration. They are viable options for transforming organizational culture on cross-departmental projects, and they can also make project-related tasks much more efficient while building trust with circle participants.

Chapter 3: Methods and Tools

Overview

In this chapter, I describe the approach and methodology I employed, during the COVID-19 pandemic, to spark innovation and promote intrapreneurship in my organization through the use of an online learning circle, with the ultimate aim of creating a more collaborative workplace culture. This study intended to introduce an online learning circle as an intentional structure, or platform, for collaboration on innovation projects. Within the circle, the emphasis would be placed on fostering conceptual thinking and increasing the use of rapid prototyping.

Included in this chapter is my project plan for research, a set of assumptions and predictions, a logic model outlining my research design, a chart representing domain-specific data collection criteria, and a brief description of the digital platforms used to host the online learning circle. In addition, a blog was utilized to document some of my reflections on what I learned and how I grew professionally during the process while advancing my leadership and facilitation skills as a new President & CEO.

Setting

The setting for this study was the MiSci, a nonprofit organization located in Detroit, a Midwestern city on the border of the United States and Canada. MiSci is recognized by its audiences, communities, and partners as the region's home for informal science and technology learning and is situated within a very popular and well-respected cultural district in Midtown. The organization impacts more than 250,000 people annually through exhibitions, Omnimax, Planetarium, 4D Theater, and STEM that are facilitated onsite, offsite, and online.

MiSci is made up of nonprofit professionals from diverse backgrounds in roles that include scientists, educators, managers, exhibit developers, marketers, and fundraisers. The

organization's structure can be described as functional, with workgroups co-located in departments with others of similar job titles and expertise. During any given year, the staff participates in multiple cross-departmental project teams that manage special projects and focus on designing, developing, operating, and evaluating new exhibits, programs, and events. These teams run continuously throughout the year and meet regularly. And although our organizational culture is undoubtedly team-focused, it is not particularly innovation-oriented.

Our project team leaders are often, but not always, department leaders who directly oversee the majority of the resources needed to execute the projects initiated by the organization's leadership. If teams have problems concerning team efficiency or effectiveness, a functional leader higher up in the organization chart, such as a department leader, director, or chief, usually steps in to make decisions and resolve issues and conflicts. Although these team leaders are quite adaptable when the need arises, they unfortunately rarely get to take advantage of the opportunity to integrate reflection as a tool for evaluating team performance or for improving practices.

When teams are unable to execute projects effectively, task forces are often assembled to perform course corrections or respond to risks or emerging crises. Task forces are often led by directors or mid-level managers within the organization who have the expertise to solve a given problem or address a particular issue. Reflective practice is rare, but it does occur and is typically facilitated on the front-end as a way to reframe the problem or situation. Occasionally, a few unsanctioned task forces sprout spontaneously. These groups are typically led by self-empowered, sometimes self-appointed, employees who are comfortable taking initiative and working outside the boundaries of existing organizational structures to get things done. Assertive and self-starting leaders like these, who work in medium to large organizations and take it upon

themselves to lead change and foster innovation, are known as intrapreneurs (Krueger, 2015). Intrapreneurs tend to be more comfortable exploring new ideas and taking risks. However, instead of venturing outside of an organization, they often work within the confines of it, with an interest in facilitating innovation from beyond the boundaries of rigid formal structures and hierarchies.

Before this study, the intrapreneurs who existed within my organization were uncovered by several enterprise-wide SNAs and ONAs that I facilitated during late 2019 and early 2020. These analyses produced detailed sociograms that identified the distribution of the intrapreneurs and revealed many of their hidden informal social ties. Although many of our intrapreneurs had an interest in collaborating with others with similar dispositions, because of timing, they rarely had the opportunity to work together on the same project. I viewed this as an incredible opportunity for increased collaboration within our current structure.

Restating the Problem

My organization exists in a state of organizational inflexibility, with semi-rigid departmental boundaries and silos. We require new solutions that allow us to effectively transition to a more flat, agile, and socially networked structure beyond standard project team huddles and meetings. Making an internal cognitive and structural shift from silos to social networks to create a more collaborative culture in the workplace is extremely challenging. However, my study benefits greatly from insights gleaned from prior SNAs and ONAs that I conducted at my organization in the past year. Data from these analyses indicated the presence of distributed leadership on several project types, including agile, sashimi, and waterfall-based projects.

The data also hinted at the role that distributed leaders played in sparking innovation, promoting intrapreneurship across departments, indicating that regardless of the project type, distributed leadership and intrapreneurship can have a positive impact on fostering a collaborative culture. Although the network analyses were constructed to uncover the strong and weak ties within the social and organizational structure, they were not intended to propose solutions or offer specific recommendations on how to address the silo effect or the rigid organizational boundaries we often experience in the workplace. The action research study was an attempt to bridge those gaps and provide solution options to address my overall concern.

Research Platform

My overall research question was: How might I create a more intentional structure for project work at MiSci that sparks innovation, promotes intrapreneurship, and creates a more collaborative culture in the workplace? After reframing this question and researching a plethora of approaches for addressing my problem, I selected online learning circles as the best option to employ during my action research intervention. Online learning circles are intentional structures for collaboration on projects, and they can be effective platforms for both individual and group learning as they offer a formal set of collaboration practices and norms (Riel, 2014).

For my study, I decided to assemble an online learning circle within my organization and use it to temporarily replace our standard project meeting. The online learning circle would differ greatly, in both style and function, from our existing meeting format. I expected that the online component of the concept would provide new opportunities for circle members to chat and share documents digitally and asynchronously. This aspect would prove to be particularly important during the onset of COVID-19 in March 2020 when our science center unexpectedly closed in response to the Michigan governor's stay-at-home executive order.

The circle I set out to establish was composed of a small group of employees, self-identified intrapreneurs, who together, supported activities that served to flatten hierarchy and foster equal participation across multiple departments. They would also serve as my action research participants and would function to a large extent as co-researchers. Inside the circle, leadership would be distributed throughout the group, rather than emanating from a single individual. The circle would be framed around themes, or challenges, that addressed current and future issues and opportunities relevant to circle members.

To resolve selected challenges collectively, each member of the circle would be charged with taking on one or more key aspects of a challenge and lead their fellow circle members through a collaborative problem-resolution process to address it. Individual members would be invited to self-select specific aspects of the projects to lead based on their interests and professional expertise. Members would be encouraged to support the work of others while they lead their project activities and be responsible for both the processes and deliverables of their individually selected work.

I initiated my research with the expectation that the online learning circle would have a long-term flattening effect on organizational hierarchies and a connecting effect on existing organizational silos, and would foster a more open and collaborative culture. The circle was facilitated online using digital tools with social networking capability. For the participants, I hoped that the online learning circle would slowly emerge as a viable alternative for teams looking for a simpler way to communicate and collaborate at a distance where technology would serve as the mediator of knowledge sharing (Riel & Polin, 2010).

Not surprisingly, given the timing of this research project, many of the issues and opportunities raised in the online learning circle would be directly influenced by the unfolding

impacts of the novel Coronavirus or COVID-19 pandemic. However, the business disruption and social distancing reality of our regional government lockdown order significantly increased the utility of the online learning circle given that COVID-19 forced nearly all of our MiSci team members to frequently work remotely. The online learning circle that would be established served as a valuable platform for our distributed leaders to develop concepts, collaborate on projects, and facilitate strategic thinking.

Distributed Leadership

During this study, I used the lens of distributed leadership as my theoretical framework. In distributed leadership, leadership is defined as a co-performance and a function of distribution, where leaders, followers, and the aspects of their situations shape leadership routines and practice (Spillane, 2006). Facilitating distributed leadership in my organization as an approach to collaboration among intrapreneurs was intended to create new avenues for non-designated leaders to effectively lead others and not remain hidden within the limitations of the heroic leadership paradigm (Gronn, 2000). Using this lens, formal and informal leadership roles, as well as the interdependencies between leaders and followers were explored.

Spillane's (2006) delineation of three basic aspects of distributed leadership was to feature prominently in this study. The first aspect views the leadership practice as an entity in and of itself and something that is an essential part of successful leadership. The second aspect maintains that the specific interactions between leaders and followers are critical to understanding the complex dynamics of the leadership practice. And the third and final aspect underscores that the leader is in as a central element in defining leadership in distributed environments. For this study, I represented distributed leadership as the sum of interactions among leaders, followers, and their specific situations within the leadership practice.

Distributed Leadership Types and Analogies. Analogies used to describe types of distributed leadership practices among leaders, followers, and their specific situations were to be used as framing devices for understanding and classifying the collaborative activity within the online learning circle. Spillane (2006) offers three basic types of distribution of leadership. These are illustrated through sports-themed analogies as collaborated distribution, collective distribution, and coordinated distribution. It was assumed that each of these three types of distribution would be observed during my online learning circle facilitation.

Collaborated distribution is a leadership practice where the work is shared between two or more leaders working together in the same space and time to execute the same leadership routine. This type of distributed leadership practice is similar to playing the game of basketball. Online learning circle project work with multiple project leads and agile-type design sprints may indicate the presence of collaborated leadership activity.

Collective distribution involves two or more leaders displaying a leadership routine where the work of the leaders is done separately but also interdependently. This type of distribution is likened to the game of baseball where the players take turns at-bat in an attempt to hit the ball and run to a certain position on the field. The collective actions and interactions with a designated pitcher are what produce the practice. If collective distribution is observed, it may involve team members touching base with each other outside of their routine. This is analogous to instituting stage-gates or overlapping phases on a project.

Coordinated distribution describes leadership activities to be performed in a specific or well-defined sequence of activities. This type relies on interdependence and is likened to that of a relay race. This leadership distribution type is somewhat consistent with a traditional waterfall

project management approach, where the sequencing of tasks and recognition of dependencies are needed to facilitate the production of project deliverables.

Observing Types of Distribution. I desired to examine member activities within the online learning circle to potentially illustrate how distributed leadership routines might greatly influence or amplify the flow of social capital within our existing organizational networks and demonstrate the effectiveness of both formal and informal leadership roles (Spillane et al., 2003). The observation of collaborated, collective, and coordinated distribution types would allow me to challenge existing paradigms and shift the focus from individual leaders, acting as heroic leaders in designated leadership roles, to a leadership co-practice that is shared within the online learning circle itself (Spillane & Diamond, 2007).

Research Design

Action research, selected as the research design for this study, is participatory, collaborative, analytical, and reflective (McNiff & Whitehead, 2011). These aspects are particularly appealing for this study because they closely matched how I intended to facilitate leadership in the role of a learning coach embedded within the online learning circle. In a relatively siloed workplace like mine, collaboration can be one of the most difficult project team activities to both initiate and sustain. However, in an action research design, collaboration is an integral part of the process. The analytical nature of action research undergirds its utility as an approach to study change, particularly during the transition points between the cycles of iteration (Coghlan & Brannick, 2014). As the action researcher in this study, I regularly took the opportunity to reflect on my actions and decisions during these transitions, then review these reflections and use them to plot supplementary actions during the next cycle (Riel, 2010). Throughout my study, it was my aim to create a participatory and reflective environment for my

learning that would enhance my ability to facilitate distributed leadership, and also provide me with opportunities to explore new ways to foster a more collaborative culture in my organization.

Researcher's Role

The object of my action research was to establish a new process for collaboration on projects, using an online learning circle as the preferred platform for distributed leadership. My ability to facilitate this new process while simultaneously challenging the status quo was at the center of my research. As an action researcher, I had a dual role—that of both researcher and practitioner during the study (Riel, 2010). Since action research is practitioner-based, it serves as an effective framework for understanding change in one's practice and guides the interventions that are initiated in the work environment. This allows for a deeper understanding of driving questions that are posed during the process and helps identify practical ways to solve problems.

For my study, I was situated within my practice. I could influence outcomes while interacting with others who were also participating in their individual learning processes. I considered several important action research characteristics during this study: a commitment to improvement, putting the "I" at the center of the research, facilitating intentional action, authentic descriptions for action, generating valid data, supporting research claims, and making research public (McNiff & Whitehead, 2011).

Expected Outcomes

My expected outcomes were outlined in three domains: professional, organizational, and scholarly (Riel, 2015). These three domains were used to frame my action research and I cataloged my progressive elaboration in each one using a reflection blog. I also added empirical, exploratory questions for each domain to guide my reflection process.

- Professional domain - In the professional domain, I expected to enhance my skills in facilitating distributed leadership within online learning circles. By doing this, I hoped to be able to inspire the next generation of leaders, intrapreneurs, and innovators within my organization. How might I examine my approach to distributed leadership as President & CEO and be open to allowing others the space to grow professionally?
- Organizational domain - In the organizational domain, I expected to establish new sets of practices, to shift our organization toward a more collaborative culture. How might I help us manage our expertise in the work environment, share best practices among circle members, build collective knowledge and intellectual capital, and support each other as distributed leaders?
- Scholarly domain - In the scholarly domain, I expected to observe different types of distribution (collaborated, collective, coordinated) within the online learning circles and share the data, findings, and insights of my study with a broader audience. This would likely happen within my organization and beyond, and at professional conferences. How might I explore how distributed leadership emerges within the online learning circles and create new knowledge that will be valuable to action research scholars as well as online learning circle practitioners?

Data Collection and Analysis

The data sources and analysis I used for each domain were also outlined in the same three domains (see Appendix B). These domains were used to guide the data collection process and methods:

- Professional domain - (Description) Practices used to support the facilitation of distributed leadership, such as: establishing trust, ensuring mutual respect, and fostering a safe space. (Data Source) Personal reflections on events and activities during and between action research cycles. (Method) A set of themes from blog entries where new strategies and techniques are outlined, described, and reflected upon including knowledge, skills/practice, and identity. (Analysis) Evidence of shifts in themes and concepts concerning specific strategies employed to facilitate distributed leadership and collaboration.
- Organizational domain - (Description) Exploring the types of distribution as described by Spillane (2006), which are collaborated, collective, coordinated. (Data Source) Visual records of leadership distribution occurring within the online learning circles including wiki and chat used for online group work. (Method) A set of online posts from sessions will be collected to explore changes in roles, community practice, and cultural knowledge. (Analysis) Evidence of collaborated, collective, coordinated distribution taking place within the online learning circles during cycles.
- Scholarly domain - (Description) An analysis of physical and digital artifacts from the online learning circle exercises and final projects. (Data Source) Physical and digital outputs of learning circle challenges posted online. (Method) Review of online learning circle artifacts for their overall innovation potential. (Analysis) The indicators of innovation and intrapreneurship through an authentic assessment of the process.

Logic Model

An effective approach to practitioner research, action research allows a practitioner to participate in and study the effects of change on one's organization (Coghlan & Brannick, 2014). It fosters an evolution of practice over successive cycles and provides the researcher with multiple opportunities to reflect and learn (Riel, 2010). I found it to be a highly participatory and collaborative process that was both emergent and iterative. To better visualize and manage the action research cycles, my study featured a logic model that framed the action I planned to take in each phase of the project (see Appendix C). Additionally, the logic model doubled as a theory of change and was used to chart my assumptions and predictions of how my actions might directly influence my expected outcomes. The logic model delineated the flow of my proposed intervention and listed the inputs, throughputs, and outputs I expected to see. Short, medium, and long-term outcomes were also included.

Inputs

The inputs represented the primary need for solutions that foster better collaboration among team members on cross-departmental innovation projects. They covered the five strategic areas that governed my overall process. There was the identified need for recognizing and cultivating distributed leaders to fulfill our strategic, tactical, and operational goals and help to effectively transition our division from silos to social networks. I wanted to explore the development of a distributed framework for leadership in my organization that establishes a safe space for intrapreneurs to collaborate and innovate among team members and facilitate it through reflective practice and online learning circles.

Throughputs

The throughputs in the logic model outlined my action research cycles, which were focused on distributed leadership facilitation through online learning circles that served as my primary platform for group learning and knowledge building. The throughputs were representative of the specific activities that I facilitated during my action research cycles and illustrated what I expected to be doing during each successive iteration. While it may be useful to plan for multiple cycles of action research at the onset, the method compels the researcher to reflect after each successive cycle and adapt strategies and plans to build new cycles based on what has been learned. These three primary cycles are identified and described as a blueprint for the action with the assumption that each cycle influences the action of subsequent cycles.

- Cycle one - was designed to explore the strategies that I intended to use to assemble the teams, open the learning circle, create the online meeting space, and establish norms and expectations for circle work.
- Cycle two - was designed to expedite the shift from setting norms and expectations to the process of formulating innovation projects. This was done by issuing challenges to the participants (the circle members) in the form of a collaborative activity that allowed each member of the circle to lead at least one portion of the overall project process, product backlog, or deliverables list.
- Cycle three - was designed to involve the exploration of strategies that would help organize circle projects into cohesive products that can be presented to others and possibly be immediately implemented into the workplace.

Cycle Questions. Cycle questions, embedded within the logic model, were included as a way to guide the inquiry process and support the progressive elaboration of each cycle. Actions

to be taken, along with expectations for outcomes, would need to be shaped by the questions that preceded them at the beginning of each cycle. After each cycle, a brief reflection process focused on the outputs and outcomes, which heavily influenced the next stage of circle interactions. A blog was used to document my reflection throughout the process. It was made accessible to my dissertation chair, cadre classmates, and professionals in my industry who served as critical friends for my action research process.

Outputs

The outputs section was set up as a placeholder for the knowledge created or gained by circle members, along with the associated artifacts that they would create to illustrate their learning, growth, collaboration, and leadership distribution. The outputs in the logic model defined my expectations regarding what would ultimately be produced by the circle members and how those artifacts might contribute to fostering intrapreneurship, sparking innovation, and creating a collaborative culture.

Outcomes. The outcomes list represented my short and medium-term changes that were expected to address my study's purpose to create a more collaborative culture in the workplace. The outcomes also outlined my predictions of what was likely to emerge from each cycle of the online learning circle process. It was anticipated that unexpected outcomes would emerge from the process and may need to be classified as either opportunities or consequences.

Impacts. For the long-term impacts of my study, I intended to transition our organization from silos to social networks and foster the emergence of a more collaborative culture: one better able to support distributed leaders, increased innovation, and the valuing of organizational capital.

Planning and Reflecting. Designated planning and reflection activities were set up to precede and follow each action research iteration cycle. During planning, I would review the outputs and outcomes of the previous cycles and adapt my strategies based on lessons learned and knowledge gained. Critical friends that I had identified for my action research would be consulted on an ad hoc basis.

Online Learning Circle Development

Online Learning Circle - Conceptual Collaboration

The online learning circle that I set out to establish was to serve as a platform for conceptual collaboration, where circle members would be provided with opportunities to think creatively and take on timeboxed, meaning time-limited, moonshot-like challenges that focused on concept development. The circle would help to foster cross-departmental social networking, distributed leadership, innovation, and collaborative culture. I developed several objectives in support of this goal. My objectives for the online learning circle were:

- Empower a small, diverse, and representative group of mid-level employees to form an online learning circle that engages in distributed leadership, establishes formal sets of norms, and delineates expectations for circle interaction.
- Establish a set of critical questions and/or challenges that supports conceptual collaboration and guides circle interactions that are learner-centric, needs-based, value-oriented, and lead to shared circle product, service, or result.
- Generate a multiplicity of innovative ideas and strategies that advance the mission of our organization and support the development of innovative intrapreneurial projects.

- Encourage circle participants to share the outputs, outcomes, and prototypes broadly across our organization as representative artifacts of collaborative culture in the workplace.

Online Learning Circle - SNA and Beyond. As part of our enterprise-wide strategic planning process during the summer of 2019, I implemented the first SNA at MiSci. This process was done with our entire team and the analysis focused on mapping the connections between and among team members and team leaders. My objective was simple: to use the data that I collected through online surveys to generate sociograms and network maps of each team's social networks while the teams were conducting project work. I wanted to use the maps to challenge our team to think more about how to better facilitate use of social capital and expertise on project work.

The SNAs, which exist now in the form of digital network maps, provide a geometer's view of the informal social structures and associated ties that have proven to be essential for developing social capital at our organization. This gives the term circle a double meaning. In social network theory, circles refer to the members or actors within a social or organizational network diagram (Perrucci & Potter, 1989). Each circle member becomes a member of a network and shares social knowledge-based capital and experience with the group as distributed leaders.

I believed strongly that the online learning circle, with its formal structures and expectations for interaction, could strengthen social network ties and relationships among circle members. The circles could truly represent a unique platform for exploring existing connections and developing digitally enabled relationships, which were particularly important during COVID-19. Using the SNAs as an input for the process of selecting online learning circle members would provide an additional advantage in fostering new cultural practices and norms.

Online Learning Circle - Membership and Selection Process. Given our challenges with reduced staffing at our organization due to furloughs and other budgetary impacts associated with COVID-19, I decided to limit the online learning circle membership to five mid-level employees. In keeping with the best practices of organizational network development, employees from diverse backgrounds, roles, and expertise would be selected to participate (Mattessich et al., 2007). I planned to use both a prospective member's position in the organization and the findings from the social network analyses to create the most diverse and influential circle groupings. The circles would convene primarily online, but not exclusively if a partial return to the building was later authorized.

I planned to select potential circle members from our entire pool of full-time employees. Participation would be completely voluntary. I wanted to attract the intrapreneurs, that is, employees who routinely work outside the lines to innovate. The practices, norms, and expectations of the online learning circles require each member of the circle to propose and then lead an activity that supports the completion of the overall challenge or theme posed to the circle (Riel, 2014). Members of the circle discuss and agree on a set of collaborative projects with each member of the circle and are expected to serve as the leader for one project, as well as participate in all of the circle challenges.

Online Learning Circle - Infusing Action Research Cycle Questions. My path of inquiry and my initial thinking on how the cycles might progress would be relatively simple. I wanted to frame my questions as if-then and then use them to guide my action research progressive cycle facilitation. Due to the iterative nature of action research, I wanted to ensure that there was a level of inherent uncertainty built into the process. This means that during the early stages of the research, my first cycle would be the best understood and also the most

detailed. The following is the list of action research cycle questions that were framed at the start of my study.

CYCLE 1 (Opening/Emergent):

- Cycle 1a (WHO): If I use existing ONA/SNA data, combined with previous innovation project performance on projects, to what extent will I be able to select capable intrapreneurial circle members who are both willing and excited to participate in my action research?
- Cycle 1b (WHEN/WHERE): If I employ digital spaces/tools for establishing and facilitating the online learning circle, to what extent will the circle members build trust and feel comfortable openly communicating and freely collaborating online?

CYCLE 2 (Exploring/Divergent):

- Cycle 2 (HOW): If I create "challenges" for the online learning circle members, to what extent will they employ distributed leadership (collective, collaborative, coordinated distribution) and demonstrate individual ownership and collective responsibility?

CYCLE 3 (Closing/Convergent):

- Cycle 3a (WHAT): If I encourage the online learning circle members to share their challenge-based innovation projects and digital artifacts throughout the organization, to what extent will other employees have a desire to participate in a more collaborative culture within the organization that helps to spark innovation and promote intrapreneurship?
- Cycle 3b (WHY) If Cycles 1-3 were successful in establishing an online learning circle, how might my ability to facilitate distributed leadership change?

Online Learning Circle - Artifacts and Authentic Work Products. Action research employs multiple sources and methods for data collection often including both qualitative and quantitative approaches (Creswell, 2013). My study's design consisted of gathering multiple artifacts, including digital artifacts, and identifying several important measures for analyzing my effectiveness as an online learning circle facilitator and a learning coach. These artifacts were considered as authentic work products for action research (Sagor, 2000). They were required to be in digital form, consisting of the outputs of innovation challenges posed to circle members as part of project work. Artifacts were hosted in an online environment for sharing between and among circle members, along with other organizational stakeholders.

Digital Tools

Zoom Video Conferencing

Active reflection and retrospective facilitation are staples of action research. Thus, I set up several digital tools for reflection and retrospectives. Zoom, a popular video conferencing tool, was used each week for informal visual communication. Although the majority of the online learning circle work in this study was facilitated asynchronously using other tools, there was also a need for the circle members to meet face-to-face virtually in a synchronous video environment during COVID-19. Zoom was chosen as our video conferencing tool, as it was easy to set up and use, and provided a secondary way to help build rapport and trust among circle members.

Conceptboard

Challenge-based activities for the online learning circle were hosted on a cloud-based tool called Conceptboard (see Appendix D). Conceptboard is a visual, agile, online collaboration tool designed for creatives and distributed teams. Flexible team whiteboards can be set up to

share work product drafts, visualize innovative ideas, and help team members brainstorm and ideate on creative concepts. The tool can be accessed in both synchronous and asynchronous modes, allowing circle members to draw shapes, post images, create idea boards, add sticky notes, and markup content during the process. Google Docs, PDFs, jpegs, and Microsoft Office files could be easily added and linked to each board. This helped the online learning circle members in easily connecting external documents and artifacts relevant to their projects. The board overview feature supported increased collaboration and allowed circle members the ability to see where newly added board content was located. Access to each board was secure and could be shared anywhere, anytime, on practically any device. Read-only and editable modes were sometimes used. No installation was required. Conceptboard served as a central online workspace for the online learning circle's members. Circle sessions were kicked off with an initial briefing and design challenges were presented before the circle members began their collaborative project activities.

Google Docs

This study also included a generous amount of free Google-supported digital documents. Google Docs, Sheets, and Slides were employed to orient prospective circle members, organize project schedules, and share authentic work products with critical friends and action research stakeholders. Links to this study's Google Docs were made available to circle members through email invitations. A shared, but time-limited, Google folder served as a document repository. I also used Google Docs to capture my field notes as an action researcher. The notes themselves were composed of observations and impressions that were often later turned into reflective blog posts.

SurveyMonkey

To support a reflective and retrospective process for evaluating the success of challenges during cycles, a digital survey using SurveyMonkey was distributed to each online learning circle member after each cycle. This survey was used to capture circle member reflections, project outputs, retrospectives, and the type of distribution that was used. These surveys were used to ascertain which type of distribution was being used during the project-based online learning circle challenges.

Blogger

Given that the expected outcomes for action research exist in three domains: professional, organizational, and scholarly, I used Blogger as a digital journal to document my progressive elaboration through the professional domain. Blog reflections were used to capture observations and impressions and easy-to-customize aspects of my research that were unexpected or surprising.

Wix

Wix was used as an easy-to-customize platform for displaying and distributing the outputs and artifacts that were produced through the online learning circle challenges. Each challenge was expected to deliver a product, service, or result. These outputs, or deliverables, were meant to be displayed in a readily accessible location and format. I decided to build a website as it would likely be the easiest way to disseminate the findings and the artifacts of the interventions.

Validity, Reliability, and Triangulation

The criteria I used to establish the quality of my action research differed little from those used by other forms of research. My list of quality research criteria relied on the two pillars of

validity and reliability. Although most formal research is meant to be generalizable, as an action research project, this study was intended to provide specific solutions that might not be immediately replicable in every workplace (Sagor, 2010). However, validity and reliability are still very important considerations. Textual analysis, as a research method, was used to systematically examine the resulting work products, artifacts, and online texts to discover significant patterns and meanings. To further ensure the validity and reliability of this action research study, I collected a variety of data in each action research cycle to achieve a sufficient level of triangulation of data (Gray & Seaman, 2018).

The validity of my analysis of change was accomplished by providing reasonable evidence to indicate any noticeable shifts in thinking paradigms, (i.e., from silos to social networks). Following Creswell's (2014) recommendations for ensuring the validity of the study, I have provided detailed descriptions of the action research process, clarified the bias, and reported failures in my findings and final reflection. My research plan included identifying a small number of colleagues who would be able to evaluate my research procedures and assess my understanding of the process of change. These "critical friends" worked with me to review the data resulting from my action research study to help validate the findings and provide insights (McNiff & Whitehead, 2011).

Other considerations for validity in action research are outlined by Herr and Anderson (2015) listing five criteria for the validity of action research:

- Democratic validity, which poses the question, "Have the multiple perspectives of the individual stakeholders in the study been accurately represented?"
- Outcome validity, which responds to the question, "Did the action emerging from the study lead to the successful resolution of the identified problem?"

- Process validity, which responds to the question, “Was the study conducted in a competent and dependable manner?”
- Catalytic validity, which responds to the question, “Did the outputs and results of the serve as catalysts for action?”
- Dialogic validity, which asks the question of whether the research was reviewed by peers or critical friends.

Validity considered in this way expands the concept from just the validity of instruments to a focus on the whole study. All of these criteria were included as part of my study.

Ethical Considerations

Human Subjects and IRB Protection

Given that my study focused on individual and group characteristics and/or behavior in a workplace setting, it, therefore, posed a minimal risk to the subjects and required only an exempt institutional review board (IRB) application under code 45 CFR 46.110 and 21 CFR 56.110 (see Appendix E). The research was conducted in the context of an organization learning and professional development opportunity for full-time employees within a voluntary distributed leadership practice. As a result, the risk to human subjects was greatly minimized. Written permission from each online learning circle member to participate, and data outputs based on this study, follow Pepperdine University’s IRB requirements. There were no penalties or disadvantages against any prospective circle member who chose to opt-out.

Reporting of Findings

Any future publication of the findings will include the use of pseudonyms for all participants associated with the study. All details that are not critical for the research that may be

used to identify individual employees will be removed. Every precaution will be taken to ensure the privacy of the online learning circle participants.

Summary

The conceptual approach and methodology outlined in this chapter lay the foundation for sparking innovation and promoting intrapreneurship in my organization. An online learning circle was established with the long-term aim of creating a flatter, more networked culture in the workplace and was used as the framing device for collaboration. Action research, as a participatory and highly reflective vehicle for change, was selected as the methodology to be employed. Multiple digital tools were incorporated to facilitate project orientation, coordination, collaboration, and reflection. The emphasis, within each successive action research cycle, was placed on conceptual thinking and the rapid prototyping of ideas from circle members through challenges. Conceptboard, a web-based agile collaboration tool, served as the primary digital environment and a platform for online collaboration. Zoom was used regularly for video conferencing. My comprehensive research plan for my study included initial assumptions and predictions for my intervention, a logic model outlining my research design, and my domain-specific data collection criteria. A blog, focused on professional growth and change, was used to capture my reflections during and between cycles.

Chapter 4: Findings

Overview

The following chapter describes the overall findings of my action research study in which I employed an online learning circle during COVID-19 to foster distributed leadership and facilitate challenge-based innovation projects with intrapreneurs so as to increase cross-departmental collaboration in my organization. In this chapter, I detail both the expected and unexpected outcomes of my interventions. It includes a timeline of events and a narration of activities related to the actions taken during the 11 months of the project from January 12th - November 25th, 2020 (see Appendix F). Also documented, and facilitated through online surveys, is the participant feedback of those who served as members of the online learning circle. Journal reflections using a blog that took place before, during, and after the study's implementation phase, are integrated. The rationale and driving research questions for each successive action research cycle are outlined and examined. Progressive elaboration of the six challenge-based online learning circle interactions is delineated and artifacts in the form of recorded virtual meetings using Zoom, shared digital Google documents, Conceptboard idea boards, post-challenge SurveyMonkey surveys, field notes, and reflective blog posts, on Blogger.com, of the action researcher are referenced. Finally, a set of digital artifacts, which were hosted on a wix.com project website representing the outputs of each challenge, are examined and discussed.

During the process, my action research study's design, logic, and intent varied little from what was implemented. However, the actual paths to achieving my goals and objectives were deflected and considerably disrupted as a direct result of the outbreak of the COVID-19 pandemic. This disruption began on Friday, March 13th, 2020, when MiSci temporarily closed

its doors to the public due to the impending public health crisis. Overall, the intervention activities that were facilitated occurred generally as expected, with only a few minor issues that were later mitigated. Unfortunately, several major surprises were completely unanticipated, some of which were never fully resolved during the study. As a result, I consider them opportunities for future investigation.

Methodology

The action research methodology that I facilitated during the study was consistent with accepted practices for facilitating action research as a framework for critical inquiry into everyday issues and problems within a work environment. This equated to taking direct actions to improve my leadership practice while formulating new understandings and creating new knowledge. My interventions centered on a commitment to continuous improvement and appropriately keeping the "I" at the center of the research (McNiff & Whitehead, 2011). Establishing intentionality about my actions, creating authentic descriptions for the actions taken, generating valid data from multiple sources, and sharing the outputs and outcomes of the research with others across the organization were integral to the process. Throughout the entirety of the study, I maintained a dual role—that of both researcher and practitioner (Riel, 2010).

The utility of action research as a framework for facilitating change in my work environment was paramount, particularly during the transition points between iterative cycles (Coghlan & Brannick, 2014). Regular opportunities to reflect on my decisions and actions during these transitions were made available. Reflective practice was used to plot supplementary actions after each cycle (Riel, 2010). A new process for collaboration on projects, using the online learning circle as a model for distributed leadership, was introduced to the participants in the study who served as co-researchers. This allowed for a deeper understanding of driving questions

that were posed at the beginning of each action research cycle and helped identify practical ways to solve common problems. It was my aim throughout the intervention to create a participatory and reflective environment for learning that would enhance my ability to facilitate distributed leadership, and also provide me with opportunities to explore new ways to foster innovation and greater collaboration on cross-departmental projects.

Participants

Recruitment

The process I outlined for selecting participants, who were to later become online learning circle members, was methodical. I started with a simple informal verbal announcement about the opportunity at several face-to-face meetings. I followed up with a formal written email on January 14th, 2020, soliciting employees to consider volunteering for a new professional development opportunity. This email complied with Pepperdine University's IRB guidelines. My intent was for the email to come across as neutral so that potential volunteers saw it as a true voluntary opportunity rather than a job requirement. In the email, I described that, in preparation for our next big strategic step as an organization, we would be shifting our internal structure from departmentally based operational silos to innovatively focused social networks. To do this, we would likely need to take a very disciplined approach to our strategy and planning and begin to set our sights on new initiatives and large-scale transformative projects that place more emphasis on higher-order thinking than we currently perform.

I indicated that I was looking for four to six employees to voluntarily participate in this endeavor. However, participants would be required to be full-time employees. This would be necessary to properly manage their time as participants, as they were volunteering for the assignment only and not volunteering their time separately from their positions. They would still

get paid their normal full-time exempt rate throughout the project. Some exceptions could have been made to allow for part-time employees to participate, and ultimately a few did express interest, but I ultimately decided to only include full-time employees who could dedicate a sufficient amount of time to the project.

Commitment. In the email, I attempted to clearly explain that this opportunity may require participants to do extra work, meaning work outside of their normal routines. Fortunately, this was already classified in their job descriptions as 5% or 10% other duties as assigned. I hoped that the line about extra work would help weed out individuals who were not willing to go above and beyond in their current roles. However, to manage the risks associated with overloading my participants, I intentionally planned to structure the project-based challenges in a way that would closely align with work currently assigned to each employee. During this study, they would be challenged to think strategically, far beyond the day-to-day work assignments that many of them were assigned. Additionally, I indicated that they would need to be comfortable with intense levels of collaboration, given that they would be primarily working on short-duration projects in a fast-paced online environment and participating on a team composed of their colleagues. I was seeking participants who already considered themselves intrapreneurs, or at least those who could identify with the concept and were self-motivated, proactive, and action-oriented. I expressly indicated that participants would be expected to be creative, coachable, and willing to listen and grow while receiving constructive feedback. Lastly, I shared in the email that I was in a doctoral program at Pepperdine University in California studying learning technologies and that this opportunity would be part of an action research study focused on innovation, intrapreneurship, and collaboration in the workplace.

Privacy and Confidentiality. Participants were made aware that any comments they shared during the study would be kept anonymous at their request, and that I would not disclose their names or other personal information unless it was agreed to by both parties. Reasonable steps would be taken to protect their privacy and confidentiality during the process, particularly with online chat, video, and other digital data. Therefore, potential risks would be minimized. I added that action research can be characterized as research performed collaboratively with others, as opposed to research done on others, and explained that as such, my study would have no subjects, and I as the researcher would be the primary focus of my study (Riel, 2014).

Benefits of Participation. I explained that one benefit for them as participants would be working more closely with MiSci's leadership team. They would also benefit by serving as the leaders of several strategic innovation projects, learning and sharing expertise with colleagues, receiving training and expert knowledge of distributed leadership and collaborative culture, and they would have the opportunity to be part of a digitally facilitated online learning circle. Participants would additionally work directly with other high-performing colleagues on mutually beneficial projects. Emphasis would be principally placed on participant learning rather than specific outcomes, so the typical conflicts that they might experience over resources, responsibilities, and priorities, would be minimized during the study. They were made aware that activities would be grounded in intentionally organized group work and would be presented and facilitated in a way that would likely be much more engaging than a typical siloed, resource-strapped, open-ended MiSci project. I concluded the email solicitation by stating that employees would be required to email me directly on or before Friday, January 17th, 2020, to declare their interest.

Initial Responses. After the solicitation email went out, I initially only received two emails of interest. Both were from part-time staff who were not eligible but who wanted to let me know that these types of opportunities were exciting to them. When I sent out an email reminder just a few days later, right before the deadline, I got four more emails from team members who expressed extreme interest in being a part of the study. Fortunately, they were the ones who most closely fit my intrapreneur profile. I would later discover that I would need these particular employees to be participants if I was to make the online learning circle-based distributed leadership and collaborative culture model work in our organization.

Obtaining Consent. On Friday, January 24th, 2020, I conducted a face-to-face meeting with all of the interested employees for an orientation, Q&A, and open discussion regarding informed consent (see Appendix G). At that time, it was explained that data collection for my study would be in the forms of field notes, recorded observations, surveys, and a few ad hoc informal interviews. With the help of the selected volunteer participants, my study would also produce digital artifacts and deliverables that illustrated innovation and demonstrated intrapreneurship. I made them aware that I was including informed consent letters to ensure participant protections within my action research. I also informed them that my facilitation of distributed leadership and its influence on their actions would be part of the study. I stated that since they would be participants in the study rather than subjects, my focus would primarily be on me improving my leadership practice as a President & CEO. I explained how my participants would be protected during the process and that I would need to gain their consent if they chose to voluntarily participate.

Narrowing the Field. In early January 2020, at the start of my study, I had informally identified eight people who I thought fit the profile of intrapreneurs within our organization. It

turned out that six of those eight employees applied to voluntarily participate in my action research, and only five would be selected. Their demographics varied. The age distribution consisted of three employees in their late 20s, one employee who was in his/her mid-30s, and one employee who was over 40. There were three male and two female participants. Two of the participants, one male and one female, had worked at the organization for less than a year. The other three had been employed for more than five years, with one of them being part of the organization for nearly 10 years. They represented five of the seven major departmental silos in the organization including marketing/PR, guest relations, operations, exhibits, and science & theaters.

Two of the original eight people that I had informally identified as possible candidates never actually contacted me, not even to inquire. I was quite surprised that they had chosen to opt-out, as I was fully expecting that they would want to participate. I approached the two employees who opted out separately to ask why they chose not to participate. I tried to clarify the requirements so that they fully understood the opportunity. One cited schedule and workload as the reason why they would not be able to fully participate in the online meetings. Later, after my action research project had concluded, I found out that the other potential candidate wanted to be part of the study but did not want to work with two of the people who had already joined. This was unfortunate as I believe that a valuable professional development opportunity was missed. However, this illuminates an important challenge of creating a collaborative culture, which is establishing a welcoming environment and achieving synergy among group members.

Data Sources

Data were collected from multiple sources throughout my study. In all cases, the data collected were captured using digital tools, in keeping with the learning technologies focus of my

research. Sources were used to collect both qualitative and quantitative data. However, emphasis was placed on the collection of qualitative data from the participants, and from me in my role as the action researcher, that supported the cycle questions guiding each successive intervention. A subset of the data collected using digital tools was categorized in the personal domain of action research, where I attempted to document and analyze my leadership change over time as well as its effects on organizational change in my attempt to spark innovation, foster intrapreneurship, and create a more collaborative culture in the workplace.

Zoom

Video conferences using Zoom were conducted during each of my action research cycles. The purpose of using Zoom was to establish an easy-to-use, reliable platform for online learning circle meetings. The easy-to-use interface simplified the online orientation process. Zoom was by far the most impactful of the digital tools employed during my study. From March 12th, 2020, to September 28th, 2020, more than 20 one-hour meetings were facilitated on Zoom. Of the 20 meetings that were facilitated, 10 were recorded, with permission from the participants, for later review and analysis. Although the circle members and I participated in several face-to-face meetings in January, February, and March, our first official online learning circle meeting, facilitated using Zoom, happened on April 6th, 2020. Since most of the circle members were already very familiar with Zoom as a platform for video conferencing, successful adoption of the tool for this application happened quickly.

Conceptboard

Using a creative planning and collaboration tool known as Conceptboard, the participants were able to generate seven idea and innovation boards during the study. More than 30 hours of synchronous time were spent collaborating on Conceptboard with the five participants spending

nearly 40 hours of asynchronous time spent using the tool. Conceptboard provided an extremely simple and accessible platform for circle members to share ideas in a digital environment. It features the ability to collaborate both synchronously and asynchronously on projects. Conceptboard also features a chat function, which was used only sparingly during our synchronous activity. Premium versions of the application also allow for videoconferencing within the interface. Integrated videoconferencing would have been a very effective tool to use during our online learning circle meetings, however the need to have this feature, and the cost of upgrading the plan did not positively net out. Therefore, I decided to just use Zoom as the primary videoconferencing platform and toggle the share screen mode while using Conceptboard with the group.

Google Docs

Google Docs was used during the study as shared spaces to post text-based content that could be quickly added and edited during circle challenges. Working together with participants, we produced nearly 15 pages of field notes using Google Docs, capturing brief observations, brainstorming, and impressions. These field notes were generated throughout the study during each action research cycle. Functioning essentially as digital whiteboards, they supported content development and the documentation of new processes and procedures. They were also often used for notetaking and capturing random thoughts during Zoom meetings. Only a select few of the Google Docs were appropriately organized and filed given that most of them were created merely as temporary places to store content during group discussions.

SurveyMonkey

After each challenge activity, I distributed a survey to the participants. The surveys were designed and distributed to the participants during the study and were used to capture

participant/co-researcher knowledge-building and reflections. There were six surveys, one for each online learning circle challenge. I employed the use of SurveyMonkey exclusively throughout the project as my preferred digital survey tool. Its primary function, instead of individual blogs, was to gather immediate feedback from the participants, particularly after online learning circle meetings. Each survey consisted of a list of six to seven questions that focused on the key aspects of my action research. The questions covered topics such as what worked, what did not work, and what participants would want to change in future meetings. I wanted to ensure that I was able to capture both reflections about the participants' learning circle experiences and ideas for what might make their experiences more efficient and effective. SurveyMonkey's relative ease of use and automated features made it easy for me to maintain a predictable cadence with my requests for feedback from circle members.

Blogger.com

Over 10 months, I produced more than 40 reflective online journal entries as an action researcher. Anderson et al. (2007) describe reflective journals as a "research tool for capturing reflections and documenting thinking" (p. 208). Each reflection was captured in an individual blog post on Blogger.com. Three to five posts were made each month and covered a variety of subjects. On average, I spent 15 minutes composing each reflective blog post. The foundations of reflection for my action research project began on January 12th, 2020, as I searched for an appropriate digital platform for my blog. By January 22nd, after reviewing several suitable web-based applications, I chose Blogger.com as my platform. The following day, I created a new blog, selected a theme, and titled it "Distributed Mind." This was the blog that I used exclusively throughout the 10 months of my action research study (see Appendix H). Reflective thinking, writing, and posting to the blog occurred continually throughout the project, though it was often

intermittent. Some posts were extremely detailed, such as those relating to social and organizational network analysis. Other posts, like those associated with online learning circle challenges, were extremely brief and served simply as timestamped updates. These blogs served as primary source data for me to explore how my thinking evolved.

During the study, I impressed upon my participants the importance and value of reflective thinking while facilitating an innovation process. For the establishment of the online learning circle, I originally wanted circle members to take time to reflect and journal regularly. I did not expect them to write a tome after each online learning circle meeting, but I did want them to share their thoughts and feelings about the work we were doing together and how it may be influencing their perspectives. I had initially considered the idea of converting my blog into a community blog, where members of the online learning circle would participate in posting, with me, their reflections. I thought of this approach as sort of a distributed reflection and conceptualized it as a process by which each circle member would contribute to a single blog and recognize the collective thoughts and feelings of the group. However, due to the dynamic nature of our work environment during COVID-19, I decided it would be best to not request this additional work from the circle members during each cycle. Under normal circumstances, this concept could have been extremely valuable. But the pandemic was incredibly unpredictable and was by no means normal. Although the idea of circle members reflecting openly and honestly through informal written communication was intriguing, I thought that it was also risky. As a result, I decided to keep circle member reflection in the realm of the informal verbal communication taking place in our Zoom meetings. Even though not all of the conversations were recorded, they did serve as a convenient way for circle participants to vent their

frustrations, share their fears, and seek support from others during the study, which was being heavily influenced by the ongoing pandemic.

Wix

Wix was used for displaying and distributing the outputs and artifacts that were produced through the online learning circle challenges. Each challenge was expected to deliver a product, service, or result immediately applicable to our current situation as an organization. These outputs, or deliverables, were meant to be displayed in a readily accessible location and format. In search of an easy way to share the innovations that resulted from the project-based challenges, I decided to build a website. The final website, although not comprehensive of the entire action research study, did turn out to be an adequate mechanism for dissemination.

Action Research Cycles

Composed of three iterative action research cycles: Cycle 1 - The Intrapreneurs, Cycle 2 - The Challenges, and Cycle 3 - The Innovations, my study was facilitated over 11 months from January to November 2020. I had a total of 23 meetings with my participants. Three of the meetings were face-to-face, with two orientation meetings at the start of the study and one wrap-up and reflection meeting at the end. The rest of the meetings were virtual. There were 20 meetings of this type, all of which were hosted on Zoom, with 17 being official online learning circle meetings. My early efforts went into establishing the online learning circle. However, the remainder of the meetings were framed around the implementation of challenge-based activities for creating innovations aimed at advancing the organization.

The cultural transition from silos to social networks to influence greater collaboration within our organization happened in stages. Effective collaborative interactions among circle members were an important step forward and it required a new distributed leadership-based

project meeting format, and the integration of the digital platforms Zoom and Conceptboard. Intense focus and active reflection were needed to facilitate the research virtually during the very challenging time we were in due to the COVID-19 pandemic.

The three action research cycles were directly guided by my overall action research question: How might I create an intentional structure for project work at MiSci that sparks innovation, promotes intrapreneurship, and creates a more collaborative culture in the workplace?

However, the cycles themselves, which loosely flowed in a three-point story arc of opening the circle, exploring the circle, and closing the circle, had their supporting research question for which subsequent interventions were based. The first cycle took place over a set of six meetings. Cycle 1 - The Intrapreneurs was convergent and heavily influenced by the previous ONA and SNA data that revealed social capital within the organization. It had a dual purpose, with one aspect focused on the intrapreneurs themselves, their backgrounds, expertise, and respective positions within the organizational structure, and the other aspect focused on how digital platforms could be effectively used to facilitate online learning circle trust-building, collaboration, and project work. The second cycle, representing the challenges, took place over 11 meetings and was more divergent, focusing on participant exploration and practice of collective, collaborative, coordinated distribution. This was done through project-based innovation challenges presented to online learning circle members. The third and final cycle representing the innovations consisted of six meetings, which were again convergent. They coalesced around promoting and sharing the innovations and digital artifacts that were produced from the challenges of the second cycle. The significance of these innovations and artifacts was substantial, given that they were produced during the COVID-19 pandemic. Their impact was

expressed through the fact that they were subsequently shared across the enterprise to promote intrapreneurship encouraging future participation in online learning circles and distributed leadership.

Critical Friends

McNiff and Whitehead (2011) suggest that engaging with critical friends, i.e., people who appreciate your action research project but who are also considered independent enough to effectively ask critical questions of your work, is important for providing alternative viewpoints. I tapped three critical friends during my study. Two were professionals in the fields of science centers and museums, and the other was a national board-certified teacher who ran a gifted education program for a school district. Each critical friend provided valuable insights on various topics associated with the recruitment of the participants and the initial setup of the online learning circle. My critical friends were extremely instrumental in helping me develop my organizational network survey. Thinking about network analysis questions as objectively as possible is important to ensure their validity. It would be important for me to not leave any questions out that might later prove to be critical to a thorough understanding of my work environment. My critical friends were able to help me reflect on my approach and serve as thought partners during the process. A total of seven meetings were conducted, each lasting approximately 60 minutes.

Cycle 1 - The Intrapreneurs

Research Question (Cycle 1)

Objectives. Originally conceived as two separate cycles, I decided to consolidate two of my original action research cycle questions into one cycle to shorten the time it would take to kick off the online learning circle challenges, which were scheduled to take place during Cycle 2.

The two areas I defined were selecting capable intrapreneurs as participants and establishing an online learning circle using a digital platform. I began with the objective of using existing ONA/SNA data, along with previous innovation project performance on projects, to select capable intrapreneurial circle members who would be interested in participating in my action research. I also wanted to ensure that the participants who volunteered would be able to invest the additional time and energy needed for the duration of the project. The second objective was to employ digital spaces/tools for establishing and facilitating the online learning circle, building trust, and supporting open and honest participant collaboration online. I wanted to determine to what extent the circle members would be able to build trust and feel comfortable openly communicating and freely collaborating online. My Cycle 1 research question was in two parts:

> If I use existing ONA/SNA data, combined with previous innovation project performance on projects, to what extent will I be able to select capable intrapreneurial circle members who are both willing and excited to participate in my action research? In addition, if I employ digital spaces/tools for establishing and facilitating the online learning circle, to what extent will the circle members build trust and feel comfortable openly communicating and freely collaborating online?

To answer this, I recruited a pool of full-time employees and selected those who were both interested, capable, and available to participate. As members of the circle, they functioned as distributed leaders on challenge-based online learning circle projects that were relevant to the current and future needs of the organization. I anticipated that those selected would be capable of dismantling the status quo and be ready and willing to break down any internal barriers that prevented us from being efficient, effective, and able to fulfill our strategic goals.

Establishing the Circle

Setting Up the Circle. Our first meeting as a group, which was held face-to-face in my office at MiSci on January 24th, 2020, was attended by all five designated participants. During the meeting, I explored the reasons that they had for signing up for the project. Their responses were fairly consistent, almost universal. The participants expressed that, although they worked hard each day and had busy schedules, they still wanted more. However, they were not interested in the mundane; they wanted to be more regularly involved in projects that were new, creative, innovative, and challenging.

Second Circle Meeting. On January 26th, 2020, I drafted an online survey using SurveyMonkey to capture the initial reflections of the participants. I intended to use the data from this survey as a baseline to begin my work. Unfortunately, due to a few early schedule challenges at the beginning of the year, I was unable to finalize the survey and get it distributed. I instead prompted the group to share their thoughts about participating in a focus group-style conversation. This went well and the face-to-face aspect of the meeting helped to allay fears and build trust with the potential participants. In a meeting shortly after, I was able to get all of the informed consent letters signed and returned.

Third Circle Meeting. Then, on January 28th, 2020, I had a meeting with the group to discuss alignment. During the meeting, I also presented an opportunity for us to experiment with a new ONA assessment so we could learn more about the informal connections within the group and within the network of other employees on staff at MiSci. They were excited by this approach and expressed interest in learning new techniques for measuring and modeling social capital within our organization. After facilitating a 101-style briefing on SNA and ONA, many of the participants shared informally that they thought they already knew who occupied central

positions within the network sociograms and who they saw as go-to employees for getting things done. As intrapreneurs, they appeared to be very aware of the informal structure of the organization versus the formal structure depicted on our organizational charts. My understanding of the group's situativity and dispositions at this early stage would prove extremely beneficial as we progressed through the online learning circle challenges in Cycle 2.

Launching a Network Analysis

After the second orientation meeting on January 28th, 2020, I decided to use network analysis to learn more about the relationships between the participants in my group and the employees of the larger enterprise of MiSci. It was very clear to me how each participant had made an impact on the organization in terms of innovation and risk-taking. However, I did not have a good understanding of what happened behind the scenes, how they connected, and in what ways they accessed the social and organizational capital of the organization. Given that I had experimented with SNA ONA previously at other organizations where I worked—the Chicago Architecture Foundation, and particularly at the Saint Louis Science Center where I facilitated an enterprise-wide ONA using a Heidrick and Struggles web-based tool called SYNAPP—I thought it might be appropriate to facilitate a few surveys at MiSci as well to gain insights. For this project, I decided to use Socilyzer because of its visualizer and friendly user interface. I also already had templates stored in my account that I could quickly and easily copy, convert, and modify. An added benefit would be to compare the sociograms that I had used in previous studies with the new ones that I would be generating at MiSci.

Distribution Matters. I took the approach of building the survey questions around Spillane's (2006) three types of distributed leadership: collaborative, collective, and coordinated distribution. Then we developed question sets that were developed under these headings. My

interest was to try and determine how my participant intrapreneurs were distributed throughout the organization and if there were any informal connections or habits of mind that they normally use that I might want to build upon. On February 16th, 2020, my ONA was launched. I refrained from limiting the distribution to just the employees on my action research participant list, but I forwarded it to people who were closely connected to our active innovation projects. The limits of my account would only provide me with an opportunity to include 10 additional employees. I was very conscious of the implications of missing someone critical to the flow of social capital in my organization, so I solicited additional names from my action research participants.

The Results. By February 26th, the results were received and tabulated. I wanted to know if my list of potential intrapreneurs, the five people who decided to opt into the online learning circle process, and the sociogram produced by this ONA, were congruent. As it turned out, these two components were very much in line. All of my participants, who would be my future online learning circle members, had very high incidences of in-degrees and out-degrees related to their connectivity and value to the overall network. Some, of course, had more centrality than others, but for the most part, they were all very important nodes in MiSci's network. It was at this point in my study that I was confident that my intrapreneurial participants would be able to effectively transition from working in a hierarchical, siloed work environment, to a social network, where they could collaborate more efficiently, effectively, and intentionally within the framework of an online learning circle.

Technology Training. As a result, establishing my first online learning circle at MiSci became much easier than originally anticipated. We had gained considerable momentum after the first few meetings and the team was ready to start. But first, I needed to facilitate a brief

orientation of the primary tools to be employed during my study: Zoom, Conceptboard, Google Docs, and SurveyMonkey.

First Online Meeting

Introduction to Zoom. Zoom served as the primary platform for my intervention and functioned as a quasi-laboratory for testing distributed leadership modes. Our first Zoom virtual meeting, where I provided a basic orientation for the project's technology tools, was on March 12th, 2020. During the meeting, I demonstrated each tool and answered participant questions. My objective was to have the participants meet online and become comfortable with expressing themselves on Zoom, utilizing the chat feature to practice dialogue and collaborative conversation.

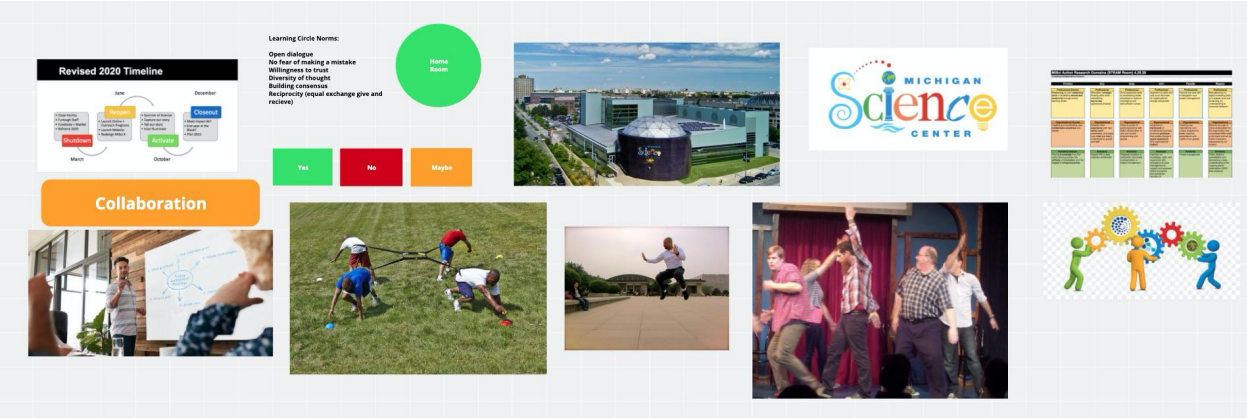
Response to Zoom. During the first learning circle meeting, I had everyone meet online using Zoom, which served exclusively as the digital videoconferencing platform for our meetings. All but two of the circle members had used Zoom at least once before and they were very comfortable with the technology. For the two who had not used Zoom before, I eased them into the environment and demonstrated chat features such as hand-raising and voting. This approach helped to ensure that circle members felt comfortable in an open space where they were free to engage in higher-order thinking skills to solve complex strategic problems and to generate new ideas for tackling common everyday problems. One circle member expressed relative comfort in using Zoom and cited the chat feature as a way to balance the modes of conversation and be more efficient with our discussions:

> I feel like this is the way to go for us. We need to embrace technology to help us be more efficient. I also like that I have multiple ways to communicate using Zoom. I like the fact that I can text and talk. (circle participant, personal communication, March 12th, 2020)

Introduction to Conceptboard. In the second half of the meeting, I had the participants log into Conceptboard to get comfortable with the tool. Conceptboard is relatively simple to use and makes adding content for idea boards extremely easy. My objective was to have participants utilize the digital canvas and drag and drop images, text, and other digital content onto the canvas. It quickly downloads the files into a format that is easily manipulated, and this feature allowed me to have participants annotate their content and the content of others to create expansive idea boards. One of the nicest features of Conceptboard is that everyone who is logged into a particular canvas gets a cursor with their name under it. So, not only can users see lots of other cursors flying across the screen, but they get to see who is doing what, when, and where. After logging in, we started with working on the virtual canvas and creating boards. Then we worked on simple dragging and dropping of image content. Later, we practiced adding text content to the canvas. These activities provided training for visual storytelling and online collaboration, which would be critical skills for generating idea boards for project-based innovation challenges during Cycle 2.

Figure 1

Conceptboard Orientation Canvas.



Note. This section of the Conceptboard orientation canvas depicts the shared activities of the circle members during the first online meeting using Conceptboard while engaged in a synchronous conversation using Zoom.

Response to Conceptboard. As the meeting transitioned to using Conceptboard, things did not go quite as smoothly as with Zoom. Several members had trouble logging in and finding the right board. One circle member was not sure what to do or how to engage while logged in:

> I've been here the whole time, but I'm not seeing anyone here with me. This appears to be a cool tool to use, but I am by myself, and I don't know what I'm supposed to be doing right now. (circle participant, personal communication, March 13th, 2020)

However, within just a few minutes, I was able to get everyone on the same page and begin the orientation. Next, I proceeded to help the participants navigate the environment and tour the features and functions of the tool. Then I took advantage of the shapes tool to create a circle in the middle of the canvas and colored it green. I used the green circle space as sort of like a home base on the canvas. When I wanted everyone to begin an exercise, I would ask them to move their named cursors to the green circle. This technique worked very well. When I needed everyone to take a time out, I would offer the green circle as a place to come and rest their cursor. This procedure allowed me to keep track of everyone's activities during synchronous periods. My approach appeared to be useful and gave everyone a sense that we were working together as a group.

STEAM Room. While still online, we discussed coming up with a name for our online learning circle and settled on the name STEAM Room. This represented several things that were significant to the members of our new circle. The acronym STEAM, which stands for science, technology, engineering, the arts, and mathematics, is a multidisciplinary approach to integrating

different subject areas and allows learners to create multi-dimensional activities. This dimensionality allows for cross-disciplinary and sometimes even transdisciplinary activities. Emphasis is often placed on a project-based methodology where learners are given a challenge and they have to respond to the challenge based on the knowledge that they have gained along the way. After discussion and acceptance of the name, we realized that we were running out of our allotted time for the meeting. Later, we set up a basic website called *STEAM ROOM* to house many of our innovation artifacts (see Appendix I).

COVID-19 Impacts. What I did not know at the time was that the very next day I would be deciding to close our doors to the public on March 13th, 2020. There was so much uncertainty. This was a very challenging situation and it was a difficult decision to make to shut our doors. While we were all in our morning online learning circle Zoom meeting on March 12th, we all knew that there would be changes coming soon. This was one of the most challenging decisions that I made during my action research. However, it was nice to know that I had the full support of my online learning circle to help me get through it. That gave me a sense of confidence that we would make it out the other side successfully.

Setting Norms

On April 6th, 2020, we had our second Zoom meeting and started working on drafting our learning circle norms. To begin, I shared a set of common norms that practitioners use when facilitating online learning circles (Riel, 2014). I then allowed them to take ownership of the circle as its members and generate their norms. The norms that they drafted were fairly straightforward. They are listed as follows:

- No fear of making a mistake
- Willing to trust

- Diversity of thought
- Building consensus
- Reciprocity (the ability and responsibility to both give and receive).

These five norms were adopted by consensus and served as guidelines for participation throughout the many challenges that my online learning circle members would later participate in during the second cycle.

My Reflection (Cycle 1)

Distributed Mind. My action research reflections during Cycle 1 were all captured in my private blog, entitled Distributed Mind, hosted on Blogger.com. During Cycle 1, I posted 25 separate blog posts of varying lengths covering a variety of subject areas, issues, and challenges related to my study. The average time for writing each blog post was approximately 20 minutes. The majority of the posts during my first cycle were centered around recruitment, establishing my online learning circle, ONA, and participant usage of several of the learning technologies employed during my study. Each blog post during Cycle 1 was drafted and posted shortly after a major interaction, decision, or event in my study's timeline. The following is a list of select blog posts.

Soliciting Participants. Gathering participants was perhaps one of the most nerve-racking aspects of my study and I reflected the most on this subject because it was one of the riskiest parts of my study. Although I believed that my driving questions were personally interesting, I was unsure if others would feel the same. However, I was extremely excited to kick off the process. In my blog I wrote, "I'm excited to see this opportunity come to fruition. It will be an incredible chance for our MiSci team members to voluntarily participate in creating a more

collaborative culture in the organization and receive professional development" (C. Greer, personal communication, January 20th, 2020).

Compatibility. One of my first issues revolved around the need for compatibility of the participants who would compose the learning circle. Reflecting on this I wrote in my blog:

> I guess I am making a lot of assumptions that who I think should apply will apply. I am worried that I might have people apply who may not see themselves as or be intrapreneurs. I am also worried about ending up with volunteer participants with conflicting personalities. There is a lot of risk in this part of the process. (C. Greer, personal communication, January 25th, 2020)

There were several personality and workstyle clashes during the early part of the process of forming the circle as the participants began to interact more with each other throughout the study. However, none of those clashes ended up being significant enough to disrupt the progress of the work.

Survey vs. Focus Group. Early on, I was interested in experimenting with different approaches to reflective practice. However, none of them felt quite right. I wrote in my blog, "This pre-cycle survey concept I'm trying to draft is just not working. Perhaps I'm thinking too hard about this and overcomplicating things. Maybe I should just sit down and talk to everybody?" (C. Greer, personal communication, January 27th, 2020). This approach of face-to-face informal verbal conversation appeared to be effective. It was a reflective experience for me and an informative experience for my participants.

Meeting Face-to-Face. The first circle meeting was face-to-face. I was aiming to secure an early win with this first meeting. I was optimistic leading up to the meeting and had good reason to be. An operationally focused team at MiSci expressed their shared interest in

participating in strategic activities. This was rare. The following week, I reflected in my blog that, "I could not have asked for any better-aligned people for this project. I am starting to feel as though this project will work out and be a complete success. We need this right now!" (C. Greer, personal communication, January 28th, 2020). I felt positive about the group of participants that was assembled and was ready to start transitioning to an online environment.

Tapping into Social Capital. In a blog post titled "Alignment is Everything," which I posted after our third online learning circle meeting, I said:

> I feel like they (my participants) are starting to see and understand not just the nature of my action research but also the rationale behind why I am pursuing this line of investigation. They seem to have a grasp of the value of learning from others and how to make social capital more readily accessible to project team members in ways that allow us to get more done by managing our resources better. (C. Greer, personal communication, January 28th, 2020)

The importance of my participants recognizing the value of social capital at MiSci cannot be understated. As an organization, we work very hard to squeeze the most out of our team members simply because we have to. As a fledgling and often struggling organization, we have limited resources to tap. However, we also get a lot done with very little. This is a testament to our utilization of social capital among staff within our organizational network.

Silo Effects. One of the issues that helped contribute to the rationale of this study was our need to transition internally from departmental silos to social networks. In February, I posted in my reflection:

> There are a lot of unknowns within the knowns here. It seems on the surface like all of the people who need to be connected are connected, at least informally, particularly the

> people that identify as intrapreneurs. But why then am I still clearly seeing a silo effect when we take on cross-departmental projects? This is a mystery to me. (C. Greer, personal communication, February 9th, 2020)

This issue was part of the reason why I wanted to further explore the connections between and among employees, which served as the impetus for the ONA.

Organizational Network Analysis (ONA). The rationale behind the facilitation of the ONA was to acquire a better understanding of the landscape of MiSci's social networks and organizational structures that might contribute to a silo effect. I reflected in my blog:

> I have learned from this difficulty that you may not always be able to get a good picture of your work community context using just one tool or technique. Each tool or technique has its limitations. It's important to try several methods, perhaps at least three, to triangulate on the position and activity of a given participant within a network. (C. Greer, personal communication, February 17th, 2020)

Initially, I had a sense that my participants, being intrapreneurs, would be plugged into the social capital of the organization. However, I had little evidence of this effect until I launched the ONA. As I wrote down in my blog, "It seems that their initial assumptions were essentially correct. They did intuitively already know who occupied important roles in our informal organizational network" (C. Greer, personal communication, February 26th, 2020). This gave me great confidence in my approach.

Technology Training. Successfully facilitating the technical training required for the participants to engage in my study bore some risk. Many of the participants would be working with tools that they have never used before. Unfortunately, not everyone on our team was tech-savvy. In my reflection, I expressed my concern for this phase:

> This is an important step that has to be achieved quickly and effectively. If the team doesn't feel comfortable in Zoom or Conceptboard, it will be an uphill battle throughout the project. I am trusting that I picked the right tools for this. If I facilitate a mock exercise, that might give them a better feel for how the process will work for subsequent meetings. (C. Greer, personal communication, March 9th, 2020)

The mitigation of risk was important, so I did a lot of planning before kickoff and made sure that there were ample opportunities for the participants to learn how to use the technology and support one another's learning as well. This accelerated their acclimation to the speed of the online learning circle. Momentum was increasing during this part of the project, and I was a little surprised at how well things were starting. Reflecting in my blog I wrote, "My project planning has been crisp this time. I seem to have everything in good order and moving at a good clip" (C. Greer, personal communication, March 11th, 2020).

Our First Zoom. Our first Zoom virtual meeting, which would serve as our basic orientation for the project's technology tools, was on March 12th, 2020. During the first learning circle meeting, I had everyone meet online using Zoom, which served as the preferred digital video conferencing platform for our meetings. When I chose to employ Zoom as my video conferencing tool of choice in January, I had no idea how much the pandemic would thrust Zoom into the spotlight three months later. I had been using Zoom for about four years before the outbreak and very few people were using it at the beginning of 2020. However, the increased need for teleworking and virtual meetings spurred by the onset of the pandemic quickly made Zoom a household name. As the worldwide adoption curve for Zoom started spiking around mid-March, everyone on MiSci staff also got comfortable with using the tool. These

circumstances made it much easier for me to facilitate my online learning circle study as the world was transitioning to virtual work environments.

COVID-19 Impacts. However, what I did not know at the time was that the very next day I would be making an executive decision to close MiSci's doors to the public on Friday, March 13th, 2020. In my reflection blog that evening, I wrote:

> My early success was too easy, and I should have been worried. We were all aware of the rolling closures and shutdowns in other parts of the world and across the country. I guess it never really dawned on me that the coronavirus shutdowns would come to Detroit and cause me to have to shut our doors, but here we are. (C. Greer, personal communication, March 13th, 2020)

Squaring the Circle. Overall, even with the impacts of the pandemic, the success of Cycle 1 was beyond my expectations. The processes that I put in place that focused on voluntary professional development for staff added a sense of order to what was otherwise an extremely chaotic time. This first part of my Cycle 1 action research question was fully addressed given that the ONA appeared to be very effective in identifying intrapreneurs at MiSci—many of whom would later volunteer to be online learning circle participants. The second part of my Cycle 1 action research question, which focused on the digital tools, Zoom, Conceptboard, and Google Docs, was also addressed. All of the prescribed tools were easily adopted by the circle members, with Zoom becoming a go-to technology in a period when social distancing quickly became the norm. By the end of Cycle 1, I felt well prepared to kick off the next cycle, which would prove to be the most complex phase of my study.

Cycle 2 - The Challenges

Cycle 2 began shortly after completing six online learning circle meetings, three for establishing the circle and building consensus around team norms and three focused on developing comfort with Zoom and Conceptboard. Inputs for this cycle were positioned around the need to effectively facilitate distributed leadership and establish a safe and effective online collaborative space for my study's participants. I used Spillane's (2006) distributed leadership types as a guide. My objective for this cycle was to conduct multiple project-based online learning circle challenges and to foster the co-performance of all three distribution models: collaborative, collective, coordinated distribution.

Research Question (Cycle 2)

My Cycle 2 action research question was: If I create project-based challenges for my online learning circle members, to what extent will they employ distributed leadership (collective, collaborative, coordinated distribution) and demonstrate both individual ownership and collective responsibility?

The outputs for this cycle were to create a list of pros/cons and recommendations for how to implement the three types of distribution in an online learning circle environment. Short and medium-term expected outcomes were to acquire an understanding of how the three types of distribution function in an online learning circle and to evaluate the use of learning circles within the organization as a viable platform for facilitating multiple types of project management methods, including waterfall, sashimi, and agile.

Challenge List

Ultimately, I facilitated six project-based challenges with the participants of my online learning circle, making Cycle 2 the most dynamic phase of my intervention. As a result of

multiple COVID-19 factors, my online learning circle needed to focus on adapting to new internal and external working environments, both of which were incredibly chaotic in the beginning. However, the seeds of collaborative culture at MiSci were starting to sprout, in part due to a unique combination of innovative strategy and impacts of the pandemic. The challenges presented to the online learning circle were:

- Creating a new value proposition
- Designing and launching a new prototype website
- Applying to be a Smithsonian Affiliate
- Reimagining our daily huddle
- Designing and fabricating an Ames Room
- Hosting our Illuminate fundraiser/friendraiser.

Gauging Interest

Each challenge had its unique character, and I tried to pick challenges that were diverse enough to force the team to try different distributed leadership modes or types. Challenges were first reviewed by the learning circle members to check for relevancy and interest. I started by creating themes around which they could create a set of project activities in the circles. When I proposed a challenge, I first asked if they thought it was interesting and/or valuable to them. I wanted circle members to have agency over the acceptance of a given challenge to ensure that the time spent on circle projects would be of value. If not, I was prepared to have them change, modify, or replace the challenge with one that was more relevant to the group, but hopefully of the same project type.

Challenge Format

I created a standard format for each challenge that included a rationale and business case, along with the specific activities that were facilitated followed by a retrospective. I also included survey feedback from the circle members, and a reflection on my experience facilitating the online learning circle. My assumptions before each challenge were documented and my assessment of the actual work products produced was also included.

Online Survey

At the end of the week, I distributed an online survey to gather feedback and reflections from circle members. My objective was to analyze the effectiveness of the challenge along with the impact it had not only on my learning of how to be a better facilitator of distributed leadership in an online learning circle environment but also to be able to capture the reflections of the circle members during the process. The survey questions were administered through SurveyMonkey and the question set was shared with the circle members before distribution. The surveys themselves were distributed to the circle members individually. The feedback remained completely anonymous. I used a setting in SurveyMonkey that removed the ability for me as the administrator to identify the feedback based on email or IP address. This was fully communicated to the circle members, and I think it helped them to be open to providing honest feedback. The survey questions, listed below, represent the basic information that I gathered after each challenge:

- What worked?
- What did not work?
- What did you learn / what would you change?
- How many hours did you spend?

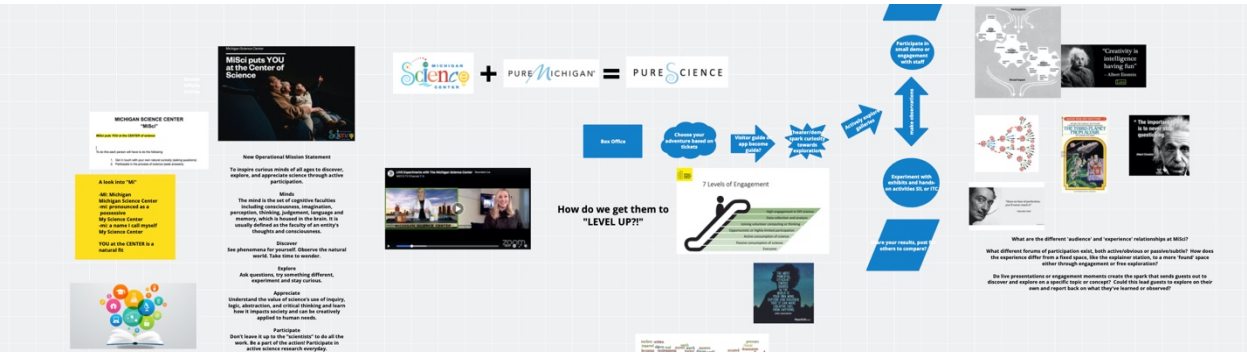
- Rank type of co-performed distributed leadership.
- Did you trust your fellow circle members?

Challenge 1: Value Proposition

Challenge 1: Creating a New Value Proposition. The first online learning circle challenge was presented on April 27th, 2020, on Zoom. The overall purpose of this challenge was to have circle members try out the new project meeting format and get comfortable in a challenge-based online learning circle environment. The SMART goal that I presented to the circle members was a challenge to, by May 1st, build upon our new value proposition of MiSci puts YOU at the Center of Science and create an idea board using Conceptboard that recognizes COVID-19 impacts and underscores the need for greater strategy simplification for the organization.

Figure 2

Conceptboard Value Proposition Canvas.



Note. This section of the Conceptboard canvas for Challenge 1 depicts ideas that represent MiSci's new mission and value proposition. Circle members placed concepts, flowcharts, and images on the canvas representing how the new value proposition could be expressed.

Business Case. The rationale for this challenge was straightforward. Many science centers focus on audience engagement, supporting the STEM pipeline from cradle to career, and

work to increase and advance STEM literacy with the general public. Unfortunately, however, the audiences we serve, particularly communities that are under-represented and under-resourced, represent people who are often in the margins of STEM and who are generally without access to STEM learning resources. This is an important issue to address in a struggling Midwestern city like Detroit. Our mission statement at the time was, to inspire curious minds of all ages to discover, explore, and appreciate STEM in a creative and dynamic learning environment. Reacting to the unfolding uncertainty of events of the pandemic, I thought that we needed to immediately operate under a more flexible business model, and one that might better bridge the gaps across the STEM divide in our city. At the heart of this business model would be a bold new value proposition that would be designed to work within the framework of blended learning environments that would be at the intersection of onsite, offsite, and online programs, which MiSci calls O3 or Ozone. The existing mission statement would be unchanged and remain in effect. The objective of this challenge was to have the circle members advance the concept of putting people at the center of science.

Actions and Activities. During the circle briefing, I presented an image that I thought represented the essence of putting people at the center of science. The image was taken just a few months earlier in our planetarium and depicted a young family, two parents, and a child, in our planetarium looking up in wonder at the stars on the dome. The lighting was dramatic. Only their faces and upper parts of their bodies were lit in an otherwise dark space surrounded by stars. The young boy depicted in the photo was pointing toward the stars as if he knew all of their names. One circle member shared that the image was impactful and embodied the concept of wonder, something we at MiSci strive to achieve in our audience interactions. The circle member said, “I simply love this photo. It captures the power of our facility, establishing a sense of place and

inspiring wonder. We need to bottle this somehow and sell it to people in need of a science fix" (circle participant, personal communication, April 27th, 2020).

I thought the photo conveyed the idea that people often know more about science than they give themselves credit for. This is what a science center is all about: helping people discover for themselves, test new ideas, and share what they have learned with others. I created a Conceptboard workspace to gather creative ideas around the idea. Over the week, the circle members were to come up with additional images that would directly illustrate the concept, or augment/supplement it in some unique way.

Outputs and Outcomes. The team elaborated on these ideas and also generated additional supporting statements, and even programs that we currently facilitated, that could be aligned to our new value proposition. Two circle members even added new ideas for programs and exhibits that could be launched soon that were aligned to the concept. The result was a fully articulated canvas in Conceptboard that incorporated future-oriented thinking around our value proposition. The canvas included nearly 20 pictures and diagrams, and even quotes, that captured the essence of the idea. During the activity, one circle member shared that the activity helped them to shift the way they viewed our organization's opportunities both during and after the pandemic:

> This exercise inspired me to think beyond our current COVID-19 reality. I feel like this was therapeutic for everyone at that time we were all under great stress. At first, there was a lot of mystery surrounding what would happen to our organization and whether we could survive the impacts of the pandemic. I feel very positive about the opportunities ahead of us now. (circle participant, personal communication, April 27th, 2020)

Survey Feedback. The online survey for the first challenge was distributed on May 1st and had perfect participation, yielding five total responses with a 100% completion rate. A total of 15 minutes and 33 seconds combined was spent completing the survey and no questions were skipped. Circle members spent on average 2 hours 30 minutes working on the project to create a new value proposition during the first week. Given that this was the first online learning circle challenge survey, I shared the question set with the circle members before administering it (see Appendix J).

What Worked. One thing that the circle members thought worked well during the first challenge was utilizing Zoom for online learning circle meetings. Some of them were already familiar with the tool, whereas others expressed that this was their first time using it. All of the circle members agreed that Zoom's ease-of-use, ability to share screen, and integrated chat feature were valuable features. A survey respondent shared their feedback on the interaction between the different technology tools.

> When I use the shared screen mode in Zoom, I am able to facilitate activities in Conceptboard while each person can view my actions. Using Conceptboard adds a different dimension to experiencing a Zoom video conference. This is a very cool tool! (circle participant, survey response, May 8th, 2020)

Also, the circle members were able to add to the canvas in Conceptboard and build upon the initial ideas that were presented for developing a new value proposition for MiSci.

> This is a good way to brainstorm! Being able to share ideas not just verbally but graphically also helps with understanding more about what our colleagues are saying. A picture is truly worth a thousand words. (circle participant, survey response, May 8th, 2020)

What Did Not Work. An aspect that did not work well was logging into Conceptboard. It took one circle member nearly 30 minutes just to log in. This was the result of the circle member accidentally missing a step in the login process that was important for getting to the right idea board with the rest of the group. This extraneous communication and coordination were extremely distracting for the other members, even though the issue was to be expected with those who were unfamiliar with either Zoom, Conceptboard, or both. Adding the variable of using them simultaneously made the experience that much more complex for some. Several respondents registered user issues related to Conceptboard. One stated that it was difficult to get logged on at first. New technology often takes some getting used to. Another respondent referred to Conceptboard as a great tool for distributing leadership and allowing new levels of autonomy, especially during asynchronous work, even though using it can be cumbersome.

What Was Learned. Recognizing learning, and what they might do differently in future learning circle challenges, was varied. One respondent tried to separate the overall learning from the difficulty of using the technology and stated that even though some had trouble using the tools, they were enthusiastic about the opportunity to learn new things with their colleagues. In parallel with this feedback, another respondent expressed that there was a critical need for us to do more activities like this. They believed that working collaboratively and challenging each other is a good way for all to grow together. One respondent said that there was a positive impact of integrating the tools with his work patterns and using Zoom as a platform.

> Conceptboard is a really good tool. It's not exactly how I think, but I like the idea of it. I think that I am learning more about how to integrate technology into my workstreams, especially using Zoom as a platform to do other things. (circle participant, survey response, May 8th, 2020)

Forms of Distribution. The respondents selected collaborated distribution as the form of distribution that was co-performed most during Challenge 1. Although there was some asynchronous work along the way, their leadership practice on Zoom and in Conceptboard demonstrated work performance shared between two or more leaders working together in the same space and time. Circle members were able to execute the same leadership routines during the challenge and complete tasks appropriate to achieving the desired results.

Reflections. For the first challenge, I wondered what the quality of the work product would be. Early in the process, I feared that the circle members might be too focused on learning how to use the technology and fail to create a proper digital canvas that displayed their creative ideas. Fortunately, the opposite occurred. The circle members constructed an idea board on their canvas that greatly extended the concept of our new value proposition and provided possible directions for a newly imagined future. The ideas presented suggested a collective and cohesive vision for new exhibits, events, and programs. This was something for which I had hoped. The circle members also displayed their dedication to the process through the diligence in which they worked on the challenge over multiple days, so as to complete their activities by the end of the week on schedule, and they did this on their own without me prompting them throughout the process. They logged in every day, added some analogous photos, then returned the next day to add relevant quotes. Flow charts were also constructed and added to help the circle members think more deeply about the concept of connecting with our audience in totally new ways. Their exploration of innovative methods for attracting new audiences and engaging people who might be situated on the margins of STEM was commendable and demonstrated an understanding of how to work collaboratively to address issues related to the relevance and accessibility of our exhibits, events, and programs.

However, reflecting on some of the technical issues I faced, I may have overestimated the ease of using Conceptboard. Since I use Conceptboard regularly in my work, I had forgotten many of the issues I experienced while first learning to use the tool. It is common to forget the initial learning of a tool and assume it would be easy for everyone to get acclimated. When some circle members had trouble logging in and establishing a comfortable level of use, I realized that I should have done more training for the circle members on effective use of the technology tools. Fortunately, the technical issues were not too much of a distraction from the critical work that needed to be done during our first circle challenge.

My prior assumption of circle members' reactions to the images was that they would be inspired by the concept of putting people at the center of science. I had little doubt that developing a new value proposition would be something that they would want to participate in. Given that it was the first challenge, my goal was to use the experience to help set the stage for the challenges to follow. My goal during the first challenge was to engage the circle members in productive ways that would allow them to have a positive experience working in an online learning circle environment. Achieving this would be critical to my action research study. Overall, from this first challenge, I learned that the online learning circle environment appeared to be a viable platform for intentional and organized project work to help shape the future of MiSci despite a few technical issues.

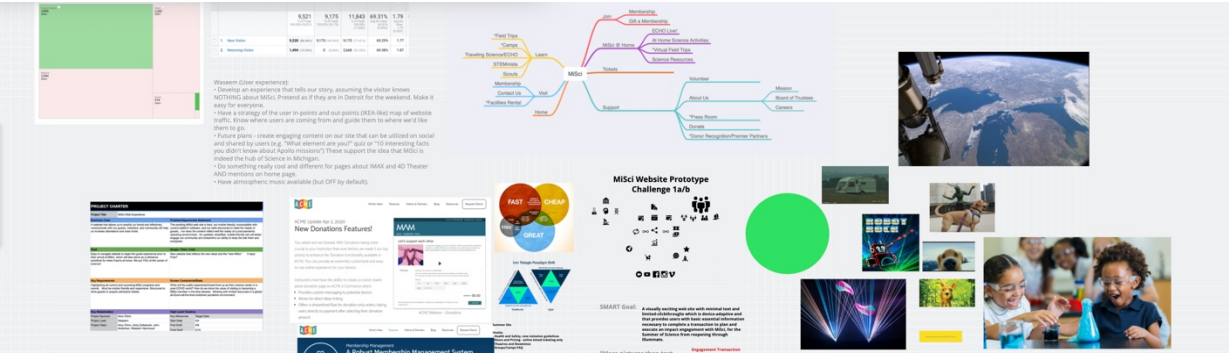
Challenge 2: New Website Prototype

Challenge 2: Designing and Launching a New Prototype Website. On May 4th, 2020, I delivered the second challenge to the circle, which was to design and build a new MiSci website prototype with a new look/feel and brand by 5 p.m. Friday, May 15th. The overall purpose of this challenge was to have circle members learn how to collaborate to take a large

complex project and break it up into smaller more manageable pieces. This challenge would be divided into two distinct agile sprints of five days each. The design and requirements would be tackled in the first week, then we would review and reflect before translating our work to the following week where we would build the new prototype site for mi-sci.org. Emphasis would be placed on brand essence, promoting our new value proposition, establishing a new look and feel of the site, and finally, improving the overall website functionality.

Figure 3

Conceptboard new website prototype canvas.



Note. This section of the Conceptboard canvas for Challenge 2 depicts the requirements list, site map, page architecture, and the look and feel elements of the prototype website created by the online circle members.

Business Case. When conceptualizing this challenge, I thought we should tackle something more visible than just defining and building upon a value proposition as in the first challenge. This is where the idea of taking on the website germinated. Our existing website was slowly drifting out of sync with our rapidly evolving brand. I believed, especially during COVID-19, that if we wanted to speak to the value of MiSci as a community asset and object of civic pride, we might need to reimagine the connections. This would mean simplifying our web experience and designing a framework that would feature a lot more visual references of our

value to our audiences and the communities we serve. If successful, a new prototype website would serve to highlight and communicate the work of our online learning circle with the rest of the team.

Our existing website employed a tile-based motif that profiled our various programs, exhibits, and events. However, the style of the existing website was dated and included very few features that made the browsing experience on the site dynamic. Having worked in the zoo and aquarium field for many years, I've always been impressed by zoo and aquarium websites that do full-motion videos of the animals in action on the first page. This approach can quickly capture the attention of the viewer, communicate the organization's brand, and promote its value proposition. Our existing site did not meet this standard. Before the challenge of creating a prototype website was even officially assigned, one circle member expressed why the website might have evolved to this state, citing that a status quo approach to the website in the past may have prevented it from being updated and improved:

> We need to tackle some of the projects that were started and stopped and started again over the years but never finished. Projects like the website, which should have been updated years ago just get left on the table, and no one picks it up. We just keep reaching over it to grab something non-critical and easy to do instead. (circle participant, personal communication, May 4th, 2020)

So as part of my circle briefing, I challenged the team to create a new prototype website. Although it would be impossible to create a new website for our organization in two weeks, I thought that challenging the circle members to create a prototype was possible. Rapid prototyping and design thinking methodologies are relatively commonplace in today's innovative

organizations. However, in our very siloed and hierarchical organization, these types of processes are not often practiced, and I wondered how they would react.

Actions and Activities. For this challenge, my actions and activities started with reviewing the assigned SMART goal and sharing with the circle members how I thought they might be best facilitated. This was an important step because I did not want them to feel as though the challenge was too daunting to tackle within such a short timeframe. I was considerably more interested in getting them excited about the concept of a new website and the practice of rapid prototyping. So, I decided to help them in this process by going through several design thinking activities that would help them to break the project up into manageable components. I was hoping that these components would naturally align with each circle member's existing skills, abilities, and interests. The approach generally worked well. Several circle members had heard of using empathy for designing products and processes, but they were not yet familiar with the activities required for facilitation. Their responses indicated that the circle members were starting to conceptualize this project in ways that might lead to more success. One of the circle members assisted me by reframing my challenge to them in a way that was much more acceptable to the team members:

> This is a challenge that is obviously different from the previous one and a lot more complex. But if we can break things up and identify each other's relevant skills we will be able to chunk work for each day we progress. (circle participant, personal communication, May 4th, 2020)

It was early in the challenge sequence to expect this level of initiative, but I welcomed it and used the momentum to launch my intervention. The circle members understood the concept and were taking initiative to frame it in a way that would help them to be more successful. These

events provided early evidence of distributed leadership at play. Also, the norms of trust and empowerment, essential to effective online learning circles, were becoming visible. During the two design sprints, I checked in with each circle member individually, which was an opportunity not afforded to me during Challenge 1 because of its shorter duration. During my check-ins, I was able to help guide the process for each circle member, reiterate the charge, and clarify roles.

Outputs and Outcomes. The expected outputs for Challenge 2, also considered the work products or deliverables for my study, were a wireframe mockup of the prototype website supported by a list of design requirements. The site itself would not have to be very complex or filled with new content, but it would need to look like a new website and at least inspire our team to think that a new site, with new features and dynamism, would be viable. As with all of my online learning circle challenges, they were to be primarily conceptual, with work products that were suggestive of what could be in terms of novel innovation. I was intent on inspiring them to action and being motivational about what could be so that the circle members could create relevant projects, an expected outcome for all of the challenges. However, it was tough to achieve given that most of the circle members were not used to working in conceptual spaces and spent most of their workdays being extremely operational and reactive rather than proactive and visionary.

After the first online learning circle meeting for Challenge 2 had ended, the circle members expressed both fear and excitement, which was shared in open conversation with the circle members. One member stated that, “I love that we are working on a new website, but it seems impossible that we could create one in just two weeks” (circle participant, personal communication, May 2nd, 2020). Later in the week, there was increasing interest once the group started to settle down and meet about what to do next. By midweek, the members were breaking

down the work into manageable chunks. There was some trepidation, but for the most part, the circle members were interested and taking on the challenge and expressed that the challenge would not be hard if the work packages could be appropriately assigned. A circle member shared:

> This work is not hard. We just need to define what we are trying to actually accomplish and build consensus around that first and then everyone can go work on their task and regroup before the end of the week. (circle participant, personal communication, May 5th, 2020)

However, during the second week, things got a little bit more complex. Given that I was not regularly attending meetings taking place during the week, as they were primarily set up for the team to work in ways that they thought best, I was not sure how well things were going. As the process continued, I would occasionally get emails from circle members asking for more clarification about what was expected. What I discovered was that the team had come to an impasse, and they were finding it difficult to continue because each member had a different understanding of the challenge and the expectations for what was to be produced. Although I responded by giving them some clarification, I stressed that I wanted them to be empowered to define what success looked like as stakeholders and not to feel that they needed to rely on me once the challenge was defined and they were charged with it. I sought to encourage the circle members to define and lead different parts of the process.

The quality of the prototype website ended up being very good, albeit unfinished. The design requirements that were outlined were fairly comprehensive and included elements common to most contemporary websites. The circle members had modified the existing menu bar items and had selected a series of videos to run on a loop when the page first loads. I

suggested adding our value proposition immediately on the first page so that our uniqueness would be highly visible to visitors to the site. Other scrolling features and images representing our upcoming programs, exhibits, and events were also included. Overall, the circle members were able to produce a viable prototype website that we would later complete and launch successfully before the end of the year.

Survey Feedback. Because Challenge 2 was a two-week project with two design sprints, I created two different online surveys administered at the end of each week on May 8th and May 15th. All five circle members completed both surveys, answering 100% of the questions in less than 5 minutes for each. Members spent on average 9 hours 30 minutes working on the project during the first week and an average of 14 hours the second week working on the prototype website. This made for an average of 11 hours 45 minutes spent on the challenge between the two weeks.

What Worked. The circle members reflected on the process in mostly positive ways. Three out of five of the respondents mentioned that it was extremely helpful to assemble to define the specific needs of the website, break off to create drafts, and then reconvene within 24 hours to assess. Another expressed that it was also useful for qualified sources to provide appropriate direction and content. It appeared that once the circle members got going on the design of the structure and function of the site, they were able to collaborate more easily on the website itself. Two respondents indicated that timeboxing the project activities was also a helpful factor in their success. Having a firm, fixed deadline focused the team on making decisions and creating a quality product.

Also indicated in the positive feedback was a comment about the use of expertise, which revealed the value of social capital within the group.

> We each took our area of expertise, along with best practices at other institutions, and created a MiSci mold. The new website is infinitely better than our current model, but we can still do more to create an unexpected site where all the information can be found but immerses the user in new ways. (circle participant, survey response, May 8th, 2020)

Another commented on the process they engaged in as they worked, which generated actionable conclusions.

> A small group of us met earlier in the week to review the current prototype website and, based on discussion, had one person provide feedback and support directly. We are not afraid to question each other and have done well refocusing conversations to help reach actionable conclusions. User logins were created for more team members to allow us to support editing. (circle participant, survey response, May 8th, 2020)

Several comments indicated that multiple forms of distributed leadership were beginning to emerge. One respondent indicated that the circle members were coming together as a team and by establishing which parts of the project would be a priority, they were able to accelerate their work. This contributed to an overall positive experience for the circle members. I was very excited to read this comment because it presented an opportunity for me to build upon the idea that parts of a challenge could be shared or parceled out based on an individual circle member's skills, experience, or interest. The circle members were starting to figure out a process and path that could lead to success. They were collectively able to recognize that some efficiencies might be created if they became more comfortable with members' abilities as well as their limitations.

What Did Not Work. When asked to reflect on what did not work, it was clear that not everyone believed that the team had reached a strong sense of group work. One respondent remarked that they had a hard time connecting as a group the first week and it felt like nothing

came together. This respondent also mentioned that the timing for everyone to catch up was extremely difficult with so many other projects going on. More importantly, trying to document what needed to be done to get the website finalized was an enormous hurdle to overcome. Several respondents hinted that although including multiple voices allowed for higher levels of inclusion, it also led to other problems such as personality conflicts.

Communication, timing, and division of labor seemed to be challenging during both weeks of the challenge. The person assigned to web design in the circle took charge to begin the framing of the website. This caused some tension as others thought that editing access should have been shared across all members initially.

> Communication about the project and a defined scope were tough prior to the action team. At this time, we need to be flexible and use resources carefully. I feel like the team could have been more helpful if we had been brought in sooner. (circle participant, survey response, May 8th, 2020)

During project work, sometimes some circle members believed that getting something completed was more important than team planning and took personal initiative.

> We had originally met and broken out work assignments. But the first step never happened, and time was ticking, so a number of us took it into our own hands. We made the blueprint that was formatted into the new site. (circle participant, survey response, May 8th, 2020)

My name was specifically mentioned in one of the comments under the response category of what did not work. This feedback alerted me as to how well the team thought that I had communicated the challenge to build a prototype website.

> It seemed (to me) that it took a couple of meetings with Christian for the team to really hear what Christian was asking for and implement those items ... not sure if that was an artifact of team dynamics (Storming, Forming, Norming ...) or just reflective of the need for more detailed specifications. (circle participant, survey response, May 8th, 2020)

This was one of the most useful insights of Challenge 2. It underscored the importance of effective communication at the beginning of a challenge. This also extends to online learning circles in general. Being clear about expectations upfront can stave off confusion and set the group in a positive direction.

The duration and the timing of the timeboxed, or time-limited, challenges was also an issue. One survey respondent was concerned the time allowed for this project was not sufficient for it to be completed in a truly effective way.

> Looking at the prototype website's evolution and key stakeholders, there has been very little proactive communication meaning progress does ramp up until midweek. The project plan was created quickly and some obvious steps, like access to edit the site, were skipped, leaving most of the team only able to provide ideas and examples. Starting with a partially developed website seemed like a time saver when the project was assigned to the full team, however, the lack of initial planning and clear scope leaves me worried we're creating a product we don't want. Are we just trying to get this done, or do we want to create something good for the user? Yes, things would have changed throughout the project, but we are stuck doing things 'the old way,' which is a common trap with projects at MiSci. (circle participant, survey response, May 8th, 2020)

This kind of reflective thinking illustrated the need for an online learning circle leader to provide a clear scope of work around the tasks to be completed, and for the group to have greater

control over the nature and scope of the challenge. They likely felt too much tension between what they might plan to do and what they needed to do. Perhaps the challenge could have been posed in a way that asked them what they could meaningfully do to rethink and redesign the website as a team in two weeks. Therefore, the goal would not be to create a new website but to create a new vision in two weeks of intense work together. However, the progress that the circle members made during their two-week timebox was substantial enough to validate my initial approach.

What Was Learned. Various insights were shared in the survey responses that described how setting proper expectations can dramatically shape the outcomes of an online learning circle challenge.

> There came a point where we had different expectations of what should be published to the website prototype. Having everyone together in one room (virtual, that is) helped make that very clear, as we went through various pages to be added. I would have added in more mini deadlines within the project timeline. (circle participant, survey response, May 8th, 2020)

Another respondent indicated frustration with distributed leadership as a co-performed activity and cited a hesitation in deciding when to take charge of an activity or task. “I learned who the leaders are in the group of us. I wish I would have stepped up earlier instead of waiting for the person that I was hoping to step up” (circle participant, survey response, May 15th, 2020).

A comment that struck me as important to remember was in regard to doing the same things over again and expecting different results. One issue brought up by a respondent had to do with quality. It raised the question of how the circle members as a group knew if their new ideas were any better than the ones they were replacing.

> It seems like everyone has their own idea about what it should be, but no clear direction or definitive information is being provided so that we can get it there. Are we going to end up with another website that we don't like? It kind of feels like it. (circle participant, survey response, May 15th, 2020)

This comment reveals the importance of proper stakeholder management during challenge projects. Perspectives on quality need to be openly aired, captured, and discussed. One respondent expressed a point of view that was consistent across several other respondent comments concerning what was learned and what might be done differently.

> Group projects are tricky because individuals work at different speeds. I learned about the speed at which my teammates work. Some of us get things done early, some do things minutes before they're due. If I could change anything, it would be that we all recognize this and compromise on what we commit to doing and by when we say we'll deliver. Not responding and not producing leaves others to steamroll others so deadlines are met. (circle participant, survey response, May 15th, 2020)

This feedback indicated to me that they were discovering for themselves how distributed leadership worked in the real-world work environment and that trust was not something that was automatically embedded in the co-performance of leadership by leaders and followers. The circle members acknowledged that trust is often something that is developed over time.

Forms of Distribution. For Challenge 2, the survey data indicated that five out of five respondents identified collective distribution as the primary form of distribution during the challenge. Collective distribution describes leadership actions/activities that are co-performed separately but interdependently. This selection is consistent with respondent feedback that

described the website challenge as extremely demanding, but doable if the work could be effectively broken up into pieces and completed asynchronously.

Reflections. My preconceived notions about Challenge 2 were that the team would be extremely excited about this challenge and ready to take it on. I could not have been more wrong. Yes, the team was very excited about the idea of a new website. They have been clamoring for an update to the website for years. However, it was the short duration timeboxing of the activity that concerned them most. Many wondered how they could design, build, and launch a new website in just two weeks, but that was the challenge that I posed to them.

The purpose of the Cycle 2 challenges was to stimulate creative problem-solving and stretch existing skill sets to the limit, forcing a critical need to tap latent social capital within our organizational network. This was my approach to sparking innovation and promoting intrapreneurship for my study. I also provided them with a cheat sheet. I posed several initial strategy questions addressing how they might break down and right-size project activities. I asked how they might better determine how to prioritize the work so that the primary objectives could be met within the allotted time interval.

As I read the feedback from Challenge 2 it started to make me think that perhaps I needed to make the online learning circle challenges more specific. My initial aim was to make them less specific, giving the circle members more freedom to interpret challenges in terms that would make the best sense to them. In hindsight, I probably should have given the circle members the ability to choose the level of specificity for a challenge. This new idea was something I noted as I progressed to the next circle challenge.

The biggest surprise for me was how quickly the team empowered themselves to take control of the challenge activities and distribute the work. On agile projects, time is always of the

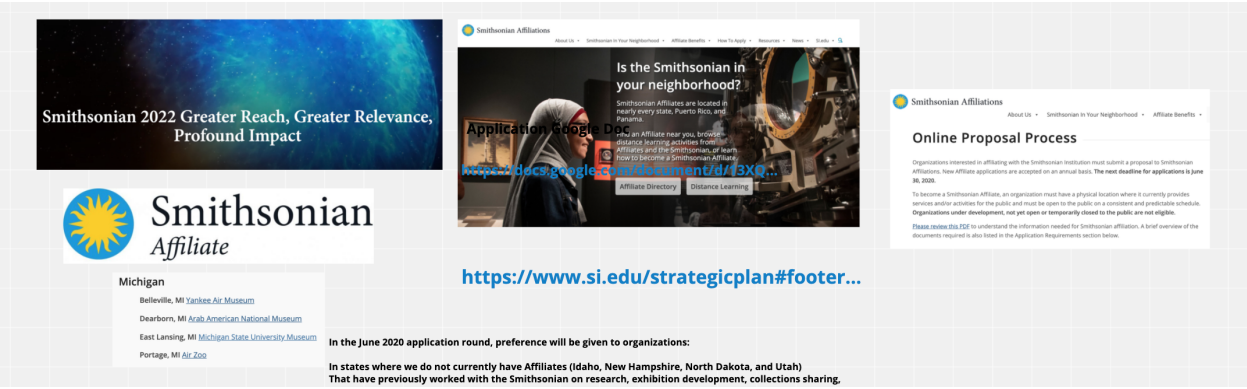
essence. This, in effect, creates pressure on the team to increase efficiency, thus increasing their velocity to deliver shippable products early and often. The collaborative work of the online learning circle was beginning to accelerate.

Challenge 3: Smithsonian Affiliate

Challenge 3: Applying to be a Smithsonian Affiliate. After a very intense two-week challenge to build a prototype website, I decided to give the circle members a new challenge that was a little less complex. I had hoped it would give everyone in the circle an opportunity to slow down and catch their breaths. The overall purpose of our next challenge was to have circle members learn how to collaborate effectively to facilitate asynchronous project work. The SMART goal for Challenge 3 was to review the submission requirements to become a Smithsonian Affiliate museum and draft an application for MiSci by 5 p.m. Friday, May 22nd, 2020. I expected that this would be a much simpler project for the team to coordinate and manage, which turned out to be the case. The goal itself was straightforward and the actions that needed to be taken to complete the application were all well within the skills, abilities, and knowledge sets of the circle members. This meant that every resource that was needed to complete the Affiliate application on time was already contained within the current responsibilities of the circle members.

Figure 4

Conceptboard Smithsonian Affiliate Canvas.



Note. This section of the Conceptboard canvas for Challenge 3 depicts information regarding the Smithsonian Affiliate program and its benefits.

Business Case. Even during a pandemic, before our nation had even started to roll out the first vaccines to guard against infections of SARS-CoV-2, we already knew the general direction we wanted to move in to put people at the center of science. However, it was not exactly clear how we would get there. One clear thing was the fact that insufficient resources would be available to our nonprofit organization to achieve our goals. As we start to recover from the pandemic, we will need to acquire external expertise, solicit in-kind donations, and work in partnership with other organizations. To achieve these objectives, we would likely need to become affiliated with other organizations, particularly museums that have expertise and other business resources that we can use to help achieve our aims. One of the more prominent networks of affiliated museums is the network of Smithsonian Affiliates, which are directly connected to the rich resources that the Smithsonian Institution has to offer.

Having spearheaded the process of becoming an Affiliate in my previous role at the Saint Louis Science Center in St. Louis, Missouri, I knew first-hand the power of being designated a Smithsonian Affiliate. During my time there, I led the process of securing the exhibition

Destination Moon, which featured exhibits and artifacts from the Cold War era and the space race. The main feature of the exhibition was the original command module Columbia that rode atop the Saturn V rocket and carried Apollo 11 astronauts Neil Armstrong, Michael Collins, and Buzz Aldrin to the moon. Only Smithsonian Affiliates, in good status, were eligible to apply. Of those, Smithsonian selected a mere four organizations in the United States. Securing special exhibitions like Destination Moon was one of the major benefits of being a Smithsonian Affiliate. A midsize science center like ours could raise its profile with an exhibit of this caliber. If MiSci were able to be awarded the status of being an Affiliate, it would change our brand potential and increase the relevancy of our value proposition. However, we would need to first submit an application, which was the purpose of online learning circle challenge number three.

This challenge contained several important components. It required the ability to cross-reference existing information and to respond to basic questions about our demographics, our budget, and our overall strategy as a non-profit serving the Detroit metro area community and other areas of the state. It also required us to track down information that had not been updated for several years. Fortunately, the team knew exactly how to get the information, but it would take an enormous amount of time to gather at all and scrub the data to ensure accuracy. Once this was completed, however, we would be able to use the updated data for other purposes such as including it in grant proposals.

Actions and Activities. I began our circle briefing by sharing with the team photos and videos from the Destination Moon exhibition that was hosted at the Saint Louis Science Center. It was a very successful exhibition and connected the Science Center with our regional NASA Center. It also raised the profile of the Science Center in the local media and provided a new value proposition to new and existing Science Center members. MiSci team was very impressed

with this project and wondered if Affiliate status would offer us the opportunity to get traveling exhibitions, rare collection items, or even expertise from scientists and curators within the Smithsonian system. During our circle's Zoom meeting on May 18th, 2020, I walked the group through the application sections, and I discussed who I thought would be able to assist with each section of the application.

During the challenge period, I responded to several messages from circle members not sent through Conceptboard. These messages were sent from a different platform, our internal email system, and were regarding questions about individual sections of the application. I tried to ensure that these questions were being interpreted properly by the circle members, especially regarding the topics of marketing and demographics. We all have a general understanding of our market in the Metro Detroit area, including the three major counties, but we do not have a good understanding of our market throughout the state. These questions were fairly specific and made it difficult to pull and plug the data during the challenge process, but we managed to figure out a technique that worked well.

Outputs and Outcomes. Although the final work product or deliverable was simply to produce a completed application, our application would also need to be competitive. We needed to ensure that everything in it was accurate and that it aligned well with our mission, vision, and rationale for why we would apply in the first place. We also needed to clearly articulate why we would be a good fit as an Affiliate. Initially, it appeared that the circle had more than enough time to be able to assemble all the information, plug it into the online portal, and submit it. The due date for the application was June 30th. This date was approximately six weeks away from the start of the challenge. We would take the Challenge 3 timebox, one week, and research, coordinate, and assemble all of the relevant information for the application. Then my executive

assistant and I would edit the content and work to enter the information into the portal, after doing a final check.

At first, what appeared to be a relatively simple project became much more challenging as the week went on. The circle members discovered that some sections of the application required specific research data on our demographics. MiSci does not have a formal internal program and exhibit evaluation, or audience research team. We typically have to shop these services out to qualified firms. This meant that it would not be trivial to collect and analyze our demographic data to submit an application with the most accurate numbers. Ultimately, the circle members decided to estimate our audience impact numbers for onsite, offsite, and online participation in our exhibits, programs, and events. The team members did their very best to gather as much data as possible and cross-reference it to better ensure accuracy. Although the data we presented was not precise, it was accurate, which made the application good enough to submit.

Survey Feedback. For the Challenge 3 survey, only four members participated in it. Of those who participated, the surveys were 100% complete. 8One circle member did not complete the survey in the allotted time. Circle members who did submit surveys indicated that they spent an average of 6 hours 15 minutes working on the project during the week. This estimate included both synchronous and asynchronous time.

What Worked. Two of the circle members, having completed similar affiliation applications in the past, suggested the concept of assigning specific roles to specific circle members. Although dividing up work in a learning circle is not uncommon, typically members voluntarily choose what they find interesting. In this case, circle members decided to formally assign roles, which actually helped the process move more quickly. This was necessary given the

short timeline of the one-week timebox. One respondent stated that splitting up the teams sped up the completion process. Group A worked on pulling information from past surveys and Group B focused on spending more time on data that simply just needed to be updated. This feedback demonstrated how expertise can sometimes drive activity within a learning circle. If a particular circle member has direct experience with a content area or process, they tend to automatically be put in charge. In some cases, they even take charge. In either case, co-performance of leadership is facilitated. This is why diversity of skill sets and background are considered critically important to include in the development of a learning circle (Riel, 2010). The more diverse the expertise of the learning circle is, the more likely someone will either step up or be assigned to take on one or more tasks that support efficient and effective completion of a challenge.

What Did Not Work. One of the most difficult aspects of online learning circle Challenge 3 focused mainly on an individual team member who was not able to pull their weight or be counted on to support the group. One response stated that some team members did not get to the work until later in the week, which resulted in circle members having to scramble to complete certain tasks. I later discovered from a circle member that this issue had existed in a less impactful way during the first two challenges. It was clear that at least one team member was having trouble keeping pace with the others. This issue ultimately started to breed resentment among the circle members, given that this particular team member was never able to consistently produce at the same levels as the others.

What Was Learned. The responses to the question of what you learned or what you would change seemed to prompt team members to discuss issues related to project management. Not everyone in the circle had the same concept of how the deliverables should be created. Nor did they have a clear understanding of the roles and responsibilities of each member during the

process. Assigning and distributing the workload and breaking up the data gathering by content expertise and access seemed to be a productive method. However, the differential in dates of the Challenge 3 deadline and the Smithsonian Affiliate application deadline may have created different time management and task prioritization expectations.

Another insight from a respondent stated that the types of questions on surveys and applications need to be unpacked to understand what is being asked.

> Two separate surveys might be asking about something like total membership; however, the answers may be vastly different depending on how they are worded. As discussed previously, it would be a very good use of MiSci time and resources to create a database/glossary of regularly requested data, along with explanations of how numbers were calculated and clarify how/why we answered questions a certain way. (circle participant, survey response, May 22nd, 2020)

Forms of Distribution. Of the four circle members who participated in the survey, all of them indicated that the distribution displayed during Challenge 3 was a combination of collective distribution, where the leadership actions/activities were co-performed separately but interdependently, and coordinated distribution, where the leadership actions/activities were co-performed in a particular sequence. This assessment was also in line with what I both directly and tangentially observed during the process. The circle members were becoming more confident in understanding the differences among the various types of distribution and their co-performance of leadership. They additionally were able to act decisively in the process of facilitating an online learning circle, including distributing the work, owning the work, and holding others accountable for the work all while maintaining a supportive team atmosphere.

Reflections. While I did not have much doubt that the circle members would be able to achieve the goal of this challenge given its simplicity, I was interested to know who might step up to be the overall leader for the challenge. Three of the five circle members deal with these datasets regularly. Any one of them could have led this challenge to completion. However, the three joined forces and shared the leadership load all while maintaining a healthy engagement of the one member who had little to no experience with the subject.

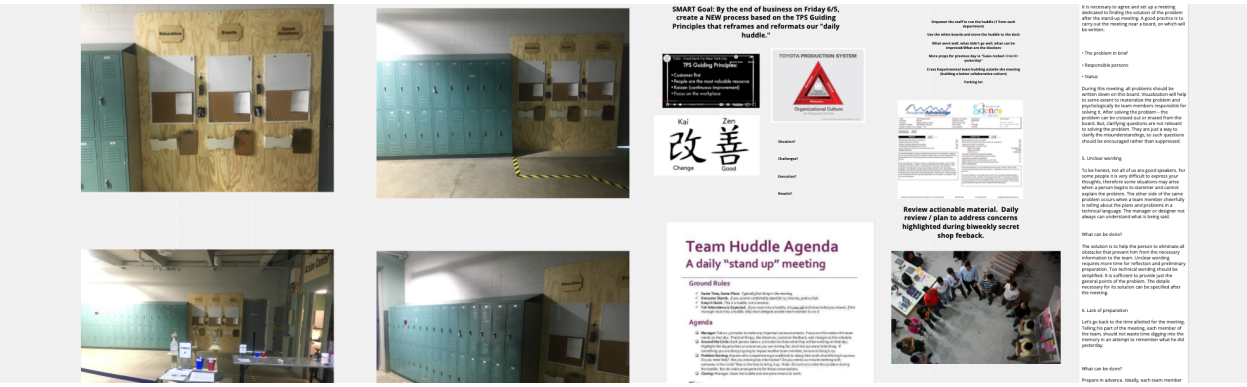
There was only one surprise of significance that emerged during Challenge 3. It was the fact that one circle member seemed to almost completely unplug from the work at hand during the week, placing undue stress and strain on the other four members. This was incredibly frustrating to the other circle members and disrupted the team atmosphere that appeared to be at least semi-present for the previous two challenges. I later discovered through an informal one-on-one conversation with the person in question that competing demands on their time made it difficult to fully participate in the online learning circle project work that week. The excuse was legitimate, but the way it was communicated to the other members was disappointing.

Challenge 4: Daily Huddle

Challenge 4: Reimagining Our Daily Huddle. The SMART Goal for Challenge 4 was due by the end of business on Friday, June 5th. It was to create a new internal process based on the Toyota Production System (TPS) Guiding Principles that would reframe and reformat our "daily huddle" or daily stand-up meeting. This was a challenge goal that was initially drafted and offered up by the online learning circle members themselves and was the first challenge for the circle that I did not design.

Figure 5

Conceptboard Daily Huddle Canvas.



Note. This section of the Conceptboard canvas for Challenge 4 depicts ideas for a daily huddle redesign and a relocation of the huddle location with information bulletin boards.

Business Case. The rationale for this challenge was to develop a new process by which we would work together as a group of departments aligned to create a unified effort to facilitate the best possible guest experience on the floor of the MiSci. A lot of work goes on behind the scenes to make every day special for our guests. In a typical year, we support visitation by the general public, including families with young children, as well as K-12 schools and organized youth groups that visit on field trips. We also like to encourage people to become members. Members typically know the organization well and have the highest amount of repeat visitation of any demographic. This means when members return, they often are looking for something more than what they received on the previous visit, meaning a deeper experience such as a behind-the-scenes tour, or something completely new like a first-run IMAX® film or a new for the theater movie. By reframing our stand-up meeting, we could potentially create a better configuration of our limited resources on the floor through more harmonious collaboration among departments and with team members that perform different functions, as indicated in our role and responsibility matrix or RASCI chart (see Appendix K).

Our existing stand-up meeting typically took place in the front lobby of the building where the guests enter. This is a common practice among science centers, museums, zoos, and aquariums. The concept is to gather employees together to hear updates and get mentally prepared for guests and the activities of the day. The consideration of the location is important. Being held in the front where the guests enter seemed like a logical location given that you can discuss placement of staff, signage, etc.

The meeting typically begins with the "front of house" manager, or the director of Guest Experience, briefing the team about the day's "run of show." The briefing includes updates on the number of schools and organized youth groups that are attending that day, current events in science, reserved tickets, or public relations activities such as remotes and on-location TV broadcasts.

Although our team typically performed a fairly good job organizing and facilitating the daily huddle, the onset of COVID-19 added a new level of awareness and attentiveness to the process. When we shut our doors to the general public on March 13th, 2020, we met shortly thereafter with our Board to discuss reopening plans. One of our board members created a challenge grant for innovation to support the organization's transition to reopening. Part of that grant would go toward supporting PPE, or personal protective equipment, for staff including hand sanitizer and other sanitation equipment and materials that would be used by staff to help lower the risk of the virus being present and spread throughout the building, potentially affecting our guests.

Given that we are a hands-on science center with lots of things to touch and manipulate, we needed to come up with a solution that allowed us to go above and beyond the current state and local health department requirements to give the public the best sense of safety and security

while visiting the MiSci. To do this we worked in collaboration with Midtown Inc., a community-based organization that helps to advance the growth and development of Midtown Detroit. They connected us with the National Sanitation Foundation, NSF International, located in Ann Arbor, Michigan. They are an organization that specializes in safety, cleanliness, occupational hazards, and sanitation. They were very well-versed in how to deal with viral spreads. The objective was to have them work with us to create practices and protocols that would help to lower the potential risks and neutralize the effects of viruses like SARS-CoV-2.

It would be the responsibility of all of the team members that worked on the floor to be trained and equipped to handle sanitation duty as well as their normal duties to address the risks of the spread of the virus. Additionally, the staff would have to support new policies and procedures to reduce the potential spread of the virus behind the scenes with staff. Staff would be asked to enter through the dock area as a single point of entry to make sure that temperature checks, mask distribution, hand sanitizing stations, and other protocols were appropriately followed. The stand-up meeting, or daily huddle, is used to brief staff on issues related to our COVID-19 response plan along with the typical general visitation of guests and school group visitation practices that we would employ under normal circumstances.

Recognizing the immediate need for revamping the daily huddle, the learning circle members offered up the idea of reimagining the format and location for the huddle for our fourth challenge. I was thrilled with the opportunity to be able to challenge the team to take on something they were already very much committed to. It made my job as their online learning circle coach, and as President & CEO, easier. This would be a fun challenge given that the team believed that not only was this an important topic to address, but it would also give everyone a

sense of security knowing that we had a new plan for how we would run our daily huddle upon reopening in the summer, which was scheduled for July 10th, 2020.

Actions and Activities. The briefing for this online learning circle challenge took place in a Zoom meeting on June 1st, 2020. I kept my remarks relatively short because I wanted to give a maximum amount of time to the team to discuss how they thought we should proceed in reimagining our daily huddle. This proved to be a prudent approach because the meeting went over by 15 minutes, in part due to the sheer excitement of the team. They were going to have the opportunity to take on a topic of great interest to them.

For this meeting, I decided to invite a special guest to the meeting to kick things off. He was a high-level representative of an organization affiliated with Toyota Motor North America that is dedicated to promoting the TPS across various industries around the world. The organization is very well-versed in lean manufacturing, Kanban, and other Total Quality Management (TQM) based approaches to production efficiency. Toyota's representative showed several videos specifically related to the Toyota Camry plant in Kentucky and the process by which they established the plant and trained the staff to efficiently produce one of the most popular sedans in history. A video of another nonprofit being trained to utilize the Toyota production system in their work was also shown. The individuals profiled shared the successes of the partnership and how it impacted their mission, operations, and community. It was an extremely inspiring video that effectively illustrated the value of using the TPS.

I explained to the online learning circle members that they did not have to use this system completely, but only needed to take inspiration from it. They were encouraged to incorporate the system's guiding principles, which I thought were very similar to some of MiSci's principles. The principles mostly centered on creating an atmosphere that inspires a culture of performance.

The concept of Kaizen, which represents an aspect of continuous improvement, was the concept I wanted to highlight. As an organization, we are not always skilled at implementing innovative improvement processes. However, the daily huddle represented an opportunity for us to employ Kaizen on a more regular basis. The team quickly embraced the idea. A circle member said:

> I have always wanted to use a Kaizen approach to my work, but never thought it was possible because it is not something that is part of our culture. We should always try to improve our practice, and sometimes it is the little innovations that can make a big impact. But Kaizen has to be sanctioned and supported for it to work. Toyota obviously knows how to do that and do it well. (circle participant, personal communication, June 1st, 2020)

The activities that took place during Challenge 4 focused on three major themes for the daily huddle, which addressed many pandemic-related concerns. The themes were: reopening with an airport theme for rearranging the entry area and exhibit galleries, the integration of the sanitation procedures to address COVID-19 risks, and an unexpected theme, which was the idea proposed by one of the circle members to change the location of the daily huddle.

The first idea was to use an airport concept as a metaphor for spacing out our guests and providing appropriate social distancing. Air traffic controllers create a horizontal separation, or spacing, for planes coming in for a landing. A similar technique could be used to keep our guests in groups and help them to explore the exhibit galleries and theaters while maintaining proper spacing. The team took this basic concept and developed it. They even designed signage very similar to that found in a typical airport with signs for arrivals and departures at the front door. They also bought green, fluorescent vests very similar to those worn by those who work on the

tarmac handling baggage and refueling aircraft. These vests would have the words “CLEAN TEAM” on the back and be used by floor staff engaged in sanitation activities.

Our second theme focused on our work in collaboration with NSF International to produce a comprehensive manual of policies, practices, and procedures that would be used as a “playbook” when we reopened. The objective was to get a seal of approval from NSF International so that we could establish a high level of confidence in our sanitation for COVID-19. We would need to use several sanitation practices across various functions of the science center, from our hands-on interactive exhibits to the seating on our science stage. Unfortunately, when we reopened on July 10th, our theaters were not able to open with the rest of the MiSci. This was as a result of the limitations imposed by the Michigan governor on gatherings, but the rest of our facility was made fully available to the public upon opening. These are the types of items that would be discussed at a daily huddle, as would any changes to the availability or accessibility of these facility features to be effectively communicated to the public.

Our third and final theme was the location of the daily huddle. This became an important topic of interest to the learning circle members after one member of the team came up with the idea of moving the location to somewhere else in the building. At first, circle members were surprised to even hear the suggestion because it was something that no one had thought about before. However, the person who suggested it said it based on the direction of the conversation. To integrate the new sanitation procedures into the daily huddle practices, they realized that most of the equipment, resources, and documentation materials needed were already situated on MiSci’s loading dock. The circle member who suggested it wondered if moving the daily huddle stand-up meeting to the loading dock would create efficiency given that all of the materials that the team would need to facilitate the distribution of masks, perform temperature checks and

organize safe entry into the facility would be right there. Everyone in the online learning circle agreed that this was a fantastic idea and that would make their activities much simpler logistically since the staff had already been instructed to enter through the dock and its proximity to public spaces and galleries.

Outputs and Outcomes. The work products for this challenge consisted of a new schedule, a new format for how the meeting would take place and who would lead the daily huddle, and a few wall-mounted bulletin boards and whiteboards that would be used to communicate important information. When facilitating a daily huddle, efficient and effective communication is key. The objective is to communicate as much information as needed in the minimum possible time. Our team needs to be able to run the building effectively during the day and to ensure that everyone is up to date on the latest information and up-to-speed on the latest procedures. The daily huddle is also the place for any critical concerns to be aired and addressed.

During their one-week timebox for facilitating the challenge, the team took time to meet on the dock to redesign the space to be an appropriate platform for facilitating daily huddle meetings. This meant creating new boards, mounts, and places to distribute PPE, as well as sign-in sheets. Also positioned on the dock were hand sanitizer, masks, and a thermometer to measure the temperature of incoming staff, volunteers, and contractors when they enter the loading dock area for the first time.

The quality of the product or output to redesign the daily huddle was exceptional and the team's distributed leadership and collaboration practices in doing it were exemplary. Challenge 4 was perhaps the best online learning circle project yet. The team reconfigured the loading dock area and included items and effects related to our new NSF International COVID-19 protocols. Additionally, the circle members designed the new daily huddle to be more upbeat, given the

somber mood of our typical COVID-19 era meetings. The daily huddle also included more inclusivity, allowing voices of individuals across departments and at different levels to be heard. The stakes were extremely high for us in regard to our reopening on July 10th, 2020. The team seemed to understand very clearly how important a safe and efficient reopening would be for the organization. Everyone at MiSci wanted to participate appropriately and to support the organization as best they could. Establishing an effective new location and format for our daily huddle was a creative and effective solution. A circle member expressed:

> Our new daily huddle gives me a feeling of hope. After all, we have been through shutting down the building and going into quarantine for so long, everyone is ready to break out and get our building reopened. But we need a little teambuilding too after being remote on Zoom meetings. Having the daily huddle on the dock makes us feel more together. It makes the work we do at MiSci feel more important. (circle participant, personal communication, June 5th, 2020)

Survey Feedback. This time, all five online learning circle members responded to the survey with a 100% completion rate. A total of 19 minutes and 13 seconds was spent completing the survey and no questions were skipped. Circle members spent on average 2 hours and 30 minutes working on the challenge project during the week.

What Worked. The challenge to reimagine the daily huddle was facilitated extremely well by the members. One respondent expressed that the circle members recognized the critical need for reformatting the daily huddle and that adding the Toyota framework was helpful to business operations.

> We already do a morning huddle. It was going to have to change after coming back from COVID, so having the Toyota framework front of mind is a nice reference to make sure

> that we are using time efficiently and effectively. (circle participant, survey response, June 5th, 2020)

The circle members appeared to find value in the Toyota model as a way to make their work easier. Another respondent's comments demonstrated the need for improving the team's ability to collaborate and for the changes to our stand-up meeting to be action oriented.

> Since we're very familiar with our morning meeting, we were able to collaborate quickly and work through improvements and new ideas. This challenge was already something we were discussing as part of the reopening, so it was top of mind and actionable. (circle participant, survey response, June 5th, 2020)

This comment typifies the general sentiment of the group. The online learning circle members found Challenge 4 to be very much in line with the work they were already collectively doing. Having it already aligned with daily work made the process simpler and reduced the number of hours spent on the challenge during the week. Another respondent to the survey expressed that it was important for the circle members to be realistic about what processes can be put in place, given the outcomes of the daily huddle to make it work. Conceptboard also provided a space for a coordinated distribution of work. The introduction of TPS from Toyota and its core principles was helpful. Two respondents stated in their feedback that using Conceptboard was also helpful because they were able to refer to it and see the relevant information that other members had posted.

What Did Not Work. But not everything with Challenge 4 was positive. The primary difficulty that the circle members experienced was having sufficient time to work on the project during the week. As we began to ramp up and get closer to our reopening date, other projects started to take precedence. This would become a theme through the next two challenges. It was

not as though the members were not interested in participating, but they expressed there is only so much time during the week that can be devoted to the online learning circle.

> I did not have time in the past week to devote to this assignment, on top of what we had talked about in a Summer of Science planning session. This past week has been particularly busy with reopening issues and tumultuous in other ways - the team is struggling to find time for real-time collaboration. (circle participant, survey response, June 5th, 2020)

However, there was an appreciation of the technology tools employed despite the difficulties experienced. With an acknowledgment of the value of asynchronous work, one respondent commented that a benefit was the use of tools like Zoom and Conceptboard rather than having to meet face-to-face since everyone's schedules were so erratic.

What Was Learned. In terms of what was learned from this challenge, the circle members had quite a bit to say. Three of the five respondents referenced working with Toyota and stated that Toyota helped them learn more about quality systems and the value of using Kaizen-based approaches. Other comments gave examples of how the Kaizen approach was already somewhat part of the manager on duty's responsibilities, which were to isolate problems and generate quick and innovative solutions.

> Through reviewing our current meeting and the resources at the new dock location, I was reminded that this is something the MOD (Manager on Duty) team has excelled at and continues to improve. Reviewing our processes is something we should plan on doing from time to time to determine whether or not they are efficient or in need of improvement. (circle participant, survey response, June 5th, 2020)

One respondent shared a comment that provided insight into the circle's understanding of quality management and quality assurance. These insights into the quality and how it can be better facilitated inspire future investigation beyond my current study. "I learned more background about quality systems from Toyota. I think that this topic demands more attention and thought than I can truly provide - I need dedicated time for learning!" (circle participant, survey response, June 5th, 2020). Spreading the collaborative learning environment concept to others across the organization also began to emerge as a learning outcome of Challenge 4 and was captured in various survey respondent comments.

> Having already been familiar with Toyota's efficiencies, it is interesting to think about how it can apply to our work. We can use this to get staff buy-in and to help make them excited about their work here. By involving them in finding solutions, we will automatically help them feel part of the bigger picture and a vital part of the team. (circle participant, survey response, June 5th, 2020)

Another respondent to the Challenge 4 survey asked the question of where else at MiSci can team members implement Toyota's TPS strategies? This question provided evidence that the circle members were starting to think beyond the confines of the online learning circle and connect what they were learning to other areas of the science center, which is perhaps the most important breakthrough to date to emerge from the challenge process.

Forms of Distribution. Circle members indicated that the primary type of distribution during Challenge 4 was collective distribution, where the leadership actions/activities were co-performed separately but interdependently. This appeared to occur across the board and is perhaps the most difficult type of distribution to co-perform because of the required level of coordination needed to get its collective work appropriately synchronized.

Reflections. My expectations before Challenge 4 were that I would not have to do very much to push this challenge forward after an initial introduction. I believed this, in part, because of the initial excitement that the team expressed for this challenge. I assumed that they would find the activity congruent with their current efforts to adapt our public experience to the disruption of COVID-19. Therefore, I expected that they would be highly motivated and that their response to the challenge would be well facilitated and executed. They did not disappoint.

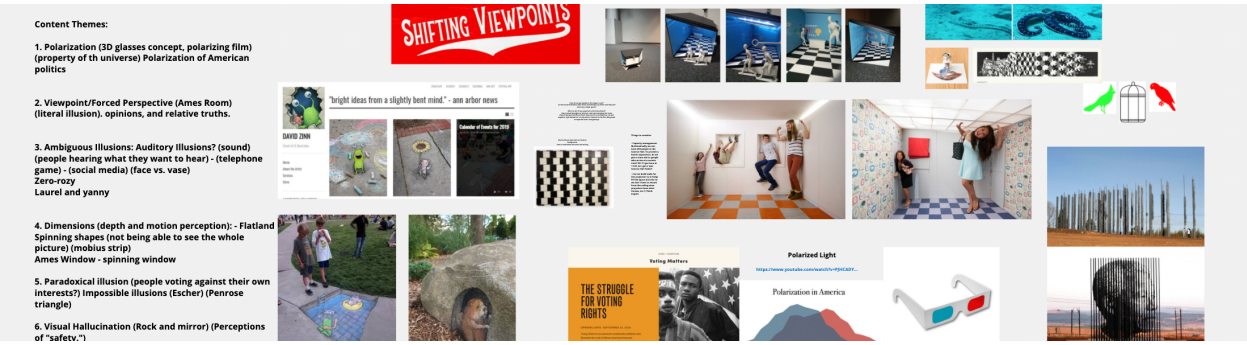
I was surprised at how well this particular challenge was facilitated. One might assume that by the fourth challenge the team would have more confidence, which they certainly showed. But given the fact that reimagining and redesigning the daily huddle, along with moving it to a new location was a considerable amount of work, I was pleased to see the level of ownership and initiative taken by the circle.

Challenge 5: Ames Room

Challenge 5: Creating an Ames Room. Challenge 5 kicked off on July 24th, 2020, with the SMART goal to create several new innovative exhibit elements to advance and/or complement the development of our Ames room by July 28th, 2020. Invented by American scientist Adelbert Ames, Jr. in 1946, the Ames Room is a distorted room designed to create an optical illusion through a forced perspective. From a prescribed vantage point, the room appears to be shaped like an ordinary rectangular cuboid, with a vertical back wall at right angles to an observer's line of sight, two vertical sidewalls that are parallel to each other, and a horizontal ceiling and floor. The true shape of this distorted room is that of an irregular hexahedron. Depending on the room's design, all the surfaces can be regular or irregular quadrilaterals, with one corner of the room being farther from an observer than the other. The result is people or objects on either side of the room will look larger or smaller depending on the orientation.

Figure 6

Conceptboard Ames Room canvas.



Note. This section of the Conceptboard canvas for Challenge 5 depicts images of Ames Room designs on display from places around the world. This image also depicts the design model for the Ames Room. The full-scale version was constructed at MiSci in late 2020 and erected on the fourth floor in the Science Gallery.

Business Case. The leadership team at MiSci decided to construct the Ames Room to create social media moments in our facility around new and innovative exhibits. Guests would be encouraged to upload pictures to social media and tag the science center. With the theaters being closed to the public since the governor's original shelter-in-place executive order went into effect in March 2020, there was a desperate need to create new attractions to draw visitors to the science center upon reopening in the summer and through the fall. MiSci has more than 220 interactive exhibits, and several of our galleries needed to be rearranged to encourage and support social distancing during COVID-19. Unfortunately, the exhibits that were on display were quite dated. Many people who return to the science center often see many of the same exhibitions on the floor that they did when they were young. It is a concern that the science center's brand cannot truly be advanced until the old exhibits are removed and new, more updated ones are introduced in their place. This is easier said than done given that traveling

exhibits are quite expensive to bring in and maintain. One way to improve the experience on the floor, and not have to spend considerable amounts of money to launch a new exhibition, is to contract someone local to build the exhibit. This is what was done.

The Ames room itself would be designed as simply one component of a larger exhibition. The exhibition was named, "Shifting Viewpoints," and it represented the forced perspective optical illusion effect of the exhibit itself. The exhibition would be installed on the fourth floor in MiSci's 9,000-square-foot special exhibition space called the Science Hall. The Ames room itself would be nearly 12 feet tall, but only take up about 20% of the total floor space. The rest of the space would be used for supporting the exhibitry, including space for social distancing.

Actions and Activities. We hired a contractor to design and build the Ames Room and several of the supplementary exhibits. The contractor built a scale model to prototype and approve the design. On July 24th, I met with the circle members on Zoom and shared photos of the model. I also showed them a short video of an Ames Room in the UK being constructed. The video covered, quite comprehensively, the science and mathematics behind the room. The circle members were intrigued by the concept and thought that this exhibition would have a lot of potential to excite our visitors and add a new dimension to the overall floor experience at the Science Center.

Challenge 5 would be the first challenge that would take place after MiSci had reopened to the public on July 10th, 2020. The majority of the staff was preoccupied with our reopening activities and disinfecting practices and protocols. These were needed for us to combat the spread of the virus. Given the added pressures of reopening, I wanted to reduce the possibility that this challenge would overwhelm the team with too much additional work. I, therefore, decided to simplify the deliverables. Fortunately, the circle members were able to meet face-to-

face during the week unimpeded, but only for approximately one hour. The rest of the time was spent performing asynchronous activities using Conceptboard.

Most of the work the team performed on Conceptboard was posting images, animated GIFs, and videos of different designs and installations from all over the world of the Ames Room concept. Very few of these were in museums or science centers. Midweek, I gave the circle members some added direction on how to compare and consider various design specifications. I also shared with them additional information on design thinking strategies and how to create empathy-centered approaches that align audience perspectives and dispositions. One circle member found this to be extremely helpful and immediately integrated this new technique as part of the circle's activities:

> Although I've heard of design thinking, these concepts are new to me. And yet, they seem so logical. We need to have a much better understanding of audience needs and be able to design exhibits that resonate with them. If we can incorporate their interests in a more useful way, we might save time and energy trying to fix things on the back end. (circle participant, personal communication, July 26th, 2020)

Outputs and Outcomes. Several ideas emerged from the online learning circle members that were focused on purchasing inexpensive, readily available items that were themed around optical illusions. These ideas included floor treatments and 3D objects. Many of the optical illusions created interesting effects. Some circle members created diagrams to show the positioning of various interactives that would be added to the room. A circle member bookmarked links to YouTube videos that were later distributed to other members of the circle:

> We needed to be able to visualize what we were trying to create for the overall experience. So, we created an Ames Room playlist of YouTube videos. There are several different types of Ames Rooms in the world and ours is pretty standard. However, we can add elements to the space for guests to better understand the geometry of the space and how it all works. (circle participant, personal communication, July 26th, 2020)

The work that the circle members produced for Challenge 5 was of high quality. Their confidence was extremely high leading up to the challenge, and throughout the challenge the circle members seemed to be able to accelerate their work. Even though the members had very limited time, they appeared to go above and beyond to meet the requirements of the challenge. It was during this time that I seriously considered giving the team an extra week to continue to develop more ideas, but our responsibilities for keeping the building open for the public and safe for MiSci staff were mounting. So, I decided to end the challenge at the end of the week as planned and give the circle members credit for work done.

Survey Feedback. There were four out of five responses for the Challenge 5 survey, each with a 100% completion rate. Circle members spent on average 2 hours 45 minutes working on the challenge during the week, which was the shortest amount of dedicated time for any challenge so far in the study.

What Worked. Given the additional challenge of balancing their time performing the dedicated activities with day-to-day efforts associated with the building reopening process, the circle members welcomed help from the outside contractor. The use of visuals and scale models of the Ames Room prototype appeared successful and shortened the amount of work needed to complete the project activities in the allotted time.

> The option of bringing in a designer/fabricator to coordinate the ideas of the project worked well. Although not always possible or necessary on all projects, taking the time to create both physical and visual models brought focus to the project. The dedicated use of Conceptboard seemed to accelerate the progress. Being able to jot down ideas and post pictures helped make the idea for the Ames Room gain traction. (circle participant, survey response, July 28th, 2020)

What Did Not Work. However, the use of Conceptboard for some circle members was not as effective. A recent technical upgrade of the software scrambled some of the content and made the idea board artifacts useless. Also, accessibility was limited. "The technology did not work for this challenge. Conceptboard did not allow half of the team to participate in the collaborative format. Conceptboard was being selective as to who got access and who did not" (circle participant, survey response, July 28th, 2020).

What Was Learned. Challenge 5 demonstrated that learning circles need not be isolated. Having outsiders participate in challenges can create a significant advantage. Allowing for the contract designer/fabricator's expertise to be employed early in the project accelerated the work and shortened the project timeline, which was a huge advantage.

> It was worth skipping over much of the brainstorming process to let someone deliver a solid product with one clear vision. I learned how we can do something really cool with a little bit of money and a little bit of help. (circle participant, survey response, July 28th, 2020)

Working with the contractor also seemed to build confidence in the team's ability to tackle a challenge that was considerably outside of their comfort zone given that only one circle member had exhibit development experience. Overall, the circle members seem to appreciate the fact that

external expertise can drive innovation when done appropriately. This insight would be incorporated in the next challenge, which also featured a contractor.

Forms of Distribution. Online learning circle members indicated that the primary type of distribution during this challenge was collective distribution, where the leadership actions/activities were co-performed separately but interdependently.

Reflections. I entered this challenge feeling relatively confident that the circle could handle the level of difficulty. This would be the first challenge that was primarily mission-focused in creating a science-based exhibition. Previous challenges focused on topics like a new website, a membership application, and daily stand-up meetings. I hoped that this topic would demonstrate their ability to work together to use design thinking principles, which they had not previously had an opportunity to do. The circle members were very comfortable with facilitating challenges on short timeboxed time scales. I was impressed by how they were able to find ways to shorten project time by reorganizing the work. I knew that time would be compressed for them to produce the deliverables. I thought that overall interest in the topic of the Ames Room would motivate them to find the time to balance the challenge and their reopening work for the facility. The circle members did an amazing job facilitating this and MiSci was covered in the television news and the newspaper as being one of the first organizations in Detroit for families that had reopened safely. We would later be listed as one of the top 10 safest sites for families during the pandemic in Detroit Metro Parent magazine.

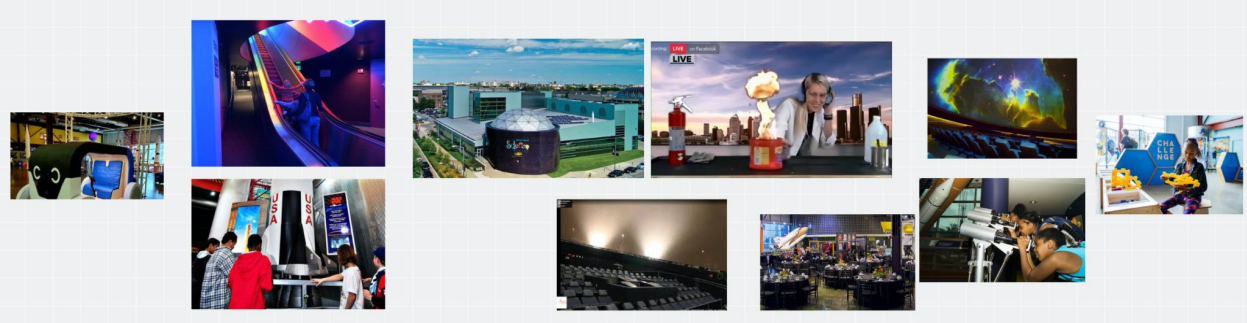
Challenge 6: Illuminate

Challenge 6: Designing our 2020 Fundraising Event, Illuminate. The sixth and final challenge served as a capstone project for the online learning circle members. There was a considerable gap of nearly five weeks between Challenge 5 and Challenge 6. This was primarily

because reopening the facility during the pandemic consumed most of everyone's time. However, this spacing in the schedule afforded the circle members time to relax, reflect, and take a break from the fast-paced timeboxed challenges we had been facilitating. Given the financial strain that the organization was under, we needed to finish the year strong with a successful fundraising event. Therefore, I decided to focus our final challenge on our annual fundraiser. The SMART goal for Challenge 6 was to reframe, design, and produce a virtual event for our annual fundraiser, Illuminate, by Friday, October 2nd. This was the actual date of the event, so several milestones would need to be reached in the weeks prior to achieve our goals.

Figure 7

Conceptboard Illuminate Canvas.



Note. This section of the Conceptboard canvas for Challenge 6 depicts ideas for Illuminate, MiSci's annual fundraiser. Images represent highlights that were presented virtually that included live demonstrations and audience member stories.

Business Case. The rationale for this challenge was not only to have the online learning circle help to support the development of our annual fundraiser but to also test the concept of facilitating an online learning circle challenge where the circle members did not have full control over the project. No previous challenge had this as a requirement. The others had project responsibilities that were totally within the circle's sphere of influence and control. In previous challenges, the learning circle members served as the ultimate decision-makers. For Challenge 6,

the online learning circle members would support an internal team in our development department.

Each year MiSci produces a fundraiser. Fundraisers in the nonprofit sector are usually designed around special events or are a special event in themselves. Many of these events take place in the evening and are quite formal affairs. For many years, our organization facilitated a formal gala as a way to raise our brand image, profile, and support annual giving. However, in 2019 we decided to change the format of the event and make it much less formal. It was thought that the formality of the event deemphasized the more enjoyable aspects of our events and limited our ability to share our culture as an accessible and engaging informal science education organization.

The result was the creation of something called the "no-gala gala," an after-work, business casual affair where food and drinks were served alongside science demonstrations and inspirational speeches from our program participants, members, staff, and the board. It was renamed, "Illuminate," and was hosted in October 2019. The event was an amazing success. Building off this new format, it was thought that we could use the same formula in 2020 and scale the event to allow for greater attendance and impact. However, as a result of the negative effects of the pandemic, it was decided in the summer of 2020 that the Illuminate gala would be transformed into a completely virtual event. The format would be formulated around a series of science demonstrations broadcast on social media and viewed by online guests from our philanthropic community. The event would be hosted by our lead science educator, who was also the lead developer and facilitator of ECHO Live, our premiere virtual program that launched during our shutdown.

Actions and Activities. The circle briefing for Challenge 6 began with me presenting a brief history of our previous galas. I shared my assessment of the successes and failures of prior events. I also explained to the circle members that for this challenge they would not be the primary project leads and that this event would be led instead by our development department. Their role would be to help to craft a comprehensive strategy supporting the virtual aspects of the event. To the circle members, this was exciting. But there was also some anxiety. One circle member expressed the hesitation that many others in the circle also shared:

> This is a great opportunity and a wonderful way for us to conclude our online learning circle challenges given the importance of this event. However, we are being brought in to do something that we have never done before, the schedule is tight, and the stakes are very high. (circle participant, personal communication, September 8th, 2020)

Although the difficulty level was high for this project, the circle members were very interested in pushing the boundaries of the event in terms of the innovation needed to host the event virtually. Their excitement was, in part, due to the success of our virtual programs during the shutdown. By the time the event would take place, we would have already facilitated more than 100 episodes of our ECHO Live virtual science demonstration program that launched shortly after we closed to the public on March 13th, 2020.

To reduce their anxiety, I sketched out a basic framework for the event, which was heavily influenced by our Board committee's ideas for the Illuminate event. I wrote down several high-level requirements and shared the list with the online learning circle members. They took the list and worked up a plan in a similar fashion to the way they had prepared for the previous five challenges, dividing up the activities amongst themselves based on expertise and interest. By this time, the team had become incredibly efficient at parsing out the work packages

and, given that the timebox for this challenge was two weeks, they believed that they had a sufficient amount of time to work the challenge activities into their existing schedules, something that was not the case for several of the previous challenges.

Outputs and Outcomes. The circle members independently and collectively worked to develop several creative approaches for the event using Conceptboard. By the end of the second day, they had come up with a plethora of ideas that could be used for both the final design and the run-of-show for the event. From engaging science experiments to anecdotal stories, they had captured most of our stories representing our successes from our shutdown, to reopening, to our summer of science leading up to Illuminate.

The quality of the ideas and frameworks presented in Conceptboard was done exceptionally well. We had contracted with an outside production company to plan and shoot video and to help with storytelling. Fortunately, we did not have to pay the production company as much because the online learning circle members had done a thorough job gathering together people and storylines that truly captured the nature of our very chaotic year along with the impact we had on those individuals and the community as a whole. I was extremely impressed with what the team had been able to accomplish within a fast-paced, two-week period. It was clear that the circle members had gone above and beyond in their work for this final challenge. Their pride in what MiSci had accomplished during the pandemic, under extremely difficult circumstances, was evident in their work.

The actual Illuminate event, which was October 2nd, 2020, was nearly flawless. Except for a few technical glitches associated with disruptions in our Wi-Fi signal, the YouTube broadcast itself, was stellar. Each segment, including my presentation to our online audience of philanthropists and funders, was well-rehearsed. To address potential risks, some elements were

pre-recorded to ensure that they could be broadcast to the online audience even in the event of signal interruptions. Our entire MiSci team, who had contributed in some form or another to the design, development, and facilitation of the event, was extremely pleased with the outcome, both in terms of how the event was facilitated and for how it was received.

Survey Feedback. For the final challenge survey, there were four out of five total responses, each with a 100% completion rate. Members spent 12 hours on average working on the project during the two-week timebox. The responses for Challenge 6 were much more detailed than normal. The circle members were extremely expressive with what they shared in their feedback.

What Worked. From the survey responses, it was clear that this final challenge was an appropriate culmination of their hard work over the nearly 10 months of my action research study. It truly served as a capstone project as I had originally intended for the challenge to be. The members of the circle were overjoyed after the event succeeded. One circle member described the event as exemplary, and the most effective one that MiSci had produced in recent memory.

> MiSci definitely had its stuff together this time. We had our scripts written on time, photos in place, and everything that we needed for the event. We prepped and were ready to go by the agreed-upon date and time. This was the most successful online learning circle challenge we did to date. Awesome! (circle participant, survey response, October 9th, 2020)

Another circle member stated that the collaboration in the online learning circle was the best yet and that they felt like a complete team for the final challenge.

> We were finally able to bring our A-game on this one. Everyone was respectful and pulled their weight. You could tell that the crew felt the importance of the moment and realized how much positive change we could affect. We need to expand this process throughout the Science Center. Imagine what we could do. (circle participant, survey response, October 9th, 2020)

What Did Not Work. There were, however, several areas of improvement that were identified, most of it was in the coordination of the contractors and some communication missteps early in the process that affected several of the circle members as they interfaced with other MiSci team members.

> There seemed to be a lot of internal strife, a lack of adherence to usual norms for purchasing processes, frustration expressed by team members, and numerous complaints about interfacing with the contractors which could be improved. We don't do these types of events every day, but we still could have been better at working together than we were. (circle participant, survey response, October 9th, 2020)

This was something that the circle members had very little control over, which made them very frustrated. However, this issue did not seem to keep them from putting their all into the event. The circle members were very intent on making sure that MiSci would be seen in its best light. Unfortunately, the work style of the contracted video production team did not quite match the fast-paced and focused work style of the online learning circle members.

What Was Learned. In expressing what was learned during Challenge 6, circle member feedback focused mostly on the event itself rather than the working relationships and functions of an online learning circle. This was likely an indication that the collaborative culture that was presenting itself in the online learning circle had become second nature. The members were now

focused more on the project work, the outputs, and outcomes, rather than the personalities, practices, and norms that concerned them during previous challenges. A circle member expressed this, stating:

> For this last challenge, we were focused. There were no real arguments or disagreements. We knew what we had to do and were able to work through problems as they arose. I was proud of being on the team and in the circle and more than anything, proud of MiSci for delivering on an awesome Illuminate event. (circle participant, personal communication, October 9th, 2020)

One circle member shared feedback that indicated that tapping into social capital was also a critical component of the success of the Illuminate event, and without it, there would not have been the same level of success:

> What can we learn from this event to inform/improve future projects? We tend to make our lives difficult rather than making informed decisions and trusting each other. The online learning circle helped us with this, I think. Is an event like this worth doing in the future? The answer is obviously, 'yes!' I ask the question because, since its initial inception, the event has never had a true identity—it's just something we always do this time of year and was poorly planned. I do think this year's event was very well planned. The collaboration from the learning circle was a factor in this. In years past, we would also do several other similar events all within the same week (after dark, member events, etc.) when it all should have been one single event. We should be proud of what we accomplished and how we were able to use each other's skills and expertise to make it the best it could be. (circle participant, survey response, October 9th, 2020)

Forms of Distribution. Circle members indicated that the primary type of distribution during this challenge was coordinated distribution where the leadership actions/activities were co-performed in a particular sequence. This is not surprising given that the online learning circle members were required to collaborate intensely with other members of MiSci team to facilitate the Illuminate event. Several handoffs were necessary to write the scripts and produce the videos. This required precise sequencing. Coordination for the run-of-show was another aspect of the event where this type of distribution was demonstrated.

Reflections. Overall, I could not have been happier with the way that Challenge 6 concluded. Everything that the online learning circle members set out to do was achieved, and they were able to do it in coordination and collaboration with others on staff. By this point in the challenge sequence, I assumed that the circle members would naturally be very comfortable with the process. After all, this was the sixth learning circle challenge I facilitated. I had a great deal of confidence entering Challenge 6 that the circle members would be critical to the success of the event. During this challenge, the circle members demonstrated all of the key aspects that I was trying to achieve with my action research: taking advantage of organizational networks, tapping into social capital, demonstrating intrapreneurship, distributing leadership, sparking innovation, and creating a collaborative culture. Finally, having a successful Illuminate event was extremely important in helping end the year on a good note, given that 2020 was an incredibly challenging year for MiSci.

Analyzing Artifacts

At the end of Cycle 2, I dedicated a significant amount of time to my work schedule for review of the artifacts produced from each innovation challenge in Conceptboard. My objective was to compare the conceptual models the circle members produced with what was ultimately

developed and launched. My examination revealed that four of the six innovations that were implemented were almost identical to the concept that the members initially designed. However, two of the innovations were not yet completed by the end of Cycle 2: Challenge 2, the new website, and Challenge 5, the Ames Room. These two innovations were still under construction at the time, but later, once completed, would emerge as almost identical to their original concepts as well. The Smithsonian Affiliate application might also potentially be placed in this category because it was still under review by Smithsonian at the start of Cycle 3. However, our application was later accepted and approved by Smithsonian, making MiSci the first metro Detroit-area Affiliate.

My Reflection (Cycle 2)

In my reflection blog, I expressed my excitement having successfully reached this important phase of my study, which was at the heart of my intervention. I expected this phase of action research to be the most exciting. We had a lot of ground to cover, and I was confident that I was able to put together a healthy mix of online learning circle challenges for the members to tackle. It all took place right at the peak of our COVID-19 response. I trusted that we would all have the energy to push through and continue to innovate.

Cycle 2 was an incredibly difficult time for me to facilitate an online learning circle because, during this time, I had to make the very tough decision to furlough, and/or put on unpaid leave, two-thirds of our staff, which affected both full-time and part-time employees. Though I had been through reductions in force before due to budget constraints, I had never been in a situation where the layoffs were this extensive. Fortunately, none of the members of my online learning circle were directly affected. This may have been by sheer luck, because as a

high-level leader in this situation, you have to carefully consider the relative value of every position in the organization, including your own.

I was fully prepared to put my research on pause, if necessary, though that would be my last resort. I also had a plan to simply convert the online learning circle membership to include members of the remaining MiSci team, which could have easily been done given that 90% of our work was already online due to shelter-in-place executive orders directed by the governor of Michigan. As it happened, our reductions turned out to be deep enough for us to survive the remainder of the year with no major additional staffing changes.

Cycle 3 - The Innovations

Research Question (Cycle 3)

My final action research cycle, Cycle 3, was initiated immediately following the facilitation of our Illuminate event on October 2nd, 2020. Cycle 3 focused primarily on the online learning circle members presenting their innovation artifacts to MiSci staff and promoting intrapreneurship by sharing their experiences as study participants. Circle members were encouraged to lead discussions about the innovations they created using Conceptboard, Google Docs, and Zoom that were conceptualized, produced, and implemented during Cycle 2. The innovations were the feature part of their dissemination activities.

As the action researcher, I focused my actions on assisting the circle members in setting up opportunities to present and share lessons learned with the entire team. My action research question for Cycle 3 was at the heart of my study, making my final cycle a crucial step in creating a more collaborative culture within our organization. My Cycle 3 action research question was:

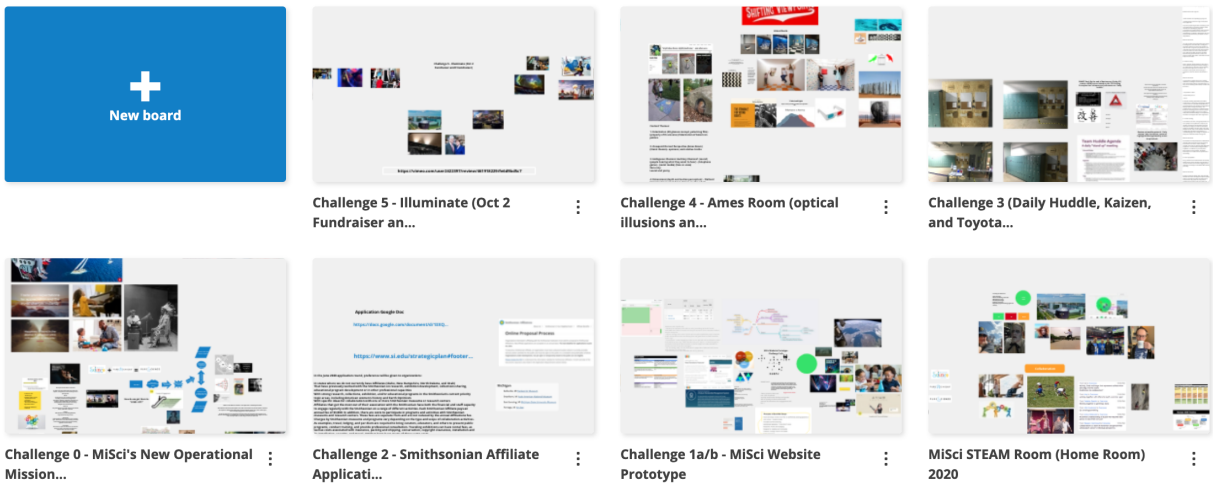
If I encourage the online learning circle members to share their challenge-based innovation projects and digital artifacts throughout the organization, to what extent will other employees have a desire to participate in a more collaborative culture within the organization that helps to spark innovation and promote intrapreneurship? Additionally, if Cycles 1-3 are successful in establishing an online learning circle, how might my ability to facilitate distributed leadership change?

Staff Engagement

My action plan for this final phase of my action research was composed of two distinct aspects: preparing the circle members to engage with MiSci staff and preparing MiSci staff to engage with the circle members. My actions were centered on ways to allow these two aspects to merge into opportunities that invited circle members to informally present their experiences during regularly scheduled team meetings. This approach would connect both formal organizational structures with informal organizational networks, which was a core element of my study's original purpose. It meant facilitating engagements and interactions between circle members and MiSci staff within existing systems, meetings, and schedules. My engagement strategy also included opportunities for the circle members to reflect on their personal experiences throughout the study, so I could capture their thoughts and emotions associated with the overall experience.

Figure 8

Conceptboard Multi-Canvas View.



Note. This multi-canvas view of Conceptboard represents all seven canvases created by the online learning circle members.

Sharing Experiences

As outlined in my logic model, the primary responsibility to facilitate the dissemination of information regarding the online learning circle's challenge-based innovation artifacts was mine. However, I thought it would be best to delegate the majority of this responsibility to the circle members. I encouraged my study's participants to independently discuss their shared experiences and lessons learned with the rest of MiSci team. Sharing took place informally during existing weekly status and coordination meetings during the weeks of October 19th and 26th, and later during the weeks of November 9th and 16th, with one week off during the week of November 2nd, which included Election Day. All of the circle member presentations were well attended by MiSci staff. This approach of integrating the dissemination within the current meeting structure proved to be a useful way of ensuring that there would always be an audience for the circle member presentations. Additionally, I incorporated both the outputs of the online

learning circle challenge innovations and the lessons learned generated through personal reflections, which were captured in my blog and action research field notes.

Participant Reflections

By Thanksgiving, my action research study had essentially concluded. All of my intervention activities had ceased. My research questions for all three cycles had been addressed, and all of my action research goals and objectives had been met. From start to finish, the implementation phase of my study had lasted a total of 11 months. I decided to have one last formal Zoom meeting with the online learning circle members to capture their final thoughts. I also met with each circle member one-on-one in an attempt to gather their reflections. After analyzing all of their feedback, which I captured in my field notes, I discovered that their reflections as participants fell into two primary categories: reflections about the innovation artifacts and reflections focused on distributed leadership and intrapreneurship within the online learning circle.

Innovation Artifacts. The first category of reflections was about the innovation artifacts themselves. These were the outputs of the Cycle 2 challenges, which produced innovations that were later incorporated into our daily work as a science center. The innovations were extremely valuable to the circle members and were produced under some of the toughest conditions we faced while addressing the impacts of COVID-19 on the organization. The circle members viewed the process of innovating as important to the overall operation of the science center and something that should be cultivated and recognized:

- Innovation is everything. We should live and breathe it. It's not easy to achieve because there are always so many barriers in the way. But when we create a space for

innovation to take place, and our leaders have confidence in us, it's amazing what we can do together. (circle participant, personal communication, October 28th, 2020)

- I have been responsible for many innovations here in the past but none that felt like the ones that we accomplished during the online learning circle. Very often people never see what you do behind the scenes because we don't really do it for recognition. But through the circle, I was able to create new ideas and see them be launched, something that was very impressive given we were still in a pandemic. (circle participant, personal communication, October 28th, 2020)
- We all supported each other's new ideas in ways that they wouldn't be in a typical project meeting. This made me excited to be able to come back each week to a new challenge and challenge myself and my teammates to be even more innovative and do the impossible. (circle participant, personal communication, October 28th, 2020)

Distributed Leadership and Intrapreneurship Within the Circle. The second category of reflections focused on the members' experiences in the circle, working with each other, and taking on new leadership identities and roles. Although distributed leadership was a new term for them, they seemed to embrace it and practice it throughout the process. Several of the members indicated that individual agency was empowering and the ability to make an impact as a leader on a project without serving as the official project manager was important. The opportunity to become an intrapreneur and allow your passion and creativity to move innovation forward at MiSci was also something extremely appealing to them. However, there had never before been a mechanism like the online learning circle, which was used as an intentional structure for collaboration, and established the staff members' ability to exercise their intrapreneurship in a sanctioned way. Their comments in this regard helped support previous evidence that employing

distributed leadership in an online learning circle to promote intrapreneurship can work. The online learning circle members felt a sense of ownership of their future and wanted to continue to work collaboratively to see their ideas come to fruition in 2020 and beyond:

- In the beginning, I wasn't sure what I would get out of this experience. I wanted to enhance my skills and take advantage of any new professional development. I was hoping to do this in a team environment, so I wasn't looking for a leadership opportunity for myself. But that's exactly what I found when I became an intrapreneur in the circle. Through this process, I realize that I no longer have to compromise my ideas or sacrifice my dreams while working with others. (circle participant, personal communication, November 4th, 2020)
- Intrapreneurship is a hard word to spell and even something harder to implement. But I think that it's a way to make a difference. It empowers me to not be afraid of trying new things and working creatively to find a hack or something that will allow me to help the organization move in a new direction without the typical resistance we always experience. (circle participant, personal communication, November 11th, 2020)
- Although I still have dreams of being an entrepreneur and perhaps doing something outside of the field, being an intrapreneur seems like the next best thing. I don't know what I don't know, but I do know that I can do this. I can come up with ideas and I can make change. I also feel like I'm a more valuable member of MiSci than I was when I started. I'm learning a whole new set of skills. This is the direction I want my career to go. (circle participant, personal communication, November 18th, 2020)

These one-on-one conversations allowed me to gather shared insights and individual perspectives from their online learning circle experiences. The circle members were able to highlight the value of the innovation challenges. Members expressed their appreciation for the value of intrapreneurship and distributed leadership. The circle members gained knowledge during the study that positively impacted their learning and their skill development. Members were also able to describe the overall impact my action research study had on the organization as a whole.

My Reflection (Cycle 3)

Reflecting specifically on Cycle 3, I find myself surprisingly focused on the little things rather than the big picture. There are several insights of interest to unpack, but many of them are extremely complex. I discovered during the internal dissemination process that the interplay between the online learning circle members and the rest of MiSci staff was much more harmonious than I would have predicted. Although the process of selecting the participants was open to all full-time employees, I assumed that some MiSci staff who did not participate in the online learning circle might be jealous of those who did. But this was not the case. Many MiSci staff who were outside of the circle were interested in what the circle members were doing. However, they were all too busy working on other projects to be significantly concerned. In my blog, I reflected on my initial expectations regarding MiSci staff who opted out of online learning circle participation:

> I would have thought that staff who opted out of an opportunity to participate in the study early on would ultimately be jealous of the staff who did choose to participate, especially after how well the innovation artifacts were received. However, this was not the case. Everyone seemed genuinely interested in the outcomes and the innovations of the online

> learning circle work. This was extremely encouraging, and it gave me the confidence to continue to share the fruits of my action research. (C. Greer, personal communication, November 20th, 2020)

Stepping back and taking in a much broader view of Cycle 3, I think my most important takeaway is the realization of just how much the online learning circle model is built for crisis situations. Throughout the implementation of this study, the reflective nature of the process allowed me to keep my focus as an action researcher by creating and facilitating challenge-based innovations. Some of the projects were extremely risky, especially trying to implement them during the COVID-19 pandemic. However, a crisis is perhaps the most optimal time to take big risks. There is often very little to lose and much to gain. In our case, we had an opportunity to gain not only the innovations themselves but the opportunity to create new attitudes and frameworks for how to facilitate change under challenging circumstances.

Finally, I think my experience during Cycle 3 helped me to see how the innovations on their own had the power to inspire others to want to participate. Even staff who were not initially interested in participating in the online learning circle were impressed with the learning circle presentations. This was inspiring for many, and several thought that after a very challenging year of restrictions, there might be opportunities to go beyond and begin the creative process of designing new futures as we open up to a post-COVID-19 world. This was an aspect of my collaborative culture concept that I had not truly considered. I began to think of collaborative culture beyond just the norms and practices. I now view it in a more balanced way, appreciating the impact of a positive mindset and the joyful anticipation that comes with collaborating with others you trust.

Impact Assessment

As a further measure of change, I distributed a culture survey to the entire MiSci team after the Illuminate event in October 2020. The return was good; 22 of the 25 full-time staff returned the survey. A majority of the respondents (91%) positively indicated a desire to have the opportunity to participate in collaborative environments like the online learning circle (see Appendix L). This was extremely encouraging, as it provided me with support for developing plans to launch new circles with a wider reach. Staff also expressed that distribution of leadership was a particular point of interest, with many staff citing a desire for more autonomy and agency during collaborative multi-departmental projects. In the survey, 82% (18 of 22) expressed the need for greater control and ownership over their work.

Additionally, the culture survey captured MiSci staff's ideas for new challenge-based innovation projects, of which the staff provided a total of 26 different concepts. These included ideas ranging from adding food trucks to our guest parking lot to developing a members' lounge on the first floor. Fielding such a large number of innovative ideas from MiSci staff demonstrated the extent to which staff who did not participate in the online learning circle still wanted to participate in the process distribution of leadership across levels and departments, as well as participate in new opportunities to spark innovation.

Finally, the culture survey indicated that at least four out of six of the innovation artifacts produced by the online learning circle played a critical contributing factor to the success of the organization during 2020. I interpreted this to mean that the outputs of the challenges produced by the circle members were also deemed as valuable to staff who were not members of the circle and valuable to our recovery as an organization that was severely impacted by the pandemic.

This result served as a way for me to frame my action research study's influence on collaborative culture and how the artifacts themselves could serve as symbols of hope during a crisis.

Summary

Reviewing the findings from all three action research cycles reveals a consistency in the overall logic of my study. Despite some minor delays in participant selection, along with the overall disruption associated with the COVID-19 pandemic, I found that each of the three cycles displayed surprising compatibility and interoperability with each other. This indicated a high degree of alignment from cycle to cycle. Progressive elaboration was also observed as the cycles evolved over the 11 months of the study.

Cycle 1 Conclusions

The findings from Cycle 1 illustrated that SNA and ONA have incredible value in exploring social capital in networked structures. Unfortunately, some structural holes were observed where people had been laid off or put on unpaid leave. Isolated nodes and marginalized groups within the sociogram were expected. However, I found MiSci's intrapreneurs were able to traverse those structural holes to find ways to connect critical resources and social capital representing the expertise within MiSci's talent pool.

The digital tools that were selected for my study performed effectively without any major incidents. The use of Zoom for video conferencing was ideal. Although Zoom was selected before the pandemic as my preferred tool for video conferencing with groups, Zoom's popularity across the country as the preferred video conferencing solution during the outbreak aided in establishing comfort with the tools. Each one of my learning circle members became experts at not only logging in, turning their cameras on, and unmuting their microphones but facilitating

other digital tools through the share screen interface and utilizing other collaborative functions within Zoom to be able to enhance their collaborative practices.

Conceptboard, used primarily in Cycle 2, was another valuable tool that allowed for creating idea boards and collaboration on concepts. Each idea board tells a story not only of the ideas that were presented but how the online learning circle members arranged the ideas from each other to create a collective narrative about their innovative idea. This fact plays an important role in the sometimes-difficult transition between the conception of a project and the completion of a project. My online learning circle members seemed to be able to handle this fairly well and never really had any issues with turning their ideas into action.

Other tools such as Google Docs, SurveyMonkey, and Wix, for web applications, were also effective. Capturing personal communication from the online learning circle members and the reflective journaling associated with action research was simple. These digital tools seem to be perfectly suited for the application. They were easy to use and were able to be employed at no cost.

Cycle 2 Conclusions

The findings from Cycle 2 seem to support the notion that a timeboxed, challenge-based approach to facilitating online learning circle tasks works well. The online learning circle environment created a safe space for circle members to push boundaries and to break down silos. They also were able to demonstrate distributed leadership regularly and hand off tasks both through coordinated distribution, collective distribution, and collaborative distribution. Circle members selected the distribution type that worked best for the challenge that was provided. They were able to exercise clear delineation of responsibility for task execution all while collaborating in both synchronous and asynchronous modes. The outputs of each online learning

circle challenge represented a separate innovation artifact that was both timely and functionally relevant for our needs at the time.

Cycle 3 Conclusions

In reviewing the innovation artifacts holistically, I was able to determine that the online learning circle members were heavily engaged in tapping into social capital within the organization as a whole. They were not necessarily encouraged to do this, but it demonstrated their resourcefulness as intrapreneurs. Circle members helped to facilitate the dissemination of the innovation to a wider audience. The utilization of existing meeting structures created efficiency in communicating. This generated increased interest by MiSci staff who did not participate in the study. During the dissemination phase, each of the online learning circle members had an opportunity to share their experiences and what they learned. Although I never instructed the online learning circle members to divide up the tasks of dissemination as they did during our Cycle 2 challenges, they seemed to be comfortable with that method of distribution of work. This implied that new skills were added to the inventory of the circle members, and they were motivated to utilize those skills to communicate their experiences to others within the organization.

Reflecting on the Process

Later in a reflection, I stated that, "I realize now just how much team development sometimes includes a layer of familiarity, appreciation, and respect for your fellow participants" (C. Greer, personal communication, August 4, 2020). I felt like I missed a step in my recruitment process because I did not anticipate their perspectives at all. This is something that I reflected on considerably after the project and want to make sure that, in subsequent action research that I undertake, I should endeavor to find ways to make the process more accessible to people even if

they think that they might not learn from or work together with some or all of the participants. The framing is important, and it is possible other people might have participated, if I framed it differently.

My first reflection, "The Other Side," posted on January 22nd, 2020, captured my exuberance of having received a green light on December 9th, 2019, to begin my action research after being approved by Pepperdine University's IRB. In this post, I expressed that I was "cautiously optimistic" that I could successfully execute my action research project at MiSci. Although only six months into my role as President & CEO of MiSci, I was still incredibly motivated to apply what I had learned over the years about project management, distributed leadership, and intrapreneurship in a new setting. Subsequent posts were made during my pre-cycle planning phase. It was a relatively uncertain time for me in the project because, at that point, I was still trying to determine exactly who the participants would be and how an online learning circle might be implemented in a nonprofit science center setting.

Admittedly, there were times in which, due to the stress of the pandemic, I did not want to share my thoughts in writing at all and preferred to stay focused simply on the work in front of me and the job at hand. Reflecting on this period, I harbor no regrets for not capturing this information, but I do wonder if it would have been more therapeutic for me to continue to post reflections anyway and keep the more poignant details of my emotions private. Over time, I learned that the openness of my reflection often expressed itself as a function of the frequency of my posts. Overall, I believe that my blog-based reflection process was extremely valuable.

Reflection on Findings

Across the three cycles, I reviewed a myriad of artifacts that were generated from my action research study. Some of them, such as my social and organizational network sociograms,

and my logic model, were used as inputs to each cycle. Other artifacts emerged during challenge facilitation in Cycle 2, such as recorded Zoom meetings, emails, and Google Docs that were used as digital whiteboards during the process. Still other artifacts functioned as outputs of the challenges, such as Conceptboard canvases that were used to capture our collaborative design thinking concepts of future innovations for the science center. I cataloged and organized each of these artifacts to use as data source material for my final report and future analysis.

I also considered my personal reflective blog as a valuable artifact, which was used to capture reflections of my experiences as an action researcher during my study. My blog, hosted on Blogger.com, was a convenient tool for reflective journaling throughout. I produced 31 posts over the course of the three cycles. I reviewed them closely to get an overall impression of how my study evolved during the 11 months. My blog was a welcome reminder of how, in general, each blog entry served two purposes. The first purpose was rearward facing. I wanted to document my mood after each intervention to informally conduct a temperature check on myself. The second purpose was forward facing. I wanted to anticipate what was to come in my plan, share my anticipatory thoughts, and tweak my strategy for the next challenge and/or cycle.

Along with my blog, there were a total of 18 official Zoom meetings that took place as part of the study. Not all of them were learning circle challenge meetings. Some of the official meetings were used simply for orientation purposes. The circle members had at least 21 unofficial Zoom meetings, which were used for collaborative planning and development of the innovation artifacts. A total of seven Conceptboard canvases were created during the Zoom meetings, including the first, which was used as a practice canvas for circle members to be trained on how to use the Conceptboard platform as a tool for collaborative brainstorming.

The six innovation artifacts produced by the challenge-based activities of the online learning circle members, the participants, and the artifacts produced by me, the action researcher, were representative of the study's overall impact. Several of the innovations were later used as inputs to multiple MiSci fiscal year 2021 strategy and budget planning meetings. The innovations served as models for new concepts that could be employed during the upcoming fiscal year. A select few of the innovation artifacts were immediately integrated with our standard operating procedures. Many MiSci staff members saw these innovations as extremely valuable during the pandemic and viewed them as progress in the face of uncertainty and despair. They were genuinely proud of the work that the circle members performed and generally surprised by how much the members were able to get done in a typical, one-week, timeboxed project environment.

Chapter 5: Discussion, Conclusions, and Recommendations

Overview

In the final chapter of my action research study, I review my entire action research process, from my initial problem statement to my ideas for future projects. This review presents my research questions, establishes the context for my study, outlines the actions and interventions of my study, and presents my insights and innovation strategies for how to create collaborative culture by employing online learning circles to foster distributed leadership, spark innovation, and promote intrapreneurship. Using lessons learned from my exploration into collaboration and collaborative culture, I have reframed my initial problem. Although my ongoing focus was on sparking innovation and promoting intrapreneurship through challenge-based innovations, toward the conclusion of my work, I discovered that the online learning circle model was a much more powerful tool than I originally considered. As an intentional structure for project work, the online learning circle not only served as a framework for distributed leadership and a platform for asynchronous collaborative activities, but it also became an oasis for innovation during a period in history that was one of the most disruptive in recent memory—the COVID-19 pandemic.

Over a tumultuous 11-month period, I established an online learning circle with five circle members who served as my action research participants. Each of the participants was a full-time employee at MiSci who volunteered to participate in my study. Most were interested in professional development through on-the-job training and were looking for new leadership opportunities in which to learn and grow. I was incredibly surprised to discover that they all were willing to go above and beyond and carve additional time out of their already busy schedules to participate.

During the process of facilitating my online learning circle, I hosted more than 23 meetings, the majority of them online, with the circle members. Most of the meetings were extremely efficient and productive. For each meeting, I presented the circle members with the same basic goal, which was to accomplish something innovative by the end of the week, also known as their timebox or agile sprint. At the beginning of each meeting, I presented a SMART goal to the circle members (specific, measurable, achievable, realistic, time-bound) based on a relevant identified issue or opportunity. My primary activity during these circle meetings was facilitating interactive and collaborative video conferencing sessions that utilized web-based tools for project coordination and idea generation. Each weekly timebox, or sprint, was considered an innovation challenge, and the circle members essentially raced against the clock to meet their assigned SMART goal. The ultimate output of a sprint was an innovation artifact that could be a product or a service, or even a result. The sprints, which contained the challenges, occurred weekly and included a reflection period, considered a retrospective, between weeks. There was a total of six sprints and all of them produced an innovation artifact that positively impacted MiSci in several important strategic, tactical, or operational ways.

Reframing My Problem

From Silos to Social Networks

Successfully facilitating cross-departmental innovation projects in heavily siloed nonprofit work environments like mine is not without its difficulties (Bundred, 2006). The problem I identified was a critical need for us to shift our organizational structures and cultures from rigid and formal organizational silos to flat and flexible informal organizational networks for agility and innovation. To address this problem, I knew that our leaders would need to be inspired, and possibly coached, to be more inventive when designing new ways to navigate the

complexities of new dynamic business models and traditional organizational structures. This was an extremely challenging problem for me to address as a new President & CEO. I needed leaders who were internally enterprising and comfortable challenging the status quo. But would they be willing to openly dismantle departmental silos, traverse functional areas, and flatten hierarchy to unlock new ways to successfully collaborate?

Fortunately, our internal silos were already being challenged. There were several multi-layered informal social networks that had already sprouted spontaneously. However, many of them were behind-the-scenes and hidden from view. Their lack of visibility reduced their ability to be effectively recognized as sanctioned pathways for organizational change. Our standing meetings were organized around formal functional groupings in departments and aligned to existing projects. Our project team leaders were under extreme pressure to maintain a delicate balance between prescribed formal meeting structures, based around leadership hierarchies, and informal social networks that were more distributed, democratic, and flat. I experienced this pressure daily at MiSci. If we were going to expand and scale, we would need to launch a formal transition from a state of organizational inflexibility, with all of our rigid departmental boundaries, to a more open, flat, and socially networked structure that allowed for greater agency, autonomy, and emergent collaborative culture.

Research Question. I revisited my research question throughout the study. Its meaning has remained constant, but it was slightly edited and refined along the way: How might I create a more intentional structure for project work at MiSci that sparks innovation, promotes intrapreneurship, and creates a more collaborative culture in the workplace? My interest was in uncovering new ways of establishing structures and functions that foster better collaboration and influence workplace culture in positive and productive ways. Also, I thought that there would be

incredible value in finding creative ways of freeing up social capital within the organization and flattening the hierarchy if necessary to do it. I desired to take an empirical approach to address my research question and allow myself the opportunity to be open to multiple possibilities, specifically those offered by MiSci staff. But what conceptual framework could I successfully employ to explore those possibilities?

Refining My Purpose

From my very first week on the job in July 2019, I was incredibly motivated by the need to break down internal silos and invisible barriers. After nearly 30 years in museums, I have experienced firsthand how these obstacles can easily attenuate an organization's innovation potential. I have been no stranger to the frustration that vertical and horizontal barriers cause or the stress of the lack of resources to truly do quality work in nonprofits. At MiSci, I knew that the stakes were even higher and that techniques that worked in other facilities in other circumstances might not work in this environment. But I recognized a fantastic opportunity to work collaboratively on cross-departmental projects in support of our mission and new direction. Creating a culture of collaboration was a worthy goal, but would collaboration be enough to provide the level of innovation that I envisioned?

Focusing on the outcomes side of my logic model, I identified innovation and intrapreneurship as key aspects of my inquiry. I wanted to enable MiSci's intrapreneurial leaders to distribute their out-of-the-box tools and techniques in open, sanctioned spaces. Could they help me demonstrate to the rest of the organization that an innovation-focused collaborative culture was not only possible but also within reach?

Contextual Considerations

Reflecting on Leadership

At the beginning of 2020, I began my research with a deep desire to enhance my leadership skills. Only a few months into my new role as President & CEO of the MiSci, I endeavored to establish a new culture with the organization's full- and part-time staff. As the person occupying the highest-level leadership position in a struggling nonprofit organization, it quickly became clear that there was a great deal of responsibility and an inordinate amount of risk that came with the job. Surrounding nearly every decision and every move I made was an invisible cloud of a change-resistant culture that had to be overcome if we were going to achieve sustainable growth and success. Even with several experienced C-suite leaders and multiple high-performing managers on staff, I was still working within a makeshift organizational structure with lots of missing pieces in the employee ranks. Layoffs, position eliminations, and uncomfortable amounts of attrition in the years that preceded my appointment made the task of righting the ship seem incredibly daunting, if not impossible. However, I was determined to break with organizational tradition, challenge my assumptions, and design a robust platform for innovation and change that would also allow me to learn and grow along the way as a new leader.

Situating My Practice. My practice, situated at MiSci, is a 501(c)(3) nonprofit organization and one of the foremost cultural organizations in Southeastern Michigan. MiSci receives contributed revenue and also generates earned revenue through general admission. MiSci is valued and recognized by its audiences and communities as the region's home for informal STEM learning. We engage families, school groups, and young adults through innovative hands-on exhibits and events, as well as onsite, offsite, and online programs. The

facility has several theaters, including an IMAX® Dome Theatre, a Sparks Energy Theater, a 4D engineering theater, and a planetarium. These, along with a science demonstration stage and a fourth-floor major exhibition space, serve as the primary drivers of visitation, along with more than 220 exhibits.

In January 2020, we had a staff of approximately 35 with about 15 to 20 more who were brought on seasonally. My C-suite leadership team at the time was composed of seven chiefs and associated contract staff supporting education and exhibits, facility operations and guest services, finance and accounting, marketing and public relations, and development. Although we were missing several key positions in human resources, exhibit production, digital learning, outreach, marketing, and theater operations, the team was very hard working, and many had assumed the duties of previous staff who were laid off. This meant that we had very little bench strength. If someone got sick or went on leave, there were very few options for maintaining coverage. This posed a significant risk to business continuity and morale, which would be greatly exposed after the pandemic hit.

Realigning the Literature. In this dissertation I reviewed research informing my study's problem of shifting organizational structures and cultures from rigid and formal organizational silos to flat and flexible informal organizational networks. Shifting these structures creates new opportunities to establish a more solid foundation upon which to foster a more collaborative culture. This can help to spark innovation and promote intrapreneurship in the workplace. The work cited in the review provides a baseline path of inquiry that describes the theoretical underpinnings supporting my overall action research question.

Core Content. I divided the research literature into five core content sections, each featuring content that was closely aligned to the key terms contained within my overall action research question. The five sections were:

- Innovation and intrapreneurship - How are innovation and intrapreneurship linked? I investigated the concepts, conditions, and processes that support the promotion and spread of innovation within organizations. It included an exploration of intrapreneurship and the impact and influence that intrapreneurs have on innovation within organizations.
- Organizational structure and function - How does organizational structure limit cross-departmental innovation? Vertical and horizontal barriers help to create organizational silos. I highlighted the most common types of organizational structures used in both for-profit and nonprofit organizations. Particular attention was paid to the invisible boundaries and barriers within these structures that can create organizational silos.
- Social capital and network analysis - What are considered the human pathways that enable the flow of social capital? This section outlined how SNA and ONA, mediated by digital tools, can help make typically invisible social capital visible. Also considered was how collaborative culture can emerge even from networks with structural holes that have marginalized individuals or groups.
- Distributed leadership and individual agency - In a period of post-heroic leadership, how can leadership be co-performed and shared? I examined the relationship between organizational structure and individual agency. The conceptual and theoretical ideas that frame the concept of distributed leadership were analyzed. Special emphasis was placed on how distributed leadership practices can positively impact the flow of social capital.

- Collaborative culture and online learning circles - I needed a highly interactive and participatory structure for organizing group work, but could it be successfully implemented in my work environment? To select a mechanism that could be used to foster a collaborative culture, I explored the concept of the online learning circle within a range of contexts. This was foundational to my research.

These concepts were congruent with my inquiry and aligned with my identified problem. An overview of collaborative culture, a set of definitions for innovation, a description of intrapreneurship, and a framework for understanding social capital and network analysis, arguments for distributed leadership, and a case for online learning circles were all articulated in my literature review. These core content areas provided me with a base-level understanding of the issues and challenges surrounding my study's problem of moving from silos to social networks. The research also laid the groundwork for addressing my study's purpose to create a collaborative culture. Successive action research cycles were framed by many of the concepts presented in my literature review, which supplied best practices for sparking innovation and promoting intrapreneurship.

Theory and Practice. To find the optimal balance between theory and practice for my study, I attempted to harmonize the concepts in my literature review with similar phenomena in my work environment that I was observing in real-time. Serving in the role of a practitioner-scholar for my study, I was not just researching for understanding, but also for the purpose of change. I wanted the lens for my study to be focused on how I could establish a framework for intentionally collaborative work and build upon the somewhat accidental collaboration that was already occurring. Central to my approach was looking for models that emphasized distributed methods and the co-performance of leadership.

Network Analysis. The SNAs and ONAs that I conducted early in 2020 provided compelling supportive evidence that effective cross-departmental collaboration was frequently happening at MiSci. The sociograms that were generated showed structural holes that matched places in the organizational chart where turnover in staff had left gaps. And, although there were some individual nodes, or actors, that were isolated, they all had at least one in-degree and one out-degree, which indicated at least minimal levels of regular communication with those in the network who served as gatekeepers. The distribution of nodes hinted at shared decision-making and problem-solving on our current innovation projects.

The Unified Mind. Our distributed leaders, working independently and unsanctioned, discovered creative ways to transcend many of our inflexible structures to share ideas and collaborate effectively (Spillane, 2006). Team leaders often remarked that when they were working together it was as if they were working as a single unit or unified mind, despite pre-existing conflicts and disagreements (Hutchins, 2001). This unified mind phenomenon, also known as distributed cognition, related our collections of individuals and artifacts to one another within our practice (Rogers & Ellis, 1994).

Knowledge Building. With distributed leadership as the conceptual framework for my interventions, I was able to offer opportunities for each circle member to fully participate. I made a concerted effort to not let their rank and experience allow them any more privilege than was due in terms of how decisions were made (Spillane, 2006). With each member of the circle agreeing to be a task leader of the group at predefined points during the process, they were able to effectively co-perform leadership with others. This created a sense of collective cognitive responsibility among circle members, where each member of the circle shared in the fruits of the knowledge-building process (Goldman & Scardamalia, 2013).

My Lens on Leadership. Given that my online learning circle was designed to operate within both formal and informal networks, I was able to effectively demonstrate a non-formal way to employ distributed leadership. Framing devices were also used to initiate a set of dimensions that defined the format. Agreed-upon sets of norms that supported the collaborative interaction were established. An optimized phase structure was used to guide the overall process (Riel, 2014). With distributed leadership as my lens on leadership, I was able to view leadership practice as the work of many leaders within the work environment and not just embodied by the activities of one heroic leader (Spillane, 2006). The interactions of our intrapreneurs illustrated the aspects of leaders, followers, and the situation that can be found in both distributed leadership and distributed cognition, which is often linked to activity theory (Engeström et al., 2007).

Three Types of Distribution. The three types of leadership distributions described by Spillane (2006)—coordinated distribution, collective distribution, and collaborative distribution—were all illustrated during my study's innovation challenges. I sought to investigate each type to learn more about how these types manifested themselves within the online learning circle's collaborative work. Studying this co-practice was useful in uncovering how our intrapreneurial leaders assisted each other and modeled effective ways to achieve success through collective action.

Impact of COVID-19. The impact of COVID-19 was amazingly unexpected, yet incredibly significant to my understanding of how distributed leadership can function during a crisis. Although the seeds of my study started many years before the start of the pandemic, my study's implementation phase could not have come at a better time. As the leader of my organization, I had the incredible responsibility of managing our board, our staff, and our

community's expectations during this time. This was extremely challenging to facilitate and maintain emotional stability. Although there were times where heroic leadership from me as President & CEO was warranted and necessary, the majority of the work—because of the many dimensions and layers of the pandemic—required us to be more agile as an organization, where leadership was needed at all levels. Running a distributed model at this time was incredibly valuable for us and it allowed us the opportunity to achieve new levels of teambuilding and cohesiveness under intense pressure.

Racial Reckoning of 2020. Not only did my study take place during the COVID-19 pandemic, but also during the racial reckoning and social unrest of 2020 fueled by the deaths of George Floyd, Breonna Taylor, Ahmaud Arbery and so many others. Social justice and racial equity instantly became one of the most important topics in our field. There was a lot to unpack both internally and externally and many organizations were trying to determine how best to address the pent-up frustrations, unconscious bias, structural racism, and open distrust that existed internally across museums. While it was challenging to keep my composure during this time, I was convinced that my study was serendipitously positioned during this moment of great change and social upheaval as a unique opportunity to holistically address the needed culture change in our organization. I sincerely believed that flattening out our organizational structure and distributing leadership would provide more opportunities for people who may have felt isolated, or been marginalized, to be included and engaged in real ways.

Managing the Methods

Design vs. Action

Selecting a research method is perhaps one of the most critical decisions a researcher has to make when pursuing a dissertation. It is not a decision that you can easily go back on and

change direction midstream. Given the complex nature of my study, with all of its layers, and 2020's chaotic cultural upheaval and dynamic business climate, I knew that I would need to choose an extremely flexible research design. My choices were between design-based research and action research. A design-based research (DBR) design would have been considerably simpler and was extremely attractive to me as a method. However, I ended up selecting an action research design for my study because its approach seemed to align more consistently with the essential components of online learning circles. Collaboration can be difficult to initiate and sustain in a siloed workplace such as mine. Action research was a way to ensure that reflective practice would be an integral part of my work to change the culture at my organization. My online learning circle environment featured agile-based innovation challenges and emphasized progressive elaboration. As a result, I was able to take advantage of the utility of the method's analytical nature as an approach to study change in my workplace and my leadership practices, particularly during the transition points between cycles of iteration (Coghlan & Brannick, 2014).

A Dual Role

As an action researcher, I regularly reflected on my actions and decisions throughout the process and worked to plot supplementary actions for upcoming cycles (Riel, 2010). I was able to create a participatory and reflective environment for my learning. I was also able to enhance my ability to facilitate distributed leadership with my circle members. This allowed me to begin the process of transitioning our organization from rigid silos to more flexible social networks, creating better avenues for collaboration. Action research allowed my efforts to be focused on research done in collaboration with others, as opposed to research done on others (McNiff & Whitehead, 2011). This helped me to promote collaboration tacitly, or simply by the nature of the process. Establishing an effective platform for facilitating distributed leadership and creating

a collaborative culture as the subject of my research elevated the impact of my leadership as a new President & CEO. I was able to improve my practice as an action researcher, with a dual role—that of both researcher and practitioner during my study (Riel, 2010).

Phased Iteration

Facilitating my study in phases, or iterative cycles, helped to define a beginning, middle, and end for my research. My first phase was to select the right participants and open the world of the online learning circle at MiSci and concentrate on trust-building and group cohesion with our intrapreneurs. During my second phase, I emphasized shared work, framing the activities, and setting up an environment for modeling distributed leadership. My final phase was aimed at capturing the learning and sharing the outputs and deliverables of the study, which inspires and motivates others to learn more about the online learning circle process.

Action Research Outcomes

My expected outcomes for this study were outlined in three action research domains: professional, organizational, and scholarly (Riel, 2015). I used these domains to frame my research and to catalog my progressive elaboration through each cycle using a reflection blog.

- Professional domain - In the professional domain, I enhanced my distributed leadership facilitation skills while situated within an online learning circle. I believe that I was able to inspire a new generation of leaders, intrapreneurs, and innovators within my organization.
- Organizational domain - In the organizational domain, I was able to successfully establish new sets of collaborative practices. Through my study, I shifted our organization toward a more collaborative culture.

- Scholarly domain - In the scholarly domain, I was able to observe different types of distribution (collaborated, collective, coordinated) within the online learning circle and share the data, findings, and insights of my study with a broader audience. This was not only within my organization, but at conferences in the United States and Canada, and in multiple publications. I believe that I was able to create valuable new knowledge that will serve action research scholars and online learning circle practitioners for years to come.

Reviewing the Findings

Intentional Structures

Early in my study, I researched several potential solutions for creating collaborative environments. I found that even a cursory review of contemporary business practices revealed that there is no shortage of approaches. My review included methods such as design thinking, lean startup, open agile, and scrum. These were all very well-respected methods. However, learning circles stood out from the rest because of its simplicity and relative ease of implementation. Learning circles offered an incredibly simple, flat, and flexible framework for collaboration, as they are highly interactive and intentional participatory structures for organizing group work (Riel, 2014). Learning circles are also task-based, project-oriented, and are built on trust among the members (Riel & Polin, 2004). I wanted to explore how effective learning circles might be in establishing a collaborative culture in the workplace.

Analyzing Sociograms

After facilitating multiple SNAs and ONAs in January, February, and March of 2020, I found that there were several visible structural holes in the sociograms that indicated how difficult it was for MiSci staff to connect with each other on cross-departmental innovation

projects. Some nodes, representing MiSci staff, were clumped together with lots of in and out degrees, making for easier communication and knowledge transfer. Other nodes, however, were completely disconnected and isolated. This data seemed odd given the fact that the organization was so small. How could there be so many silos in an organization of just 35 people? In pursuit of an answer to this question, I became extremely interested in how learning circles could be used to free up social capital in our informal networks and help connect disconnected nodes that were located in the margins of the work.

Collective Responsibility

Collective work often produces common goals that allow horizontal organizational structures to give way to knowledge sharing and increasingly flexible leadership opportunities (Rogoff, 2014). We were a small team at MiSci, so I assembled a team of five learning circle members. I thought five would be enough to secure a diverse set of participants, and possibly be manageable enough to tackle complex innovation projects. The recommended size of a learning circle is between four to six active participants (Riel, 2006). In a learning circle, each member is required to take on a set of tasks, or a set of deliverables, and help lead other members through it. This helped me to balance individual ownership with collective responsibility within the group, and provided a safe space for both innovative thinking and organizational learning throughout the study (Riel, 2014). I found that facilitating the learning circle with this in mind allowed me to employ the model as both a conceptual framework and an intentional structure for group activities.

Online Learning Circles

To allow for more frequent participation and asynchronous communication I implemented a modified version of the learning circle model called online learning circles. An

online learning circle is facilitated through the use of various digital and web-based technologies. Establishing an online learning circle in digital space is not inherently different from facilitating a learning circle face-to-face. Learning circles can translate well in digital spaces and can operate in both synchronous and asynchronous modes (Gilson et al., 2014). My objective for operating the circle in an online mode was to create a safe space for open knowledge-building dialogue supportive of distributing work virtually on task-based projects (Bereiter & Scardamalia, 2005). This created an opportunity for online learning circle members to collaborate more regularly, even when not collocated. I found that our intrapreneurs, my online learning circle members, connected more frequently between regularly scheduled project meetings than at any time previously. Our plans to work online were fortunate. When the pandemic forced everyone and everything online, we were prepared.

Challenging the Status Quo

To create online learning mini projects that would spark innovation, promote intrapreneurship, and model distributed leadership, I centered collaborative group work on challenges. The challenges were timeboxed mini projects, also considered agile sprints (Sutherland, 2019). This means that all the work was temporary and happened within a predetermined amount of time, which was typically one to two weeks in duration. My objectives for each challenge to the circle members would be in the form of SMART goals. I found that the SMART goals helped to focus group work within the circle by simplifying the task requirements. All of the outputs, outcomes, and artifacts of the online learning circle were produced through these challenges. A total of six challenges were undertaken by the online learning circle members. They were of various topics that were relevant to the organization at the time, addressing strategic, tactical, and operational priorities. I kicked off each session with an initial

briefing and presented my design challenges to them before the circle members began their collaborative project activities.

Conceptual Artifacts

The final product, or deliverable, of the online learning circle's challenges, became the shared property of the members. I often referred to these deliverables and innovations because of their impact on MiSci as a whole. They represented the collective consciousness that was exhibited through distributed cognition by the members of the circle (Hutchins, 2001). I viewed the deliverables as authentic assessments of my circle members' overall experience. I found that integrating authentic assessments helped to build trust, support openness to participation, and enable reciprocity (Riel & Polin, 2004). I also found that shared norms emerged from this process, which allowed circle members to collaborate without fear of being judged or feeling unsupported during the process.

Learning Technologies. For greater efficiency and effectiveness, and also to be able to operate in both synchronous and asynchronous modes, I selected a variety of learning technologies to aid in my facilitation of the online learning circles. These digital tools served as platforms for communication, facilitation, and documentation of the work that was performed and the reflections that were captured as part of the overall experience of the circle members. They also aided my work as the learning circle facilitator and learning coach.

Zoom. Zoom was a tool that allowed for multiple types of online communication, from real-time video and audio to presentation sharing and text-based chats. Now very popular for video conferencing, Zoom was used as my primary tool for synchronous communication in the online learning circle. It was easy to set up and use, and its features allow for multiple types of

communication. Zoom was an extremely effective tool to use during the onset of the COVID-19 pandemic, in which the majority of our staff worked from home.

Conceptboard. The most accessed tool that was used by the circle members was a digital whiteboard, or canvas, where concepts and ideas could be openly shared. I optimized it to be used in concert with videoconferencing. The members were able to easily create idea boards, add sticky notes, and markup each other's content during the collaborative process, which allowed them to take on the challenges week-by-week. I encouraged circle members to collaborate online both synchronously and asynchronously. Conceptboard became an easily accessed digital workspace where circle members' artifacts and innovations were cataloged and stored.

Google Docs. To help prospective circle members, organize project schedules, and share authentic work products with critical friends and action research stakeholders, multi-function digital tools were needed to draft written documents, organize numeric content and schedules, make presentations, and capture my field notes as an action researcher. Google Docs, Google Sheets, and Google Slides were the preferred tools selected because of their ubiquity, ease of use, and flexibility. Although several documents were created, they were temporary and were mainly used to help assemble content to be added to Conceptboard or posted in the building on a physical bulletin board or corkboard.

SurveyMonkey. To support a reflective and retrospective process for evaluating the success of the challenges during cycles, a digital tool was used to capture personal communication, participant feedback, and internal dialogue. SurveyMonkey captured circle members' reflections, project outputs, types of distribution, and documentation for challenge retrospectives. Beyond my use of Google Docs for field notes as an action researcher,

SurveyMonkey was a convenient digital tool that had built-in time and date stamps for recalling circle member feedback and keeping it in chronological order.

Blogger. Frequently throughout the study, I employed a digital journal to document my progressive elaboration through the study. This included my impressions of my interventions and reflections on my experience. These reflections were illustrative of my interests and emotions during my study. I used Blogger.com to capture expected outcomes and document aspects of my research that were unexpected or surprising.

Wix. Finally, I found a need to use a customized platform for displaying and distributing the outputs and artifacts associated with the innovations that were produced through the online learning circle challenges. Each challenge delivered a product, service, or result of some kind. I wanted them to be displayed in a readily accessible location and format. I decided to build a temporary website using Wix.com. It provided an easy way for me to disseminate my findings and innovation artifacts from my study.

Revisiting My Logic

My study's logic model, drafted in its final form in late 2019, visually described my overall plan and served as the framework for my subsequent investigations and interventions. Using both an ONA and an SNA, combined with previous innovation project performance, I was able to select capable intrapreneurial online learning circle members who were both willing and excited to participate. This was critical to my entire effort. With a solid team in place, I explored a variety of action research questions and innovation challenges. Each cycle began with a cycle question and included an identified set of actions and/or interventions, outputs, artifacts, outcomes, and a single impact statement regarding sparking innovation, fostering intrapreneurship, and creating a collaborative culture at MiSci. In Cycle 1, my actions led to the

establishment of a digital platform for collaboration, Conceptboard, where circle members could openly share their innovative ideas online. Cycle 2 was almost completely focused on the challenges and innovations, and the artifacts for understanding how various forms of distributed leadership emerged during my study. These forms included collective, collaborative, coordinated distribution (Spillane, 2007). Individual ownership and group responsibility were elements that I observed, signaling the presence of a healthy online learning circle. For Cycle 3, I prompted the circle members to capture the artifacts from the challenges and share their innovations with MiSci colleagues to promote the benefits of collaborative culture. By this stage in my study, I believed that I had demonstrated to myself that I could effectively identify, recruit, and motivate intrapreneurs at MiSci to participate in collaborative activities. I was also able to build new skills and personal confidence in facilitating distributed leadership as a new President & CEO.

Cycle Review. When reviewing the findings from all three of my action research cycles, I found consistency in the overall logic of my study. Despite minor delays in the selection of participants and disruptions associated with the COVID-19 pandemic, there was little deviation from the goals in my original plan from cycle to cycle. I found that each of the three cycles was surprisingly compatible and interoperable.

The findings from Cycle 1 demonstrated that SNA and ONA methods are incredibly valuable techniques for exploring social capital in networked structures and selecting intrapreneurs. Multiple isolated nodes and marginalized groups within the sociogram were detected in the data. However, I found that MiSci's intrapreneurs were able to traverse those structural holes and connect critical resources and social capital. Digital tools that were selected for my study were very effective and were facilitated without any major issues.

The findings from Cycle 2 supported the notion that agile project management-based timeboxed challenges are compatible with online learning circles. Distributed leadership in the forms of coordinated distribution, collective distribution, and collaborative distribution were regularly displayed during the challenges and cataloged by my post-challenge surveys. The online learning circle environment facilitated the breakdown of silos and created a safe space. After analyzing the survey data, I found that collaboration occurred in both synchronous and asynchronous modes. Additionally, the innovation artifacts produced were both timely and relevant to business needs.

The findings from Cycle 3 indicated that online learning circle members were heavily engaged in tapping into social capital across the organization, not just in their online learning circle. Unprompted, they demonstrated their resourcefulness as intrapreneurs. Circle members also demonstrated initiative and helped to facilitate the dissemination of their challenge-based innovations to a wider audience across the organization. I found that the utilization of existing meeting structures for dissemination created incredible efficiency in communicating.

Outputs Achieved. In summary, all of my if-then statements in my logic model, which directed my actions and interventions, were executed at the end of the project. The proposed outputs that I outlined in my logic model were all produced by the end of the process as well. These included:

- A list of high-performing distributed leaders—serving as circle members willing to participate in my study—was identified and established during our first online learning circle meeting.

- A set of digital collaborative tools for facilitating online learning circles were integrated, utilized, and tested during the process including Conceptboard, Zoom, Google Docs, SurveyMonkey, Blogger, and Wix.
- A list of pros/cons and recommendations were generated for how to implement three types of distribution (Spillane, 2006). These were shared with other leaders in the field in two separate sessions presented at the Association of Science and Technology Centers (ASTC) virtual conference.
- A set of six conceptual innovations—the outputs of the innovation challenges—were also produced, implemented, and shared with MiSci Board and staff. They included a new value proposition, website prototype, daily huddle format and location change, Smithsonian Affiliate application, Ames Room exhibit, and the Illuminate fundraiser event design and run of show concept.
- A temporary website/blog that illustrated my study's intent, process, results, and recommendations for facilitating distributed leadership within online learning circles at MiSci was produced and used to share the results of my study with my action research critical friends and others.

Progressive Elaboration. Because of the highly reflective aspects of action research and the iterative nature of challenge-based agile project management, there was a reasonable amount of progressive elaboration that occurred while facilitating the online learning circle for my study. During my interventions, I found that I was able to successfully make the outputs of one challenge be the inputs of another. Anything that was learned from the previous challenge was able to be built upon in the next. Progressive elaboration increased the velocity of the circle's performance on the challenges. This was noticeable by the circle members as the transitions

between cycles and challenges progressed. Survey results indicated that early and often deliverables increased, and team cohesion improved over time. It took six challenges to be able to achieve the level of team performance for the online learning circle that I sought. I found that my progressively elaborated approach reduced the risks associated with trying new things and challenged the status quo in ways that positively affected internal organizational culture, such as communication, coordination, and collaboration.

Impact. In an all-staff culture survey that I distributed after our final challenge in October 2020, I found that 20 out of 22, or 91% of those surveyed, expressed a desire to have the opportunity to participate in more collaborative cultural environments like the online learning circle. Additionally, in the survey, I found that 18 out of 22, or 82% of the staff who participated, expressed the need for greater control and ownership over their work as intrapreneurs. The culture survey also captured MiSci staff's ideas for new challenge-based innovation projects, which meant that innovative ideas were sparked as a direct result of my study. The staff provided more than 25 different innovation concepts to this effect. Finally, the culture survey data indicated that at least four out of six of the innovation artifacts produced by the online learning circle played a critical contributing factor to the success of the organization during 2020 despite the impacts of the COVID-19 pandemic.

Insights and Innovations

The insights that I gathered during my study were a direct result of the findings from each successive action research cycle. During the first cycle, I discovered that SNA and ONA are effective ways to uncover structural holes in formal organizational networks and identify intrapreneurs in an organization. Sparking innovation and promoting intrapreneurship without a supportive collaborative culture can be difficult in an organizational structure with entrenched

vertical and horizontal boundaries. However, I found through my action research that intentional structures for collaboration like online learning circles can address this common problem, even during a pandemic. Reflecting on each of my three cycles, I can take inventory of the challenge-based innovations created by the circle members, who were my study's participants. During the study, a direct impact was made on the circle members' experience and growth as professionals, and on the staff at MiSci.

With my action research interventions now complete and findings appropriately reported, I decided to capture seven key insights from my study and my experience as an online learning circle facilitator, an action researcher, and a President & CEO. These insights draw upon both the successes, failures, and surprises of my study and also incorporate lessons learned from past experiences facilitating learning circles, leading innovation projects, and managing teams of diverse staff with varied expertise in nonprofit environments. These insights can also be actionable and employed as strategies or processes by online learning circle leaders, serving as learning coaches, or other project professionals looking to distribute leadership across teams and their organizations as a whole as they seek to increase innovation, intrapreneurship, and collaboration at an enterprise-wide level.

The concepts are aligned with my overall understanding of the research literature combined with my direct experience facilitating distributed leadership through online learning circles in my workplace. Learning to acquire a healthy balance between theory and practice is a necessity in action research work. The following represent that balance and provide some potentially helpful tips for leaders interested in facilitating online learning circles.

The seven key insights and innovation strategies I propose for establishing, operating, and sustaining online learning circles in your organization are:

- Create a canvas for collaboration
- Chunk your challenges to spark early and often innovation
- Design for distribution of labor and leadership
- Respond with relevance and add value to the "why"
- Promote perspective by fostering diversity and shifting viewpoints
- Incite intrapreneurship and ignite a chain reaction of change
- License learning for all.

Recognizing that these insights and innovative strategies were derived from my study and evolved from my action research experience, in the following section I will describe them in the form of prescriptive advice for how to foster collaborative culture using an online learning circle as a platform for distributed leadership, innovation, and intrapreneurship.

Create a Canvas for Collaboration

Collaborative culture does not happen in a vacuum. It often emerges from existing relationships and established internal mechanisms. You can start by creating a canvas for collaboration and focusing on the simple things that already work in your organization to bring people together. Being intentional about establishing safe spaces where your team members can share new ideas openly and learn from others' expertise is critical (Daft, 2001). Allowing your colleagues the freedom in this space to make their own mistakes without being ridiculed is important. Take full advantage of what is already available to you in your work environment, then begin your pivot.

Avoid painting your collaborative canvas with a palette of random norms. Norms should be meaningful and derived from actual collaborative activities experienced in team-based environments. As a leader, you may want to be more thoughtful about the process. Be willing to

adapt your strategies and document the effective practices that are most often used to get things done. Promoting a collaborative mindset can lay the groundwork for your circle members by demonstrating effective ways to germinate, share, stack, and launch new ideas.

Consider taking the threads of creativity, autonomy, and trust and weaving them into the fabric of your canvas. Informal social networks in your organization thrive on these elements (Cohen & Prusak, 2002). If there are team members who exemplify these ideals, give them leadership opportunities and let them co-create your collaborative canvas.

It is important to recognize that not everything happens in synchronous, formal meetings. Collaboration often happens in unsanctioned spaces and outside of your project's organizational chart (Grant et al., 2016). Be comfortable with the chaos that this might bring. Trust your circle members to work with each other to get the job done. When they seem to have the process under control, take a step back and let them lead.

During my action research, I found it important to start with informal social relationships where team members already had a rapport. Although few at the time, I uncovered several existing multi-departmental project teams that were successful, where team members regularly crossed vertical and horizontal boundaries to tap resources and expertise for innovation (Daft, 2001). I used existing face-to-face and new digital platforms to get my online learning circle off the ground. My canvas was digital, using Zoom rooms, Google Docs, and online collaboration tools like Conceptboard. I chose these tools because I thought that a digital approach to learning circle facilitation would offer the most flexibility, allowing the circle members to work autonomously and asynchronously. This provided me with an incredible strategic advantage as a leader during the mandated quarantines of the 2020 COVID-19 pandemic.

Chunk your Challenges to Spark Early and Often Innovation

In today's hyper-competitive business environment, innovation often needs to be continuous. However, the work that generates it does not have to be. Chunking, or dividing your team's activities up into smaller more manageable units, can allow time for them to reflect and learn from both success and failure. Many new innovative ideas build upon previous ones (Tushman & O'Reilly, 1996). The creative destruction of old, outmoded concepts is the very essence of the innovation phenomenon (McCraw, 2010). Innovation can appear without warning and can happen anywhere, in its own time, or within a pre-specified unit of time.

The size of the container that you put your team's work in makes a difference. Design constraints can increase innovation potential, but so can time constraints. Be mindful of this and introduce timeboxing as a way to allocate a fixed time for planned activities (Daft, 2001). This approach can help to guard against the need for open-ended, ambiguous tasks on projects. Have your team work on activities during this period, then have them stop working once the allotted time is up. Afterward, assess whether your planned goals were reached and how you might modify your approach. Be open to progressively elaborating on your previous actions.

If you make challenges part of your internal culture, your team will likely rise to the occasion, as they recognize the value of both learning and doing. Allow them to freely work outside of the established boundaries of organizational structure (Jones, 2013). But do not let your team fall into failure, unable to recognize the value in making mistakes and failing forward. Give them challenges that build individual character and you will change the character of your teams.

My challenges were pitched to my online learning circle members like a race against time. By definition, projects are temporary endeavors (Snyder, 2013). As such, successful

projects tend to squeeze a lot of production into a defined amount of time. During COVID-19, I needed business adaptation to happen quickly. However, incubating, managing, and maintaining business adaptation often requires an incredible effort to continuously produce new ideas internally (Kim & Oh, 2002).

Given that we were in the middle of a pandemic when we kicked off our challenges in April 2020, I employed a strategy that incorporated real-world problems derived from COVID-19 impacts. Because there was so much confusion about the effects of the virus and so much uncertainty about when science centers and museums could reopen, I decided to integrate an agile project management method with a more robust reflective practice during the process. Higher-order critical thinking and creative problem solving were emphasized. I used on-the-job professional development training models to help me build upon established experiential learning foundations, create new skills and increase the velocity of learning on projects by the circle members (Wysocki, 2009). Whether you are a learning circle facilitator, learning coach, or innovation team project lead, strongly consider using timeboxed challenges within your practice as vehicles for early and frequent innovation.

Design for Distribution of Labor and Leadership

Fostering the optimal distribution of leadership is more than just moving pieces around on a chessboard. Leaders should avoid having an organizational chart that is set in stone. Being rigid can create too much risk in fast-paced business environments. Allow your structure to flex and adapt as projects evolve (Hyväri, 2006). Have your team members take on project activities that are tough to tackle, yet still speak to their individual passions and expertise. Then support their ideas while challenging them to be even more creative or take more risks.

Establish a holistic view of leadership in your organization, rather than one that focuses simply on aggregate quantities of individual contributions within the leadership practice (Gronn, 2002). Consider facilitating an SNA or an ONA to get a better understanding of the underlying formal and informal structures that influence decision-making and change. Try to identify leaders based on strong correlations to their centrality within your network's sociograms (Burt, 2004). Look for leaders up and down the vertical dimension of your leadership hierarchy. Appropriately supporting leadership at all levels can drive innovation and culture change and possibly open up new avenues to hidden social capital (Borgatti & Cross, 2003).

Nascent leaders within your organization may not occupy formal leadership positions. Meet with your intrapreneurs one-on-one to get a sense of the barriers that may be preventing them from stepping up or feeling empowered to lead. Stress the importance of optimizing leadership across the board and recharacterize the value of leadership within your organization as the capacity for aligning resources, setting direction, and establishing a commitment to generate results (McCauley & Van Velsor, 2004).

We are slowly shifting to a post-heroic leadership business environment. As such, it has become increasingly acceptable to see leadership as something beyond what can be done by a single person to other people (Badaracco, 2014). Avoid leaning too heavily on individualism in leadership. Venture beyond the single hero or heroine concept and acknowledge the part played by two or more supporting players (Spillane, 2006). Create new paradigms within your organizational culture that replace archaic heroic concepts of leadership with models that reframe it as a group activity between and among people (Preedy et al., 2012).

My study attempted to answer the basic question of who gets to lead (Lipman-Blumen, 2000). The incredible rise of cross-functional teams in both for-profit and nonprofit business environments is aggressively reconstructing leader-follower identities. With increased job complexity, the need for greater agility rises in response to market changes and demands for innovative solutions (Conger & Pearce, 2003).

Facilitating the innovation challenge of developing our proposal and application to become a Smithsonian Affiliate required an enormous amount of research, data analysis, and coordination. A complete team effort was needed. The leadership of the online learning circle shifted multiple times and the circle members indicated that the distribution displayed during the challenge was a combination of collective distribution, where the leadership actions/activities were co-performed separately but interdependently, and coordinated distribution, where the leadership actions/activities were co-performed in a given sequence. The circle members became more confident in understanding their roles in the co-performance of leadership. They acted decisively in the process, owning the task and holding each other accountable for the work, demonstrating the idea that leadership can be cultivated and supported at all levels.

Respond with Relevance and Add Value to the "Why"

Responding with relevance means selecting challenges that not only have strategic significance to the overall operation of the organization but also are of interest to your online learning circle members from a tactical and operational perspective. As the circle leader or learning coach, you can assign challenges based on your priorities or provide a list of challenges that meet your goals and let them choose. You can also be completely hands-off and give your circle members free rein to challenge themselves to innovate. It is important that your team feels

empowered and possesses the ability to affect change (Brown, 2009). Whatever approach you decide to take, make sure empowerment is still an identified outcome.

If there is not already a sense of urgency around your challenge topic, you will need to create it (Kotter, 2009). Basing your online learning circle challenge themes on new opportunities, timely issues, or critical needs that need to be addressed will ensure this. The urgency that you create can help ensure a productive timeboxed environment. You will want to communicate to the circle members that it is not only important to get what has to be completed, but it is also important to do it with immediacy (Kotter, 2009).

It should be recognized that innovation is inherently about adding value (McCraw, 2010). The value that is created in challenge activities within online learning circles does not have to be big, but it should represent a noticeable update, upgrade, or progression. Many of the new ideas that your circle or project team members generate may be interesting or even have incredible promise, but unfortunately, these ideas may not be relevant to the daily activities of your team (Jones, 2013). It does not mean that you should avoid these types of ideas. It simply means that you might have to do additional work to connect the dots on challenges where the everyday impact is not so obvious.

Adding relevance to the business case and/or rationale of your challenge will be of critical importance. You want your circle members to have an overall expectation that the incredibly hard work that they put in during their timebox or sprint will lead to a net positive. This is especially important during a time of crisis. Your circle members will almost certainly encounter uncertainty or be assigned tasks that are outside of their immediate expertise. However, if the challenge is relevant to their work, they may be more motivated to tackle it.

Each of the challenges I pitched to my online learning circle was directly relevant to issues and opportunities that we faced during the pandemic. As an example, reimagining our daily huddle, or stand-up meeting, was relevant because we needed a new meeting format during the pandemic. We were required to reconfigure our building for reopening to increase building sanitation and decrease the risk of viral spread. The reconfiguration included new protocols, procedures, and practices that needed to be instituted to ensure the safety of our staff and guests. The daily huddle meeting was a space where coordination around these topics could be facilitated. The circle members offered up the idea to relocate the huddle to the loading dock where staff would now be exclusively entering and exiting the building. They chose a very creative format for the meeting that allowed staff to freely share mission-oriented success stories based on their everyday interactions with guests. The format also outlined new methods for efficient and effective communication of activities, updates, and status reports.

Promote Perspective by Fostering Diversity and Shifting Viewpoints

From a leadership standpoint, one could argue that perspective is everything. Unique viewpoints often come by virtue of position in an organization. Depending on what level you are as a leader often can determine how much of a strategic view you have of the enterprise as a whole. It is assumed that those at the top rungs of the ladder in an organization are the ones with the best view of the opportunities for innovation. But this is not always the case. Often it is the employees on the ground, with direct connections to the customer, who spot trends early and develop a sense of what new ideas might become innovations. This is where knowledge creation can be captured and shared for the benefit of advancing new ideas within the organization (Mitchell & Boyle, 2010). Senior leaders need to be creative and discover new ways to gather the perspectives of staff, volunteers, and even contractors and consultants who may have insights on

how to improve. Innovations can often shift perspectives (Jones, 2013). But perspectives may not change in your organization unless innovations occur or a crisis emerges. Your intrapreneurs likely possess the unique perspectives by which to envision innovative solutions. They may also be in the best position to do something about it. Empower your intrapreneurs to use informal networks and backchannels to grow your organization's innovation potential (Hawe, 2004).

However, be careful not to disrupt the hierarchy too much by giving intrapreneurs too much authority, which could undermine your formal leadership structures (Daft, 2013). Take the time to construct frameworks that allow your intrapreneurs to shake things up enough to get change moving, but not so much as to where you accidentally create chaos and the potential for insubordination or lack of trust. It is a balancing act on collaborative projects. Promoting individual autonomy while maintaining a sense of group responsibility and team culture can be challenging.

Each person in your online learning circle has their unique viewpoint. It is important to recognize each circle member as a true stakeholder, someone who has something to gain or to lose from the challenge (Snyder, 2013). In my study, I wanted each circle member to see the challenges from the perspective of achieving a personal gain, hoping to minimize what they might lose. I used diversity in the team dynamic to guard against cognitive dissonance (Cooper, 2019). Avoiding disconnects within the team helped to bring clarity to the discussion and thinking process (Stroud et al., 2012).

Fostering diversity within your online learning circle diversity is key to minimizing blind spots. Although the size of your online learning circle can vary, circle member diversity is of critical importance. Of the six defining dimensions of learning circles, the diversity of participants tops the list (Riel, 2014). Tackling new challenges can require out-of-the-box

solutions. Including voices from different departments, occupational sectors, levels of expertise, and different ethnic and cultural backgrounds can help to minimize groupthink. Your circle members' contextual lenses can offer different viewpoints of the same problem. When differences are honored, valued, and integrated—rather than being marginalized—deeper, more meaningful knowledge construction can take place (Mitchell & Boyle, 2010). Approaching both classic and asymmetrical problems from different angles can make a difference in how solutions are generated and tested (Brown, 2009). Use your online learning circles to help form new communities around learning, where employees with diverse perspectives can be united in a common cause.

Incite Intrapreneurship and Ignite a Chain Reaction of Change

Inciting intrapreneurship is more than just inspiring new leaders to pursue their creative ideas. It is also about tapping into the collective social capital of the project team and igniting a chain reaction of change that helps shape the future of the internal landscape of your organization (Pinchot, 2000). Project leaders, who work outside the lines and beyond the silos, need inventive ways to get into the flow as they tackle the toughest problems in your organization and learn to transition from independence to interdependence (Bundred, 2006).

Linking up your intrapreneurs in a learning circle, particularly in an online format using collaborative digital platforms, can multiply the effect, and create a chain reaction of change with trust that is the hallmark of collaborative culture. Some of your intrapreneurs may need to be authorized to cut through the bureaucratic red tape to find success (Close & Zinkham, 2007). After all, intrapreneurship can be risky and challenging the status quo can put a target on intrapreneurial changemakers back. However, if your intrapreneurs can learn to also work within

established organizational systems and structures, and in concert with others to get things done, innovation can flourish (Pinchot, 2000).

Intrapreneurs can be positioned to attack internal silos and invisible barriers that attenuate an organization's innovation potential (Jones, 2013). Giving them a platform like an online learning circle to exercise self-efficacy and display leadership confidence that is inspirational to others can challenge existing paradigms (Bandura, 2017). Discovering a shared interest in fostering innovation and change with like-minded colleagues can be empowering. Intrapreneurs need to feel that the online learning circle is an open, supportive, and sanctioned place to champion their new ideas (Pinchot & Pellman, 1999).

Call on your intrapreneurs early in the process. Give them the motivation and the space to be their best as they rise to the challenge. Get them into the flow where their leadership and personal awareness are heightened and achieve new performance levels (Wilder et al., 1989). When budget cuts decimate your human resource pool, as it did for us in 2020 as a result of the COVID-19 pandemic, the leaders who are the most comfortable challenging themselves to innovate and demonstrate their ability to adapt to new business environments as they learn new skills will be your heroes.

License Learning for All

Licensing learning for all means recognizing the importance of learning both during a particular challenge and throughout the entire lifecycle of an online learning circle. Intentionally establishing time for individual reflection and creating safe spaces for group feedback is critical (McNiff & Whitehead, 2011). Circle members should be empowered to step back and actively assess their actions, activities, and the impact of their work as a team. Challenges for learning circles should be set up with built-in difficulty and an acknowledgment of the inherent risks

involved in innovating. A reflective environment can provide circle members with comfort in knowing that errors can be corrected and mistakes reframed without social penalties.

Although it may be second nature for action researchers to regularly engage in reflection, those new to online learning circle work may need to take time to get comfortable with the concept. For learning circles to be effective, reflection is a key component—as reflection can enhance learning (Riel, 2014). Opportunities for learning in online environments can be plentiful, but circle members need to be encouraged to take advantage of them. Meeting a new challenge often requires adaptation to new situations, events, technologies, and even new personalities. Your circle members will need to quickly become accustomed to regularly reviewing and reflecting on their actions to tap into the benefits of the online learning circle format.

It is important to note that not every challenge that your circle takes on will be successful, but the value of what the team learns from the overall experience could be significant. Your role as an online learning circle facilitator is to not only propose challenges to the members but to also serve as their learning coach—helping the team to evolve their processes and grow their learning potential over time. The incremental and iterative nature of agile project management invites teams to learn from both failure and success to foster a culture of collaboration and innovation. In projects that utilize the waterfall method, the emphasis is on progressive elaboration. As you move through the phases of the project, this approach invites you to elaborate on the original requirements and focus more on the details. When facilitating agile projects that incorporate both incremental and iterative methods, opportunities exist to accelerate the work of the team as team members produce value for the user or customer early and often in the process. Agile retrospectives, which capture the learning that takes place before, during, and

after each timeboxed sprint, can serve as frameworks for continuous improvement (Sutherland, 2019). Encouraging your online learning circle members to improve as well as perform can be an effective way to grow your team's ability to adapt.

However, during the early stages of online learning circle development, there is often a lack of trust (Riel & Polin, 2010). This can affect how the circle members relate to each other. For my first three challenges, the Cycle 2 survey data indicated that the online learning circle members had difficulty properly reflecting on their work. Several of the members did not feel comfortable sharing their perspectives openly with others. At the time, the goals were still a bit fuzzy and group norms were fairly nascent. The circle members were also just getting to know one another. By Challenge 4, centered on redesigning our daily huddle, the group had already gone through a series of reflective activities during the previous three challenges. They criticized themselves for not adhering to their own group norms over that time. They wanted to change that. They also wanted to make sure that everyone's expertise was being utilized appropriately as the work was being divvied up and the leadership distributed during the challenges. By Challenge 6, the circle members were very comfortable expressing themselves, discussing risks, owning their mistakes, and openly sharing what they learned with one another and the rest of the staff.

Give your circle members a license to learn. Allow for empowerment during collaborative activities and openness to reflection during retrospectives. Consider merging your approach with models of distributed leadership to add new dimensions to your online learning circle format. The learning pathways for each circle member will be unique and likely influenced by their individual learning preferences, academic background, and professional experience. New inputs and course corrections in response to changes in the project requirements or business

environment are to be expected. Although reflective practices for learning can create additional work, your team members will likely gather valuable experience in how to overcome the many obstacles that are inherent in collaborative activity.

Implications for Practice

Online learning circles can be an effective framework for organizational change and facilitating that change by sparking innovation and promoting intrapreneurship, especially when remote work or telework are required components of team interaction. Online learning circles can be employed to take advantage of the benefits of conjoint agency and distributed leadership. However, distributed leadership is perhaps most useful when considered as a conceptual framework for collaboration versus a normative or practical approach. Having an understanding of both the formal and informal interactions amongst leaders, followers, and the situation is of critical importance to those who want to change the culture of their organization and move it from isolated static silos to integrated dynamic social networks where the value of social in organizational capital can be effectively realized (Bundred, 2006).

During my study, aspects of my action research were shared with the science center and museum fields. These dissemination opportunities came in the form of conference presentations and journal articles. Mostly shared were the list of innovation artifacts and tips for establishing online learning circles as intentional frameworks for collaborative work in the workplace. I found that there was considerable interest from other leaders in the field who were also looking to create collaborative environments in the workplace that sparked increased innovation during the pandemic. Interest in my collaborative work at MiSci increased significantly leading up to the annual Association of Science and Technology Centers (ASTC) conference. I facilitated a conference session at ASTC on the topic of creating collaborative culture during a crisis. My

session was co-presented with colleagues from COSI, in Columbus, Ohio, the Exploratorium in San Francisco, California, and The Tech Museum of Innovation, in San Jose, California. Our session was rated highly in conference surveys and evaluations.

I firmly believe that the significance of this study has broad implications for both for-profit and nonprofit leaders alike. The impact of my findings on practice may be particularly significant for nonprofit leaders, particularly in science centers and museums, and even leaders who work in zoos and aquariums. Having held several leadership positions in each of these types of organizations, and having facilitated distributed leadership and learning circles in them as well, I believe that my study's approach to a successful implementation of online learning circles applies to various types of complex cross-departmental innovation projects.

Finally, given the fact that my study was facilitated during the COVID-19 pandemic demonstrates the flexibility and adaptability that online learning circles can have in some of the most extreme business and work environments. I hope that my successful use of online learning circles and action research will inspire other leaders in my field and beyond to embrace distributed leadership and endeavor to foster a collaborative culture in their practice.

Future Research

This study began with the goal of creating a collaborative culture and an identified need to dismantle MiSci's formal organizational silos and transition to a flatter, more inclusive organizational structure that tapped hidden social capital in our existing informal social networks. A critical step was the identification of intrapreneurs, innovators, and changemakers within the organization who was able to successfully navigate vertical and horizontal barriers within the structure to innovate outside the lines. This was partially achieved through social and organizational analyses. The establishment of an online learning circle, with its challenge-based

innovations, was a key factor in accessing and connecting intrapreneurs. However, it was only the first step. Toward the end of Cycle 3, I documented in my field notes two new action research topics that could generate new questions and develop into separate studies.

Creating a Conceptual Collaborative

My first new topic is a direct extension of my existing study on a collaborative culture. It centers on the conceptual process that I facilitated with my online learning circle using Conceptboard as a platform. My new research interest is the process of developing the conceptual design and ideation skill sets of circle members. My preliminary overall action research question for this new action research topic is: How might I change the fundamental nature of the online learning circle challenges by removing the timebox and making the activities about open-ended conceptual innovation rather than constraining it as a temporary endeavor?

Looking back reflectively on my study, I initially set out to create an intentional structure for collaboration focused on concepts only. However, due to the pandemic, I had to shift my objective toward producing agile projects from the idea boards that were created in Conceptboard. Although the innovations developed from the challenges had an incredibly positive effect on the advancement of the organization, it was not my original goal. In the beginning stages, I was merely looking to use online learning circles as a vehicle to host what, at the time, I dubbed a "conceptual collaborative." This circle would be a group of intrapreneurs dedicated to advancing abstract ideas that might spur paradigm shifts.

As a certified project manager, I appreciate the need for and value of real-world outputs and deliverables. But I was also curious about project management approaches that catered to the early and often delivery of concepts and ideas. I needed an easier way to produce the seeds of ideas that might be found at the "fuzzy front end" of innovation (Koen et al., 2001, p. 46). It

takes discipline to focus exclusively on the conceptual side of innovation. People often want tangible results. But if the goal is primarily to shape a leadership vision and strategic direction for an organization, I believe that there could be great value in a study like this.

Each time you come up with a new idea, the potential of destroying an old one increases (McCraw, 2010). In our business environment, we are constantly moving from one project to another. We rarely have an opportunity to just dream. I want to create a safe space where leaders can dream together. It would be an online meeting of the minds where intrapreneurs can openly share ideas and envision the future. There are currently very few, if any, formal mechanisms in my organization that serve this purpose. As I envision it, creating a conceptual collaborative can serve as an intentional structure for generating future-focused ideas.

MiSci Manifesto

My second new topic is an evolution of my collaborative culture study that centered on organizational design and how flattening the structure and infusing agile project management might help promote intrapreneurship. My preliminary overall action research question for my second research topic is: How might I create a new organizational framework, with values and principles adapted from the Agile Manifesto, that flattens out my organization's structure and is built around the concept of intrapreneurship?

The positive net effect of my investigation into a collaborative culture was a more flat, networked, and empowered work environment at MiSci. Lowering barriers, removing boundaries, and connecting silos were also some of the benefits. However, I am still trying to determine if the online learning circle concept can serve as the basis upon which new informal networks and organizational structures can be built. I want to explore this at the enterprise level and determine the scalability of the concept. Participants joining a new circle and continuing

their process of knowledge building and distributed leadership is common after the tasks of an online learning circle are completed. This effect can generate a chain reaction that spreads the internal collaborative culture to other parts of the organization, increasing or enhancing an organization's ability to spark innovation and promote intrapreneurship.

Conclusion and Final Reflection

As the President & CEO of the MiSci, I discovered that some of our most valuable ideas have sprouted and bloomed because distributed leaders, operating independently as intrapreneurs, uncovered ways to use their informal social networks to break through silos and successfully collaborate across departmental lines. Because traditional organizational structures are often stubbornly inflexible and woefully under-optimized for collaboration on cross-departmental innovation projects, our leaders often have to empower themselves to become intrapreneurs and form ad hoc agile teams to innovate (Cross & Parker, 2010). These collaborative environments foster creative problem-solving, unlock social capital, and generate early and often deliverables. But I have often wondered, what would happen if our distributed leaders could go one step further and collectively redraw existing organizational structures to foster better collaboration within project teams and across departments?

My action research study, facilitated during the outbreak of the COVID-19 pandemic, honors distributed leadership and demonstrates how online learning circles can be used as intentional structures for agile project work in virtual spaces, transforming traditional organizational structures from being hierarchical and siloed, to being flat and flexible, sparking innovation, promoting intrapreneurship, and creating a collaborative culture in the workplace. The process of facilitating this type of transformation is not trivial. Empirical approaches that help leaders uncover the true value of the social and organizational capital within an organization

have to be explored in today's fast-paced, often chaotic business climate. Efforts should be undertaken to redesign formal structures around the work of intrapreneurs who are willing to risk it all to disrupt the status quo and innovate. We must learn to trust and empower intrapreneurs to help break down internal silos and spark innovation within both formal and informal organizational networks.

The findings from my action research study indicate that my efforts to employ an online learning circle to create a collaborative culture at MiSci were successful. Online learning circles were an incredibly flexible and effective platform for generating shared norms, creating an atmosphere of openness and trust, and facilitating reciprocity among team members (Riel, 2014). Although the result of this work was positive, this is not the end of my journey. My journey continues. Lao-Tzu is often credited with the proverb that states that a journey of a thousand miles begins with a single step (Laozi & Seddon, 2006). This is an insightful and inspiring statement, but it is silent about the end of that journey. Perhaps it is because Lao-Tzu wants us to be mindful of the process rather than just the product.

During my process, I learned a lot about myself and about the amazing potential for teams of dedicated and passionate distributed leaders to collaborate, learn, and grow during even the most challenging times. This point was made particularly clear given the incredible impacts that the COVID-19 pandemic had on our organization during the intervention phase of my study. The experience made me keenly aware of the power of online learning circles and how they can help build and maintain team cohesion even during a crisis.

As an action researcher and the subject of my research, I found personal satisfaction in conducting a research methodology that was done in a participatory fashion with others rather than on others (McNiff & Whitehead, 2011). I also valued being able to co-perform leadership as

a distributed practice among creative and capable peers (Spillane, 2006). During my study, I felt like the quintessential intrapreneur, challenging assumptions, sparking innovations, and failing forward without regrets (Pinchot, 2000). I was even able to get into an optimal state of flow at times as I attempted to balance myself on the boundary layer between anxiety and boredom (Csikszentmihalyi, 2009). Although there were things that I might change if I were to repeat this process, as a new President & CEO I find myself satisfied with the incredible impact that my study had on my new organization. I am grateful for the opportunity to both freely give and receive with everyone I engaged during the process, facilitating reflective practice along the way.

The possibilities for future study are intriguing. I look forward to experimenting with the online learning circle format by modifying time constraints and creating a conceptual collaborative of intrapreneurs focused on constructing new mental models and frameworks for improving strategy and furthering innovative ideas (Beedle, 2014). I am also excited by the idea of creating a "MiSci Manifesto" and strategy to design, develop, and operate a flatter, more socially networked organization based on the original Agile Manifesto (Sutherland, 2019).

During my action research while facilitating learning circles, I have come to understand that the more things change, the more they remain changeable. As an experienced leader in my field, I hope to continue to change outcomes, grow as an intrapreneur, and innovate collaboratively with others. For the moment, however, I would like to just pause and enjoy the view after climbing this incredible mountain. The doctoral dissertation was the ultimate challenge for me. As I enjoy the vistas, I find myself yearning to traverse distant peaks and embark on new journeys. Where will my next steps lead me?

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APPENDIX A

Socilyzer - Social Network Analysis

Figure A1

Visualization of Social Networks

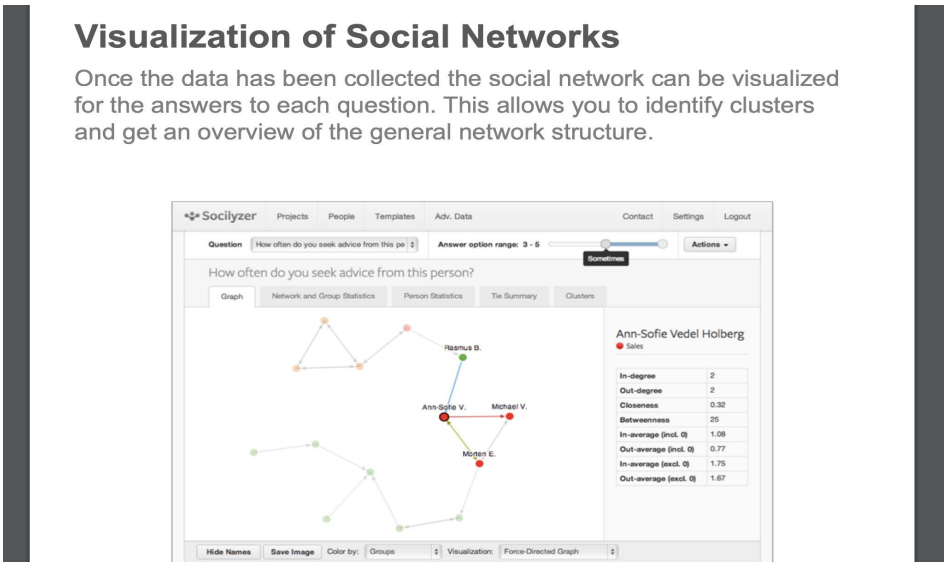
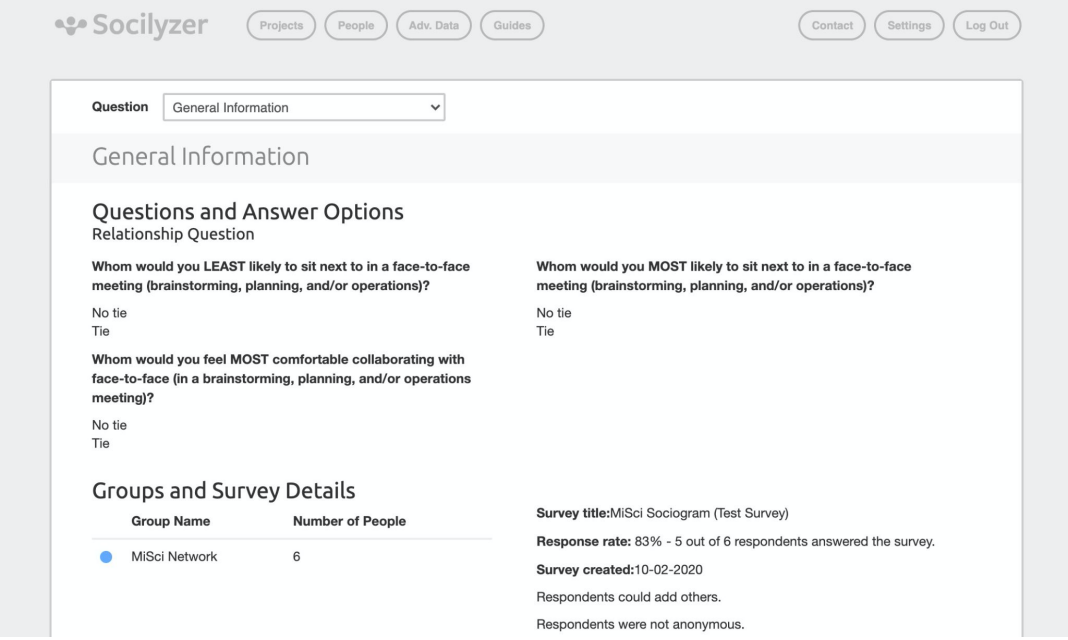


Figure A2

Socilyzer



APPENDIX B

Action Research Data, Domains and Criteria

Figure B1

Creating Collaborative Culture

Creating Collaborative Culture

Action Research Data, Domains, and Criteria

Domain/Criteria	Description	Data Source	Method	Analysis
Professional Domain	***Strategies***	***Blog***	***Selection***	***References***
Enhancing my own **leadership skills** in facilitating **distributed leadership** through online learning circles	**Practices** used to support the facilitation of distributed leadership, such as: establishing **trust**, ensuring mutual **respect** and fostering a **safe space**	Personal **reflections** on events and activities **during** and **between** action research **cycles**	A **set** of **themes** from **blog entries** where **new strategies** and **techniques** are **outlined**, **described**, and **reflected upon** (knowledge, skills/practice, and identity)	**Evidence of shifts** in themes and concept with respect to specific strategies employed to facilitate distributed leadership and collaboration
Organizational Domain	***Distribution***	***Concept Board***	***Selection***	***Code***
Creating and coordinating new **collaborative practices** and **norms**	Exploring the **types** of **distribution** as described by Spillane (2006), which are **collaborated**, **collective**, **coordinated**	**Visual records** of **leadership distribution** occurring within the online learning circles (**wiki** and **chat** used for online group work)	A set of **online posts** from sessions will be collected to explore changes in roles, community practice and cultural knowledge.	Evidence of **collaborated**, **collective**, **coordinated distribution** taking place within the online learning circles during cycles.
Scholarly Domain	***Artifacts***	***Website***	***Selection***	***Presenting***
Sharing **knowledge** from the online learning circles, the **artifacts** of **innovation**, and the **impact** of **intrapreneurship**	An analysis of **physical** and **digital artifacts** from the online learning circle **exercises** and **final projects**	**Physical** and **digital outputs** of learning circle challenges **posted online**	Review of online learning circle **artifacts** for their **overall innovation potential**	The **indicators** of **innovation** and **intrapreneurship** through an authentic assessment of the process

APPENDIX C

Logic Model

Figure C1

Creating Collaborative Culture (completed)

Creating Collaborative Culture (completed)

MiSci Action Research Logic Model

Inputs *Need/Resources*	Throughputs *Activities*	Cycle Questions *If, then...*	Outputs *Participation*	Outcomes *Short-term*	Outcomes *Medium-term*	Impacts *Long*
NEED to identify **distributed leaders** ready to help fulfill the **strategic goals** of the organization (completed). **RESOURCES** are full time staff who are dedicated to the mission and open to trying new things.	**Pre-cycle** Review existing ONA/SNA data and **identify** current **intrapreneurial project leaders** as potential circle members (completed)	Pre-cycle: (WHO): If I use existing ONA/SNA data, combined with previous innovation project performance on projects, to what extent will I be able to select capable intrapreneurial circle members who are both willing and excited to participate in my action research?	A **LIST** of **HIGH PERFORMING**, **DISTRIBUTED LEADERS**, who will serve as circle members, willing to participate in my study (completed)	**Development** of **new methods** for **identifying** and **convening** distributed leaders (completed)	**Discovery** of a **next generation** of **intrapreneurs** within the organization (completed)	The **emergence** of a more **collaborative culture** at **MiSci** and new **strategies** and **models** and **organizational structure** for supporting **distributed leadership** that spark **innovation**, and promote **intrapreneurship** across the organization (The estabmilishment of a "**collaborative enterprise**.")
COVID-19	COVID-19	COVID-19	COVID-19	COVID-19	COVID-19	
NEED to transition the organization from **silos** to **social networks** (completed). **RESOURCES** are existing online tools that can be used for collaboration.	**Cycle 1** ***Open the Circles:*** Assemble team(s), **establish** online space, **orient** circle members, **set norms** for the circle.	Cycle 1: (WHEN/WHERE): If I employ digital spaces/tools for establishing and facilitating the online learning circle, to what extent will the circle members build trust and feel comfortable openly communicating and freely collaborating with each other online?	A **SET** of **DIGITAL COLLABORATIVE TOOLS** for facilitating online learning circles (Concept Board, Zoom, Google docs, website/blog) (completed) Also **NORM SETTING** was included (done in Conceptboard).	**Integration** of a set of **new tools** and a **platform** to help distributed leaders also become **effective online collaborators**	**Establishment** of a **standard set** of **tools** and a **platform** for online collaboration on projects	
		(reflect/blog)				
NEED to facilitate **distributed leadership** and establish a safe and effective **online collaborative space.** **RESOURCES** are Spillane's distributed leadership modes.	**Cycle 2** ***Facilitate the Circle:*** Co-perform **all three distribution models** (Spillane, 2006): "collaborative, collective, coordinated distribution," launch challenge projects	Cycle 2 (HOW): If I create project-based challenges or the online learning circle members, to what extent will they employ distributed leadership (collective, collaborative, coordinated distribution) and demonstrate both individual ownership and collective responsibility?	A **LIST** of **PROS/CONS** and **RECOMMENDATION S** for how to implement three types of distribution in an online learning circle environment.	**Understanding** of how the **three types** of distribution **function** in online learning circles, (effectively matching **waterfall**, **sahimi**, and **agile** project management methodologies).	**Recognition** within the organization that online learning circles are **viable platforms** for **facilitating** multiple types of project management methods (waterfall, sahimi, and agile)	
		(reflect/blog)				
NEED to **spark innovation** and **promote intrapreneurship** on **collaborative projects**. **RESOURCES** are existing issues and challenges in need of solutions.	**Cycle 3** ***Close the Circles***: Present innovation projects, **classify** and cultural norms and practices	Cycle 3 (WHAT): If I encourage the online learning circle members to share their challenge-based innovation projects and digital artifacts throughout the organization, to what extent will other	A **SET** of **six conceptual innovations** based on the challenge/theme presented to the online learning circle groups.	A **process** for the **design**, **development** and **production** of conceptual innovations to share across the organization	A **process** to sparking **innovation** and promoting **innovation potential** through **intrapreneurship**	

APPENDIX D

Conceptboard

Figure D1

MiSci STEAM ROOM Conceptboard

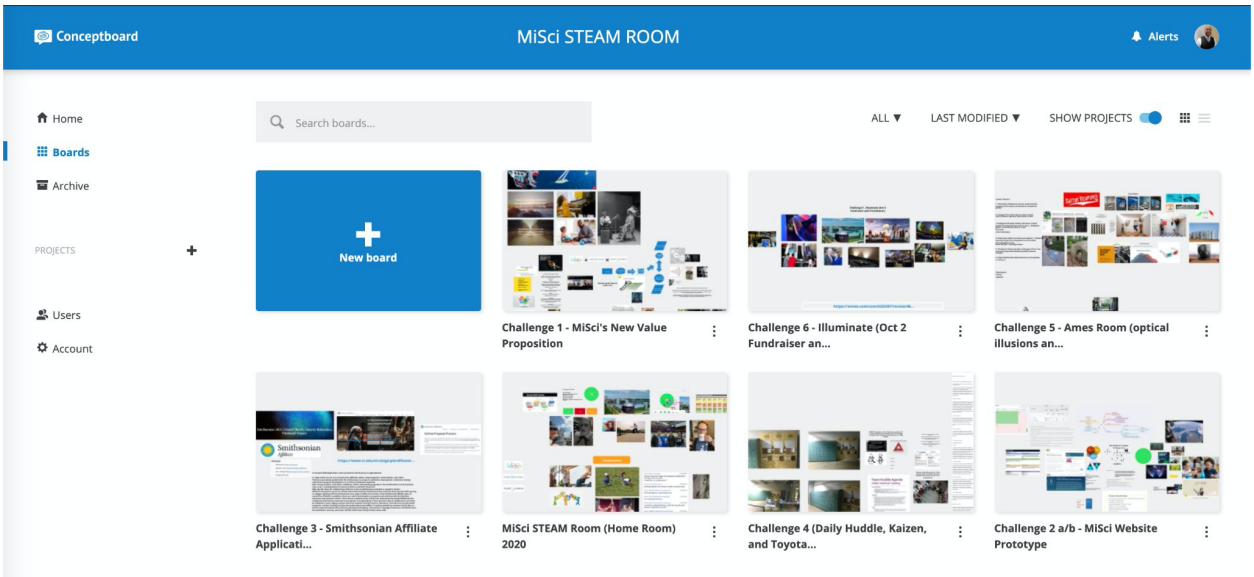
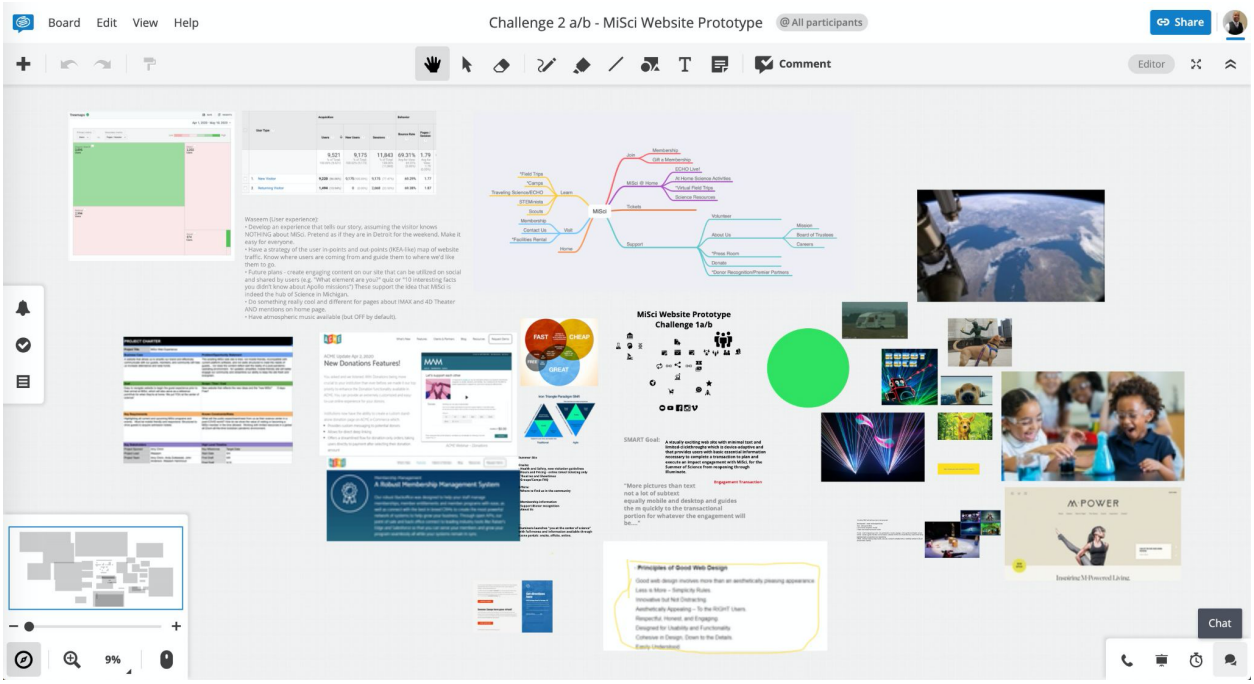


Figure D2

Challenge 2 a/b – MiSci Website Prototype Conceptboard



APPENDIX E

IRB Approval

Pepperdine University
24255 Pacific Coast Highway
Malibu, CA 90263
TEL: 310-506-4000

NOTICE OF APPROVAL FOR HUMAN RESEARCH

Date: December 09, 2019

Protocol Investigator Name: Christian Greer

Protocol #: 19-01-976

Project Title: CREATING COLLABORATIVE CULTURE: CAN ONLINE LEARNING CIRCLES SPARK INNOVATION AND PROMOTE INTRAPRENEUERSHIP?

School: Graduate School of Education and Psychology

Dear Christian Greer:

Thank you for submitting your application for exempt review to Pepperdine University's Institutional Review Board (IRB). We appreciate the work you have done on your proposal. The IRB has reviewed your submitted IRB application and all ancillary materials. Upon review, the IRB has determined that the above entitled project meets the requirements for exemption under the federal regulations 45 CFR 46.101 that govern the protections of human subjects.

Your research must be conducted according to the proposal that was submitted to the IRB. If changes to the approved protocol occur, a revised protocol must be reviewed and approved by the IRB before implementation. For any proposed changes in your research protocol, please submit an amendment to the IRB. Since your study falls under exemption, there is no requirement for continuing IRB review of your project. Please be aware that changes to your protocol may prevent the research from qualifying for exemption from 45 CFR 46.101 and require submission of a new IRB application or other materials to the IRB.

A goal of the IRB is to prevent negative occurrences during any research study. However, despite the best intent, unforeseen circumstances or events may arise during the research. If an unexpected situation or adverse event happens during your investigation, please notify the IRB as soon as possible. We will ask for a complete written explanation of the event and your written response. Other actions also may be required depending on the nature of the event. Details regarding the timeframe in which adverse events must be reported to the IRB and documenting the adverse event can be found in the *Pepperdine University Protection of Human Participants in Research: Policies and Procedures Manual* at community.pepperdine.edu/irb.

Please refer to the protocol number denoted above in all communication or correspondence related to your application and this approval. Should you have additional questions or require clarification of the contents of this letter, please contact the IRB Office. On behalf of the IRB, I wish you success in this scholarly pursuit.

Sincerely,

Judy Ho, Ph.D., IRB Chair

cc: Mrs. Katy Carr, Assistant Provost for Research

APPENDIX F

Project Timeline and Milestone List

Table F1

Creating Collaborative Culture - Project Milestone List

Creating Collaborative Culture - Project Milestone List 10.4.20											
Project Timeline and Milestone List											
Cycle	Date	Duration	# Participant(s)	Meeting Type	Meeting Tool(s)	Challenge	SMART Goal	Project Tool(s)	Deliverable(s)	Survey Tool	Reflection Blog
	January 2		26			all staff survey				Survey Monkey	
Start of Project	January 12										
Pre-Cycle	January 24	2 weeks	5	Huddle	F2F	Informed consent	Orientation	PDF	Complete the informed consent form	n/a	Blogger
Pre-Cycle	January 28	2 weeks	5	Huddle	F2F	Sociogram	Orientation	n/a	n/a	n/a	Blogger
Pre-Cycle	March 12	1 week	5	OLC	Zoom	Check-in	Reflection	n/a	n/a	Group discussion	Blogger
Cycle 1	April 6	1 week	5	OLC	Zoom	Check-in	Reflection	n/a	n/a	Group discussion	Blogger
Cycle 1	April 13	1 week	5	OLC	Zoom	Check-in	Reflection	n/a	n/a	Group discussion	Blogger
Cycle 1	April 20	1 week	5	OLC	Zoom	Check-in	Reflection	n/a	n/a	Group discussion	Blogger
Cycle 2.1	April 27	1 week	5	OLC	Zoom	Challenge 1: Operational Mission Statement	React and respond to a new "operational mission statement" or value proposition by creating an idea board in response to COVID-19 impacts and the need for greater strategic simplification by May 1.	Conceptboard	Idea board	Group discussion	Blogger
Cycle 2.2a	May 4	1 week	5	OLC	Zoom	Challenge 2a: Website Prototype	Design and build a new MiSci website prototype with FULL look/feel and brand by 5:00 pm Friday, May 8.	Conceptboard	Website design Wordpress	Survey Monkey	Blogger
Cycle 2.2b	May 8	1 week	5	OLC	Zoom	Challenge 2b: Website Prototype	Design and build a new MiSci website prototype with FULL features and functions by 5:00 pm Friday, May 15.	Conceptboard	Website design Wordpress	Survey Monkey	Blogger
Intercycle	May 11	1 week	5	OLC	Zoom	Check-in	Reflection	n/a	n/a	Group discussion	Blogger
Cycle 2.3	May 18	1 week	5	OLC	Zoom	Challenge 3: Smithsonian Affiliate Application	Review the requirements and facilitate an "initial completion" of the Smithsonian Affiliate application for MiSci by 5:00 pm Friday, May 22.	Conceptboard	Affiliate Application	Survey Monkey	Blogger
Cycle 2.4	June 1	1 week	5	OLC	Zoom	Challenge 4: Daily Huddle (Stand Up Meeting)	SMART Goal: By the end of business on Friday, June 5, create a NEW process based on the TPS Guiding Principles that reframes and reformats our "daily huddle."	Conceptboard	Redesigned Dock Area	Survey Monkey	Blogger
Intercycle	June 8	1 week	5	OLC	Zoom	Check-in	n/a	n/a	Reflection	Group discussion	Blogger
Intercycle	June 9	1 week	5	OLC	Zoom	Special Meeting	n/a	n/a	Building reopening	Group discussion	Blogger
Intercycle	June 22	1 week	5	OLC	Zoom	Check-in	n/a	n/a	Reflection	Group discussion	Blogger

Creating Collaborative Culture - Project Milestone List 10.4.20											
Project Timeline and Milestone List											
Cycle	Date	Duration	# Participant(s)	Meeting Type	Meeting Tool(s)	Challenge	SMART Goal	Project Tool(s)	Deliverable(s)	Survey Tool	Reflection Blog
Cycle 2.5	**July 24**	1 week	4	OLC	Zoom	**Challenge 5: Ames Room**	SMART Goal: By the end of business on Friday, July 31, develop several new innovative exhibit elements to advance and/or complement the Ames Room using design/build/purchase ideas that are inexpensive and relatively easy to implement.	Conceptboard	New Ames Room Exhibit Ideas	Survey Monkey	Blogger
Cycle 2.6	**July 31**	2 weeks	4	OLC	Zoom	**Challenge 6: Illuminate**	SMART Goal: By Friday, October 2, reframe, design, develop, and produce a virtual event for our annual fundraiser/friendraiser, Illuminate.	Event Plan	Event Plan	Survey Monkey	Blogger
Cycle 3.0	**August 27**	n/a	1	Meeting	Zoom	**Flatarchy or Holocracy**	n/a	Google Docs	Restructure	n/a	Blogger
Intercycle	**September 9**	n/a	1	Meeting	Zoom	**Flatarchy or Holocracy**	n/a	Google Docs	Restructure	n/a	Blogger
Intercycle	**September 14**	n/a	1	Meeting	Zoom	**Flatarchy or Holocracy**	n/a	Google Docs	Restructure	n/a	Blogger
Intercycle	**September 21**	n/a	5	OLC	Zoom	**Check-in**	n/a	n/a	Reflection	Group discussion	Blogger
Intercycle	**September 28**	n/a	5	OLC	Zoom	**Check-in**	n/a	n/a	Reflection	Group discussion	Blogger

APPENDIX G

Informed Consent

January 24, 2020

(Name)
(Title)
Michigan Science Center
5020 John R St.
Detroit, MI 48202

Dear (Name),

As part of my graduate studies in pursuit of a **doctorate in learning technologies at Pepperdine University**, I am conducting action research on my leadership skills in establishing online learning circles, facilitating distributed leadership on projects, and fostering collaborative culture within my organization with the intent of sparking innovation and promoting intrapreneurship. Doctoral candidates like me coordinate with Pepperdine's Internal Review Board (IRB) to ensure that all research is compliant with school policies and regulations that protect research subjects from potential risk of harm and/or unethical practices. The proposed study and IRB processes align to Accreditation of Human Research Protection Programs (AAHRPP) standards.

This informed consent form…

- describes and outlines my research study;
- reviews with you how you will be protected during the process;
- and allows me to gain your consent if you voluntarily choose to participate.

Although much of the content listed in this form is primarily for individuals who would be considered "subjects" in a typical education research project, you would be considered more of a "participant" in this study, rather than a subject since the study is focused on me improving my leadership practice.

You are therefore invited to voluntarily participate as an employee of MiSci in this action research study. Data collection for this project will be in the forms of "field notes," "observations," and some "informal interviews." With the help of the participants who volunteer and are selected, the study will also produce digital artifacts and work products in support of new and innovative strategic initiatives and projects, with the intent of advancing the Michigan Science Center.

IRB #: 19-01-976

Participant Study Title: CREATING COLLABORATIVE CULTURE

Formal Study Title: CREATING COLLABORATIVE CULTURE: CAN ONLINE LEARNING CIRCLES SPARK INNOVATION AND PROMOTE INTRAPRENEURSHIP?

Principal Investigator: Christian Greer, Ed.D. Candidate; Mobile: (312) 550-6289

If you agree to participate in this study, the project will involve:

APPENDIX H

Reflection Blog - Distributed Mind

Figure H1

Distributed Mind Blog

APPENDIX I

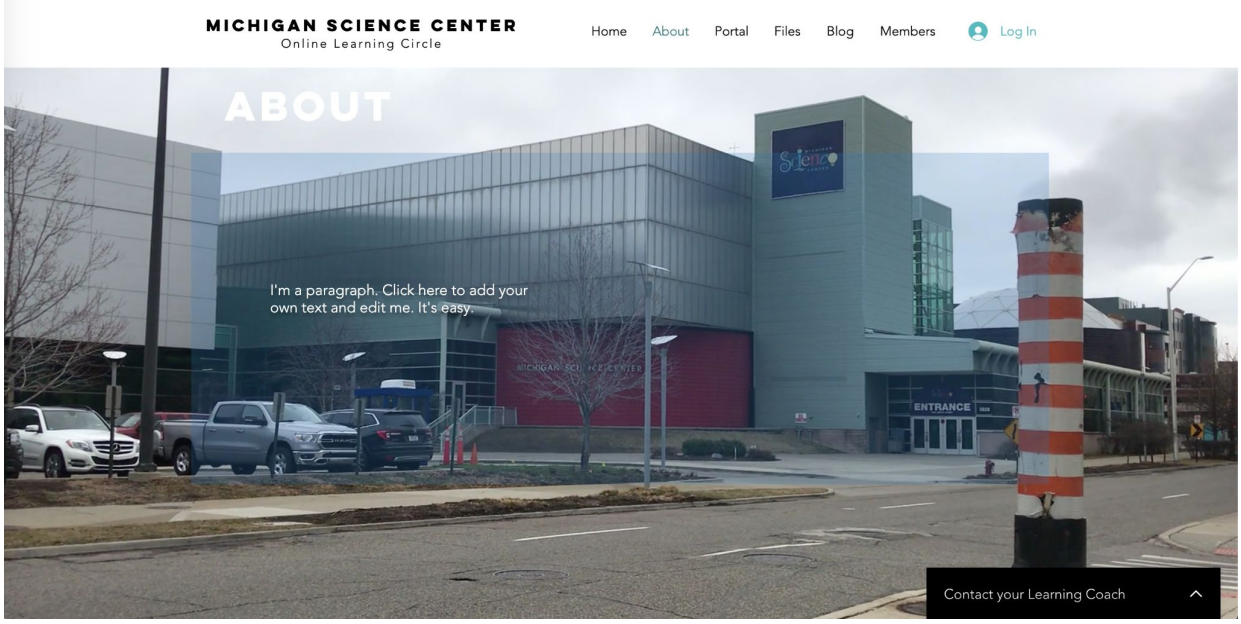
Steam Room - Online Learning Circle Website

Figure I1

MiSci Online Learning Circle - STEAM ROOM

Figure I2

MiSci Online Learning Circle – About



APPENDIX J

Challenge Survey

MiSci STEAM ROOM Challenge 4 - Daily Huddle (Kaizen and TPS)

SMART Goal (Specific, Measurable, Attainable, Relevant)

SMART Goal: By the end of business on Friday, June 5, create a NEW process based on the TPS Guiding Principles that reframes and reformats our "daily huddle."

Q1: What worked?

Q2: What didn't work?

Q3: What did you learn?/What would you change?

Q4: Approximately how many hours did you spend on this challenge?

Q5: Please rank how the leadership, by online learning circle members (you), was co-performed and distributed during this challenge?

The leadership actions/activities were co-performed in the same place and time. (Collaborated Distribution)

The leadership actions/activities were co-performed separately but interdependently. (Collective Distribution)

The leadership actions/activities were co-performed in a particular sequence. (Coordinated Distribution)

Q6: Did you trust others within the circle, and do you think that others trusted you, to facilitate your part of this week's STEAM ROOM Challenge?

APPENDIX K

RASCI Role and Responsibility Matrix

Table K1

MiSci Floor Engagement RASCI Matrix

MiSci Floor Engagement RASCI Matrix												
Category	Priority Area	Priority Rating	CG	JA	MO	AZ	AC	AC 2	PT Educators	AS	SS	AH
Self-Actualized Things - Pe	Employees can answer questions	Medium	R	R	R	R/A	R/A	R/A	R	S	R	R
	visible/helpful staff presence	High		S	R	R	A/R	A/R	R	R	I	
	all staff able to answer common	Medium	R	R	R	R/A	R/A	A/R	R	R	R	R
	uniforms/professional looking er	High	R	R	R/A	S	R/A	R/A	R	A	R	R
	present and visible sanitizing thro	High		S	R/A	R	R	S	S	S	I	
Training Required - Superv	Opening and Closing Duties ("Pu	High		S	R/A	R	A/R	R/A	R	S	S	
	Everyone doing "what they are s	Medium	R	R	R/A	R	A	A/R	R	S	I	
	All staff are trained or in a define	Low(er)		I	R/A	S	R	A/R		R/A	R/A	I
Goals / What We Hope Gu	new, exciting moments of discov	Medium	C	S	S	C	S	A/R	R	S	S	S
	In-Building Member Perks (Consi	High		A	I	S	R/A	A/R		S	S	
	Reasons for guests to visit again	High		S	I	C	R	A/R	R	C	S	S
Projects	Working Exhibitry	Medium		A	R/A	S	S	S	S	I	C	I
	Theater Programs	Medium	C	C	S	C	S	R/A	R	C	C	I
	STEM Engagement Programs (de	Low(er)	R	I	S	C	S	A/R	R	S	S	S
	way finding	High	C	S	C	C	A/R	S	R	C	C	
Basics - SOPs	cleanliness on floor (dust, dirt, et	High		A	R/A	S	S	S	S	S	I	S
	consumables stocked in restroon	High	I	S	R/A	S	S	S	S	S	I	S
	safe, working exhibits and spaces	Medium	I	A	R/A	R	R	S	S	C	C	S
	Internal marketing	Medium	C	S	S	R/A	R/A	S	S	R/A	S	S

APPENDIX L

Internal Culture Survey

Mi-Sci Internal Culture Survey Draft

|

Objectives

- To collect insight from employees associated with the organization's workplace culture, leadership, professional development and mission alignment
- Allow employees to reflect on leadership strategies
- Give voice to employees
- Assess and improve organizational management
- Build a bridge between current culture and desired culture

Survey Focal Points

This survey of **Organizational Culture** will explore the impact of workplace culture (expectations, experiences, philosophy, attitudes, beliefs, customs, written and unwritten rules, vision, values, norms, systems, symbols, language, assumptions, and habits) on employees of MiSci.

- **Team Dynamics -** professional relationships with colleagues
- **Leadership** - communication, management styles, rapport
- **Empowerment/enablement** - adequate resources, access to professional development, systems and processes, compensation
- **Alignment** - understanding of role & impact, recognition, day-to-day decision making
- **Development** - career aspirations, opportunities for advancement

Reflection Questions - Who do we want to be?

- Is our workplace culture relatable?
- What can be improved?
- How well aligned is our culture with our stated values & ethics?
- An organization that is continuously in meaningful development and transition
- Strong and effective communication strategies are implemented in order to ensure that all