Educational development leadership:

A distributed leadership case study of a university teaching and learning centre

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Abstract

Teaching and learning centres at universities lead educational development efforts to improve and innovate teaching at universities, yet these centres face many challenges. It has been argued that they could adopt a strategic organizational leadership approach to meet these challenges, but how this can be theoretically and practically achieved is an open question. This case study explored the use of social network analysis (SNA) and distributed leadership as theoretical and practical tools.

The primary questions guiding the initial inquiry were (1) *How can leadership in teaching and learning in a large research intensive university be understood as a distributed network?* (2) *How do SNA concepts (such as centrality, betweenness and density) help to illuminate distributed influence within this network and how do they relate to participants' demographic characteristics (such as discipline, formal role, professorial status, number of years teaching, department size, professional development as an educator, and number of years at the university)?*

The research began with a comprehensive literature survey on: teaching and learning centres, educational development, and higher education leadership for teaching and learning. The resulting conceptual framework incorporated distributed leadership and social network analysis. A second literature review focused solely on distributed leadership, critically reviewing the extant publications in higher education contexts. Normative perspectives were found to be dominant, while analytical perspectives were lacking.

Empirically, the dissertation follows from these results to map out a leadership network based on advice and information seeking behavior. Through purposive sampling of formal educational development leaders, and snowball sampling of formal and informal leaders identified through advice and information-seeking behavior and recommendation, an institutional network map educational development leadership emerged. 196 interviews were conducted at a large, research-intensive university in Canada. Informal leaders included not only full-time professors, but also part-time professors, support staff, and teaching assistants. Formal leaders who were identified and interviewed included deans and vice deans, directors, chairs, and a vice-provost. Correlations between centrality measures (in-degree, betweenness, closeness, or eigenvector) and demographic variables (professional development as an educator, years at organization, years as an educator, organizational level, formal leadership position, has conducted educational research were investigated using Pearson's r, but no significant relationships were identified.

In addition to analysis of the network, a researcher reflective journal supports the case study.

Key words: teaching and learning centres, educational development, higher education, leadership, distributed leadership, social network analysis

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Glossary of select terms

The following terms may be unfamiliar to readers who are not well read in the relevant fields. Some may have synonyms. Some may have more than one interpretation. Some of these terms will be expanded upon in the dissertation. The glossary gives lay definitions for the purpose of clarity and ease of understanding. It is alphabetical.

distributed leadership (DL): one specific perspective on leadership, which has multiple interpretations but tends to see leadership as shared among multiple individuals who may or may not have formal leadership roles (Bennett, Wise, Woods & Harvey, 2003)

educational development (ED): the work of teaching and learning centres. Essentially, the endeavor to facilitate faculty growth as educators. May also be referred to in other terms such as faculty development or academic development, which also may be different pursuits such as research or leadership (Bédard, Clement & Taylor, 2010; Ouellett, 2010)

educational leadership: the practice of leadership in educational settings, much of the research literature is specific to kindergarten to grade 12 (K12) contexts (Bush, 2003).

higher education: post-secondary education, after grade 12; this can include both universities and colleges (Kretovics, 2011)

leadership: The leadership literature is diverse and there is no single accepted definition, but for the purposes of this dissertation, a process of social influence (Bolden, Hawkins, Gosling & Taylor, 2011)

leadership theory: a large and diverse set of research literature including multiple competing and/or complimentary perspectives and/or hypotheses which endeavor to explain or understand what leadership is and how it can be practiced (Bush, 2003)

teaching and learning centre (TLC): units within universities which do the work of educational development. May also be referred to in other terms such as academic development units, or faculty development centres. Different universities have different expectations of these centres, and some may focus on administrative needs such as research grants or technology loans (Diamond, 2005)

teaching and learning leadership: for the purposes of this dissertation, and within higher education — which includes research and service (service is a broad term, but can include community outreach) — leadership for teaching and learning is meant to describe the means and ways in which processes of social influence are used (Marshall, 2011)

Chapter 1: Introduction

My first degree was a Bachelor of Science in computer science, where I learned that I am not a particularly talented computer programmer nor do I enjoy the work of programming computers. With a bachelor's degree, and being a native speaker of English, I was able to obtain a position as an English language teacher at a Chinese military university. Although I had no formal training as an educator, I was surprised to learn that I very much enjoyed the work of teaching. An ironic discovery, given that I had studied computer science precisely because as a high school student who preferred courses such as history over mathematics, and reading fiction for fun, I chose not to study what I enjoyed because I did not want to teach.

After two years of teaching in China, I was contacted by a university in Saudi Arabia which was looking for highly computer-literate English language teachers. The offer was contingent on passing a University of Cambridge certificate program in teaching English to adults. This certificate was my first formal education about education: reflective practice, backwards design, methods of instruction, and more were combined with a practical component for volunteer students in what was a transformational experience for me. In Saudi Arabia I had the pleasure of working with a large group of more experienced colleagues, and the good fortune of being promoted to computer-assisted language learning coordinator contributing to curriculum design and academic administration, as well as helping colleagues to use computers to improve their teaching. This university had a well-funded teaching and learning centre (TLC) that regularly offered professional development seminars on a variety of topics and I found their services very helpful.

Following this, I undertook a masters in applied linguistics, focusing on language

education and covering the basics of curriculum, instruction, and assessment. Moving to Thailand, I enjoyed a series of university positions including teacher-training with a Faculty of Education and adjunct faculty teaching a doctoral course on higher education leadership; it was in order to teach this course that I began reading about educational leadership and management generally, and within higher education in particular. Both of these universities, one a public institution under the Ministry of Education and the other an intergovernmental organization under the Ministry of Foreign Affairs, had TLCs and I was fortunate to be able to work with them from time to time in a minor capacity.

One commonality in all of these universities was that most professors had little or no formal education as teachers. This had been the case with myself as well, at first, and it isn't necessarily a handicap; it is in fact quite common globally. Another commonality was that teaching and learning centers – whose services I believed were incredibly useful – struggled to engage with professors across the disciplines who were already very busy and had already learned so much. Professors are busy people, with research and service expectations taking up a significant portion of their professional time. Simply meeting the basic requirements of being responsible for a course can already take a significant amount of time, without even taking extra time to learn how to do things differently. And doing different things will, again, require extra time. These professors are also physically dispersed and their busy schedules are unlikely to have significant overlap of available time to learn more about education (which, in most cases, is not their field nor is it a requirement for the profession).

Professors are therefore busy people; commitments to research and service, in addition to teaching, can be resource intensive (Blackmore & Blackwell, 2006). According to Smith et al. (2003), university faculty members certainly should expect quality educational development (ED)

(Smith et al., 2003), but does ED lead to improved teaching and learning? This is an open and challenging question, because it is difficult to establish connections between ED and student learning outcomes (Groccia, 2010), a view supported by relevant literature in a review on the impact of instructional development in higher education by Stes, Min-Leliveld, Gijbels and Van Petegem (2010) and by Wilson (2012). For example, outcomes from ED can be *negatively* affected by: insufficient time spent on development, low quality development, insufficient access to workplace conditions promoting change, and/or, participants' insufficient motivation to change; or *positively*, by participants working with colleagues, and/or having a voice in initiatives for their ED (Smith et al., 2003). Certainly, some ED activities conducted with some teaching faculty will directly benefit some students in some cases, but not every initiative will be successful with all participants in every contextual implementation. ED can have benefits beyond improving teaching and learning, however; for example, faculty members who reported more learning about teaching have also reported strong job satisfaction (O'Meara, Rivera, Kuvaeva & Corrigan, 2017).

Learning about teaching made me a better teacher, and helped me to enjoy teaching more, and so I wanted to know more about how a small centralized unit can work successfully with professors from across the disciplines to enhance classroom teaching and learning at a university. This was the problem I brought with me when I returned to Canada, to begin a PhD, after 10 years of working as an educator overseas.

Overview of the dissertation

> *Expertise in the discipline does not necessarily imply expertise in teaching the discipline (Havnes & Stensaker, 2006, p.6)*

> *… academics who teach at the university. For this set of teachers, informal learning is of particular importance as university teachers traditionally begin teaching in higher education with little or no formal training (Van Waes et al., 2017, p.34)*

> *The literature on higher education teaching leadership is woefully inadequate (Gunn & Fisk, 2013, p.42)*

> *It is simply not possible to change a university's teaching by working repeatedly with the same few enthusiasts, however comfortable and personally rewarding that is. You have to find ways to engage almost with everybody. Even modest changes to regulations and policies can have profound impacts on everybody, and simply accepting the context without trying to change it seems almost cowardly. Once you have moved beyond working only with individual teachers, an understanding of organisational change and leadership seems vital. Some of my recent work that involves extended relationships with whole course teams, instead of short encounters with isolated individuals, has been revelatory (at least to me) in terms of the scale and impact of the changes that followed. The work coming out of Lund on this issue (e.g. Roxå & Mårtensson, 2009) will, I suspect, be seminal (Gibbs, 2013, p.11-12)*

Chapter 2: Teaching and learning centres as leadership units in an organizational network: A conceptual framework for research and practice

This first article aims to synthesize as succinctly as possible various literatures in order to: (1) explain the work of teaching and learning centres, as well as the challenges facing them, (2) review the extant literature on teaching and learning leadership at universities, in order to identify key themes and methodological gaps, (3) put forward the methodological tools of Spillane's analytical distributed leadership and social network analysis as appropriate, complimentary, and underutilized methodological tools to address these gaps, (4) briefly present complexity theory as an epistemological position underlying these literatures, and (5) discuss how the resulting conceptual framework addresses the issues facing teaching and learning centres as identified in the literature. This conceptual framework is a unique, literature-based and theoretically grounded contribution to the field of teaching and learning leadership.

When I started this PhD, I began with reading about teaching and learning centres, but found there wasn't a great deal of literature on their leadership and management. As I kept reading, I discovered the literature on educational development which was much richer but still not enough, I felt, for a Ph.D. I broadened the scope of my reading further to include higher education leadership for teaching and learning; much of this was about practitioners and for practitioners. In the TLC and higher education literature, the notion of distribution was a recurring theme (e.g. Bolden, Petrov, & Gosling, 2009; Christensen Hughes & Mighty, 2010).

At the same time, as part of my required coursework I continued to read about educational leadership theory, and leadership theory in general, but this was mostly in K12 and business contexts. There is also a leadership literature specific to the military context, but this I did not explore. From the educational leadership literature, the concept of "distributed leadership"

aligned with the less theoretical literature on TLCs and higher education leadership.

This focus on distributed leadership mapped well onto my experience. First of all, when I first began teaching in China, I relied greatly on colleagues for advice and problem-solving. Taking part in administrative meetings when I later had a coordinator position in Saudi Arabia, I saw how different units of the university were largely autonomous. Within our unit, formal leadership roles were taken up by those of us who emerged from the faculty, for one reason or another, to sit in the meetings where decisions were made. These decisions were mostly made by consensus, rather than fiat, and each of us at the table had our networks of colleagues with whom we consulted and discussed in order to inform our deliberations at the administrative meetings.

Later, at another university, I worked in a centralized unit (the language center) which served the entire campus. I remember our centre director – who had been there for many years – always knew who would be knowledgeable or sympathetic in each of the different departments of the university when something was needed. He had a network in his head, and when he retired from the university that information – which was crucial for the successful continuing work of the centre – was lost.

If teaching and learning at universities is influenced formally and informally by a network of relatively autonomous colleagues interacting over years within and across institutions, I wondered, could TLCs tap into that network and how could it be modelled? Figure 1.1 illustrates the overlap of the literatures informing this dissertation, while Figure 1.2 illustrates the resulting conceptual framework which is described in detail in the first article (Chapter 2).

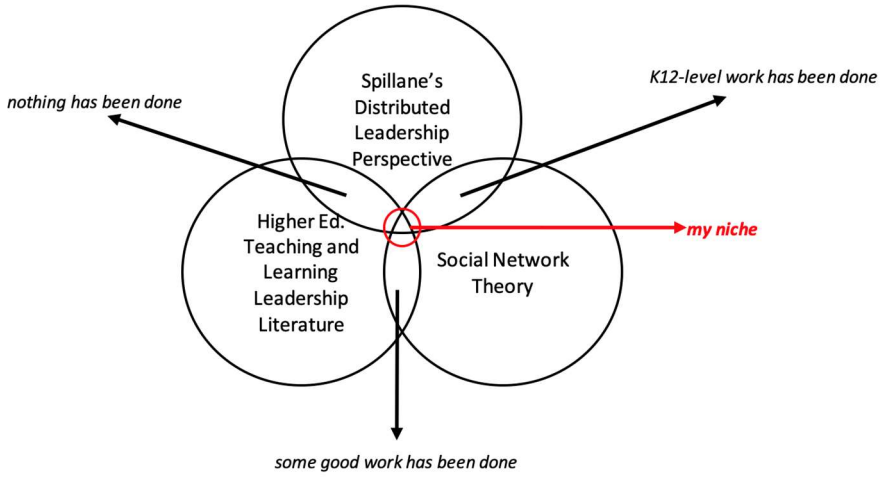

Fig. 1.1: Overlay of related fields of study

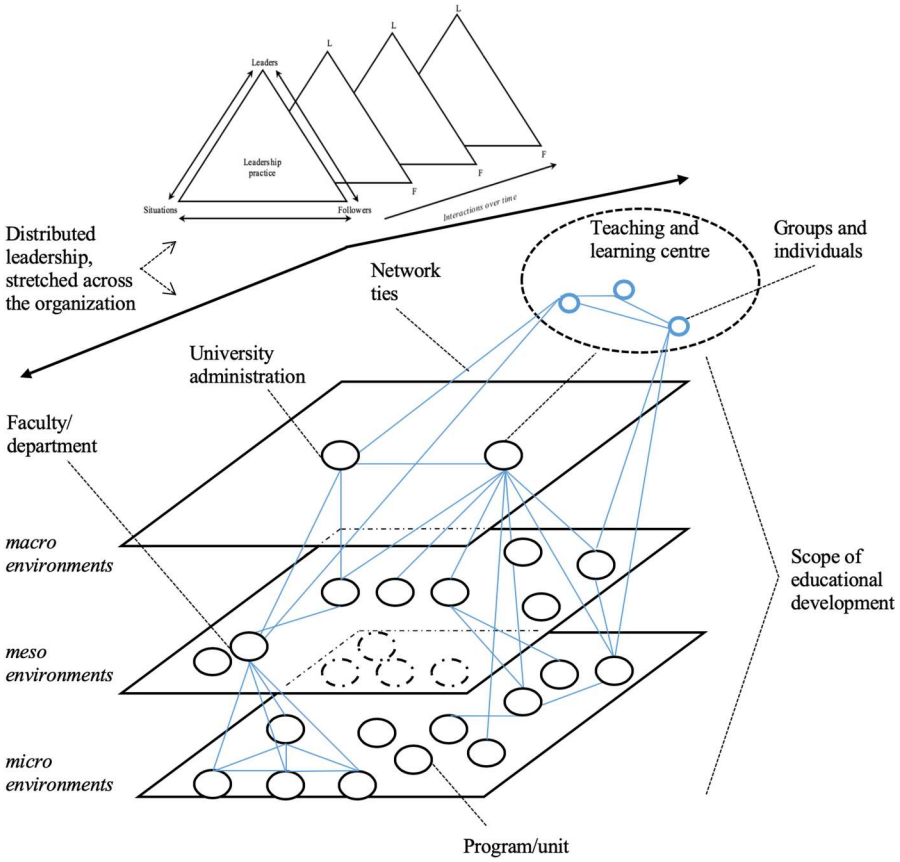

Fig. 1.2: A conceptual framework of leadership for educational development at universities

This paper introduces a novel conceptual framework designed for TLCs to enhance their role as leadership units within organizational networks, derived from a comprehensive review of intersecting literatures. It outlines the need for TLCs to adopt an organizational leadership perspective and develop informal leaders, an area previously underexplored. The framework incorporates Spillane's distributed leadership (2006) and social network analysis (SNA), addressing gaps in the literature regarding informal leadership and the use of theoretical frameworks. Grounded in complexity theory, the paper provides a robust tool for addressing TLC challenges, thus contributing a valuable resource for future research and practice in educational development.

The paper begins with an overview of the evolution, current roles, and challenges of Teaching and Learning Centers (TLCs) in higher education. It begins by tracing the origins of TLCs, noting their initial focus on student engagement and assessment and their expansion into broader roles such as institutional culture transformation. The paper details the diverse terminology and functions associated with TLCs and emphasizes the term 'educational development' (ED) for its international use and inclusive nature. It identifies various challenges faced by TLCs, such as unstable leadership, resource constraints, and the need to balance teaching with research priorities. The paper then argues for the adoption of an organizational leadership role for TLCs and suggests a strategic, system-wide approach to overcoming these challenges. To support this, the paper introduces a novel conceptual framework grounded in distributed leadership theory and social network analysis, aiming to enhance the role of TLCs as central hubs in their educational networks. This framework is designed to help TLCs better conceptualize their organizational contexts.

The next section reviews the state of research on leadership for teaching and learning in

higher education, finding that key themes include autonomy, collegiality, and distribution. Autonomy and collegiality are central, with tensions arising between individual educators' autonomy and the collaborative efforts required for effective ED. The review finds that leadership effectiveness is highly context-dependent, with variations across disciplines, institutional levels, and cultural settings. A notable theme is the distributed nature of higher education leadership, where networking and collaboration are vital. The review also identifies critical gaps, including the lack of attention to informal leadership and theoretical frameworks in existing literature. It suggests that Spillane's distributed leadership (2006), combined with social network analysis, offers a promising approach for addressing these gaps and improving TLC leadership and ED practices.

Following on from the identification of distributed leadership (DL) as a promising approach, the paper explores Spillane's concept of DL and its application to higher education. It begins by highlighting the broad and contested nature of leadership research, noting the diversity of leadership categories identified in recent reviews. The importance of incorporating theoretical perspectives into research is emphasized, particularly in qualitative studies where theory provides rigor and coherence. Spillane's DL perspective is presented as a response to the need for a more nuanced understanding of leadership, especially in complex educational settings. DL is noted for its alignment with higher education's collegial traditions and its potential to analyze leadership in practice. The section outlines that while DL is widely discussed in higher education, it is not extensively applied in TLC or ED literature. The section explains that DL recognizes both formal and informal leaders, and it sees followers as integral to leadership practice rather than as external variables. Spillane emphasizes that situations (including tools, routines, structures, and culture) are crucial in shaping leadership practice and vice versa.

The next section adds Social Network Analysis (SNA) to the framework, including complexity theory. It highlights how SNA can be used to map and analyze organizational networks within educational institutions, such as identifying key opinion leaders and understanding connections between departments. While SNA has been used in educational leadership research, it is underutilized in ED. SNA reveals relationships between individuals or groups (nodes) and their connections (ties), offering insights into network dynamics that can help improve ED practices, but university-level network mapping has not done.

Finally, the discussion section returns to the challenges identified at the beginning of the paper and suggests how the proposed framework can be applied. For example, the network mapping can identify informal leaders and maintain connections that are resilient to changes in formal leadership positions. Or, by identifying and supporting informal leaders who are already influencing teaching and learning in their local contexts, TLCs can extend their impact without over-extending their limited resources. Moreover, the framework proposes that a distributed leadership perspective can accommodate these challenges by recognizing the contributions of multiple individuals across different contexts and by leveraging the expertise of local leaders. Lastly, the discussion explores how the framework can help TLCs assess their impact. By using SNA to map the network of ED leaders and measure the growth of this network over time, TLCs can gain insights into their effectiveness. This method provides a way to track the reach and influence of TLCs across an institution, helping them to identify areas for improvement and demonstrate their value to the broader academic community.

This first article provides a theoretically rich conceptual framework grounded in the extant literatures and which directly informed the empirical element of the doctoral work. Itself, the conceptual framework is a strong contribution to knowledge.

Chapter 3: What do you mean by 'distributed leadership'?: Choosing an analytical perspective in higher education

The second article critically examines the literature on distributed leadership in higher education. An interesting thing about leadership is that most people will agree that it is important, but few people can say exactly what it is. For example, what if anything is the difference between leadership and management? In the literature, there are more conceptualizations than even many leadership theorists would be able to describe in toto. For example, what are the differences between shared leadership, collective leadership, team leadership, distributive leadership, and distributed leadership? Distributed leadership has emerged as a popular concept in higher education literature, but is lacking the critical analysis which has been applied at the K12 level.

In higher education, those who take on formal leadership roles have not necessarily studied leadership in any formal sense, which is curious considering that most professors would expect their students to read the literatures of their disciplines. Furthermore, professors in a leadership role do not necessarily see themselves as leaders (Simmons, Germain-Rutherford, Davis & Karamifar, 2022; Simmons & Taylor, 2019), and may not even consider reading about leadership. As with teaching, this isn't necessarily a handicap. Plenty of individuals with doctorates in engineering or whatever field are not only talented educators but also natural leaders. Probably, in the execution of their duties, they have learned much about people management; through experience – that *greatest of teachers* – or leadership training, or reading of the popular literature in sources such as Forbes or the Chronicle of Higher Education. However, it does mean that the literature written by and for these leaders of higher education does not tend to borrow heavily from theoretical leadership literatures.

In the K12 educational leadership literature, the three most influential perspectives are

arguably instructional leadership, transformational leadership, and distributed leadership. Of these, the instructional leadership is premised on the principle of the school principal as the leader of teaching and learning (Hallinger, 2005); this does not translate well to the university context, where academic freedom and disciplinary differences are highly influential. Transformational leadership is more about empowering followers to be the best they can be, and to motivate them towards commitment to institutional goals and values (Hallinger, 2003). While transformational leadership is more applicable to the higher education context, it is also more of a normative ideal than a way to describe how leadership actually is actually practiced.

Spillane (2004) has used the analogy of a dance to describe distributed leadership. If we watch a dance, it is not just the person who "leads" that is important. The interaction between the dancers is key, and if one of the dancers decides to improvise then the others will either adjust accordingly or not, which in turn may lead to other changes. The situation in which the dancing takes place is also highly influential. Two people doing a tango is different from a troupe of Irish tap dancers, both for improvisation and for the music which should accompany them. In order to analyse a dance, we must consider not only the "leader", but also the interactions between the dancers and the way some of them might emerge as more influential on the overall performance. And we must consider the overall situation, from choreography and context, to music and costumes. Similarly, Spillane argues, leadership is not just what formal leaders do. Leadership within a complex organization can instead be considered as an emergent phenomenon arising from interactions between formal and informal leaders and followers who interact in a situation over time.

Distributed leadership has been liberally used in both the K12 and higher education leadership literatures. This second paper, therefore, takes a critical perspective on what

distributed leadership is, and specifically reviews the higher education literature to argue that although Spillane's analytical perspective on distributed leadership is a foundational perspective, it has not been applied to the higher education context. Unlike normative perspectives on distributed leadership, this analytical perspective provides a description of what leadership is, allowing us to conduct research. Despite the growing popularity of distributed leadership in higher education, and the existence of similar literature reviews in the K12 literature, this paper is the first to provide a review of the empirical literature, in addition to being the first to propose Spillane's analytical perspective for higher education research.

The paper begins by addressing the complexity and elusiveness of leadership as a concept, emphasizing how leadership, especially "distributed leadership," has become a central topic of interest in both academic and practical contexts. Despite its widespread adoption, the definition and understanding of distributed leadership remain inconsistent, leading to challenges in its application and analysis. The introduction highlights the growing interest in distributed leadership, noting a significant increase in references to the term over the years. However, it points out the lack of a unified definition and the overlapping and sometimes confusing use of related terms such as "shared," "collective," and "collaborative" leadership. This lack of clarity can lead to challenges in both scholarship and practice, as researchers and practitioners may inadvertently miscommunicate or conduct incomplete analyses. The introduction also establishes the focus of the paper: exploring distributed leadership specifically within the context of higher education. The paper argues that while distributed leadership is often mentioned in higher education, it has not been thoroughly examined, particularly through the lens of Spillane's perspective (2006), which integrates concepts from activity theory and distributed cognition. The introduction sets the stage for a deeper exploration of these theoretical foundations and their

potential applications in analyzing and guiding leadership practices in educational institutions.

The next section of the paper analyzes how distributed leadership in higher education has been conceptualized and discussed in the literature, using a framework borrowed from Gunter, Hall, and Bragg (2013). The framework categorizes knowledge production into four types: functional-descriptive, functional-normative, critical, and socially critical. The paper first examines how distributed leadership is described in practice (functional-descriptive), noting that higher education literature often lacks a focus on this analytical perspective, though it could benefit from applying Spillane's work. It then explores the more common normative perspective, which promotes distributed leadership as a beneficial approach for managing higher education institutions, despite some inconsistencies in how it is conceptualized. The paper also discusses critical knowledge production, where distributed leadership is analyzed as an idea, revealing tensions and challenges in its implementation. Finally, the socially critical perspective is addressed, highlighting concerns about the uncritical adoption of distributed leadership, particularly regarding issues of power and diversity in higher education.

The paper then moves into a detailed presentation of Spillane’s Distributed Leadership (SDL), arguing that its theoretical foundations are often overlooked in the literature on distributed leadership within higher education. Spillane’s work, while rooted in extensive research in K-12 settings, offers a robust conceptual framework that has yet to be fully embraced or explored in higher education. SDL is grounded in three essential elements that distinguish it from more general conceptions of distributed leadership. First, it focuses on leadership practice as the central concern. This means that leadership is understood not as a set of individual actions but as an emergent phenomenon produced through the interactions of leaders, followers, and their specific situational contexts. Second, SDL emphasizes that these interactions are critical to the formation

of leadership practice; neither leaders nor followers operate in isolation, and the context plays an equally significant role. Third, the situation itself is both a product of and a contributor to leadership practice, creating a dynamic and reciprocal relationship.

Spillane's work makes it clear that SDL is not a prescriptive model of leadership but rather an analytical tool designed to help researchers and practitioners diagnose and transform leadership practices. It is not meant to replace other leadership theories but to offer a different lens through which to view leadership dynamics. For example, SDL does not negate the importance of individual leadership skills or the roles of formal leaders, nor does it suggest that everyone in an organization is a leader. Instead, it acknowledges the complexity of leadership as distributed across multiple actors, routines, and situational factors.

The paper goes on to elaborate on the two main aspects of SDL: the leader-plus aspect and the leadership practice aspect. The leader-plus aspect is the more widely recognized component, which posits that leadership is spread across multiple individuals within an organization, both formal and informal. This aspect is relatively straightforward and aligns with much of the existing research on distributed leadership in higher education. The leadership practice aspect, however, is where SDL differentiates itself. It posits that leadership practice is inherently tied to the interactions between leaders, followers, and the situation, and it is through these interactions that organizational leadership emerges. This approach draws on theories such as distributed cognition and activity theory, which view leadership as a system that is shaped by and shapes its context over time.

In addition, Spillane's framework acknowledges the role of followers and situational factors, which are often underexplored in leadership studies. Followers are not merely passive recipients of leadership but active participants who influence and are influenced by leadership

practice. Similarly, situational factors — ranging from tools and routines to organizational culture and external pressures — are integral to understanding how leadership is enacted and distributed. The paper discusses how these elements, while initially conceptualized in K12 contexts, are transferable to higher education and provide a useful lens for analyzing leadership dynamics in complex organizational settings.

Chapter 4: Who are the leaders? A social network analysis of university teaching and learning leaders from the teaching and learning centre perspective

The third article applies the conceptual framework to perform a social network analysis of the whole university organizational network of formal and informal leadership for teaching and learning.

Spillane's research in K12 settings using his analytical distributed leadership perspective (e.g. Spillane, 2004) evolved to adopt social network analysis (SNA) as a tool to analyse the complex relationships between leaders and followers (e.g. Spillane, Healey & Kim, 2010). While the higher education literature on distributed leadership has not adopted SNA, the educational development literature has begun to apply this tool. This tool is consistent with the existing idea of TLCs as hubs, and with the importance of significant conversations between professors who are colleagues engaging in the practice of teaching in higher education.

Over the course of six months, and beginning with a purposive sample of 7 educational developers and instructional designers from the TLC, 196 semi-structured interviews were conducted, representing a response rate of 55%. Participants were asked, based on the method of Spillane and colleagues, to identify individuals at the organization to whom they had gone for

advice or information about teaching and learning, or who they would go to or recommend. The case study was bounded by the organization, so although participants mentioned that they had sought advice from retired colleagues, or family members, or colleagues at other organizations, those contacts outside the organization were not included. The snowball sampling was inclusive of anyone currently holding a position within the university, including part-time professors and support staff.

The resultant network data was entered into Gephi 0.10.0, "the leading visualization and exploration software for all kinds of networks" (Gephi, 2022). Gephi is a network analysis software that creates visualizations based on network connections, and is able to calculate network metrics using algorithms from graph theory. During data collection, one professor in the natural sciences who was engaged in network analysis for empirical research (as opposed to social network analysis in the social sciences), enquired as to the software I would be using for analysis. We were amused, if not surprised, to learn that we were using the same software.

With Gephi a variety of illustrations were made for data analysis. Figure 1.3 illustrates how the actual data collected graphs on to the conceptual framework in Figure 1.2. An interesting thing seen here is that the majority of participants held no formal leadership position. Gephi allows for filtering the network to only view specific attributes based on the data entered for each node or participant. In Figure 1.3, the entire network is shown, but filtering allows isolating groups within the network such as a specific department, or only those participants who had been with the organization for more than 10 years, or whichever sets are of interest to the researcher and are included in the data collected for the network. Figure 1.3 has been colour coded based on university faculty (e.g. the Faculty of Arts is one color), but colour coding can also be adjusted to different variables. Figure 1.3 shows the nodes (which represent participants)

in different sizes, in this case based on their in-degree (in-degree is a simple network measure which is the sum of how many times another node has a directed tie into a node). This means, in Figure 1.3 the nodes with the largest size are the nodes which were nominated by other members of the leadership network.

It can clearly be seen that the majority of large nodes are in a green color (which represents the university administration), these participants are primarily TLC staff, who are formal leaders of teaching and learning at the organizational level. At the bottom of Figure 1.3, there are other large nodes who do not hold formal leadership positions and yet were repeatedly identified by their colleagues as sources of advice and information about teaching and learning. Gephi contains different algorithms to visually layout the network. In addition to allowing for visual analysis of various layouts, filtered and formatted based on characteristics of the nodes, Gephi can perform the algorithmic analysis based on graph theory.

For the purposes of this dissertation, the nodes are formal and informal leaders of teaching and learning at a university, and the roads are the exchange of information and advice about teaching and learning. If leadership is a process of social influence, the nodes are those which most often provide advice and information are the most influential and hence the 'leaders'. In the fourth chapter, the third article contains the results of network analysis for different measures of network centrality, to investigate what are the results and what that could mean for the TLC. Density of ties is another SNA measure computed by Gephi and considered in comparison to other parts of the network as well as to the literature.

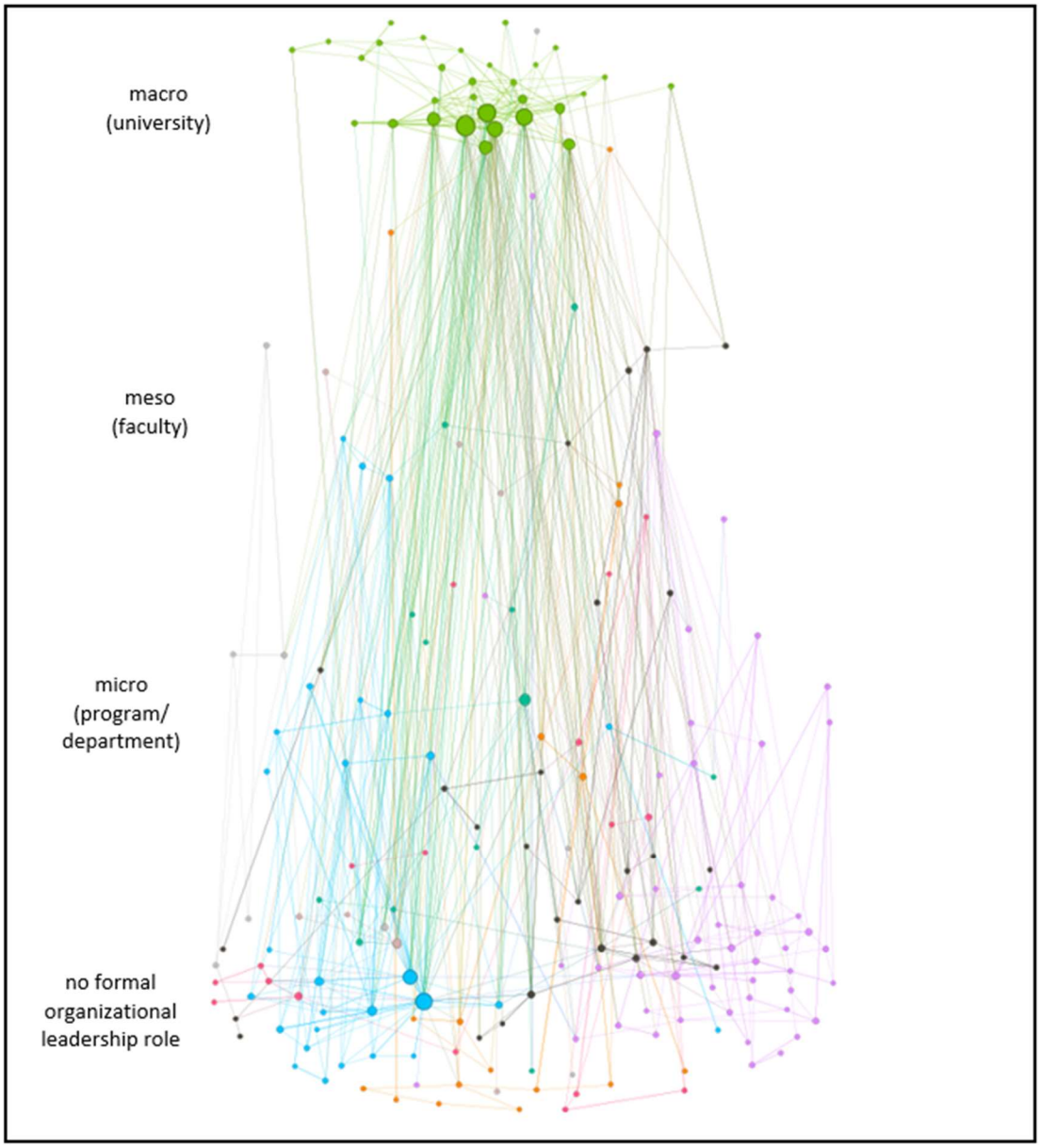

Figure 1.3: Organizational leadership network divided by organizational level

In order to try to understand the composition of the leadership network as identified through snowball sampling and centrality analysis, Pearson's r was used to explore any correlations between four different centrality measures and the following demographic variables:

- Professional development as an educator

- Years at organization
- Years as an educator
- Organizational level (macro, meso, micro)
- Organizational status (e.g. full professor, or part time staff)
- Leadership status (formal or informal)
- Research in education (have or have not conducted)

No significant correlations were found.

The contributions of this article include providing the first whole network social network analysis of university leadership for teaching and learning, the first from the TLC perspective, and the first time snowball sampling was used for populating a network in a university context.

Chapter 5: Reflections and lessons learned

In this section, I rely on my researcher reflective journal to narrate a reflection. A selection of entries from the journal are divided into sections on method, questions not asked or answered, and notes on participants.

Methodological notes include the importance of a script or notes to introduce myself and the research, the importance of having each participant sign two consent forms, the addition of providing hand delivered letters of invitation, and the inclusion of online interviews stemming from health complications (from cancer, to COVID19).

Questions not asked or answered is a section for questions that occurred to me over the course of data collection. Some of these were questions that could have been answered with the

data I had, but there was no clear purpose to do so; especially since the third article became too long. There were other questions which could not be answered with the data I had, but might be of interest to future research.

Finally, there were notes on participants. These notes are generally quite positive, as I was humbled by the caliber of organizational leaders I was fortunate to interview, and overall I noted more than once how I was struck by the general charm, pleasantness, and charisma of the participants.

Given the struggles I experienced trying to get permission to do this research during the early years of my doctoral degree, the researcher reflective journal documented a journey from fear and insecurity, to positivity resulting from the success of the methodology and the interactions with the participants, who were described in the journal as “awesome”.

Chapter 6: Conclusion

The conclusion chapter tells a narrative of my doctoral journey, ending with a summary of conclusions from the three articles.

References

Since the first two papers are literature reviews and heavily referenced, and some references are repeated across the three papers, the dissertation as such is not heavily referenced at the end. Any references that are used in the first, penultimate, and final chapters are included in the reference list at the end. Glossary references are also included.

Chapter 2 (Article 1): Teaching and learning centres as leadership units in an organizational network: A conceptual framework for research and practice

Abstract

Teaching and Learning Centers in different forms have become common on university campuses across the globe. Despite variation in structures and activities, these centers are unified in their commitment to educational development and typically face common leadership challenges within their organisations. These challenges include: unstable leadership structures; resource constraints; working in contested areas such as epistemology/pedagogy, academic freedom, and the role of the center; teaching being viewed as a low priority of faculty and/or administration, compared to research; and assessing/evaluating their impact. With these challenges in mind, this paper critically reviews the literatures on leadership for teaching and learning in higher education, including educational development and leadership of Teaching and Learning Centers. The review suggests Teaching and Learning Centers need to consider contextual differences within the organization, leadership distribution, organizational networks, and interactions between colleagues at the university. This literature-based paper presents a novel conceptual framework that is epistemologically grounded in complexity science and integrates Spillane's analytical distributed leadership and social network analysis, as a potential tool for TLCs to address the aforementioned challenges. The paper concludes with a brief discussion of practical applications for meeting the challenges of leading Teaching and Learning Centers identified through the review of the literature.

Key words: teaching and learning centers, educational development, leadership for teaching and learning, Spillane's distributed leadership, social network analysis

Introduction

This paper presents a novel conceptual framework for research and practice of Teaching and Learning Centers as leadership units in an organizational network, based on extensive reviews of overlapping areas of literature. According to Collins and Stockton (2018), a conceptual framework can be loosely described as a framework that serves as a guide to illustrate the interconnectedness of various sources and concepts, in order to demonstrate the cohesive relationship and integration of existing literature within a research context. In order for TLCs to take on an organizational leadership role, this review argues that informal leaders should be identified and developed within their contexts and the proposed conceptual framework is a useful tool to achieve this.

The literature covered here was identified using a snowballing technique. First, databases such as EBSCOhost, Google Scholar, and the database searching university library website were used to search for a variety of relevant terms. Relevant terms included 'teaching and learning centers', 'higher education leadership', 'university teaching and learning leadership', 'educational development leadership', 'educational development', etc. As relevant articles were identified, further sources were identified and those references were also sought out. For particularly relevant articles, the reverse citation function of Google Scholar was used to identify newer publications which cited the older papers. Finally, email alerts were set up for journals which offered that service, to keep the literature current. These included *Studies in Higher Education,* or *Educational Management, Administration, and Leadership*.

The first section summarizes literature to introduce Teaching and Learning Centers (TLCs), from their beginnings and their work of educational development, to the challenges they face and the suggestion in the literature to adopt a leadership approach that considers the whole

organization. This section aims to emphasize that TLCs take an organizational leadership perspective on their work, an area where little research has been done specific to TLCs.

The next section reviews literature on leadership for teaching and learning in higher education, highlighting recurring themes of autonomy and collegiality, the importance of contextual differences, and leadership distribution. Critically, the review notes that informal leadership is largely absent from the extant literature, which is curious given the recurring themes. A second critical point is the absence of theoretical and conceptual frameworks used in the reviewed literature. The current paper thus fills a gap by providing a theoretically rich conceptual framework upon which future work can build.

The third section introduces Spillane's distributed leadership (e.g. Spillane, 2006). The usage of the concept of distributed leadership in the literature skews heavily towards a normative perspective on leadership distribution as desirable, while Spillane's conceptualization as a tool for analysis of leadership in practice is absent in the extant higher education literature. The contents of this section therefore provide an overview of Spillane's distributed leadership, which provides the leadership theoretical lens for the conceptual framework.

Methodologically, the conceptual framework incorporates social network analysis (SNA). The fourth section of this paper introduces SNA including higher education leadership work previously conducted. Of note, the educational development literature has in the past decade begun to incorporate social network analysis on a small scale, but the extant literature has not considered a leadership perspective at the organizational level, as presented in the conceptual framework. Social network analysis takes into consideration the collegial and distributed nature of higher education leadership, and is consistent with Spillane's distributed leadership.

Epistemologically, the conceptual framework is grounded in complexity theory, covered briefly in the fifth section. Explicit underlying epistemologies are absent from much of the

literature reviewed in the justification and construction of the conceptual framework. Complexity is useful as it is pragmatic, and powerful as it can include aspects such as power and culture which play a role in leadership but are not explicitly included in the conceptual framework.

The discussion section returns to the challenges faced by TLCs, and how the conceptual framework presented in this article can be applied to address them. The novel conceptual framework presented here is theoretically rich, and grounded in different but overlapping literatures. The contribution to the field is a comprehensive tool for research and practice towards TLCs as network hubs for leadership of educational development.

Teaching and learning centers

North America's first TLC was created in 1962 at the University of Michigan as "a voluntary unit that relied largely on a network of motivated professors to transmit interests and ideas" (Grabove et al., 2014, p.3). The UK, Canada, Australia, West Germany, and Sweden also opened TLCs in the sixties and seventies (Gosling, 2009; Grabove et al., 2014; Moses, 1987), and today subsections dedicated to teaching and learning exist at many universities globally. TLCs may have different names, such as: academic support centers, instructional development centers, educational development centers, staff development units, educational professional development units, and, educational development units (Bédard, Clement & Taylor, 2010; Gosling, 2001; Gosling, 2009; Stigmar, 2008; Knight, Tait, & Yorke, 2006; Havnes & Stensaker, 2006; Moses, 1987; Diamond, 2005; Simmons, 2010). Early centers focused on student engagement and learning assessment, "but more recently a broader role for TLCs is emerging: as facilitators of the transformation of institutional culture" (Clark & Saulnier, 2010, p.111).

The work of TLCs includes "improving teaching and learning methods across the institution and providing staff development relating to teaching and learning" (Gosling, 2001,

p.81). In scholarship and practice this encompasses and overlaps with a variety of terms such as: academic development, faculty development, instructional development, educational development, professional development, organizational development, the scholarship of teaching and learning, curriculum development, and/or organizational development (Gosling, 2001; Gosling, 2009; Ouellett, 2010; Taylor and Colet, 2010). Specific work at any TLC may incline it towards specific terms, and at times 'academic/faculty development' is tangential to teaching and learning, such as general leadership training, disciplinary grant writing workshops, and so on. This paper adopts the term 'educational development' (ED), because it is a term broadly used internationally, has been argued as the most inclusive term (Ouellett, 2010), and is characterized "by the focus on the range of development activities that are applied and that work in synergy to strengthen learning and teaching capacity" (Taylor & Colet 2010, pp.144). Bédard, Clement, and Taylor (2010) offer a comprehensive conceptual framework encompassing the meaning and scope of educational development, validated through consultations with international colleagues. The conceptual framework presented in the current paper adopts the meaning and scope put forward by Bédard, Clement, and Taylor (2010).

ED is important, because, since 1985 "the discipline of teaching and learning in higher education has developed and there is a growing consensus as to what constitutes effective teaching in higher education, how students learn, and how to improve teaching through both professional development and the scholarship of teaching" (Fraser, 2005, pp.159). Examples of this consensus can be found in Chickering and Gamson (1987), Christensen Hughes and Mighty (2010), and Biggs and Tang (2011). In these works, active learning is a specific example of how students can positively benefit from professors. According to a meta-analysis of 225 studies on undergraduate STEM courses, when comparing lectures to active learning, active learning leads to a nearly 50% improvement in exam performance. Moreover, lecturing is associated with a

55% higher failure rate. These positive effects on academic achievement are consistent across all STEM fields and apply to classes of all sizes, different types of courses, and various levels of difficulty (Freeman et al., 2014). Since teaching faculty often have little or no formal training or expertise as educators (Brancato, 2003; Grabove et al., 2014; Havnes & Stensaker, 2006; Van Waes et al., 2018), TLCs play an important role in keeping them informed of these developments and their implementation.

TLCs engage in ED in a variety of ways, and act metaphorically as the hub of a wheel where the spokes represent context-specific information flows (Singer, 2002). They might offer technological support, teaching or research training, project funding, and more (see Gibbs, 2013, p.6-7; Gosling, 2009, p.13). While TLCs tend to be centrally located in university administrations, a distributed model can be found where ED goals are pursued by a variety of employees across multiple departments. This is common at traditional universities in the UK (Gosling, 2001), while Norway and Denmark have tended to have the former and latter, respectively (Havnes & Stensaker, 2006). The theme of distribution recurs in the TLC literature, as well as the higher education leadership literature which will be discussed below. In order to accommodate distribution theoretically, the conceptual framework will incorporate distributed leadership, which is also discussed below.

Before moving on to new literatures, the TLC and ED literature includes reference to challenges faced. Overcoming such challenges was the impetus for the creation of this conceptual framework. Different contexts can present a variety of obstacles to ED (Stigmar, 2008), but TLCs generally face challenges as summarized in Table 1.

	unstable TLC leadership structures	**resource constraints**	**working in contested areas such as epistemology/pedagogy, academic freedom, and the role of the center**	**teaching seen as a low priority compared to research**	**assessing or evaluating their impact**
Bédard, Clement & Taylor, 2010		X			X
Bélanger, Bélisle, & Bernatchez, 2011					X
Challis, Holt, & Palmer, 2009	X	X	X		X
Cooper, 2004			X		
D'Andrea & Gosling, 2001				X	X
Diamond, 2005	X				
Forgie, Yonge & Luth, 2018	X	X	X	X	X
Fraser, 2005		X	X	X	
Grabove et al., 2014		X		X	X
Gosling, 2009	X			X	
Gosling & Turner, 2014	X		X		
Havnes & Stensaker, 2006			X	X	
Holt, Palmer, & Challis, 2011		X	X	X	
Moses, 1987		X	X	X	X
Palmer, Holt & Challis, 2010	X	X	X		
Pchenitchnaia, 2007		X		X	X
Scott & Scott, 2016				X	
Smith & Gadbury-Amyot, 2014					X
Thompson, 2004		X	X	X	X

Table 1: A summary of challenges faced by TLCs as reported in the literature

It has been suggested that TLCs address challenges systematically and organizationally (Brancato, 2003; Forgie, Yonge & Luth, 2018; Gosling, 2001; Grabove et al., 2014; Groccia, 2010; Grupp, 2014; Havnes & Stensaker, 2006; Holt, Palmer, & Challis, 2011; Jolly, 2014; Kenny et al., 2017; Kolomitro & Anstey, 2016; Steinert et al., 2016). TLCs are well positioned

to embrace an organizational leadership role (Holt, Palmer & Challis, 2011; Taylor, 2005). Ling (2005) reminds us that ED extends to the facilitation of learning through complex systems of people, technologies, organizations, and structures. In this environment, educational developers "are increasingly recognized for their expertise, not only with respect to teaching, learning, and academic culture, but also for their abilities to facilitate learning in the organization" (Taylor, 2005, p.37).

However, when working at the organizational level, standardized and pan-institutional ED efforts may misalign with individual and disciplinary interests of autonomous professionals who make up the professorate (Havnes & Stensaker, 2006; Pearson & Trevitt, 2005). In this case, departments and disciplines can provide valuable organizational middle ground between TLCs and individuals (Athey & Hoffman, 2007; Baxley et al., 1999; Jenkins, 1996; Matthews et al., 2015; Radloff, 2005; Taylor, 2010; Trowler & Cooper, 2002). Here, we see the importance of local leadership, distributed around the university and incorporating the voices of informal opinion leaders who may speak for their colleagues.

It follows that TLCs should strategically position themselves as facilitators at the hub of a pan-organizational network at multiple levels (Holt, Palmer, and Challis, 2011; Pearson & Trevitt, 2005; Thompson, 2004). This paper presents a conceptual framework for doing so (Figure 1). Collins and Stockton suggest that "perhaps the best way to display a conceptual framework is to design a visual image or map of how existing ideas in the literature work together" (2018, p.5), hence the creation and inclusion of the illustration in Figure 1. Figure 1 is the result of the literature review which is presented in this paper, and is presented here as a preview to assist the reader in seeing how the different pieces come together.

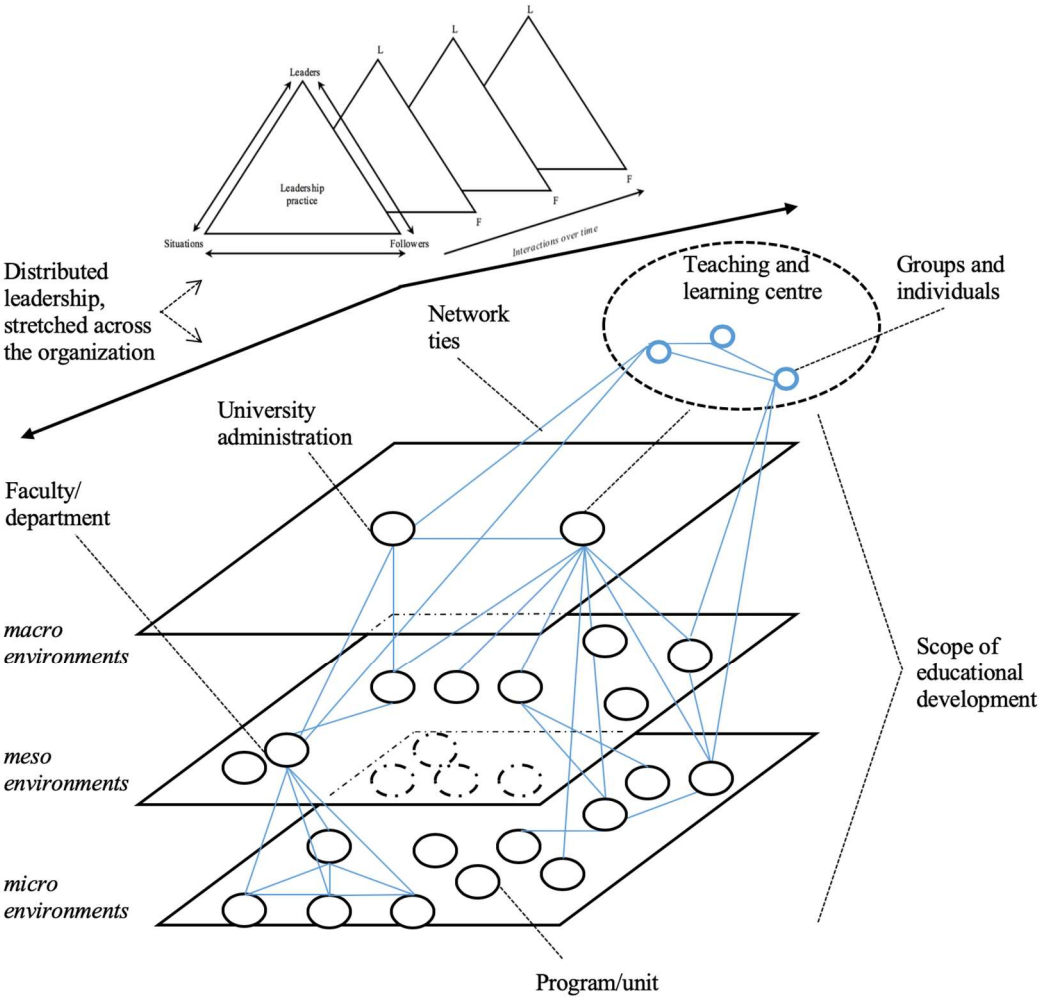

Fig. 1: A conceptual framework of leadership for ED at universities

The conceptual framework acknowledges that leadership at universities is distributed across levels and among colleagues working largely autonomously. In this environment TLCs are embedded in a network of colleagues who may or may not be involved in educational development activities. Spillane's distributed leadership (2006) provides a practiced-oriented and established tool to frame leadership distribution, and is consistent with SNA which provides a methodological tool to describe and compare patterns of interactions among colleagues.

Leadership for teaching and learning at universities

The conceptual framework is meant to assist TLCs which are embedded in higher education organizations. Hence, the literature on leadership for teaching and learning in such organizations was consulted and incorporated. Leadership *specifically* for teaching and learning in higher education is the focus of this review, an area of research which has been described as "scant" (Marshall et al., 2011, p.88) and "woefully inadequate" (Gunn & Fisk, 2013, p.42), "understated" (Kinnunen, 2024, p.265), and in the case of meso-level leaders "still in its infancy" (Maddock, 2023, p.18). The following review synthesizes empirical literature on leadership for teaching and learning at universities, focusing on ED and TLC leadership-oriented publications.

Key themes

Autonomy and collegiality are a recurring theme in this literature. Autonomy is a traditional principle in academia, granting individual educators the right to decide what and how they teach; tension arises when a third party such as a TLC seeks to change teaching methods, requiring leadership dependent on collegial cooperation (Gibbs, Knapper and Piccinin, 2009; Gunn & Fisk, 2013).

Autonomy and collegiality are evident concerns in the ED and TLC literature. ED leaders have "explicitly cautioned against playing the role of 'expert' with colleagues from across the disciplines" (Taylor, 2005, p.36), while academics have been considered unlikely to adopt mandatory changes to teaching and learning practices (Cooper, 2004). Collegiality, rather than power, describes the relationship between ED leadership and teaching faculty (Blackmore, Stainton and Wilson, 2005). While power relations characterize teaching and learning micro-cultures within departments, they are more evident in professor-student relations than among academic staff who maintain a position of autonomy (Trowler & Cooper, 2002). When ED

opportunities are provided, teaching faculty tend to prefer those which are collaborative or collegial (Ferman, 2002). An interesting sub-theme of collegiality and autonomy is that faculty members may be willing and able to pursue ED more or less independently given appropriate support (Andrews et al., 2016; Amudsen & Wilson, 2012; Ferman, 2002; Knight, Tait & Yorke, 2006).

Gibbs, Knapper and Piccinin (2009) conclude that "it is abundantly clear that there is no simple recipe for successful leadership of teaching and that what is likely to be supportive of excellent teaching is highly context-dependent" (p.57). Martin, Trigwell, Prosser and Ramsden (2003) investigated perceptions of leadership, finding great variation in the ways that leadership was perceived by the department heads, with even greater variation held by 'follower' teachers, sometimes within the same department. The authors attribute these variations to differences in local contexts. Trowler (2005) argues that "because of very different histories and contexts, different cultural milieux and therefore different [Teaching and Learning Regimes], what is 'best' for one place will be sub-optimal elsewhere" (Trowler, 2005, p.26). This is consistent with the findings that context was considered by participants to be a key consideration in leadership for ED (Blackmore, Stainton and Wilson, 2005; Mårtensson & Roxå, 2016; Taylor, 2005; Trowler & Cooper, 2002). Havnes and Stensaker (2006) posit that TLCs must be understood as a part of their institutional context, and that TLCs are tasked with assisting the development of that context. They further argue that the potential success of TLCs is also dependent on the constraints of this context.

Contextual differences can include disciplines and levels. Gibbs, Knapper and Piccinin (2009) found that while academic disciplines had a major impact on leadership of teaching and excellence-associated change, department size and country did not. According to research by Irving (2015), the importance of working within disciplinary communities was a key aspect of

leadership in academic contexts. Different contexts can also be found at different levels of the organization. For example, Marshall et al. (2011) found that responsibility for teaching and learning leadership and management was understood to be shared across multiple contexts and the institutional (macro), faculty/department (meso), and program/unit of study (micro) levels, and was diversely practised and distributed by individuals and groups. The importance of intra-organizational levels is further highlighted when we consider that heads of development typically believe their responsibility lies at the macro level (Blackmore, Stainton & Wilson, 2005). It has been noted that the missing level of research analysis is that of small groups (Trowler, 2005), even though -as Heinrich (2013; 2015) has noted- all teaching academics belong to teaching groups, within their department/discipline by default and sometimes across disciplines. Heinrich adds that, "if teaching groups can be put on the map of higher education institutions, and if management issues can be addressed, a start is made in altering the forces affecting engagement with teaching" (2013, p.468). Heinrich (2015) also notes that making teaching groups explicitly visible within the micro to macro organizational structure can help to understand how they formed and how they can be supported. The conceptual framework presented in Figure 1 provides a theoretically grounded method of doing so which TLCs can adopt and apply. The framework explicitly includes the levels as elucidated by Marshall et al. (2011)

A third and final theme informing the conceptual framework presented in this paper is distribution. Gibbs, Knapper and Piccinin (2009) found that "some form of dispersed leadership was visible in every department" (p.11). In keeping with leadership distribution, networking was considered important for ED leaders (Blackmore, Stainton and Wilson, 2005; Taylor, 2005). The links between TLCs and faculties are considered both crucial and insufficient (Palmer, Holt & Challis, 2011), which some TLCs try to address through the strategy of supporting key change agents and through establishing teaching and learning groups (Gosling 2001). Grabove et al.

(2012) suggest that building a community of faculty interested in teaching and learning across the organization can contribute to support and sustainability within learning communities. The best ways to nurture these champions of teaching and learning will likely be highly context specific, but a likely first step in any institution would be to identify who are the key change agents across the institution; the conceptual framework presented in this paper uses a distributed leadership perspective and social network methodology to do so.

Critical points

The extant higher education literature on teaching and learning tends to focus on formal leadership (Gunn & Fisk, 2013). In those ED studies where 'leaders' were studied, participants were in formal positions with regard to influencing ED (Athey and Hoffman, 2007; Blackmore, Stainton and Wilson, 2003; Blackmore, Stainton and Wilson, 2005; Mårtensson & Roxå, 2016; Taylor, 2005). At TLCs, when 'leaders' were included in the participants, they held formal positions (Challis, Holt & Palmer, 2009; Forgie, Yonge & Luth, 2018; Grabove et al., 2012; Gosling, 2001; Holt, Palmer & Challis, 2011; Palmer, Holt & Challis, 2010; Palmer, Holt & Challis, 2011). Informal leadership thus seems to be an understudied phenomenon. This conceptual framework incorporates informal leadership through integration of Spillane's (2006) perspective on distributed leadership.

Another feature of the literature on teaching and learning leadership in higher education is that conceptual/theoretical frameworks do not play a noticeable role, nor does leadership theory. ED in particular has been described as an atheoretical field (Bédard, Clement & Taylor, 2010). While there exists a large body of literature on change and leadership within educational contexts most is in schools rather than universities, and Trowler suggests that much of this literature "is under-theorised, or applies theory in rather undeveloped and inelegant ways" (2005, p.21). Where

theory is introduced or mentioned in the literature reviewed here, it rarely plays a cohesive and consistent role in research design. Some ideas or theories are presented, notably: activity theory, change, communities of practice, and culture. Conceptual/theoretical frameworks were not noticeably written into the data collection and/or analysis (exceptions being Crawford, 2008; Gibbs, Knapper & Piccinin, 2009; Holt, Palmer & Challis, 2011; Knight, Tait & Yorke, 2006; Spowart, Turner, Shenton & Kneale, 2016). Reference to the literature on leadership theory is rare (exceptions being Gibbs, Knapper & Piccinin, 2009; Knight & Trowler, 2000; Ramsden, Prosser, Trigwell & Martin, 2007). Since the above review of leadership for teaching in university contexts reveals the importance of autonomy, collegiality and context, and an apparent lack of attention to leadership theory or the use of explicit conceptual frameworks, I turn next to the work of Spillane on distributed leadership which, I suggest, is a way forward for TLC leadership and ED practice.

Spillane's distributed leadership

According to Richards (2012), modern scholarship into the meaning of leadership has been ongoing since the 1920s. Leadership is a concept strongly ingrained in the collective mind of human societies and yet highly contested by scholars (Bolden, Hawkins, Gosling & Taylor, 2011; Meindl & Ehrlich, 1987; Vroom & Jago, 2007). For example, in a review of articles published in the top ten leadership journals between 2000 and 2012, Dinh and colleagues (2014) identified 47 established and 33 emergent thematic leadership categories; not theories or perspectives, but categories of theories and perspectives. It was noted in the above reviews that explicit theoretical positions were not typically present, but integrating theory into academic work is beneficial for several reasons. For example, given that there are so many ways that 'leadership' can be conceptualized, what specific perspectives on leadership are being used in this or that study?

Without a specific and articulated vision of leadership, how can studies be compared or how can they build on previous work? While overreliance on theory can hinder research, or theory can be difficult to relate to practice, theory and epistemology which inform methodology is a signal of rigor particularly in qualitative research (Collins & Stockton, 2018). Consistent with the above themes of distribution, this conceptual framework incorporates distributed leadership. Specifically, the distributed leadership perspective articulated by Spillane as tool for analyzing leadership in practice.

Distributed leadership (DL) has emerged as a popular leadership paradigm in higher education literature, and Marshall et al. (2011) note that "a concept of distributed and transient leadership is liberally described in the higher education literature on leadership and management" (p.89). It has been argued that the collegial and collective traditions of shared governance and academic freedom align well with a broad perspective on distributed leadership (Burke 2010; Gosling, Bolden & Petrov, 2009). Despite growing interest in DL in higher education, it is not evident in TLC or ED publications.

In empirical higher education literature the most common usage of DL is a normative one, based on the assumptions that DL is desirable and that techniques can be identified to facilitate it. Although these and other publications about DL in higher education add to the richness of the field, what is absent are journal publications employing an analytical perspective on DL, and in particular, that put forward by Spillane and colleagues. The upper left corner of Figure 1 shows a conceptual illustration of Spillane's DL (adapted from Spillane, 2006).

Spillane's particular distributed perspective on leadership was grounded in the core work of instruction in K12 schools (Spillane, Halverson & Diamond, 2001; Spillane & Diamond, 2007a). Although a range of leadership and other literature has been applied to support DL (see, for example, Spillane, Halverson & Diamond, 2004), the core concept is based on the theoretical

roots of distributed cognition and activity theory. Melding distributed cognition and activity theory, rather than individual traits being of interest, leadership cognition and leadership activity are distributed across people and material/sociocultural situations (Spillane, Halverson & Diamond, 2004). Further, from a distributed perspective, practice is not simply what activities are performed by who, but also how, why, and when interactions among leaders and followers occur (Spillane & Healey, 2010; Diamond & Spillane, 2016). Practice is understood to be stretched over social and situational contexts (Spillane, Diamond & Jita, 2003), and has a particular framing "as a product of the joint interactions of school leaders, followers, and aspects of their situation such as tools and routines" (Spillane, 2006, p.3).

Spillane and colleagues have recognized the value of exploring different perspectives of distributed leadership (e.g. Diamond & Spillane, 2016). At the same time, Spillane (2006) notes that the common usage of distributed leadership simply acknowledges the multiple-individuals aspect, while DL from his perspective has three essential elements:

1. Leadership practice is the central and anchoring concern.
2. Leadership practice is generated in the interactions of leaders, followers, and their situation; each element is essential for leadership practice.
3. The situation both defines leadership practice and is defined through leadership practice. (p.4)

DL acknowledges that leadership is stretched over multiple formal and informal leaders who work together and apart (Spillane & Orlina, 2005; Spillane et al. 2008). Spillane and Healey (2010) posit that although formal leaders would always maintain their leadership status, informal leaders may emerge depending on the situation.

DL sees followers as both a constituting (i.e. core component) and a mediating constitutive (i.e. influencing factor) element of leadership practice, as opposed to a variable external to leadership practice (Spillane, Halverson & Diamond, 2004). For example, "followers choose to listen to leaders and decide which leaders and leadership messages should be heeded and which should not" (Spillane & Diamond, 2007a, p.9). Followers, while acknowledged as an important component of a distributed perspective on leadership practice, have received less attention in research than the leader-plus aspect, or the situation dimension.

Aspects of the situation are 'constitutive of and constituted in' DL practice (Spillane, 2006). This means the situation is both a defining element of leadership practice and is shaped by leadership practice. Spillane frequently discusses situation in terms of tools and routines, which allow interactions to be scripted and patterned. He notes that structures, culture, language, etc. are also worthy of consideration but that those are outside the scope of that book (Spillane, 2006). The situational aspect of discipline of instruction has been found to result in differences in leadership distribution (Spillane, 2006; Spillane & Diamond, 2007b), a result consistent with research in higher education.

Practical advantages of taking a distributed perspective include: expertise and knowledge from multiple leaders is already distributed and exceeds that of individuals; distribution facilitates management of leadership; and, developing individuals without considering multiple leaders may lack efficiency (Spillane, 2006). In addition to this, a diagnostic consideration of how leadership is practiced can be a "design tool for thinking about the improvement of leadership practice" (Spillane, 2006, p.89). Next, we move to social network analysis, a methodological tool for mapping the interactions between followers and leaders.

Social network analysis in educational development

Spillane's has also used social network analysis techniques to investigate aspects of educational leadership in schools (e.g. Spillane & Shirrell, 2017). At the same time, as covered above in the section on TLCs, it has been suggested that TLCs view themselves as a hub within an organizational network. Social network analysis (SNA) provides a tool for mapping the organizational network, such network maps can be used to identify aspects of the network such as key opinion leaders or weak ties between the TLC and different departments across the institution. With more research, patterns may be identifiable which TLCs can use to improve the efficacy of their work.

SNA follows from the premise that patterns among and between individuals can be mapped and analyzed with the assistance of mathematical graph theory and computation. In SNA, the relations between actors in a network and the influence of their environment is the primary focus (Borgatti & Ofem, 2010; Brass, Galaskiewicz, Greve & Tsai, 2004). These actors are considered 'nodes' on the network, and can be made up of individuals or groups (Borgatti & Foster, 2003; MacAulay, 2010). Relationships connecting nodes are network 'ties', a single focal actor is an 'ego', and nodes connecting to the ego may be called 'alters' (Borgatti & Foster, 2003). Empirical work on leadership and social networks is minimal (Brass, Galaskiewicz, Greve & Tsai, 2004), although "the potential synergy between leadership research and social network approaches is huge" (Balkundi and Kilduff, 2006, p.435).

A review of SNA in higher education by Kezar (2014) noted that student access and success was the primary focus, with informal network operations, network structure and ties (strong/weak, connectedness, longevity, organic/artificial, diversity, and interactions), the unknown roles central actors and opinion leaders as possible areas for future research. Research on faculty members' social networks has not been widely conducted (Van Waes et al., 2015a).

However, following from Roxå & Mårtensson (2009), theoretical discussions and empirical investigations can be increasingly found in the ED and related literatures. From the literature, the following conclusions can be drawn about SNA in ED contexts. First, academics who teach have conversations with peers about teaching (Pyörälä et al., 2015; Rienties & Hosein, 2015; Roxå and Mårtensson, 2009; Thomson, 2015). Second, actors in these conversations can be mapped onto formal and informal networks (Rienties & Kinchin, 2014; Rienties & Hosein, 2015; Van Waes et al., 2015a). Third, looking at network ties provides insights. For example, ties between actors can be strengthened through: friendships (Rienties & Kinchin, 2014, Van Waes et al., 2015b), trust, supportive departmental cultures, and, physical proximity and access (Van Waes et al., 2015b).

These early steps in the use of SNA in ED contexts suggest that there is much inquiry scope remaining. Theoretically, SNA can be used to investigate a range of variables and perspectives related to ED, from age and gender, to culture and discipline (Rienties & Hosein, 2015). Van Waes et al. (2018) raise the questions of how network content, diversity, and size might interact, and how these combinations of interactions might be important for ED.

Leadership is not typically a component of these SNA publications, though two exceptions were found. Andrews et al. (2016) were specifically looking for opinion leaders influencing teaching and learning in their faculty. Quardokus Fisher et al. (2019) also look at leadership in the context of change. However, unlike the comprehensive framework described in the current paper they did not incorporate leadership theory into their studies.

Practically, TLCs can use network visualizations for identifying groups with cohesive learning ties, or groups which are isolated (Rienties & Hosein, 2015). When isolated groups are identified, educational developers can be weak ties that connect network groups (Matthews et al., 2015), or identify other potential bridge builders (Rienties & Hosein, 2015). Networks can be

nurtured, diversified in terms of teaching experience and expertise, and teachers can be encouraged to "more frequently consult others for information or advice around their teaching practice, i.e. in terms of seeking solutions, meta-knowledge, problem reformulation, and validation" (Van Waes et al., 2018, p.3). Simply "increasing university teachers' network awareness and intentionality may be a valuable element in a [professional development] program for these teachers" (Van Waes et al., 2018, p.2). However, identifying and exploring the demographic characteristics of nodes on a network, and the various ties connecting them, becomes a complex task.

Epistemologically, the proposed conceptual framework is underpinned by complexity theory. Complexity theory, or, complexity science, aims to understand complex systems that are greater than the sum of their parts, and are self-organizing and adaptive (McMurtry 2008). Organizational systems generally, and social networks specifically, thus fall under the complexity umbrella. Emergence is a useful idea from complexity theory (McMurtry, Rohse & Kilgour, 2016) which lends itself to leadership as an emergent phenomenon, particularly in the case of informal leadership. Through a complexity lens, models and theories (such as DL and SNA) are not representations of truth so much as pragmatic tools which can inform interactions and realisations (Osberg, Biesta & Cilliers, 2008). ED is itself a complex field, as individual educational developers work through different perspectives across the disciplines within their institutions (Cruz et al., 2022). Since much of the literature reviewed above does not explicitly state an epistemological position, doing so is another advantage of the conceptual framework presented in the current paper.

Discussion

This novel conceptual framework synthesizes the literature for teaching and learning leadership in higher education. Figure 1 includes a summary: a TLC which is likely centralized, engaging in a range of ED development activities, within and across a university organization which has a variety of contexts and groups at macro, meso and micro levels, including within different disciplines and departments. To this was added theoretical and conceptual frames to further address autonomy/collegiality, context, distribution, formal/informal leadership, and leadership theory: specifically, Spillane's distributed leadership and social network analysis. The resulting framework is thus directly informed by the themes which emerged from the literature reviewed above. Moreover, it addresses the theoretical gaps by incorporating specific and relevant theoretical and methodological aspects.

As mentioned in the TLC section, context is important. There is no panacea or one-size-fits-all solution to the challenges faced by TLCs. The purpose of this paper is to present a literature-based review of TLCs and their work, and present relevant and overlapping literatures that can inform thinking around practical solutions and empirical research. This paper opened with a description of TLCs and the challenges they face (Table 1). I argue that the proposed conceptual framework might serve as a useful tool to address the challenges faced by TLCs in the following ways.

First, the challenge of unstable TLC leadership structures. In the case of leadership turnover at TLCs, by having a literal map of ED leadership across the university which can be achieved through SNA, knowledge of social connections around campus could first be identified and thereafter maintained. Such a map would include informal leaders identified by colleagues through the process of map building. When the managerial structure of a TLC changes, the ED leadership outside of the unit may remain isolated from change effects but intact for future

consultation. TLCs could construct such maps using either an online survey format or an interview format to query information and advice seeking behavior. Advantages of the online format include the possibility to mass email to all members of the university community, and the participants could voluntarily name colleagues. This is logistically convenient, and the results could be easily entered into SNA software for analysis. A likely disadvantage of the email survey approach would include email and survey fatigue, whereby while the whole network would be invited to participate some may decline. Alternatively, participants could be invited to take part in interviews. The interview approach would be more time intensive for the TLC member assigned this research activity, but would give prospective participants the opportunity to meet the researcher and ask questions to clarify the intentions of the research and what types of information are sought specifically. Especially for new staff at TLCs, such a research project would require them to get out of the center and explore the campus in ways that they otherwise might not despite working for the institution for years.

With respect to DL, the TLC could collect and collate include artefacts, documentation that influences teaching and learning at the institute as a way to maintain leadership stability in the face of unstable leadership structures. From a distributed leadership perspective, tools and routines are a central part of leadership practice which does not change when people shift positions, although knowledge of what tools and routines exist to influence leadership practice may be lost. Routines common at most universities include student evaluations of courses, teaching awards, and grants for teaching and learning research. Some of these tools might be under the TLC, but different departments might offer different tools. The conceptual framework serves as a guide to name (and collate) what is being done across the campus, and identify how the TLC can support these activities if they are not already doing so.

The second challenge of resource constraints can be, and has been, addressed through taking a distributed perspective on leadership. Faculty fellows, formal ED leaders, volunteer professors, or some other departmental representative outside of the TLC, are contacts motivated to influence teaching and learning in their local context, but not relying heavily on TLC resources. SNA adds to this by giving TLCs a tool to map out where they have, and do not have, such ambassadors. By exploring existing networks, unknown informal ED leaders can be identified, supported and brought into conversation with each other as a continual effort to enhance networks and connections. For example, if a TLC were to use interviews and snowball sampling to map out the network, SNA can identify who are the most central individuals who are reported to be already influencing teaching and learning in their local contexts. What do these individuals find is effective with their colleagues and within their disciplines? What more could the TLC do to support them specifically? Further to this, identifying documents that that are recognized as having an impact on teaching and learning practices, such as course evaluations, can be an efficient way to influence teaching and learning behavior and practice. By conducting analysis of distributed tools and routines contained within documents, TLCs can identify which are more influential. It is possible, for example, that faculty do not take teaching evaluations seriously because they see them as largely political. Or, perhaps faculty are not applying for teaching grants because they have no ideas on how to conduct scholarship of teaching and learning research. Perhaps the only tool which the faculty take into consideration is the student evaluation of the course, since this is a mandatory exercise and having low evaluations will directly impact them. Focusing limited resources on impactful activities requires first acknowledging that such tools and routines are a part of how leadership is distributed. In addition to identifying and analyzing these, it is helpful to identify informal leaders across the organization in order to conduct analysis on the tools on routines.

Third is the challenge of working in contested areas such as epistemology/pedagogy, academic freedom, and the role of the center. In the conceptual framework, the role of TLCs is explicitly revealed as the hub of a network of distributed ED leadership. A distributed leadership perspective accommodates both academic freedom and epistemological diversity in research and teaching because it acknowledges that multiple individuals contribute to leadership at the organization. As well, it is agnostic as to what constitutes 'good' teaching practice and/or leadership, and recognizes differences in situational contexts. Moreover, working productively with others who have different beliefs is facilitated if faculty perspectives are considered by a network of knowledgeable colleagues, and also if these colleagues are local ED leaders acting as open-minded ambassadors for and to the TLCs. Mapping out the network of individuals across campus who are identified by colleagues as sources for advice and information is a necessary first step. In this way, instead of a TLC planning their activities centrally, they can solicit needs, interests, and ideas from those whom they seek to influence- the professors- via the influencers identified through SNA. Some TLCs no doubt incorporate input from their broader community, but how many have analysed the network using a research methodology grounded in theory?

The academic culture of teaching being viewed as a low priority of faculty and/or administration, compared to research is particularly challenging. It is not surprising that research as a core part of university work is, internationally, seen by many faculty members as defining their roles, or by many administrations as a source of prestige and funding. Rather than push against this reality, the proposed conceptual framework allows for influencing teaching and learning through consideration of the situational contexts. It follows that distributed ED leaders who are members of the department/discipline are embedded within microcultures that adapt and interpret organizational change, and so are valuable points of contact within the network. This is

true for both the easily identifiable formal leaders, as well as informal influencers identified during the process of populating a network map.

Considering distribution through tools and routines, TLCs could consider how the organization is signaling to professors the importance of teaching and learning. Likely teaching excellence is included in the vision and mission statements at multiple levels, but it remains unclear how this is understood across multiple contexts and levels and, more importantly, how it might be supported and realized. Another area to consider is hiring and promotion criteria, or other incentives, since if these are skewed towards research then professors will be motivated to focus on research, often at the expense of attention to teaching. In such cases, TLCs may focus on scholarship of teaching and learning in order to take advantage of research as a priority. In some institutions, however, research on teaching the discipline may not be considered as valuable compared to disciplinary research. In such cases, TLCs will need to work with administration to ensure that research on teaching is named within policies and procedures as equivalent to disciplinary research.

For those working within TLCs, the conceptual framework provides a rich scholarly and theoretical background in which to ground research and practice within TLCs, which can be appealing to research-oriented colleagues. If TLCs can present research which is based on leadership theory, using tools such as SNA which their colleagues in fields from biology to epidemiology are also using, and with an explicit epistemological position, this would demonstrate to colleagues that the work of TLCs is also a serious academic and scholarly endeavor.

The final challenge is that of TLCs assessing/evaluating their impact. Effectiveness is difficult to measure, but the ED leadership reach of the center could form one aspect of its effectiveness. That is to say, SNA can be used to explore how TLCs are influencing ED across

the organization, providing a baseline for measurement of effect. If over time TLCs can demonstrate their network of active distributed leaders is growing, then they are in that way being effective. For example, if TLCs map out their organizational network, and where they are situated within it, they might find that some departments are not connected to their organizational network at all. In this case the center could, again by asking about advice and information seeking behavior, identify an individual within unconnected departments to tie in to their network. These individuals could be specifically consulted or contacted about future activities, including aims and scheduling and could be connected across disciplinary boundaries to other colleagues who have passion for investigating and supporting teaching within their respective disciplines.

Conclusion

This paper began by introducing the history, role and scope, and challenges of TLCs, before reviewing the relevant leadership literature. Based on the importance of networks across multiple levels, collegiality, autonomy, context, formal and informal leadership, a conceptual framework is proposed which synthesizes these key themes. Given the apparent inattention to informal leadership roles within the university, a paucity of leadership theory in the literature, and inconsistencies with epistemology, Spillane's distributed leadership, as well as social network analysis, and an epistemology of complexity, are brought together in a proposed conceptual framework. This framework serves to address shortcomings in the extant literature while staying consistent with the TLC and leadership literatures.

Future research could examine the efficacy of this framework for leadership of teaching and learning in higher education, or TLCs specifically, taking advantage of the flexibility and comprehensiveness of the overall framework and its parts. Using the framework as a guide, TLC

researchers could examine questions such as: What would such a university-wide network of formal and informal leaders look like? How could the network be identified? What demographic characteristics would correlate with formal and informal leaders identified within the network? Would there be significant differences in network attributes such as density and centrality within different parts of the network? In addition, given that research on distributed leadership has been conducted in higher education, a critical analysis reviewing this literature is itself an area worthy of more detailed exploration in future publications.

Although the conceptual framework discussed in this paper was developed with TLCs in mind, and with deliberate attention to teaching and learning, it is not limited to those contexts. Leadership for other areas of interest at universities, which face similar challenges, could also consider if such a conceptualization of research and practice might be useful. For example, institutional diversity offices, or interdisciplinary environmental sustainability units, or English as a medium of instruction centers may find benefit in using the conceptual framework. As universities globally continue to research, teach, and serve in societies, finding ways to better connect individuals and groups across disciplinary boundaries can help us all move forward, together.

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Chapter 3 (Article 2): What do you mean by 'distributed leadership'?: Choosing an analytical perspective in higher education

Abstract

Much has been written on distributed leadership, a concept increasingly adopted in education and other fields. There is no commonly accepted definition/perspective of distributed leadership, and the field can be conceptually confusing as 'distributed leadership' is used synonymously with other leadership perspectives that may have their own extant literatures, such as team leadership, democratic leadership, or shared leadership. This review paper situates distributed leadership first within the theoretical foundations of distributed cognition and activity theory. Following a brief description of the foundations and borrowing from a mapping framework used to analyse distributed leadership in K12 school contexts, the extant higher education distributed leadership literature is examined. While there is much valuable scholarship on distributed leadership in higher education contexts, what seems to be missing is the very analytical perspective which followed from the theoretical foundations put forward by the authors who are frequently cited for inspiration. To address this gap in the literature, Spillane's distributed leadership is put forward as a conceptualization that is relevant to higher education contexts.

Key words: leadership, distributed leadership, Spillane, higher education

Introduction

> *Almost no area of inquiry or interest has shown itself to be more elusive, or more controversial, and also more confounding to human understanding, than the notion of leadership. It has been, and remains, a notoriously perplexing, yet tantalizing, preoccupation for those who research and/or expound on it, and for those who, more pragmatically, wish to embrace and master it, to effect change or effective organizational performance. (Allix & Gronn, 2005, p.181)*

As the above quote suggests, much time and thought has gone into understanding leadership. Of the dozens of adjectives used in scholarship to describe leadership, 'distributed' leadership is one which has seen increasing interest.

According to Bolden (2011), a search for 'distributed leadership' on google.co.uk returned 187,000 hits on March 8, 2011; on April 2, 2022, there were about 447,000,000. Interest in distributed leadership has clearly risen, and the concept of distributed leadership has been widely adopted in educational leadership and management as well as other scholarly fields. There is no unified definition or understanding of precisely what distributed leadership is, but an enduring and broad perspective comes from an early review by Bennett, Wise, Woods and Harvey (2003), who proposed three distinctive elements of distributed leadership as: (1) leadership being the product of concertive or conjoint activity, emphasizing it as an emergent property of a group or network, (2) with openness of the boundaries of individuals contributing to leadership, and (3) varieties of expertise distributed across many individuals.

Distributed leadership is widely cited, but there is no canonical literature, and the idea is used inconsistently in academic, policy, and practical discourse. Moreover, there are similar and overlapping perspectives on leadership which may be used interchangeably (Bolden, 2011; Fitzsimons, James & Denyer, 2011), but in some cases have distinct literatures of their own. Bennett, Wise, Woods and Harvey (2003) included in their review the related keywords 'delegated leadership', 'democratic leadership', and 'dispersed leadership', and they also nod to earlier notions of collegiality. Bolden (2011) points to a slightly different list: 'shared', 'collective', 'collaborative', 'co-leadership', 'emergent', 'dispersed', and 'distributive' leadership. Similarly, Fitzsimons, James and Denyer (2011) mention 'dispersed', 'devolved', 'democratic', 'distributive', 'collaborative', 'collective', 'co-operative', 'concurrent', 'co-ordinated', 'relational' and 'co-leadership', noting that 'shared' and 'distributed' were most commonly used terms. Spillane and Diamond (2007a) suggest the idea of leadership-as-distributed easily becomes 'many things to many people', and it may be used prescriptively or analytically, with some scholars moving back and forth, "sometimes unknowingly, between normative and theoretical stances" (p.1). Given both inconsistent usage and understanding, as well as widespread adoption, of distributed leadership, researchers and practitioners risk 'talking past each other' and performing 'fuzzy' scholarship and diagnostic work (Diamond & Spillane, 2016; Spillane & Diamond, 2007a; Spillane and Healy, 2010).

This literature-based review paper is specifically interested in distributed leadership in higher education, an area which has been liberally described (Marshall et al., 2011) but perhaps not critically examined. It has been noted that "in the UK and elsewhere, the idea of 'distributing leadership' in universities is becoming more popular. Yet, there is surprisingly little research on this topic" (Floyd & Fung, 2017, p.1), indicating a missed opportunity to examine higher education leadership through Spillane's perspective on distributed leadership. I argue that

Spillane's perspective on distributed leadership grounded in concepts from activity theory and distributed cognition, provides an articulated theory for analysis of leadership in educational organizations and for guiding future research and development. This paper begins by presenting the foundations of distributed leadership from the K12 educational leadership literature, and then borrows a framework from that literature for analysing distributed leadership research. The framework is applied to the higher education literature on distributed leadership, and finds that analytical perspectives such as Spillane's are lacking. Finally, the paper presents Spillane's analytical perspective in detail, so that higher education researchers can consider applying it to their leadership research.

Theoretical and conceptual foundations of distributed leadership

The widespread adoption of distributed leadership combined with the conceptual and terminological ambiguity surrounding it is a curious development. The two main conceptual models of distributed leadership are generally acknowledged to originate separately from Gronn and from Spillane (Bennett, Wise, Woods & Harvey, 2003; Tian, Risku & Collin, 2016). Gronn (2000) cites heavily from the ideas of Gibb (1954), and others have traced the roots of distributed leadership back thousands of years, but the ideas from Gronn and Spillane published at the turn of the millennium coincide with the start of current interest in distributed leadership. Much of the distributed leadership literature has been written in educational contexts (Bolden, 2011), often used to describe research tied to democracy, efficiency and effectiveness, or human capacity building (Mayrowetz, 2008). Outside of educational research Gronn and Spillane, with colleagues, are also widely cited. However, "in a fascinating twist, while almost all authors cite Gronn or Spillane and colleagues for inspiration in thinking about distributed leadership, very

few have embraced the activity theory framework or the methodological techniques suggested by it" (Mayrowetz, 2008, p.428).

Acknowledging the shortcomings of 'great man' theories of leadership and simple leader-follower dichotomies, Gronn (2000) initially argued that activity is the bridge between social structures and individual agents, and that leadership should be seen as a phenomenon which emerges from and may be shared during activity. His ontological argument in favor of leadership drew on distributed cognition, while pointing to activity theory as a potentially valuable mechanism for investigating leadership. Around the same time, Spillane, Halverson and Diamond (2001) published a distributed theory of school leadership. To develop this, they chose to "appropriate concepts from distributed cognition and activity theory that underscore how social context is an integral component, not just a container, for intelligent activity" (p.23). Considering distributed cognition and activity theory, what is of interest is leadership cognition and leadership activity distributed across people and material/sociocultural situations rather than individual traits of a 'leader' (Spillane, Halverson & Diamond, 2004).

Distributed cognition is the idea that knowledge-related activities and processes of the mind are a function of social, cultural, and technological influences (Salomon, 1997). This concept aligns well with activity theory, a heuristic generally attributed to Lev Vygotsky, which views human activity as situated within a socio-cultural system where actors use tools in working towards some object of activity. One reason for this comfortable alignment is that activity theory "situates individuals' cognition within, rather than just interacting with, social and cultural contexts of interaction and activity" (Salomon, 1997, pp.rxiv). Working from the philosophy of Karl Marx, the first generation of cultural-historical activity theory for understanding human behaviour was proposed by Soviet psychologist Vygotsky, who introduced the concept of a mediating artefact between an acting subject and the object of their activity (Engeström, 2001).

This first generation was limited by a focus on the individual subject, and was developed further by Vygotsky's colleague Leont'ev, who asserted that mediation was not achieved through artefacts alone, but also through social interactions (Engeström & Miettinen, 1999). Following increased international scholarly interest in activity theory from the 1970s to the 1990s, the problem of diverse perspectives between interacting activity systems arose, leading to a third generation which allows for two or more activity systems which interact (Engeström, 2001).

Gronn's perspective on distributed leadership (e.g. Gronn, 2000) has since developed separately but not in isolation from Spillane and colleagues (e.g. Spillane, Halverson & Diamond, 2001). In 'From distributed to hybrid leadership practice' Gronn (2009) observes that "the claim that the leadership of an organization observes a distributed pattern is basically unremarkable" (pp.197-198). Noting that "on the credit side of ledger, distributed leadership has helped to expose limitations inherent in leadership understood individually and has tempered its rather inflated view of human agency" (p.198), Gronn further suggests that it is not distributed leadership which has captured the zeitgeist, inasmuch as the concept of distribution. Examples provided by Gronn of other ways that phenomena have been identified as distributed include distributed information systems, distributed knowledge, distributed cognition, distributed decision-making, distributed work, distributed learning systems and distributed denial of service. With the rise of social media, big data science, and COVID-influenced activities of contact-tracing and remote work, the present day is arguably more rooted in distribution.

Gronn's own criticisms include that "now that distributed leadership is well entrenched in the linguistic furniture, there is a somewhat promiscuous inclination to think of virtually every initiative on the part of teachers and administrators as leadership" (p. 200). He adds that key formal individuals do in fact wield significant influence which must be accommodated in any

conceptualization of leadership. He calls this synergy between individually-focused and distributed leadership 'hybrid' leadership (Gronn, 2009).

Distributed leadership in higher education

In order to make sense of the proliferation of research on distributed leadership in K12 contexts, Gunter, Hall and Bragg (2013) used a mapping framework to analyse literatures on distributed leadership in K12 schools. The current paper borrows this framework to review publications on distributed leadership in higher education. The framework outlines four categories of distributed leadership research:

1. Functional-descriptive knowledge production: this line of thought has "an emphasis on what is happening in everyday practice in schools regarding tasks, organizational processes and relationships" (Gunter, Hall & Bragg, 2013, p.560); the work of Spillane can be situated in this perspective.
2. Functional-normative knowledge production: "provides models and rationales for practitioners to improve their practice" (Gunter, Hall & Bragg, 2013, p.563), with cross citation between key authors blurring distinction (e.g. Harris & Spillane, 2008). Arguments against distributed leadership tend to focus here (e.g. Corrigan, 2013).
3. Critical knowledge production: "more about examining distributed leadership as an idea and how this links with practice" (Gunter, Hall & Bragg, 2013, p.566); questions of power, as well as much of Gronn's writing (e.g. Gronn, 2002; Gronn, 2009), can be situated in this perspective.
4. Socially critical knowledge production: aims "first, to reveal and evidence a critique of the field's depoliticization of leadership, and second, to describe and advocate more socially just forms of leadership" (Gunter, Hall & Bragg, 2013, p.568).

Functional-descriptive knowledge production

This body of research would use distributed leadership as an analytical tool to investigate leadership practice in higher education, with practice and not multiple leaders being the key area of interest. Here, the underlying assumption would be that leadership *is* distributed, and the goal would be to understand what that looks like in practice in situational contexts. The higher education distributed leadership literature does not clearly include journal publications meeting this criterion. A distributed perspective on leadership, as described by Spillane, would fit this category, and hence the argument in this paper that this specific analytical perspective on leadership could be considered for higher education contexts. Spillane's analytical perspective on distributed leadership will be presented in more detail after the analysis of the extant higher education literature.

Functional-normative knowledge production

The most common usage of distributed leadership in higher education literature is the normative one, whereby scholars may "propose that a DL approach is the most appropriate way to handle the management problems that institutions encounter" (Jones & Harvey, 2017, p.129).

An early advocate for a distributed perspective on higher education leadership was Gregory (1996), whose publication seems to predate work from both Gronn and Spillane. Rather than distributed cognition or activity theory Gregory took inspiration from the broader literature on educational leadership and organizational development (to which Gronn, Spillane, and colleagues have also nodded). Gregory advises that "the reservoir of expertise, critical thinking and leading ideas lies at all levels and is often located in hidden corners. Successful leadership is about finding it, and helping and encouraging new leaders to come forward" (1996, p.49).

Another argument in favor of the functional-normative perspective at universities is that "academics are well educated, largely autonomous and trained to be highly critical and so are more likely to oppose and challenge more traditional leadership models and behaviours" (Floyd & Fung, 2017, p.3).

This literature tends toward a general understanding of distributed leadership without borrowing from existing frameworks in the K12 education research (e.g. Davison et al., 2013; Floyd & Fung, 2017; Holt et al., 2014; Menon, 2005; Youngs, 2017). A possible exception is the work from Jones and colleagues (see Jones et al., 2010; Jones et al., 2011; Jones et al., 2012; Jones, 2014; Jones et al., 2014; Jones et al., 2017) who use variables first identified in the review by Bennett et al. (2003) to create their own leadership distribution tools. Jones and Harvey also edited a special issue of the *Journal of Educational Policy and Management* called 'Leading the academy: Building capacity through distributed leadership', where most contributions use the tools from Jones and colleagues (see Beckmann, 2017; Carbone et al., 2017; Sharma et al., 2017; excepting Youngs, 2017), and with the final two articles being Jones and Harvey (2017) and Jones et al. (2017).

The tools developed and presented by Jones et al. are valuable for practitioners and scholars, and this body of literature contains practical suggestions and scholarly insights. When taking a normative approach to distributed leadership, Jones et al. (2010) note that the following are needed to develop DL: funding and time, integration between formal and informal leaders, and opportunities for communication and networking. Moreover, Floyd and Fung remind us that distributed leadership:

> is complex on a number of levels: the plurality of the institutional mission; the diversity of possible leadership/management roles; the challenge of effective

> communication; and the effects of traditional academic values and identities, which may support but may also be antithetical to the strategic direction of the institution. (2017, p.1)

Much of the higher education distributed leadership literature appears to fit within the functional-normative knowledge production category; this is not of itself negative, but does suggest a certain homogeneity. It also suggests low levels of awareness about the details of Spillane and Gronn's foundational arguments. For example, in one article, Youngs (2017) proposes an alternate ontology for distributed leadership based on practice and activity. This is curious, since Spillane, Halverson and Diamond (2001) made the same basic argument 16 years earlier in initially proposing a theory of distributed leadership, yet Youngs does not cite Spillane at all. Youngs makes considerable mention of activity and tensions, but doesn't specifically mention activity theory nor does he cite Engeström. This author appears to be presenting activity and practice as unique arguments, through slightly different theoretical foundations; this in order to answer criticisms against distributed leadership which are more concerned with the problems associated with the common usage of 'distributed leadership', rather than initial theoretical foundations of distributed leadership as an analytical/conceptual framework.

The work from Jones and colleagues at times comes across as inconsistent about how distributed leadership is being conceptualised. For example, Jones et al. (2014) point out that "existing research into distributed leadership in higher education has been criticized for being normative and less democratic than is suggested in its theorization" (p.603). Which is a reasonable point, because it has. However, they then proceed to describe a project which was based on the assumption that distributed leadership is desirable, and present, across three large tables, their suggested tools for successfully distributing leadership. This may be doubly

prescriptive, and they don't seem to address the criticism against normativity which is brought up in the abstract.

In the same year, the lead author does acknowledge the limits of prescription in that "no universal model can be developed that is easily implementable" (Jones, 2014, p.139). That article, titled 'Distributed leadership: A critical analysis', presents discussion of a project using a distributed leadership lens. Distributed leadership is described as "a particular form of shared leadership that has been conceptually explored for its potential applicability to the higher educational sector" (Jones, 2014, p.131). This statement is problematic because it suggests to the reader that distributed leadership is agreed to be a form of shared leadership, and ignores the theoretical foundations of distributed leadership as well as the existence of a separate field under organizational studies which is more inclined towards leadership in teams (e.g. Pearce, Conger & Locke, 2008).

While it is not easy to identify precisely how distributed leadership is being conceptualized by the authors of this literature, there is a normative focus which suggests that it considered is a positive and beneficial leadership approach. Critical and socially critical scholarship on distributed leadership, discussed next, suggests there is concern that the normative usage of distributed leadership may have intended or unintended negative effects on university faculty members.

Critical knowledge production

The second largest body of higher education distributed leadership research is more about developing and understanding emergent ideas about distributed leadership in higher education practice contexts. For example, Sewerin and Holmberg (2017) refer to distributed leadership in their exploration of how junior and senior formal leaders in one university conceive of university

work. Similarly, Vuori (2019) presents a project about redesigning a college campus and curriculum, finding that distributed leadership was a bottom-up and adopted practice, with managerial involvement and support. Vuori (2019) uses activity theory as their analytical framework, and in the conclusions discuss how the findings help to develop and understand distributed leadership as an idea in higher education. Activity theory is also adopted by Zou, Parker, and Hounsell (2022) as the analytical framework, with distributed leadership being a finding rather than a frame.

As with the functional-normative literature, these publications take a broad view on leadership-as-distributed across multiple individuals (e.g. Van Ameijde et al., 2009; Zepke, 2007), with one author stating that "the general premise of the leadership model is relatively uncomplicated" (Burke, 2010, p.53). That higher education leaders have a tacit understanding of distributed leadership can be expected, as it has been pointed out that the concepts of shared governance, collegiality, and autonomy align well with distributed leadership (e.g. Burke, 2010; Gosling, Bolden & Petrov, 2009). However, other research in this vein has found that perceptions of distributed leadership by university leaders are complicated in that:

> it is not really obvious what it [distributed leadership] refers to, and yet everyone seems to know what it means: clearly its interpretation therefore has as much to do with meaning making as merely a description of a commonly perceived phenomenon. (Gosling, Bolden & Petrov, 2009, p.303)

In addition to differences in perceptions among and between university leaders, there are tensions which emerge in the critical literature. In universities, "a dynamic tension was experienced between the need for collegiality and managerialism, individual autonomy and

collective engagement, leadership of the discipline and the institution, academic versus administrative authority, informality and formality, inclusivity and professionalization, and stability and change" (Bolden, Petrov & Gosling, 2008, p.364). Further to this, 'distributed leadership' as a rhetorical tool in higher education risks being co-opted "by those in positions of real power to give the illusion of consultation and participation while obscuring the true mechanisms by which decisions are reached and resources allocated" (Bolden, Petrov & Gosling, 2009, p.273). Such criticisms are also put forward in the socially critical literature.

Others (Lu & Smith, 2021; Lu, 2022) question the extent to which the Western model of distributed leadership should be adopted by centrally run Chinese universities, which have a well-established system relying on formal leadership positions and formal procedures. Across the higher education landscape a great deal of variety can be expected in how distributed leadership is perceived and practiced, as it is influenced by personal, social, structural, contextual, and developmental factors (Bolden, Petrov & Gosling, 2008). A final tension, perhaps the antithesis of formal leaders exploiting distributed leadership rhetoric, is that "if organizations decide to push the 'emergent' approach to distributed leadership too strongly they may end up missing the very real need for individual responsibility and accountability as well as a strong sense of vision and direction" (Bolden, Petrov & Gosling, 2009, p.273). Similarly, Lizier, Brooks, and Bizo (2022) found tensions around trust, clarity and hierarchical power structures in their study.

Consistent with the functional-normative literature, inconsistent conceptualisations of distributed leadership can be found – indeed, may be unavoidable – in these publications as well. Vuori (2017), for example, points out the conceptual confusion surrounding distributed leadership and states that it is different from 'distributive', 'shared', 'constructivist', and 'hybrid'; a few paragraphs later, Vuori cites the same sources for 'distributive leadership' in a discussion of distributed leadership.

Gosling, Bolden, and Petrov (2009) do nod to Spillane's perspective on distributed leadership as encompassing factors beyond multiple individuals. They specifically point to Spillane's mention of situation as constitutive of leadership practice, arguing that a further constitutive factor is rhetoric. It could be noted that Spillane and colleagues have also acknowledged the importance of language, and rhetoric, as situational factors.

Socially critical knowledge production

Socially critical discussion of distributed leadership in higher education is difficult to discretely distinguish from the critical research, but Lumby (2003; 2013) has contributed clearly to this area. Lumby (2003) initially took a general view on distributed leadership, which in 2003 was a reasonable perspective to take given that there was little existing research to draw on. More recently, Lumby (2013) points out that both Gronn and Spillane proposed distributed leadership as a heuristic tool, but that the common usage of the concept is normative. Lumby's criticisms are directed primarily at the normative and uncritical use of distributed leadership-at-large. Lumby does mention that the analytical lens perspective on distributed leadership does not adequately accommodate theorizing of power, but it could be noted that Diamond and Spillane (2016) have stated that power has been an influence on their thinking.

Even more recently, Joslyn (2018) has argued against an undemocratic participatory model of distributed leadership in the context of lack of diversity in UK universities. However, issues such as power and diversity can be accommodated by Spillane's analytical framework if a researcher wants to make it so; for example, in the analysis of interactions between leaders and followers, or as a situational factor.

Spillane's analytical distributed leadership

The current paper argues that there are theoretical roots to distributed leadership which are often overlooked in how distributed leadership is conceived. Spillane's distributed leadership (hereafter SDL) is based on these foundations and yet underrepresented in the higher education distributed leadership literature. This next section provides an overview of SDL as described in series of publications over 15 years, being informed by large scale studies in K12 schools as well as the writings of other scholars including those pursuing different avenues of distributed leadership research.

Spillane and colleagues have recognized the value of exploring different perspectives of distributed leadership (e.g. Diamond & Spillane, 2016), and have cited, or worked with, notable K12 scholars as Gronn, Harris, and Leithwood. At the same time, Spillane (2006) notes that the common usage of distributed leadership simply acknowledges the multiple-individuals aspect, while SDL has three essential elements (see Figure 1):

- Leadership *practice* is the central and anchoring concern.
- Leadership practice is generated in the *interactions* of leaders, followers, and their situation; each element is essential for leadership practice.
- The *situation* both defines leadership practice and is defined through leadership practice. (Spillane, 2006, p.4; italics in original)

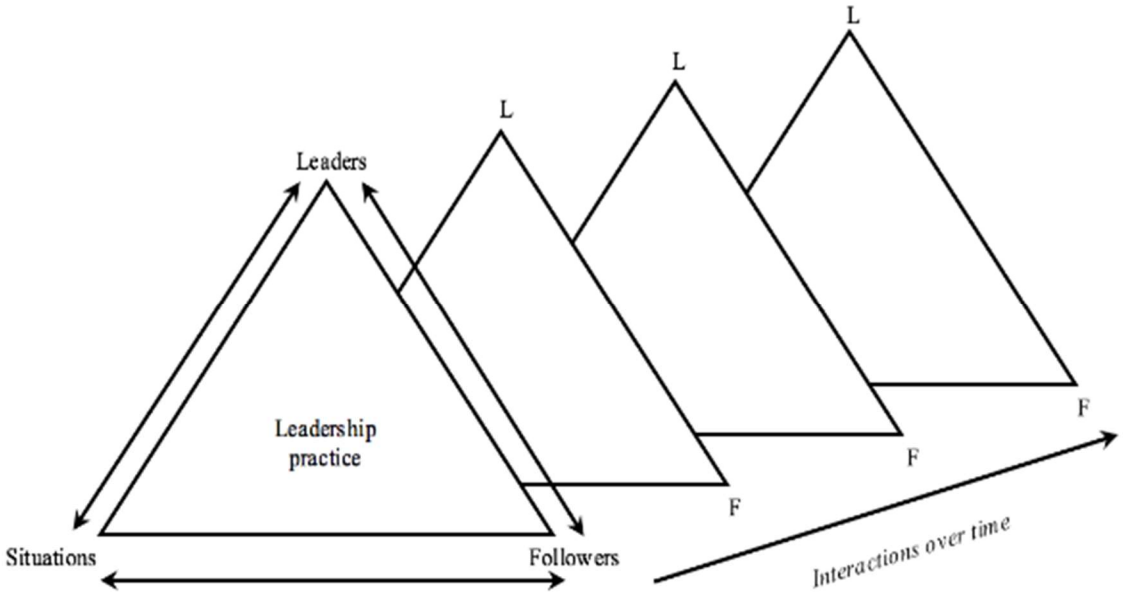

Figure 1: Leadership practice from a distributed perspective (adapted from Spillane, 2006, p.3)

Spillane has made it clear that this perspective on distributed leadership provides a diagnostic tool for transforming leadership practice through a research framework for understanding and reflecting on it (Diamond & Spillane, 2016; Spillane, Halverson & Diamond, 2004; Spillane, 2006; Spillane & Orlina, 2005; Spillane & Diamond, 2007b; Spillane & Coldren, 2011). In this usage, SDL is only normative in the way any conceptual framework is, in that it emphasizes some elements of a phenomenon over others (Spillane & Orlina, 2005). In addition to providing a specific analytical framework, SDL is distinct from a general usage of distributed leadership in that:

- It is not a prescription or template for effective leadership (Diamond & Spillane, 2016; Spillane, Halverson & Diamond, 2004; Spillane, 2005; Spillane & Orlina, 2005; Spillane, 2006; Spillane & Diamond, 2007b).

- It does not imply that the role of individual formal leaders is negated (Spillane & Diamond, 2007b), or that individual skills/knowledge are unimportant -"they clearly are"- (Spillane, Diamond, & Jita, 2003, p.542).
- It does not imply that everyone is a leader (Spillane & Diamond, 2007b; Spillane & Healey, 2010).
- It does not only encompass collaborative situations (Spillane & Diamond, 2007b).
- It is not 'team leadership, 'collaborative leadership', 'shared leadership', 'co-leadership', 'democratic leadership', or, 'situational leadership'; these are relatives but not synonyms (Spillane, 2005; Spillane, 2006; Spillane & Diamond, 2007a). Although 'hybrid leadership', 'dispersed leadership', 'devolved leadership', et al. are not specifically mentioned, the point likely applies to those as well.
- It is agnostic regarding mechanisms of social influence; it allows for 'transactional leadership' or 'transformational leadership', for 'democratic leadership' or 'authoritarian leadership' (Spillane, 2005; Spillane, 2006; Diamond & Spillane, 2016).
- It does not require actions to be effective or successful, to be positive or beneficial (Spillane & Diamond, 2007a).

Spillane has discussed distributed leadership in terms of two main aspects. First, the leader-plus aspect, which is the prevalent understanding that leadership is not the sole purview of individuals in formal positions. Second, the practice aspect, which highlights how leadership does not occur in a vacuum and can only be understood within the context where it occurs (including followers, and other elements of the situation).

The leader-plus aspect

SDL acknowledges that leadership is stretched over multiple formal and informal leaders who work together and apart (Spillane, Halverson & Diamond, 2001; Spillane, Diamond & Jita, 2003; Spillane, 2006; Spillane & Diamond, 2007a; Spillane & Orlina, 2005; Spillane et al., 2008; Spillane & Healey, 2010). Although formal leaders always maintain their leadership status, informal leaders may emerge depending on the situation (Spillane & Healey, 2010). Different leadership tasks may be performed by or with different individuals. A strategy for identifying informal leaders could be to "examine who is responsible for the functions that are thought to be essential for school improvements" (Spillane, 2006, p.13).

Distribution can take a variety of forms for a variety of reasons. Leadership routines such as teacher development, curriculum development, curricular selection, and school improvement planning often involve people working together; alternatively, it is possible for individuals performing the same types of leadership routines to work in isolation. Goals in leadership arrangements may be different or contradictory, and means for achieving a goal may also differ (Spillane, 2006). Leadership may be distributed by default and/or by design. By design, internal factors such as formal structures, routines, or positions may shape structures and routines, as could external agents. Leadership distribution by default emerges when some leadership tasks are taken on without purposive design, such as when a gap is noticed. Such formal and informal mechanisms work through and with each other, from a distributed perspective (Spillane, 2006). A final consideration for the leader-plus aspect has been what makes a leader influential, and Spillane (2006) points to human capital, cultural capital, social capital, and economic capital as bases of influence.

The leader-plus aspect of SDL is relatively uncomplicated and is largely consistent with the broad view of distributed leadership and the relevant research in higher education as presented above.

The leadership practice aspect

The practice aspect of SDL differentiates it from a general view on leadership-as-distributed across multiple individuals by incorporating followers and the situation as both affecting and being affected by leaders. This is instantiated in practice and maintained through interactions over time, and leadership emerges from these complex longitudinal interactions. In other words, SDL, like distributed cognition or activity theory, views other individuals (e.g. followers and informal leaders) and mediating situational factors (contextual rules, tools/artefacts) as integral parts of a complex system from which 'leadership' emerges in practice.

Practice is understood to be *stretched over* social and situational contexts (Spillane, Diamond, & Jita, 2003), and is "a product of the joint interactions of school *leaders, followers*, and aspects of their *situation* such as tools and routines" (Spillane, 2006, p.3; italics in original).

Followers

SDL sees followers as a constituting and mediating constitutive element of leadership practice, as opposed to a variable external to leadership practice (Spillane, Halverson & Diamond, 2004). For example, "followers choose to listen to leaders and decide which leaders and leadership messages should be heeded and which should not" (Spillane & Diamond, 2007a, p.9). Individuals who are followers in some situations may emerge as informal leaders in other situations, a shift which Spillane and Diamond (2007a) have stated should be acknowledged and documented. Followers, while acknowledged as an important component of a distributed

perspective on leadership practice, have received less research attention than the leader-plus aspect, or the situation dimension. That followers are acknowledged as important but understudied is consistent with many conceptualisations of distributed leadership, and is not uncommon in the wider scholarship on leadership.

The situation

As with leaders and followers, aspects of the situation are 'constitutive of and constituted in' distributed leadership practice (Spillane, Halverson & Diamond, 2001). Spillane et al. use activity theory to reiterate the role of situation within SDL, whereby "situational factors serve as 'mediational means' that enable and constrain social interactions, and comprise work practice" (Spillane et al., 2011, p.166). This means the situation is both a defining element of leadership practice and is shaped by leadership practice. For example, the task of teacher evaluation may be facilitated with the use of a peer-observation or course-evaluation form. The form is a situational tool which is a defining element of leadership for teaching and learning, because it mediates between organizational leadership and whatever teaching which follows. At the same time, the form holds underlying assumptions of what is considered good teaching, and is thus shaped by leadership practice. Across interactions, tools used for the task may change, or be interpreted differently, as situational aspects continue to shape and be shaped by leadership practice (including leaders and followers) over time.

Spillane (2006) discusses situation primarily in terms of tools and routines, which allow interactions to be scripted and patterned. He notes that structures, culture, language, etc. are also worth consideration but that those are outside the scope of that book (Spillane, 2006). Artefacts are representations of leadership interactions and can suggest situational aspects which constitute leadership (Spillane, Halverson & Diamond, 2004). Spillane has written widely about example

situational factors which constrain or enable leadership practice during interactions. Although these were initially written for research and analysis of leadership distribution in K12 school contexts, they describe part of an analytical leadership framework which is easily transferable to higher education contexts. These situational factors could include, and be roughly organized into:

- Tools: memos, forms, meeting agendas, student assessments (formative and summative), student academic work, teacher observation protocols, teacher supervision rubrics, standards (governmental or institutional), lesson plans, curricular frameworks/documents/materials (e.g. textbooks), and, Internet and technology tools (Spillane, Diamond & Jita, 2003; Spillane, Halverson & Diamond, 2004; Spillane, 2006; Spillane et al., 2011; Diamond & Spillane, 2016).
- Routines: teacher recruitment, lesson study, routines to raise expectations, regular get-togethers (e.g. committee meetings, grade level meetings, faculty meetings), informal conversations, teacher evaluations, daily work routines, and, scheduling arrangements (Spillane, Halverson & Diamond, 2004; Spillane, 2006; Spillane & Diamond, 2007b; Spillane et al., 2011; Diamond & Spillane, 2016; Spillane, Parise & Sherer, 2011,).
- Symbols: language-based systems, rhetorical strategies (e.g. calling grades 'feedback'), vocabularies (Spillane, Halverson & Diamond, 2004; Spillane et al., 2011).
- Demographic factors: school size, racial and social class composition, and, school history (e.g. a tradition of teacher autonomy).
- Structures:
    - Organizational culture (Spillane, 2006); "a set of norms and cultural–cognitive beliefs that inform practice" (Diamond & Spillane, 2016, p.151), rules and norms

(Spillane et al., 2011), rules and resources (Spillane, Halverson & Diamond, 2004), social systems such as grade levels or language (Spillane, Halverson & Diamond, 2004).

    - Committee structures (Spillane, 2006); formal positions (Diamond & Spillane, 2016).

- Systems (as opposed to structures): "the 'reproduced relations between social actors or collectives organized as regular social practices'… 'System' refers to the social institutions, like work, family, school, or other constellations that we recognize as having some level of stability and regularized patterns of social interaction" (Spillane, Halverson & Diamond, 2004, p.22).
- External pressures (Spillane & Diamond, 2007b).

This taxonomy underscores the extent to which leadership in SDL is distributed across more than just multiple individuals. Further complicating consideration of the situation is that formal and informal arrangements, designed and lived, must be considered as equally important and acting in tandem (Spillane & Healy, 2010). Spillane, Diamond, and Jita (2003) also note that situations about teaching and learning are inherently challenging, as "instruction is a vast, complex, and multi-dimensional practice, including the questions teachers pose for students, that materials teachers use, the ways students interact with each other, and the teacher, and classroom management" (p.540).

'Situation' is perhaps a double-edged sword within SDL: on the one hand, it can incorporate whichever aspects interest the researcher (e.g. discipline, democracy, diversity) or the practitioner (e.g. motivation, influence, strategy). On the other hand, it is so all-encompassing

and perhaps not well-theorized enough to have great practical value at this time. The question of which situational aspects are most important is an unanswered one, and one that is likely context-dependent. From a distributed perspective on leadership, examination of day-to-day practice is an important – but neglected – area, with research tending to focus on the leader-plus aspect (Spillane, Halverson & Diamond, 2004; Spillane, 2006; Spillane & Diamond, 2007b).

Researching from a distributed perspective

SDL was developed as a conceptual framework for researching and analyzing leadership activity and generating "evocative cases for practitioners to interpret and think about as part of their on-going leadership practice" (Spillane, Halverson & Diamond, 2004, p.4). Leadership practice in the school organization is the unit of analysis, rather than the practices of leaders (Spillane, Halverson & Diamond, 2001; Spillane & Diamond, 2007a; Spillane, Halverson & Diamond, 2004). Spillane and Healey (2010) suggest that scholars looking for evidence that distributed leadership 'works' "are either asking the wrong question or have oversimplified the research question" (p.277). Spillane (2005; 2006; Spillane & Healey, 2010) argues that descriptive theory building about how leadership is distributed for instructional improvement is essential before establishing causal links. "Many important questions remain to be teased out, and there is a need for more studies to see whether patterns identified hold across… populations" (Spillane & Diamond, 2007b, p.163).

Methods employed for distributed leadership studies can vary. For example, the K8-context, 133 school, 5-year-long, theory building, Distributed Leadership Study "employed mixed methods, including ethnography, structured observations, structured and semi-structured interviews, teacher and principal questionnaires, social network surveys, and videos of leadership activities in schools" (Spillane, 2006, p.15). Another theory building study, in the K12-context,

involving 29 principals and 1,210 school personnel, at 52 schools, obtained data through an experience sampling method log, a principal questionnaire, and a staff questionnaire (Spillane et al., 2008). The aforementioned studies reinforce the essential practice of triangulating data, including from individuals with differing positions (Spillane & Healey, 2010).

Using multiple data collection techniques can also capture different angles on the phenomenon. For example, distributed leadership acknowledges both formal and informal elements of leadership as influential. Both top-down and bottom-up processes of leadership "suggest different ways of coming to know and justifying knowledge claims about how responsibility for leadership and management is distributed in the school" (Spillane et al., 2008). At the same time,

> the designed organization/lived organization dimension underscores that one can come to know how leadership is distributed in schools either through focusing on the formally designated leadership positions in the school (the designed organization) or through the day-to-day practice of leadership and management (the lived organization). While these two aspects of the organization are related, they are not mirror images of one another. (Spillane et al., 2008, p.202)

An example artefact is organizational charts, which can be examined to establish formal leadership structures, but may "provide weak road maps for how things actually get done" (Spillane, Healy & Kim, 2011, p.133), so these could be elaborated on through social network techniques and further confirmed through an observation protocol (Spillane et al., 2008).

Methodological challenges faced by researchers using distributed leadership as an analytical tool include: the complexity of interactions involved (Spillane, 2006); getting rich and

comprehensive data across large organizations (Spillane & Diamond, 2007b); and, the fact that reported data, such as from interviews and surveys, may not reflect what actually takes place during the performance of daily leadership routines (Spillane, 2006). Future research SDL "would benefit greatly from careful attention to the development of study operations and measures that could inform empirical research" (Spillane & Healey, 2010, p.278). In developing these methodological tools, researchers can also consider how they could be tailored for practitioners to evaluate, appreciate, and potentially use the resultant data about their organization's leadership network (Spillane & Diamond, 2007b). These challenges and areas for development while identified through research within school contexts would likely also hold true in higher education contexts.

Spillane and colleagues have begun to incorporate network analysis into exploration of leadership distribution (Pitts & Spillane, 2009; Pustejovsky & Spillane, 2009; Spillane, Healey & Kim, 2010; Spillane, Hopkins & Sweet, 2015; Spillane, Kim & Frank, 2012; Spillane & Shirrell, 2017; Spillane, Shirrell & Hopkins, 2016). A comprehensive discussion of social network analysis is outside the scope of this paper. In brief, social network theory uses graph theory and mathematical analysis to create and explore networks of relationships between individuals. This is a powerful technique for mapping the distribution of multiple formal and informal leaders, and their followers, which may be supplemented through other analysis for greater depth of social and situational contexts depending on the needs and interest of the researcher. With the social network analysis research, Spillane and colleagues are contributing to educational leadership scholarship and social network theory, while at the same time maintaining an interest in formal/informal leaders, followers, and the situation, as they interact over time to shape teaching and learning practice. This is likely an extension of the theory building and operationalization/measurement research for which they have advocated in the distributed

leadership publications referenced above, with two articles (Pitts & Spillane, 2009; Pustejovsky & Spillane, 2009) dedicated to instrument validation, and the notes regularly referring readers back to www.distributedleadership.org. Social network analysis is attracting increased interest in higher education contexts thus presenting educational leadership scholars with new ways to examine current gaps in scholarship.

Conclusion

The current paper began by introducing the general notion of distributed leadership, followed by an overview of the theoretical foundations of distributed cognition and activity theory. The higher education literature on distributed leadership was presented through the use of a mapping framework borrowed from the K12 literature, and noticeably absent is higher education research under the category of *functional-descriptive knowledge production*. Finally, Spillane's perspective on distributed leadership was discussed in some detail as a theoretical frame which is well-developed and could contribute theoretically and pragmatically to higher education leadership.

The main argument of this review-based paper is not that competing conceptualisations of distributed leadership are wrong. Undoubtedly, it is helpful to have diversity of thought on the poorly understood but widely touted notion of leadership. Rather, the primary argument is that an analytical perspective is missing from the extant higher education literature on distributed leadership, and that SDL is a sensible option to use in filling this niche.

SDL has solid theoretical foundations and shows continued promise to expand understandings of social phenomena through the adoption of social network analysis. SDL goes beyond people interacting and sharing leadership. While the sheer scale of complexity inherent within the 'situation' may seem overwhelming, the utility of SDL lies, as do many ideas in

research, on more scholars taking up the call to rigorously apply the same detailed perspective so that we can build a unified body of knowledge. Narrowing the scope to specific situational factors can depend on what the researcher is interested in, such as teaching/learning or social justice. For practitioners, building the case study of home organisations can create a rich dataset including leadership tasks, maps of formal/informal leaders, key tools, and so forth. Such a dataset could assist practitioners in visualising how leadership is practiced at the organisation, and how aspects of leadership practice are interacting within the system.

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Chapter 4 (Article 3): Who are the leaders? A social network analysis of university teaching and learning leaders from the teaching and learning centre perspective

Abstract

This study explores a pan-organizational network of leadership for educational development using SNA. The primary questions guiding this inquiry were (1) What is the size and density of the overall network, and are the sizes densities of different faculties or departments similar? (2) Do centrality measures (in-degree, betweenness, closeness, or eigenvector) correlate with demographic variables (professional development as an educator, years at organization, years as an educator, organizational level, formal leadership position, has conducted educational research)? (3) Since snowball sampling has been suggested by other researchers but not attempted in higher education SNA research on teaching and learning leadership, is snowball sampling an effective data collection method? Through snowball sampling, 196 members of the organization were identified and interviewed, with faculties and departments being represented at varying sizes, and some departments not represented at all. Centrality measures had no significant correlations with selected demographic characteristics. Snowball sampling was effective not just in terms of the response rate, but especially as a means for the researcher to get into the field and engage first hand with the formal and informal organizational leadership.

Keywords

social network analysis, higher education, distributed leadership, teaching and learning centers, educational development

Introduction

Many universities have teaching and learning centres (TLCs) where staff endeavor to support and facilitate the education of students by working with professors, a task which can broadly be described as educational development (ED). ED is conducted in different ways in different contexts and not everyone who does the work would describe themselves as an educational developer (Gibbs, 2013), or, by extension, a leader of educational development.

TLCs face challenges such as: (1) *unstable TLC leadership structures* (Challis, Holt, & Palmer, 2009; Diamond, 2005; Forgie, Yonge & Luth, 2018; Gosling, 2009; Gosling & Turner, 2014; Palmer, Holt & Challis, 2010); (2) *resource constraints* (Bédard, Clement & Taylor, 2010; Challis, Holt, & Palmer, 2009; Holt, Palmer, & Challis, 2011; Forgie, Yonge & Luth, 2018; Fraser, 2005; Grabove et al., 2014; Moses, 1987; Palmer, Holt & Challis, 2010; Pchenitchnaia, 2007; Thompson, 2004); (3) *working in contested areas such as epistemology/pedagogy, academic freedom, and the role of the centre* (Cooper, 2004; Challis, Holt, & Palmer, 2009; Forgie, Yonge & Luth, 2018; Fraser, 2005; Gosling & Turner, 2014, Havnes & Stensaker, 2006; Holt, Palmer, and Challis, 2011; Moses, 1987; Palmer, Holt, & Challis, 2011; Thompson, 2004); (4) *teaching being viewed as a low priority of faculty and/or administration, compared to research* (D'Andrea & Gosling, 2001; Forgie, Yonge & Luth, 2018; Gosling & Turner, 2014; Fraser, 2005; Grabove et al., 2014; Havnes & Stensaker, 2006; Holt, Palmer, & Challis, 2011; Moses, 1987; Pchenitchnaia, 2007; Scott & Scott, 2016; Thompson, 2004), and; (5) *assessing/evaluating their impact* (Bédard, Clement & Taylor, 2010; Bélanger, Bélisle, & Bernatchez, 2011; Challis, Holt & Palmer, 2009; D'Andrea & Gosling, 2001; Forgie, Yonge & Luth, 2018; Grabove et al., 2014; Moses, 1987; Pchenitchnaia, 2007; Smith & Gadbury-Amyot,

2014; Thompson, 2004).

In meeting these challenges, it has been argued that TLCs could view ED from an organizational perspective (Jolly, 2014; Steinart et al., 2016). That is to say: across the organization (Gosling, 2001), at multiple levels (Grabove et al., 2014; Havnes & Stensaker, 2006), and "through multiple channels, and with short- and long-term goals in mind" (Grabove et al., 2014, p.14), acknowledging that ED "is not merely the sum of its parts; it is the system in its entirety" (Brancato, 2003, p.63). Hence, as Holt, Palmer, and Challis have suggested, "essentially, centres need to see their strategic leadership contribution as the designers and sustainers of open teaching and learning networks encompassing powerful forms of learning both across, and up and down the organisation" (Holt, Palmer, and Challis, 2011, p.15). More recently, the focus of TLCs is shifting to organizational leadership through "influencing and implementing strategic institutional teaching and learning initiatives rather than responding only to the learning needs of instructors" (Kolomitro & Anstey, 2016, p.186).

One way to view leadership across the institution is from a distributed perspective, where leadership is woven into the fabric of the organization through the interactions of leaders and followers in different situations (Spillane, 2009). Spillane has applied social network analysis (SNA) to distributed leadership in K12 school systems, but these tools have not been combined in higher education research. SNA, without attention to Spillane's distributed leadership, has seen growing interest in ED research, since about 2009 with Roxå & Mårtensson's work on the significant conversations of academic teachers in small networks.

The current paper reports on a study which used SNA to investigate distributed leadership for ED from the perspective of TLCs. SNA is a powerful tool for investigating formal and informal leadership at universities given the complex, distributed, collegial, and autonomous

nature of university work. Roxå, Mårtensson and Alveteg (2011) rooted their perspective in the work on Teaching and Learning Regimes by Trowler and colleagues (e.g. Trowler & Cooper, 2002), identifying faculty conversations as a place where individuals and groups build and maintain cultures. The authors argued that SNA can contribute to the investigation of these understandings by identifying key change agents in clusters of individuals, differentiating between strong and weak ties between individuals, and recognizing that influencing conversational flows along these ties can influence cultures.

The purpose of the current study was to contribute a social network analysis of a large university organizational network operating through distributed leadership and identified using snowball sampling. The research aimed to establish the feasibility of using snowball sampling, to establish the network characteristics, and to determine any correlations between formal/informal network leaders and their demographic characteristics.

Literature review

Social network analysis and educational development

SNA follows from the premise that patterns among and between individuals can be mapped and analyzed. These individuals are considered 'nodes' on the network (Borgatti & Foster, 2003; MacAulay, 2010), and can be made up of individuals or groups (Borgatti & Foster, 2003; Brass, Galaskiewicz, Greve & Tsai, 2004). Relationships connecting nodes are network 'ties', a single focal actor is an 'ego', and nodes connecting to the ego may be called 'alters' (Borgatti & Foster, 2003). Kilduff and Brass (2010, p.355-357) provide a glossary of social network terms. SNA is useful because it is a lens which can be applied in most social systems at multiple levels, from

individuals to organizations, as well as because it can incorporate data which is graphical, qualitative, and/or quantitative (Borgatti & Ofem, 2010). According to Borgatti, Mehra, Brass, and Labianca (2009) this idea of individuals nested within social webs of interactions and relationships is a powerful one, which "provides an answer to a question that has preoccupied social philosophy since the time of Plato, namely, the problem of social order: how autonomous individuals can combine to create enduring, functioning societies" (p.892).

Kezar (2014) reviewed SNA literature within the context of higher education organizational change, pointing out that most of it pertains to student access and success. Kezar outlines a possible research agenda for SNA in higher education, including informal network operations as a key area for future research, and much scope for investigation of higher education network structure and ties, and that central actors and opinion leaders have unknown change roles in different university structures (2014). As Kezar points out, much of the existing SNA research in university contexts focuses on students (2014), while research on "faculty members' social networks in higher education is still in its infancy" (Van Waes et al. 2015a, n.p.). The current study contributes to the literature and extends the scope of SNA in higher education by including faculty members, staff, and graduate students who are identified by peers as influential.

Roxå, Mårtensson and Alveteg (2011), Williams et al. (2013), and, Verwoord and Poole (2016) have argued for the possibilities of using SNA in ED. In the following paragraphs I draw on empirical studies that, while they may not directly use SNA tools such as density and centrality, each demonstrate that social networks exist in ED and academics who teach have conversations with peers about teaching. Table 1 summarizes these studies.

Study	**Data Collection**	**Sample size**	**Network analysis level**
Roxå & Mårtensson, 2009	survey/ questionnaire	106	egocentric (no ties between participants)
Rienties & Kinchin, 2014	survey/ questionnaire, focus group	54	egocentric (with ties between participants)
Matthews et al., 2015	survey/ questionnaire, semi structured interviews, documentation	2	egocentric (no ties between participants)
Rienties & Hosein, 2015	survey/ questionnaire, focus group	114	egocentric (with ties between participants)
Pyöräläa et al., 2015	survey/ questionnaire	54	egocentric (no ties between participants)
Quardokus & Henderson, 2015	survey	44, 14, 20, 32, 34	whole network (5 departments, no ties between departments)
Van Waes et al., 2015a	semi structured interviews	30	egocentric (no ties between participants)
Van Waes, 2015b	survey/ questionnaire, semi structured interviews	16	egocentric (with ties between participants)
Andrews et al, 2016	survey/ questionnaire, semi structured interviews	59	whole network (life sciences faculty)
Cassidy & Poole, 2016	survey/ questionnaire	29	unclear
Van Waes, 2016	semi structured interviews	30	egocentric (no ties between participants)
Van Waes et al., 2017	survey/ questionnaire	38	egocentric (with ties between participants)
Poole, Iqbal & Verwoord, 2018	focus group	20	egocentric (no ties between participants)
Knaub, Henderson & Fisher, 2018	surveys (2012, 2013, 2016)	26, 14, 20, 24, 25 (estimated, unclear in original)	whole network (5 departments, no ties between departments)
Ma, Herman, Tomkin, Mestre & West,	survey	100	whole network (two community of

2018			practice programs)
Benbow & Lee, 2019	survey/ interviews	244 (survey) / 22 (interviews)	egocentric (no ties between participants)
Lane et al., 2019	surveys	14, 19, 16, 18, 29, 19, 18	whole network (8 departments at 3 universities, no ties between departments)
Ma et al., 2019	survey	89	whole network (community of practice programs)
Quardokus Fisher et al., 2019	surveys	21, 34, 36, 57, 40, 26, 47	whole network (7 departments, no ties between departments)
Apkarian & Rasmussen, 2021	surveys	39, 35, 15, 14, 16	whole network (5 departments, no ties between them)
Benbow, Lee & Hora, 2021	survey	192	egocentric (no ties between participants)
Noben,, Brouwer, Deinum & Hofman, 2022	survey (pre/post)	19	whole network (one department)
Simper, Maynard & Mårtensson, 2022	interviews	34	egocentric (no ties between participants)
Taylor, Kenny, Perrault & Mueller, 2022	observation/reflection	n/a	n/a
Skvoretz et al., 2023	survey	296	whole network (9 departments at 3 universities; 1 tie between 2 universities)

Table 1: Summary of research on SNA for ED

Roxå and Mårtensson (2009) found that usually there was at least one disciplinary peer interlocutor. Pyöräläa et al. (2015) note also that conversations about teaching "with different actors varied both in their foci, meaning, and level of confidentiality" (p.157). Participants in these conversations about teaching may use them for professional, emotional, and/or academic support (Rienties & Hosein, 2015).

Actors engaged in these conversations can be mapped onto formal and informal networks which reach across disciplines and may extend outside of the institution (Rienties & Kinchin, 2014; Rienties & Hosein, 2015). Van Waes et al. (2015) found that participants' connections within their ED program network did not expand as much as connections to actors outside the ED program network, a finding which points to the importance of considering informal networks and of using open sampling methods.

Although egocentric data collection and analysis has been the most commonly applied, it is a limited approach from a systemic perspective (Van Waes et al., 2017). Some whole network sampling has been done, but requires knowledge of all actors on the network (such as a master email list for all professors, who may not be eager to respond to a mass email about 'leadership' with comments about their personal connections at the university); in limited contexts such as departments and programs whole network analysis is easier to apply. In larger networks, Van Waes et al. (2016; 2017) propose using snowball sampling to capture more of the network through identified alters. Snowball sampling has the advantage of capturing more of an open network, towards a whole network, without needing to consider the entire population of professors at the university as a target sample.

Leadership is an area that has not been well investigated through SNA in ED, although the importance of influencing teaching and learning through social processes strongly hints at this connection. SNA may be used indirectly or with related ideas such as Teaching and Learning Regimes or Communities of Practice (e.g. Apkarian & Rasmussen, 2023; Cassidy & Poole, 2016; Pyöräläa et al., 2015; Roxå & Mårtensson, 2009; Ma et al., 2018; Ma et al., 2019; Quardokus Fisher et al., 2019; Taylor, Kenny, Perrault & Mueller, 2022), or as the primary theoretical construct (e.g. Matthews et al., 2015; Poole, Iqbal & Verwoord, 2018; Rienties & Kinchin, 2014;

Rienties & Kinchin, 2015; Van Waes et al., 2015a; Van Waes et al., 2015b; Van Waes et al., 2016; Van Waes et al., 2017). Although the theoretical framings for extant research using SNA in ED contexts do not appear to use leadership theory within the conceptual framework, there is brief mention by Van Waes et al. (2015a; 2016; 2017) of Spillane's research on SNA and leadership in K12 educational settings. Another exception is Matthews et al. (2015), which describes research stemming from a project framed with 'distributed leadership' characteristics (for more on these characteristics, see Jones, Lefoe, Harvey, & Ryland, 2012). In this case the project seems to be the source of data for the article, but otherwise there are no discernable connections to distributed leadership in the article. Knaub, Henderson and Fisher (2018) did explicitly use SNA to find informal leadership across university-wide networks as they developed over a four-year period, but did not incorporate leadership theory. The research reported in the current study will not be the first to investigate leadership, but will be the first to explicitly incorporate leadership theory and SNA for research on leadership for teaching and learning in higher education.

Practically, educational developers in TLCs can use network visualizations for identifying groups with cohesive learning ties, or groups which are isolated (Rienties & Hosein, 2015). When isolated groups are identified, educational developers can be weak ties that connect network groups (Matthews et al., 2015), or identify other potential bridge builders (Rienties & Hosein, 2015). Networks can be nurtured, diversified in terms of teaching experience and expertise, and teachers can be encouraged to "more frequently consult others for information or advice around their teaching practice, i.e. in terms of seeking solutions, meta-knowledge, problem reformulation, and validation" (Van Waes et al., 2017 p.3).

Social network analysis and distributed leadership

This paper reports on a study of leadership for teaching and learning at universities. Of the many conceptualizations of leadership available to scholars, Spillane's distributed leadership is one which allows researchers a holistic frame encompassing multiple formal and informal leaders, and followers, and aspects of the situation as are of interest to the researcher (e.g. tools, routines, structures, rules). While higher education scholars have not used this perspective as a key aspect of research, in K12 contexts Spillane and colleagues have used SNA together with this leadership perspective, as will be presented below.

Social network measures of interest have included centrality, betweenness, and density. Centrality measures the prominence an individual actor, whereby central actors have more ties (de Lima, 2008). Warfield (2009) notes that centrality can indicate which individuals have more resources to use and share, can relate positively to authority, and, can predict formal and informal leaders. Comparing the indegree centrality of leader/follower behaviors (e.g. de Lima, 2008; Pitts & Spillane, 2009; Spillane et al., 2008; Spillane, Healey & Kim, 2010; Warfield, 2009), it is possible to identify individual actors who are more often nominated by 'followers'. Betweenness "gives us another measure of how central a person is in an advice network by taking account of his or her direct as well as indirect ties to others in that network" (Spillane, Healey & Kim, 2010, p.130). Betweenness can measure the role of formal leaders, is based on non-directional/binary ties between actors and measures the shortest paths between actors. Density, or the number of ties in a network relative to the number of possible ties (de Lima, 2008), indicates how 'connected' an actor is, and is one of the most common social network characteristics reported (Warfield, 2009).

The leader-plus aspect of multiple formal and/or informal leaders is ubiquitous (de Lima, 2008; Pitts & Spillane, 2009; Pustejovsky & Spillane, 2009; Spillane, Healey & Kim, 2010;

Spillane, Hopkins & Sweet, 2015; Spillane, Kim & Frank, 2012; Spillane & Shirrell, 2017; Spillane, Shirrell & Hopkins, 2016; Warfield, 2009). Formal leaders, such as principals or subject coordinators, are appointed to their positions, while informal leaders are nominated by 'followers'. To identify informal leaders, followers (i.e. K12 teachers) have been: (1) interviewed (Pitts & Spillane, 2009; Spillane, Hopkins & Sweet, 2015; Spillane, Shirrell & Hopkins, 2016) or surveyed (Pustejovsky & Spillane, 2009; Spillane, Healey & Kim, 2010; Spillane, Hopkins & Sweet, 2015; Spillane, Kim & Frank, 2012; Spillane & Shirrell, 2017; Spillane, Shirrell & Hopkins, 2016) to identify their advice and information seeking behavior.

Pitts and Spillane (2009) used semi-structured interviews to establish a connection between advice-seeking behaviors and 'leadership'. As the interviewees had previously responded to an earlier draft of the survey, the authors were able to compare the responses of participants across the two measures (survey, then interview), with an 80% match rate. Their "findings indicate that asking people who they go to for advice or knowledge about mathematics instruction enabled us to identify instances of leadership for mathematics instruction" (Pitts & Spillane, 2009, p.194). Through this type of investigation, leadership interactions tend to occur more often with informal leaders than formal leaders (Pitts & Spillane, 2009; Spillane et al, 2008; Spillane, Healey & Kim, 2010; Warfield, 2009), although Spillane, Kim and Frank (2012) found the opposite. Spillane and colleagues do point out that formal leadership is important, particularly subject-specific formal leaders who may have had formal training (Spillane, Hopkins & Sweet, 2015). Furthermore, looking at betweenness the data indicate that formal leaders are more likely to form ties with otherwise unconnected staff (Spillane, Healey & Kim, 2010).

Given the work conducted by Spillane and others in K-12 settings that brings together SNA and distributed leadership, the challenges facing TLCs and the possibilities for moving away from TLCs focusing on supporting individual instructors to considering their scope of

influence across organizational structures, it is timely to examine how an SNA analysis of a network operating through distributed leadership within educational development in higher education might address some of the challenges facing TLCs.

Methodology

This study aimed to investigate leadership as a distributed phenomenon across an organizational network but from the perspective of the TLC. The research was conducted at a large, research intensive university in Canada. The conceptual framework guiding the study is summarized in Figure 1. The questions answered in the study are:

(1) What is the size and density of the overall network, and are the sizes and densities of different faculties or departments similar?

(2) Do centrality measures (in-degree, betweenness, closeness, or eigenvector) correlate with demographic variables (professional development as an educator, years at organization, years as an educator, organizational level, formal leadership position, has conducted educational research)?

(3) Since snowball sampling has been suggested but not attempted, is snowball sampling an effective data collection method?

Snowball sampling was used to map as much of the network as possible, with the educational developers, instructional designers, and managers in the teaching and learning center as the purposive sample. They were contacted with a standard email (which was used throughout the study), and invited to a semi-structured interview (of 11, 7 consented to and were able to schedule interviews). The original seven participants identified additional colleagues from whom they sought advice and information. In addition to advice and information seeking behaviour,

participants were asked who they would go to or recommend. This second question was added because, at the outset of the research, there was no way to know if the actual advice-and-information-seeking network would be able to snowball sufficiently. That is to say, if professors tended to rely on extra-organizational networks to discuss teaching and learning, or nobody at all, at least they could help populate the network map by suggesting other influential network members who may otherwise be missed.

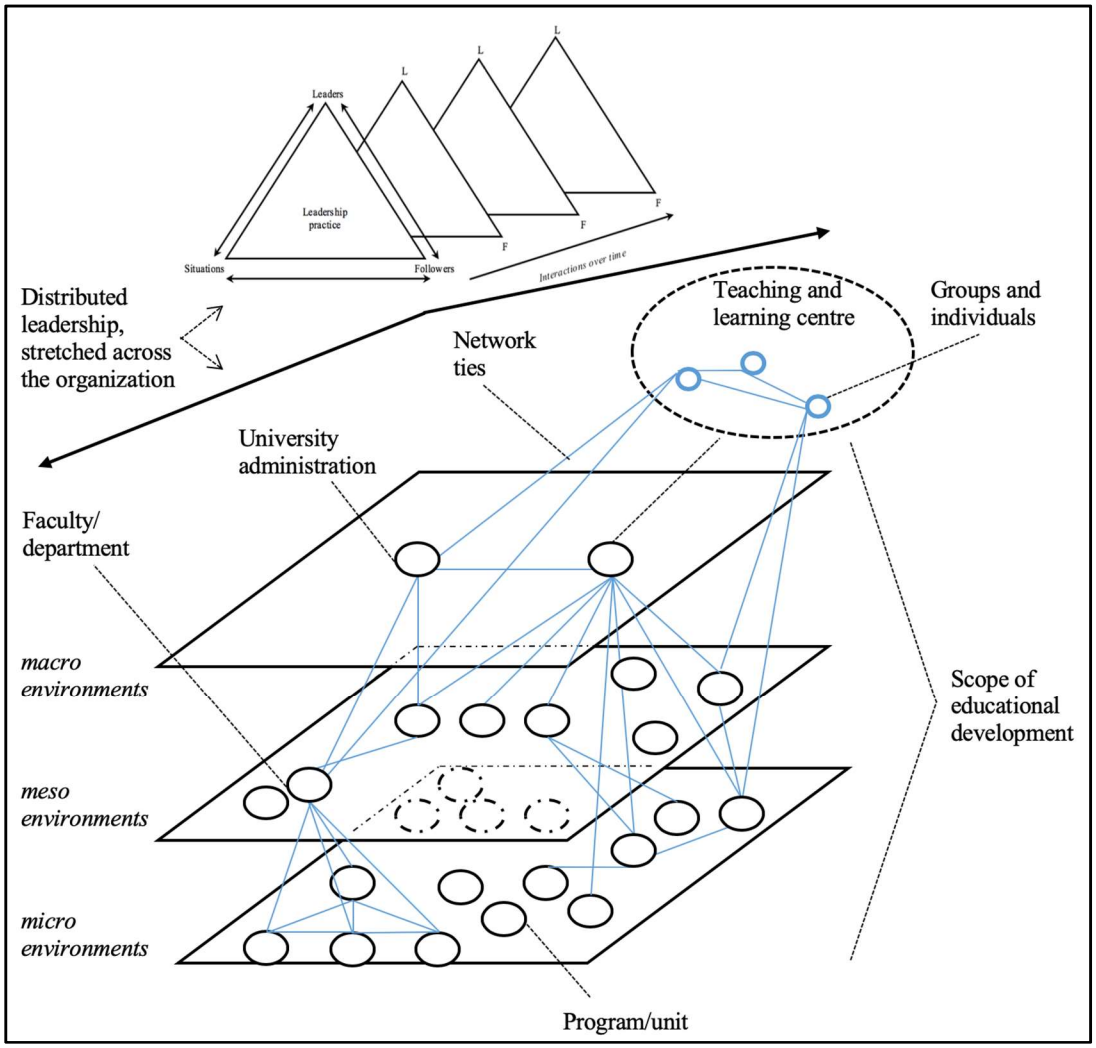

Figure 1: TLCs as a focal node for distributed educational development leadership within a university organization network

While most whole network research has previously relied on mass email surveys sent to every possible member of the network, this study chose not to for several reasons. First, snowball sampling has been suggested but not attempted, so this study adds to the growing body of SNA research for teaching and learning in higher education by attempting it. Second, people at universities and professors specifically receive a high volume of emails and may not have time to fill out a survey even if they are interested; this is especially true of the senior leadership whose contribution to a leadership study is essential. Moreover, since the network is bounded by the organization, which can include library or teaching or laboratory assistants, a mass email to all possible participants could skew results by overpopulating the leadership network with less influential people, thereby reducing reliability for the TLC's practical purposes. Third, interviews have the advantage of allowing participants to meet the researcher, ask questions, and better understand the nature of the research before continuing with informed consent and the interview protocol. With most of the participants being knowledgeable and experienced researchers themselves, this opportunity to clarify and decline to participate was valuable. Although a survey can undergo reliability and validity testing, and piloting, having the principal research present with every participant lends to the accuracy of the process.

Colleagues who were identified by the purposive same of educational developers and instructional designers at the TLC were invited by email to participate in their own interviews. From those interviews, further colleagues were identified and the sample snowballed. When invitees who were identified three times or more but did not answer the original email, they were contacted again by a letter hand-delivered to their office (seven of these were interviewed, three were willing but unable to schedule before the end of data collection). In this way, the participation in the research snowballed as each person interviewed identified colleagues from

whom they sought advice and information related to teaching, who were subsequently invited to participate.

Over six months 196 interviews were conducted in total, primarily with professors, but also with staff. Of the total 397 invited, the response rate was ~55%. While 173 of the interviews were don't face to face, 23 were conducted online due to the onset of COVID19 at the end of data collection. The duration of interviews ranged from 10 minutes to one hour, with most lasting between 20-30 minutes each.

The case study was bounded by the university organization, with one exception: when the snowball sampling was more successful than had been anticipated, to limit the scope of the investigation as well as avoid any questions about ethical conflict, the one faculty where the researcher was enrolled as a student was omitted from the data collection. In total there are nine faculties represented in this study, as well as administrative units falling under the Office of the Provost (in addition to the TLC, this included the library and student support services), and one administrative representative from another department.

Semi-structured interviews were conducted at a time and place of the interviewees' choosing, typically their offices at the university (spread across four different campuses). The interviewer maintained a University of Cambridge certification for assessment interviews, having completed thousands of standardized semi-structured interviews over years leading up to the data collection for the research, and thus was both trained and experienced. The researcher took notes and the interviews were audio recorded. While these interviews were predominantly conducted face-to-face, due to the unexpected pandemic outbreak near the end of the six months, some of the interviews were done using recorded Skype/Teams/Zoom calls. In addition to notes during interviews, and recording of interviews, the researcher maintained a reflexive journal. The participant data were entered into Excel spreadsheets, which were imported to the Gephi 0.10.0

software for network analysis.

Results

Figure 2 shows a visualization of the entire leadership network for the case university, encompassing formal and informal leaders who were identified through purposive and snowball sampling, and who gave informed consent to participate before their interview. This is a top down view of the network.

Figure 3 shows the same network, split into four levels consistent with the conceptual framework. This is a side view of the network. Forty-nine separate academic and non-academic units (e.g. departments, schools) are represented on the whole network.

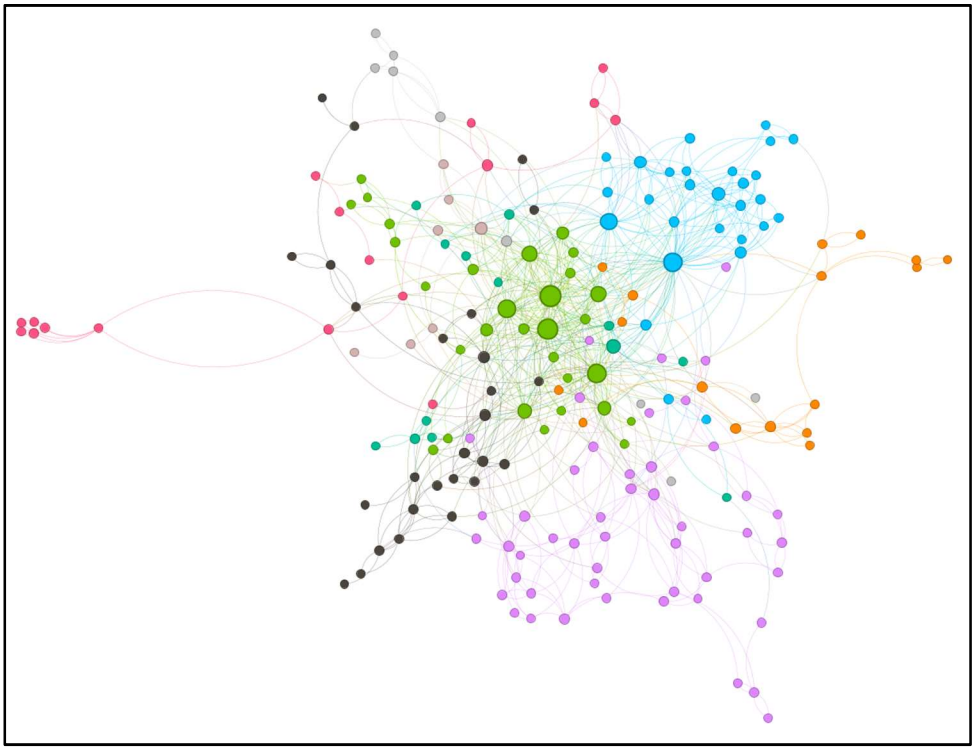

Figure 2: Network color coded by Faculty, node size determined by in-degree centrality, illustrated using Force Atlas layout and Expansion

Van Waes et al. (2018) raise the questions of how network content, diversity, and size might interact, and how these combinations of interactions might be important for ED. The results of the current study provide an initial baseline for considering networks at the level of the university.

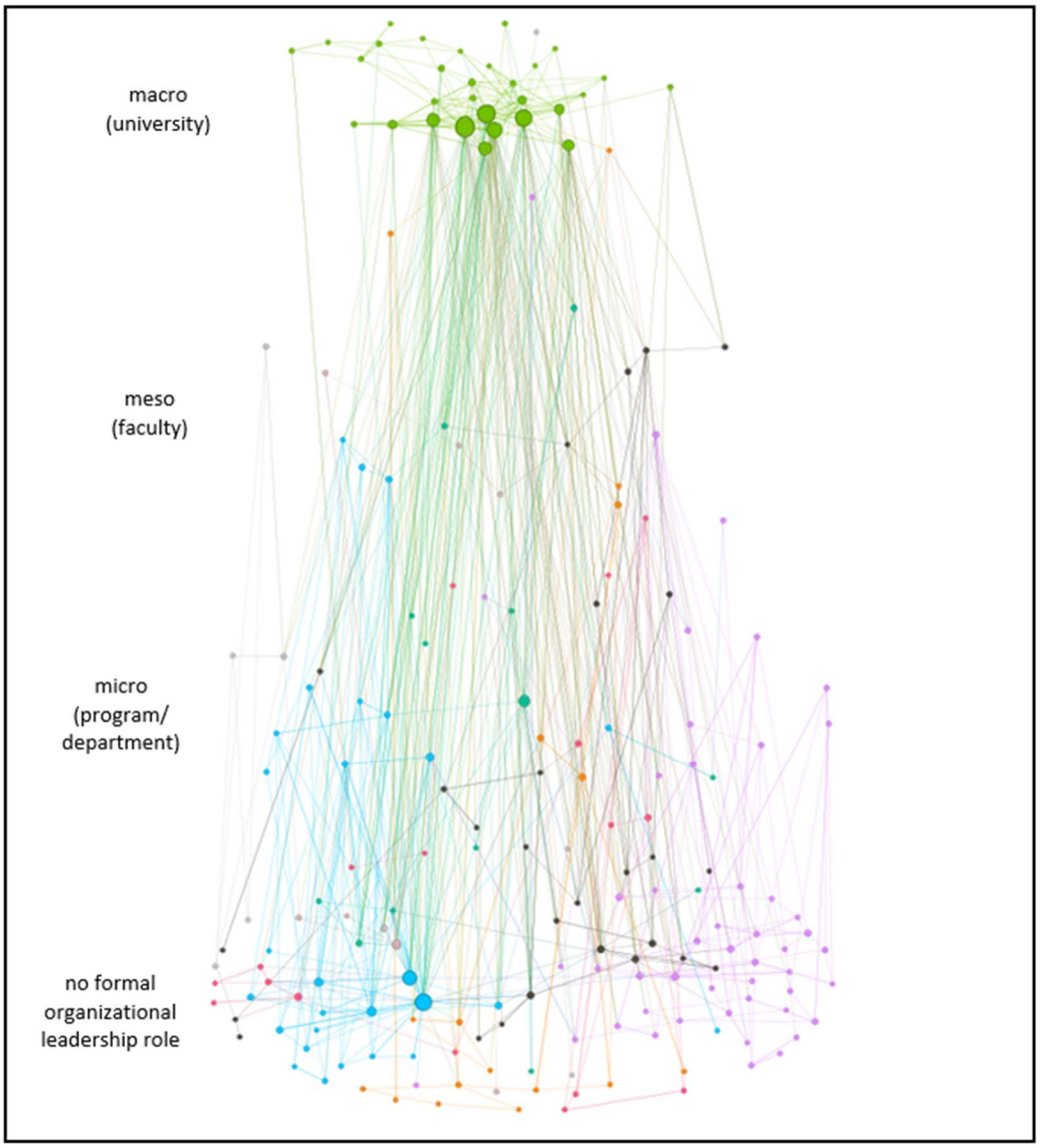

Figure 3: Organizational leadership network divided by organizational level (Color and size as Figure 2, with Fruchterman Reingold and Network Splitter 3D layouts, and No Overlap)

Density

Density is a measure of how connected a network is compared to the maximum possible number of connections within that network (Hanneman & Riddle, 2011). Table 2 shows density results for the whole network, as well as faculties and departments. In the current study, departments with fewer than three members are excluded from density analysis. This is because, although two or three people may be densely connected, they are part of a larger department which seems to lie outside of the leadership network and this inherently limits information flow.

A small network of three colleagues can easily be fully dense, but a small sample skews the value of the result; similarly, a department with only one member cannot have meaningful density information. Directed density results are reported as three different networks: have gone, would go, and combined.

	n	**have gone to**	**would go to or recommend**	**combined**
Organization (whole network)	196	0.013	0.008	0.021
University Administration	30	0.094	0.059	0.153
Faculty 1	13	0.051	0.019	0.071
Faculty 2	17	0.051	0.055	0.107
Faculty 3	17	0.053	0.021	0.074
Faculty 4	7	0.238	0.048	0.286
Faculty 5	6	0.100	0.167	0.267
Faculty 6	17	0.055	0.040	0.096
Faculty 7	28	0.098	0.050	0.148
Faculty 8	48	0.021	0.023	0.044
Department 3	4	0.333	**0.000**	0.333
Department 8	4	0.250	0.167	0.417

Department 10	11	0.082	0.091	0.173
Department 12	8	0.286	0.018	0.304
Department 13	7	0.214	0.095	0.310
Department 14	6	0.100	0.133	0.233
Department 18	7	0.238	0.048	0.286
Department 19	6	0.100	0.167	0.267
Department 26	4	0.167	**0.000**	0.167
Department 30	8	0.125	0.107	0.232
Department 35	13	0.321	0.128	0.449
Department 36	10	0.167	0.078	0.244
Department 37	13	0.231	0.115	0.346
Department 38	5	0.250	0.150	0.400
Department 15	4	0.333	0.250	0.583
Department 42	7	0.095	0.167	0.262
Department 43	7	0.333	0.071	0.405
Department 44	13	0.109	0.064	0.173
Department 47	7	0.095	0.167	0.262

Table 2: Network densities

Participants

From purposive sampling and snowball sampling, 196 participants were interviewed and included on the network. Table 3 summarizes the demographic information of sampled participants.

Macro leadership level represents participants whose responsibilities are not limited to a single faculty or department, such as TLC staff or librarians who are informal leaders; meso-level leadership at the faculty level comprises primarily deans and vice/associate deans; micro level

leaders at the department level are primarily chairs or directors; informal leaders with no formal organizational leadership role form the foundation of the network.

Organizational status	**n**
Full professor	62
Associate professor	54
Full time staff	35
Assistant professor	20
Adjunct/part-time professor	12
Assist. professor- Teaching track	10
Part time staff	2
Distinguished university professor	1

Years as an educator	**n**
0-4	4
5-9	15
10-14	31
15-19	34
20-24	36
25-29	25
30-34	28
35-39	14
40-44	5
45-49	3
50-54	1

Years at organization	**n**
0-4	16
5-9	38
10-14	48
15-19	40
20-24	22
25-29	18
30-34	11
22-24	3

Professional development as an educator	**n**
High	25
Med	54
Low	94
None	23

Research in ed.	**n**
Yes	90
No	106

Organizational level	**n**
macro	34
meso	18
micro	37
foundation	107

Leadership status	**n**
Formal	71
Informal	125

Table 3: Summary of participant demographics

A "low" level of professional development was for those who had only taken some workshops related to teaching and learning. A "high" level of professional development was a degree, such as a bachelor or master of education. A "medium" level of professional development was having taken workshops plus some other certification; several participants cited training as lifeguards in their youth as an experience where they learned about teaching which

was still influential years later in their professional practice. Similarly, some participants chose to include teaching swimming as experience as an educator.

Centrality

In-degree centrality counts the number of times an individual on the network was identified by their peers. Closeness centrality measures the shortest path from each node in the network to each other node. Betweenness centrality measures the extent to which each node on the network connects other nodes. Eigenvector centrality measures which nodes on the network are connected to well-connected alters. Table 4 summarizes centrality measures for the whole network.

	In-degree centrality	*Closeness centrality*	*Betweenness centrality*	*Eigenvector centrality*
High	38	1	0.198	1
Low	0	0	0	0
Average	4.02	0.27	0.01	0.09

Table 4: Summary of centrality statistics

For each participant on the network, correlations were determined using Pearson's r for demographic variables and the four centrality measures (Table 5). For organizational status to be calculated as a linear coefficient, the data were converted with full and distinguished professor as the highest status, followed by associate, then assistant, them full time staff, then part time faculty and staff (8, 6, 4, 3, 2, respectively).

	Professional development as an educator	*Years at organization*	*Years as an educator*	*Organizational level*	*Organizational status*	*Leadership status*	*Research in education*
In-degree centrality	0.221	0.049	0.054	**0.288**	-0.125	0.044	**0.319**
Closeness centrality	0.068	0.020	-0.084	-0.031	-0.090	-0.060	0.048
Betweenness centrality	0.171	0.060	0.065	**0.302**	0.053	0.148	**0.271**
Eigenvector centrality	0.217	0.018	-0.012	**0.307**	0.011	**0.333**	-0.189

Table 5: Summary of centrality and demographic correlations (Pearson's r)

Discussion

Size and density

Whole network analysis of a university organizational leadership network has not previously been conducted. The current study contributes to the literature a method for doing so, and the results of that method. At the outset of the study, an open question was how effective the research design would be. An early concern was that, when contacted by a stranger to discuss their teaching, and to name colleagues who would be similarly contacted, most prospective participants would exercise their right to decline all involvement. As such, a 55% interview rate with 196 participants is considered a positive result. It is worth mentioning that the researcher had something of an insider status through part-time contract work for the TLC. So, most of the purposive sample had met the researcher, as had some of the snowball sampled participants. For a researcher who is a complete unknown, it is possible that there would be more reticence to

meeting for the purpose of naming trusted colleagues who may not appreciate being contacted in turn.

A network with a density of 0 has no connections whatsoever between nodes, whereas a network where every node is connected to every other node would have a density of 1. The overall density of the full network reported in this study measured at 0.021, which is not particularly dense but the network represents a large group who are physically separated on four different campuses and 49 academic and administrative units. Size is important to understand density because individual actors in the network have limited resources for building and maintaining ties with other actors in the network (Hanneman & Riddle, 2011). This result cannot be compared to other research, as there is none to compare at the organizational level.

Comparing the faculty size and densities, at the low end one faculty has only six actors represented in the network. This could suggest that there are isolated teaching groups not identified through the snowball sampling, or perhaps there are individuals in the faculty who tend to look outside the organization for advice and information about teaching and learning. Indeed, during interviews some professors mentioned family members who worked in education, or disciplinary colleagues at other organizations, or in one case a participant referred to their colleague “Professor Google”. From the perspective of the TLC, these faculties with few ties back to the purposive sample represent areas where they can easily improve information flow by approaching the members on the network and working directly with them to identify what needs and interests their colleagues may have in order to plan activities and policies to stimulate further growth for teaching and learning. There seems to be no connection between the number of professors in the faculty, and the number of faculty representatives on the network (i.e. faculties with more professors don’t necessarily have more leaders as identified through advice and information seeking behaviour)

At the other end of the spectrum, the faculty with the most formal/informal leaders identified for the network has 48 participants. The faculties with more participants have lower densities, and again the size of the network likely plays a role. From the perspective of the TLC, faculties with several participants identified by peers as sources of advice and information about teaching and learning can be considered as less urgent areas to focus. Here there are clearly a large number of interested and respected parties not just engaged in teaching and learning, but having discussions and building reputations. TLCs may consider who are the most central individuals in these faculties, to approach directly about future planning of policies and activities, possibly by inviting them to planning meetings, or simply by using informal discussions over lunch and coffee to share information (such as ideas, interests, or needs).

As can be seen in Figure 2, not all faculties cluster together, and there are some clusters who are better connected to actors outside of their faculty than within. For this reason, TLCs should identify central actors strategically such that they achieve the most efficient reach into their network. For some faculties one champion may be enough, for other faculties the best person to approach may actually be in a different faculty altogether.

Moving to the department level, Quarkokus and Henderson (2015), Andrews (2016) and Quardokus Fisher et al. (2019) have reported departmental sizes and densities as shown in Table 6. Quardokus Fisher et al. (2019) report sample size as a percentage of total surveyed, plus external members, so for those units estimated n is used here.

Quardokus & Henderson (2015)	*Andrews (2016)*	*Quardokus Fisher et al. (2019)*
n=44, 0.060	n=19, 0.29	n=15, 0.10
n=14, 0.176	n=43, 0.18	n=18, 0.05
n=20, 0.216	n-23, 0.34	n=15, 0.03

n=32, 0.117	n=28, 0.15	n=33, 0.02
n=34, 0.107		n=18, 0.02
		n=22, 0.07
		n=30, 0.02

Table 6: Departmental sizes and densities in the literature

These were size and density results for department-level research, with the whole network invited by the researchers to participate. In comparison, the study reported in this paper found typically smaller and denser networks. It is possible that the snowball sample method of identifying formal/informal leaders contributed to the difference; not everyone was invited to participate, participants had to be nominated by other participants as influential, in order to populate a leadership network as opposed to a membership network. From the perspective of TLCs, mass emailing the entire university would likely result in a larger response for a membership network.

It is interesting to note that two of the sampled departments have a network density of 0.00 for who they *would go to or recommend*; this suggests that in these two departments, those considered leaders of teaching and learning have sought out all the help they can find.

Size and density results can be useful for TLCs as a means of measuring effectiveness. The leadership network here begins with the TLC, and can be used as a baseline for comparison to other universities or for self-comparison over time. TLC staff can see which departments they currently have champions active, and which departments are barely registering on the network.

Centrality

Centrality measures use graph theory to establish the relative position of a node when compared to all the other nodes in the network. In a social network, an actor with higher centrality is likely to have more influence across the network (Hanneman & Riddle, 2011).

Indegree centrality

Indegree centrality is a simple measure of how many actors on the network have directed ties to a specific actor. In Figures 2 and 3, indegree centrality is represented in the size of the node on the illustration. Indegree centrality is important because it is considered a measure of prestige or prominence (Hanneman & Riddle, 2011). Lane et al. (2019) defined opinion leadership *as* indegree centrality.

In the study sample, indegree centrality ranged from 0 (one of the purposive sample) to 38 (also one of the purposive sample), with an average of 4.02. This means that one participant was nominated by 38 colleagues as someone they have gone to, or would recommend, for advice and information about teaching and learning. In the study sample, 7 out of 11 participants with an indegree centrality of 15 or higher were members of the TLC. It is possible that this result follows from the methodology of snowball sampling with the TLC as the purposive sample, however, since not all TLC staff were equally high, and other network actors who were not TLC staff were also in the top 11, it is possible that the TLC staff have been effective in building a reputation as sources of advice and information about teaching and learning.

For the TLC, network data such as in-degree centrality can be presented as a measure of their effectiveness within the organization. This is to say, since the network members with the highest indegree centrality are TLC staff, clearly the TLC plays an important role in giving advice and information related to teaching and learning across the organization. With this

baseline measurement, after 3, 5 or 10 years the network analysis could be done again, and the TLC could present increases in indegree centrality as evidence of effectiveness.

In addition, indegree centrality has here identified 4 actors on the network who are not TLC staff and yet are highly regarded by their peers. Actors thus identified could be considered by the TLC as 'champions', who can be consulted for policy and planning as a means of increasing relevance and ownership of educational development activities. These champions can also be directly contacted and invited for activities. Since university professors are often busy, scheduling is often a challenge, but a schedule which includes as many of the high indegree actors as possible will theoretically have the strongest organizational impact.

In terms of correlations, consistent with the finding from Lane et al. (2019), there appears to be no significant correlation between indegree centrality and faculty status. That is to say, being a full professor or a part-time staff member makes it no more or less likely that an individual was nominated as a source of advice or information about teaching and learning. Moreover, consistent with the finding from Knaub, Henderson, and Fisher (2018), having a formal leadership position does not seem to correlate with being nominated by others. Similarly, no significant correlations were found with years as an educator, or years at the organization. The strongest correlations with indegree centrality were organizational level (0.288) and having done research in education (0.319). According to Cohen, Manion, and Morrison (2005), Pearson's r at this weak level of correlation suggests these variables may be worth further investigation. Organizational level is a possible factor in explaining centrality since these individuals, including TLC staff, have the most exposure with the broadest range of members in the organization. Having conducted research in education is surprisingly the strongest correlation in the data set. Perhaps this is due to the prestige accorded to research in a university context, or

perhaps these individuals are better known as educators because they have presented their research locally to their colleagues.

Betweenness centrality

Betweenness establishes the shortest path between two actors for each node on the network; an individual has a higher betweenness value the more often they lie on that path when considering all nodes in the network (Hanneman & Riddle, 2011). As ideas and information flow through the network, actors who are more "between" others are key brokers in what is passed on and what is not.

In the study sample, betweenness ranged from 0 to 0.189. Once again, the TLC was highly represented, with 12 participants having a betweenness of 0.45 or higher and half of those being TLC staff. Betweenness centrality has a high correlation with indegree centrality (r=0.86), but this is likely a simple function of the network properties. That is to say, having a high indegree means that those actors lie on more paths, hence the shortest path between two nodes will more likely include those actors with high indegree centrality.

For the TLC, knowing who has a high betweenness value outside of the center can assist in identifying actors who can serve as a bridge to other subgroups within the organization (Ma et al., 2018). Hence, in addition to those with a high indegree centrality, the TLC can target these individuals to develop as ambassadors to share information.

In terms of correlations, as with indegree centrality, there is a slight correlation with organizational level (r=0.302) and having conducted research in education (r=0.271). This study did not find a correlation between organizational status and betweenness, which differs from the result from Ma et al. (2018), who found that tenure track assistant professors had a lower betweenness than tenured faculty and non-tenure track faculty. Possible reasons for this are methodological, as the current study included a broader range of participants (including staff and

part-time professors), and utilized snowball sampling which means that organizational members who were not nominated by colleagues were not included in the sample.

Closeness centrality

Closeness centrality is a measure of how well a node is connected to every other node in the network, determined by establishing the shortest path, with a greater centrality indicated by a higher value as calculated by Gephi. In the study sample, ranging from 0 to 1, the average closeness centrality was 0.267. None of the 12 participants with highest closeness centrality (0.5 or higher) were members of the TLC. Upon close examination, illustrated in Figure 4, those participants with highest closeness centrality are primarily outliers on the network, which is a surprising result as we would expect greater centrality at the center of the network, corresponding with the high indegree actors as illustrated in Figure 3. According to Evans and Chen (2022), snowball sampling a biased sample of a larger network (in our case, a network of leaders in a larger organization), or high degree nodes clustered at the center of a dense network (as we see in Figure 3), can cause this discrepancy between the closeness centrality and indegree centrality. They also suggest that there may be other underlying network properties that are not known which lead to this result, in the present study the organic structure with outlying clusters could skew the data. In terms of correlations, closeness centrality has no significant correlations with demographic variables whatsoever. Overall, this suggests that closeness centrality is probably not a useful measure for TLCs to consider in a university organizational setting. For computer networks routing data through the most efficient hubs, or for city planners establishing bus terminals, and especially in networks with homogeneous spread, this measure of centrality probably has more use.

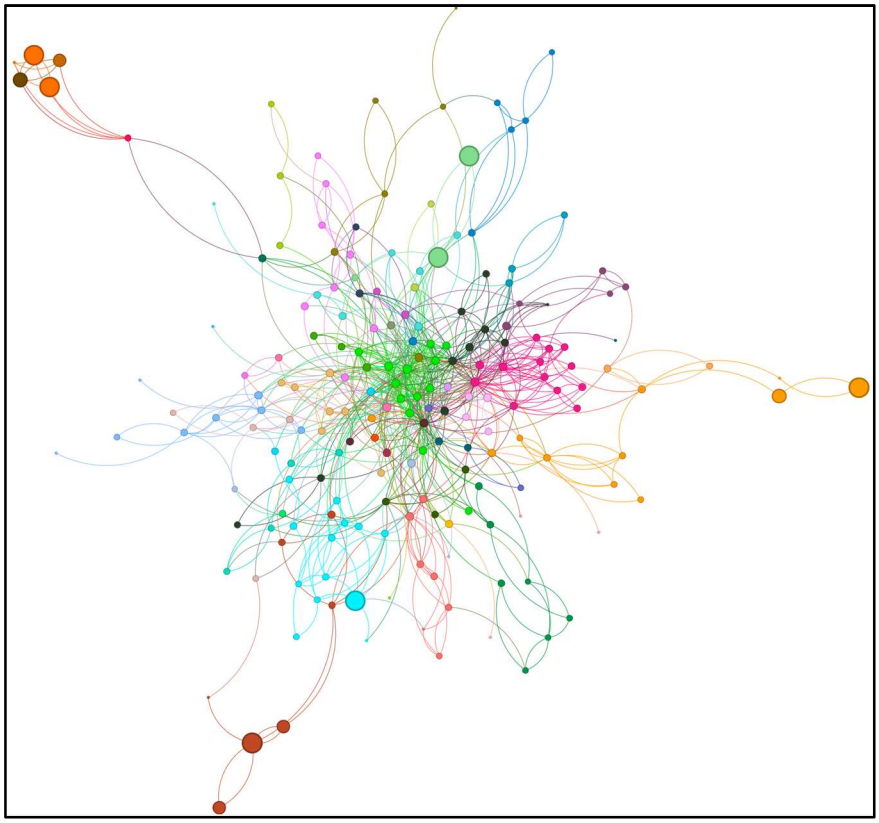

Figure 4: Network color coded by Department, node size determined by closeness centrality, illustrated using Yifan Hu layout and Noverlap

Eigenvector centrality

Eigenvector centrality stems from the concept that not all nodes are equal, and being connected to a node with higher centrality carries more weight than with a node with lower centrality (Landherr, Friedl & Heidemann, 2010).

In the study sample eigenvector centrality ranged from 0 to 1, with an average of 0.09. Of 9 participants with an eigenvector centrality of 0.5 or higher, 5 were TLC staff. This result is probably a result of a mutually enforcing property of the algorithm; that is, since the TLC staff tended to have high in-degree centrality, being clustered together with other TLC staff would

increase eigenvector centrality. For the TLC, this suggests that eigenvector centrality is probably not a useful measure.

In terms of correlations, organizational level and leadership status were the strongest correlations, at 0.307 and 0.333 respectively. Figure 3 shows, at the macro level, several high centrality nodes clustered together; these are primarily TLC staff who work across the organization and are considered formal leaders in the study.

Types of ties

Since participants were asked who they *have* gone to, and also who they *would* go to or recommend, these were entered into Gephi as two different types of ties. Both *have* and *would* contribute to leadership as a process of social influence, but Figures 5 and 6 shows the leadership network according to tie type.

In Figure 5, the network has been filtered for *have* ties, with in-degree centrality calculated for just those ties, and a layout algorithm plotted. In Figure 6, the network has been filtered for only *would* ties, with the in-degree centrality and layout recalculated. Gravity tuning was applied to both layouts so that outliers remain in view. Those outliers are participants who were either not nominated as someone a participant *had* gone to (on the left, n=21), they were only recommended. In Figure 6, outliers (n=35) were those who someone *had* gone to, but they were not recommended. Coloring for both visualisations based on Faculty.

As illustrated by the graphs, there is considerable overlap between those who participants *had* gone to, and those who participants *would* go to. Aside from the outliers, the basic network shape which has clusters of participants in the same faculty remains.

In-degree centrality shows an interesting difference. In Figure 5, the larger circles show that the people who *have* been nominated most as actual sources of advice and information are

from the TLC (indicated in green). In Figure 6, filtering for reputational *would* go or recommend ties, the TLC staff are still further nominated by participants who have not gone to them. This reflects positively on the TLC.

Outside of the TLC, there are two participants from the same Faculty who stand out in Figure 5 (indicated in blue). The individual with the larger measure of in-degree in Figure 5 has been the most nominated outside of the TLC, and the second-largest circle has the second-highest in-degree. In Figure 6, which reflects who participants *would* go to, the most recommended individual is the same individual as the second-highest for *have* gone to. Clearly an influential individual, who was also one of five former Chairs in University teaching who took part in the research.

However, the overall consistency illustrated in the visualizations supports the extension of mapping the leadership network with consideration of reputation (*would go to, or recommend*) as a second type of tie.

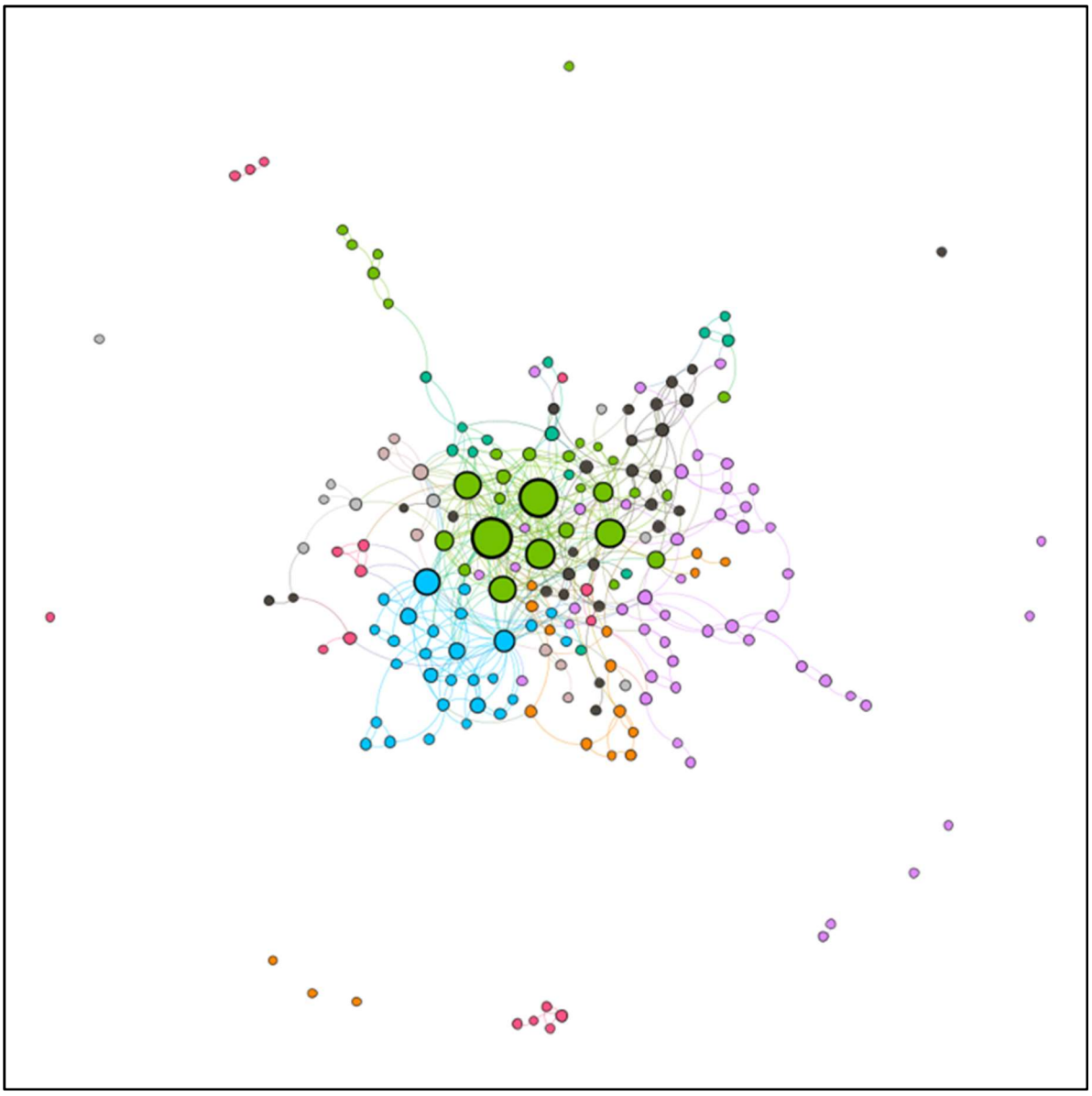

Figure 5: Have gone ties-based network, color coded by Faculty, node size determined by in-degree centrality, illustrated using Force Atlas 2

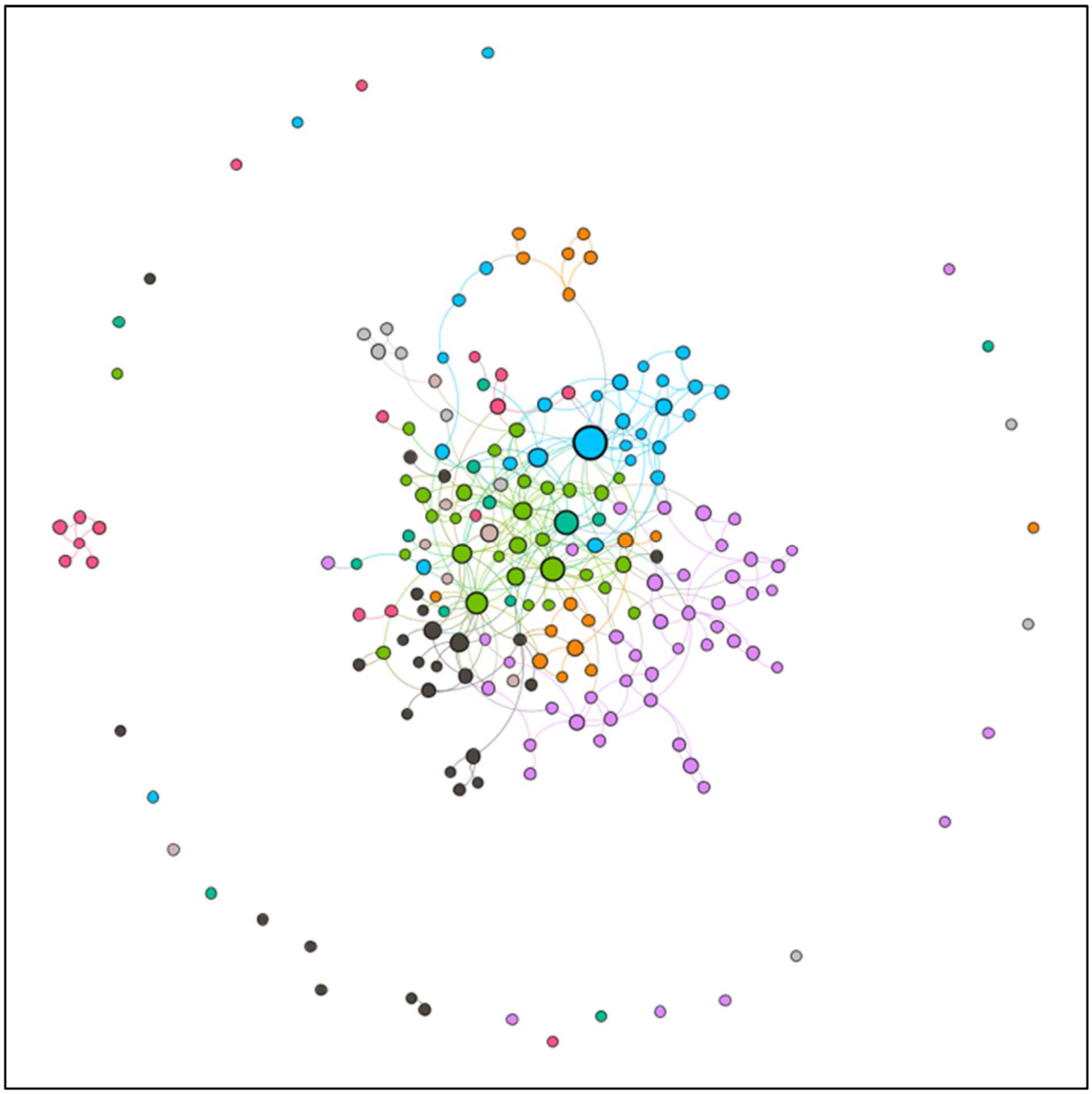

Figure 6: Would go to, or recommend, ties-based network, color coded by Faculty, node size determined by in-degree centrality, illustrated using Force Atlas 2

Snowball sampling

As seen in Table 1, snowball sampling has not been applied for SNA research in teaching and learning at universities, although it has been suggested for larger networks by Van Waes et al.

(2016; 2017). During the planning stages of this research, there was a concern that formal leaders and key informal leaders could be hesitant to participate, since they are busy and may be uncomfortable with the nature of the research where they are being asked to name trusted colleagues who will in turn be invited to participate. Snowball sampled interviews is a time-consuming process and it was unknown when the research began how far the network would spread.

The response rate for invitations to interview for this study was ~55%. The closest comparison in the literature is with Andrews et al. (2016) who had a survey response rate of 46% when emailing all assistant, associate, full, and active emeritus professors in the faculty under study. Other survey research commonly had response rates around 50%, though some full network samples were as high as 80% (Lane et al., 2019) or as low as 37% (Quardokus & Henderson, 2015). The current study, however, did not limit opinion leaders to only tenured professors, and the target network was the entire organization. The study site had a total of 48 academic departments, with the snowball sampled leadership network including representatives from 40 academic departments. This result suggests that the TLC of the study site has access to information flows across most of the campus, with eight departments they could choose to contact directly to identify possible champions.

An advantage of the snowball sampled interviews was the interviews themselves. Professors are of course very knowledgeable about research, they tend to be curious and are trained to be critical. Before beginning the interviews, it was common for professors to have questions about the methodology and use of the results. For an emailed survey, it would perhaps be possible to write a long document containing the answers to anticipated questions, but from the standpoint of the participant it is more helpful to directly get answers to the questions they have, rather than have to search for them. Participants were also occasionally unsure how to

answer a question (such as whether teaching swimming counted as experience as an educator), and although a reliable and valid survey minimizes such issues, have the principal researcher on site for every interview to clarify and answer questions lends to the rigor of the data. The size of the snowball sampled network, where every member of whom is a leader of teaching and learning through their formal position or their influence within the network, speaks to the usefulness of this approach.

It should be noted that the researcher had some minor insider status, having done contract work with the TLC at the study site; an open question would be whether a completely unknown outsider would have a similar response rate. At the same time, the researcher was not a long-term or full-time employee of the TLC, and most members of the network of the populated network were completely unknown to the researcher with some having a high indegree value on the network. For this reason, for a new TLC or new TLC employee, getting into the field is invaluable as a way to get to know each individual who is a key influencer in the organization, and this research methodology provides such an opportunity.

As the effectiveness of the snowball sampling was unknown, the question of who would participants go to, or recommend, was also added. This lends reputational ties to the network, and in practice "would" led to one cluster that otherwise would not have been found. It also identified people that nobody said they *had* gone to, but those people identified people they "had" gone to, thus contributing to identifying central people and the overall reliability of the results.

Probably it wouldn't be possible to simultaneously do a mass email survey and snowball interviews for comparison, because most respondents would complete one or the other. It could be possible to compare the same network measures at similar institutions, but because of complexity it would be difficult to know which situational factors influence whether the results

are really comparable. In the end, the decision between email survey or snowball interview probably comes down not to accuracy, but to research questions and logistics.

Distributed leadership

Other studies may make vague reference to distributed leadership, possibly citing Spillane or other leadership scholars, but this is the first SNA research on teaching and learning leadership in a university which explicitly uses Spillane's analytical perspective established for K12 educational leadership research.

Consistent with the work of Spillane, this study used advice and information seeking behaviour to map out a leadership network within an educational leadership network. While this study was not the first to do so in a university context, it was the first to do so at an organizational level. The emergence of informal leadership is a key component of distributed leadership, and in this study 125 out of 196, or 63.78%, of the leaders identified were not currently holding formal leadership positions. Many of the studies cited in Table 1 identify people in non-formal roles, and clearly those who teach at universities do not rely on formal leaders for advice and information about teaching and learning.

Apkarian and Rasmussen (2021), on the other hand, found that all of the instructional leaders in their SNA study had formal roles related to instructional practice. They proposed that the absence of informal leadership suggested a stable department, while informal leaders could suggest factions or unrest. The data in the study reported here do not necessarily support this, as formal leaders were willing to name informal leaders as sources of advice and information whom they had gone to or would recommend. Similarly, informal leaders named formal leaders as sources of the same. It is possible that there were clusters within the organization not captured by the network, even likely since some departments were not represented at all, while others had

only a few members. From the perspective of the TLC, the possible existence of isolated clusters need not necessarily denote restless factions, as there could be other factors in play including connections to external networks or situational factors as simple as scheduling. Another important situational factor is the importance of collegiality in university leadership; informal leaders need not be "interlopers", as Apkarian and Rasmussen (2021) call them, but motivated and experienced members of the network who are respected and sought out for their contributions and abilities in achieving the shared goal of student success. For TLCs, it is valuable to consider informal leaders as a key part of the organizational network who can be supported as they in turn support the formal leadership.

This study found no strong correlations with centrality measures and the selected demographic characteristics. From a distributed perspective, leadership practice emerges from the interactions of the leaders, the followers, and the situation. So, the question remains, are there any identifiable factors with leadership for teaching and learning in an organizational network. From a complexity standpoint, there could be several unidentified factors working together. Every member of this network was a leader, but also most were followers as they had gone to someone else in the network for advice or information about teaching and learning at some point. This begs the question: what motivates followers to nominate specific colleagues? This question wasn't asked in the study for every name given, and it might be difficult for participants to remember the details of why they went to each person every time, but there could be some answers there. Also, situational factors could include physical convenience (e.g. are professors more likely to seek advice and information from others whose office lies along the short path to the best coffee?), schedule overlap (e.g. does having office hours at the same time result in more conversation?), service responsibilities (e.g. do professors tend to talk about teaching most with frequent committee collaborators?), and so on.

Due to the nature of complexity, and the inclusive nature of Spillane's distributed leadership in accommodating diverse aspects of the leaders, followers, and situation, there is much scope for future research to explain the structure of the network.

Future research

This study was the first to conduct whole network analysis using snowball sampling with a purposive sample from the TLC to investigate leadership for teaching and learning in a university organization. From this baseline, similar research could be conducted at other universities. Such research could be used by TLCs as a measure of effectiveness. In the current study, information is able to flow from the TLC to almost every department in the university, but would another university have the same or a different result? Densities for the organization and faculty level in the current study have no basis for comparison, because similar research has not been conducted. Future research at these levels could be conducted to investigate if there are significant different, and if so, why.

Future research can further investigate the weak correlations between indegree centrality with organizational level, and with having conducted research in education. Other demographic or situational variables could also be investigated.

The network populated in this novel methodology resulted in the TLC being set in the center of the map by the Gephi layout algorithms Yifan Hu and Force Atlas. The most central individuals tended to be TLC staff. Is this just because of the data collection method, or would a different method yield the same result? Other researchers interested in TLCs could replicate the methodology used in this study, or alternatively begin with a different purposive sample, or try snowball sampled email surveys, or attempt a whole network mass email survey.

Limitations

The data reported in this study represent a snapshot of self-reported data snowball sampled from the TLC purposive sample. Self-reported data, while common in social science research, has the disadvantage of relying on the accuracy of information presented by participants. The results must also reflect the time that the data were collected. Snowball sampling for this study began just before murmurs of a flu-like virus in China were on the news, and data collection ended six months later with participants requesting to use online video-conferencing software for the interviews. It is possible that some invited participants would have been interested to participate pre-COVID19, but chose to decline because of the uncertainties of social proximity to a researcher running around campuses (including two medical campuses attached to hospitals), or the extra time they were required to spend in reworking their courses to be effective online. Even without COVID19 complications, the structure of these networks will always be dynamic as professors move in and out of the university, or projects or committees within the university, or formal leadership positions taken up as service for a fixed term. A final, related, weakness was that many of the people in the snapshot did not currently have a formal role but may have previously; this was not accounted for in planning the data collection process; future research could include a demographic question about whether a participant had previously held a formal leadership position.

Conclusion

This paper began by listing the challenges faced by TLCs as identified in the literature as follows: (1) unstable TLC leadership structures; (2) resource constraints; (3) working in contested areas such as epistemology/pedagogy, academic freedom, and the role of the centre; (4) teaching being viewed as a low priority of faculty and/or administration, compared to research, and; (5)

assessing/evaluating their impact. Literature suggests that TLCs could, and perhaps should, take an organizational leadership perspective on their work, and that distributed leadership and social network analysis are tools increasingly being brought to bear for similar research in higher education. The research presented in this paper used a novel framework for conceptualizing distributed ED leadership across the university, and identified through TLC-centred and snowball-sampled Social Network Analysis.

The results show that the TLC has access to a network of formal and informal leaders of teaching and learning distributed widely across the organization. While this leadership network is not static any more than TLC leadership structures, 142 of the 196 participants had been with the organization for a decade or more; formal leadership roles may change but influential members of the network may not. Given resource constraints, a TLC could use such a network map as a resource; these individuals are already known as sources of advice and information about teaching and learning, and leveraging them to inform TLC decisions and promote TLC initiatives need not cost more than a little time and effort. TLCs need not contest epistemological or pedagogical norms within the disciplines, rather, through SNA they can identify and support local leaders who are more acquainted with their colleagues and the microcultures of their departments and programs; this approach upholds academic freedom, and underscores that the role of the TLC is not to instruct their colleagues so much as to support them. In cases where teaching may perhaps not be viewed as a priority compared to research, such a network map provides TLCs with evidence that professors do in fact value teaching. At least, enough to discuss it with each other and a researcher. Furthermore, where TLCs want to promote Scholarship of Teaching and Learning, or further Social Network Analysis research, they can use the results of their network map to do so. Finally, the network map, with the TLC at the centre, can be used as evidence of impact.

The questions answered in the study were:

(1) What is the size and density of the overall network, and are the sizes densities of different faculties or departments similar? The size of the final network was 196 formal and informal leaders of teaching and learning at the organization, with low density across the organization. Different faculties and departments had different sizes and densities, with smaller cluster tending to be more dense.

(2) Do centrality measures (in-degree, betweenness, closeness, or eigenvector) correlate with demographic variables (professional development as an educator, years at organization, years as an educator, organizational level, formal leadership position, has conducted educational research)? There were no significant correlations with these variables, though weak correlations could be further investigated.

(3) Since snowball sampling has been suggested but not attempted, is snowball sampling an effective data collection method? Snowball sampling took time, but worked well. It allowed for focusing on only those who were in a position to influence others through advice and information seeking behaviour, as well as providing face-to-face communication between the researcher and the participants.

Implications for TLCs

This study shows that the methodology can be used for mapping the organizational leadership network at a university. This has implications for strategy, research, and practice.

Strategically, TLCs can clearly embrace a leadership approach that considers the entire organization. This involves recognizing the contributions of various individuals across different contexts and leveraging their expertise to enhance teaching and learning. In particular, areas where the TLC may not have ambassadors can be identified and targeted. TLCs which advocate

for the recognition of research on teaching and learning can lead by example in taking a scholarly approach to their own work

For research, TLCs which choose to adopt this framework and conduct similar research now have a baseline from which to work. Replication research may confirm that the demographic variables investigated here are not predictors of leaders. Or, other variables can be explored. . This can help elevate the status of teaching and learning research and encourage faculty engagement. By using SNA to track the growth of their network of educational development leaders over time, TLCs can gain insights into their effectiveness and identify areas for improvement. This data can demonstrate their value to the broader academic community.

In practice, TLCs can identify and develop informal leaders within their networks. By supporting these individuals, TLCs can extend their influence and impact without overextending their limited resources. Mapping out the network of informal leaders can help TLCs maintain connections that are resilient to changes in formal leadership. This method allows TLCs to solicit input from faculty, ensuring that their activities align with the needs and interests of those they aim to influence.

As Gibbs, Knapper and Piccinin (2009) have noted, “it is abundantly clear that there is no simple recipe for successful leadership of teaching and that what is likely to be supportive of excellent teaching is highly context-dependent” (p.57). However, the research presented here provides a baseline for how TLCs can use research and theory to enhance their role as central hubs in educational networks, effectively influence teaching and learning practices, and navigate the challenges they face in higher education. This strategic approach not only strengthens their position within the institution but also contributes to a more collaborative and effective educational environment.

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Chapter 5: Reflections and lessons learned

Introduction

During the data collection process, a researcher reflective journal was kept. Journaling can be a useful tool for the researcher to remember and reflect (Morrison, 2012), while researcher reflection can itself be a form of data (Cresswell, 2007). Watt (2007) points out that journaling can help novice researchers develop their identity as a researcher. In this chapter, I will reflect on a selection of the notes made which have otherwise not been included in the work so far. The selected journal entries have been thematically organized

Overall, I notice that the process of data collection was for me a very validating experience. After struggling through comprehensive examinations and various proposals, I was experiencing imposter syndrome and afraid to move forward. The first entry in the journal, written on the day I began emailing (see Appendix I) is telling:

> *September 30, 2019*
> *I'm finding it incredibly hard to start collecting data, after fighting with the faculty for so long I'm afraid of what is going to happen next. Perhaps writing in here daily will push me to have something to add every day. Anyways, today I emailed the first three potential participants, and listed the other nine to be included in the purposive sample. The ball is rolling, let's hope it stays that way.*

However, as snowball sampling was more successful than expected, and I began running around the four campuses conducting interviews with a wide range of participants willing to

discuss teaching and learning, and to name the names of specific colleagues, the outlook began to look more positive:

> *January 16, 2020*
>
> *Things are going really well, I wish I had started this 3 years ago…*

The naming of names was something that made me particularly nervous at the beginning. Making lists of names, and lists of lists of names, felt like something East German secret police would have been doing in the 1970s; why should these professors put themselves on the line and potentially irritate their trusted colleagues for the sake of a mere student who they do not know and owe nothing? The basic premises of the research written above include the fact that not only are most professors not trained as educators, but also most of those in leadership positions are not trained in leadership. While there is no reason that someone whose training lies primarily in laboratory research cannot be an excellent teacher and a brilliant leader, it would take a certain humility to be open to this research and I was fortunate that there were so many participants willing to meet. That is not to say that everyone who chose not to participate was necessarily intimidated or hostile, of course some people were just busy or cautious. Regardless, the response far exceeded my expectations given the path I had taken to get there.

By the end of the data collection, it seems that not only had my sense of scholarly curiosity returned, but also my sense of humor, as seen in the last entry:

> *April 4, 2020*
>
> *I remember in the last course I took joking that the working title for my dissertation was "It Depends", but actually that fits well with*

complexity; is there a more sensible way to look at things than that there are multiple things working together at any time?

The final entry also speaks to the complexity of the topic and the context, requiring flexibility and further tenacity, as well as acceptance that no dissertation could encompass everything. The journal entries which follow have been thematically organized into sections on methodology, questions not asked and questions not answered, and, notes on participants.

On method

Methodologically, while I consider the research to be successful and worthy of replication, there were changes made along the way as well as minor challenges to overcome. Some I think were not particularly interesting, such as participants asking for questions in advance (noted on January 13, 2020). These were simply provided to the participants without much thought. Perhaps I should have sent the questions to everyone, or no one, but I did not think it was necessary to overburden everyone, while there was no reason not to send them in advance to those who were interested.

The first issue occurred with the first interview, where in my interview protocol (see Appendix II) I had written that I should introduce myself and the purpose of my research. I had nothing prepared for this, and what evolved was a variation of the story I tell at the beginning of Chapter 1 of this dissertation. Two lessons that I take away from this as a researcher are things that I have learned as a teacher: preparation is important, but so is flexibility. Following is the journal entry where I note down that the introductory remarks were never scripted, but that I am satisfied with the way things worked out:

> *March 12, 2020*
>
> *The first time I interviewed I had to explain the justification for the research and was stuck because I didn't have a script. The story which evolved was meant to both establish my credibility as a colleague and to put the interviewee at ease. This was not intentional from the beginning but I believe was my intention as I read participants' reactions and adjusted the story. At times it continued to be tweaked depending on the audience and my interpretation of their reception, but I think was pretty consistent.*

A more substantive change was the adoption of the hand-delivered letters of invitation (see Appendix III). The original intention was to send one email, and if professors did not answer that could be seen as opting out. I was very cognizant of the sensitivity of professors' feelings after my experiences leading up to data collection, and this seemed like a way to avoid them feeling harassed or put-upon. However, some names came up more than once after they were emailed, indicating that these might be important people. I knew it was possible that, since professors are busy and get a lot of emails (especially the ones I most wanted to include), they could have missed the initial email, or seen it and simply forgotten about it. During an interview, one professor mentioned that one of his colleagues (who had come up several times) would not respond to the email:

> *January 13, 2020*
>
> *Also, [one participant] said sending one email to some of his colleagues will not get an answer, better to phone and try multiple attempts (for [one participant], specifically).*

Phone calls seemed to me a bit hit-and-miss, since they might not be in the office at the time. Phone calls also seemed to me to lean towards telemarketing and harassment. I did not want to interrupt someone with a student or a thought by causing their phone to ring. In the end, and after consultation with my supervisor, I chose to provide a handwritten letter (Appendix III). For every participants whose name was mentioned three times but who did not answer the initial email invitation, I printed a letter and delivered personally to their office. The letter included the original email as an appendix, and also explained that since they were repeatedly mentioned and clearly important members of the network I hoped they had simply missed the original email in the shuffle. This worked well. Indeed, I think the letters that encouraged key people to participate lends further rigour to the data collection, as I noted:

> *March 4, 2020*
>
> *Perhaps worth mentioning in the participants section that, in addition to sending letters for 3+ with no email response, email responses with requests for information that were not answered were let go. The 'would' question, and the 3+ letters, contribute to making the sample robust.*

Further rigour here comes from the fact that the network without the letters would include fewer of the key people than the network with the letters. This is not complicated. This note, however, also mentions the 'would' question. The would question also serves to better populate the network by not limiting the network to those whom people say they 'have' gone to for advice and information. As mentioned in the above third article, the reason for doing this was uncertainty about the snowball sampling in the university organizational context when the researcher is a relatively unknown doctoral student. Both of these methodological choices, one made before sampling began and the other after, make the sample more organizationally inclusive and thus a better reflection of the actual leadership network which it aimed to model. If I did this again, I would assume the letters would be necessary.

Another suggestion from a professor was something so basic that I had not read it anywhere and nobody had told me, regarding ethics. I have learned much about ethics from observing professors and other students in the Faculty of Education. The suggestion related to the consent forms (see Appendix IV), which I had up to then been keeping for my own records and my own safety since I wanted to make sure that I remained an ethical researcher and could prove that if necessary:

> *January 21, 2020*
>
> *One participant pointed out that I should be giving a copy of the consent form to participants to keep: this makes sense although I hadn't thought about it*

Of course, with the information on the form about participants' rights, and the research purpose, and the contact information, the participants deserved to have a copy of the form to take

away for their records and to consider at their leisure if they were so inclined. Once this suggestion was made, I began to do so, but completing two consent forms and providing one to the participant could have been included directly into the protocol. For an experienced researcher, this inclusion is probably not necessary, but it reminded me what a novice I was, and also how fortunate I was that my participants were largely highly experienced researchers themselves.

One participant made a good suggestion about how in the future I could make my life easier by limiting the interview time (some were up to 90 minutes), and by defining saturation as having gotten the same name three times. Although limiting the data collection by considering saturation as having gotten the same name would mean a less robust sample, given the amount of time necessary to conduct all these interviews it might be a sensible approach for a research paper as opposed to a doctoral dissertation. In the future, others or myself might not have six months to get such a detailed sample of such a large network.

> *March 13, 2020*
>
> *[One participant] made a good point about both 30-minute interviews and defining saturation against 3 times a name was suggested.*

In February, the data collection process expanded to include online interviews. This was not anticipated in the planning and proposal stage as something that would be necessary, and perhaps I am showing my age but I much prefer face-to-face interviews as well as face-to-face teaching. However, it became useful to go online when my health and that of prospective participants became an obstacle:

February 14, 2020

Two days without interviews in person because of a cold, but also did the first two requested Skype interviews (one on maternity leave, the other in cancer recovery), which went well but weren't as rich an experience.

A few months later, all of the interviews went online due to COVID19. I have wondered if I had contracted COVID19 myself at that time, or if it was just a cold. I also recall meeting a professor who had come back from a trip to China and was battling a lingering cough. A funny thing about the social network analysis work I was doing was that, if indeed I did contract COVID19, my contact tracing would be greatly simplified by my research methodology which is essentially the same thing. Epidemiologists studying viral spread through contact tracing have surely used Gephi to build networks very similar to mine. Eventually, COVID19 moved from being just a background concern to being a reason for all remaining interviews to be conducted online.

March 15, 2020

Coronavirus! ☹

The original intention was to do document analysis, but this did not happen due to complications arising from COVID19, and a lack of robust and relevant documentation to inform the research, and my knowledge that the TLC website was not an accurate reflection of all the work that the staff there were doing (from an earlier investigation as part of coursework, when I

was exploring options for the proposal). Adding the document analysis would have helped round out the situation aspect of the case. Spillane's (2004) distributed leadership perspective sees tools and routines as part of the situation. Documents which were identified were a description of the university Chair in University Teaching program, and the university strategic plan which included a section on teaching and learning. These tools contribute to leadership for teaching and learning as they signal to the wider community the administration's commitment to and plans for teaching and learning at the university. When the success of the data collection was an open question, having the document analysis as an option to explore leadership more fully was a backup plan to provide a contribution to knowledge. Future research could investigate university documentation as a form of leadership, to establish comprehensively what is available, what is contained, and what effect it has. However, when the sampling snowballed into six months of interviews, followed by everyone at the university adjusting to COVID19 and a rushed transition to online teaching and work, the focus of the research narrowed on social network analysis.

Questions not asked or answered

During the data collection process, as I was immersed in the research while waiting for interviews to begin, or transiting from one interview to the next, I did note down several other questions to consider. Some were things that I had the data for, some were not. I am not sure how interesting these questions are, but in the end the third article became large enough and it seemed unnecessary to try and pack more in for no reason. Some of these questions were perhaps not very interesting, for example:

> *December 19, 2019*
>
> *Do people tend to stick to their own faculty?*

I couldn't figure out a way to automatically answer this questions with Gephi, or statistically answer otherwise. From the TLC perspective, there probably isn't much value in having an answer. Another question I could have answered was about how much the response rate changed as the snowball sampling progressed:

> *January 10, 2020*
> *You also have data on when you emailed who, which (as [my friend who is a computer science professor at another university] suggested, but in discussion of Gephi) can be used to consider how quickly people answered. Does the response rate diminish as you move away from the purposive sample of TLSS?*

The journal also includes a note on formal teaching and learning awards. Being an award winner was not a demographic variable chosen for my research, as it was not a common factor in the research. While it is possible for a teaching award to be a legitimate measure of good teaching, it is also possible that such awards are neither reliable nor valid indicators of who are the best teachers. Perhaps the best teachers do not have the time or interest to fill in the forms, or the popularity to get a nomination. If a department chair or supervisor has some personal or political reason not to give a positive recommendation, or vice versa, that will affect who moves ahead with such awards. All this without actually observing a professor in the classroom, or privately consulting with an appropriate sample of students. In the end, teaching awards was a can of worms which I was not interested in opening, and based on the following note I think that was a wise decision.

> *January 21, 2020*
>
> *You don't have award winners in your demographic data anywhere. Is it worth checking who has won institutional awards? More than one participant has said (though at least once when the recorder was off), that the awards are not a good indicator of who is a good teacher. Not that my goal is to evaluate either good teachers or the awards, but it could be tied to reputation. My interview today brought up the question of how effective the chairs really are at championing teaching and learning.*

It is perhaps worth noting that award winning teachers might be seen in the eyes of others as leaders of teaching and learning, by virtue of having won the award and the exposure that brings. These individuals may thus be nominated by others through the snowballing process, and particularly the reputational tie of who 'would' people recommend. So, if the teaching awards were influential, those award winners would be included. Future research could include the winning of awards as a demographic variable to establish if there is any significant correlation with network centrality.

Outdegree data is the opposite of indegree. As seen in the third article, indegree is a simple sum of the number of directional ties pointing to a node. In other words, the indegree value of a participant is the number of people who nominated that participant. Outdegree would be the number of people that participant nominated. While some participants struggle to name anyone, others were able to quickly rattle off a lot of names. This is data I have, but even on reflection now I am not sure what would be the value of this:

> *February 13, 2020*
>
> *WHAT DOES IT MEAN IF SOME PEOPLE HAVE MORE OUTDEGREE OF HAVES?... Some people have a lot of outdegree names. [two participants] come to mind as others… They seem genuine, rather than political. Is there a correlation between in and out degree sizes?*

Notes on the participants

In addition to the sense of validation I enjoyed as a result of the success of the data collection, I also felt highly fortunate to be able to have these interviews and have interesting and wide-ranging discussions on teaching and learning and leadership. The participants included deans, vice deans, chairs, directors, and full professors with decades of professional experience in higher education. Although these discussions were outside the scope of my research, they reminded me why I had wanted to do a doctoral degree in the first place:

> *January 10, 2020*
>
> *I do feel awfully humbled at the caliber of people I am inviting and being privileged to meet. Also lots of incredible people who have retired who come up in conversations. Another thing I've been feeling lately is how nice it is to be talking about teaching again, something the faculty of education has not really given to me (except that one conversation with [a full-time professor at the Faculty of Education who took a course I was hoping to teach])*

While the following could be considered a question not asked, and future research might want to consider it, I think it speaks more to the participants of the research. Since I was worried at first about asking people to 'give me the names', it was a relief that the participants generally were not worried about which of their colleagues had given me their names. I think it speaks to the confidence of the participants.

> *January 22, 2020*
>
> *Is it interesting that most people don't bother to ask how I got their names?*

While the participants generally spoke highly of the TLC, there were a few that had negative thoughts. My goal was not to evaluate the TLC, although this was an avenue I explored during coursework. I found that this would be difficult, yet I thought the social network approach could be used in that way in the future if the methodology was successful. So, there were no questions in the semi-structured interview specific to participant opinions about the TLC, but it did come up from time to time:

> *January 22, 2020*
>
> *Some people are clearly unimpressed with [the TLC], even though I haven't asked about this. For what it's worth, they have volunteered negative opinions (only two so far, out of 52 ain't bad).*

My feeling on this is that we cannot please everyone all the time. As with student evaluations of courses, it is difficult to have a course with 52 students and not have 2 that would have preferred a different course to the one they are given. Although an evaluation of the TLC was not baked into the methodology, it is interesting that a few participants volunteered negative opinions.

I do think the methodology was successful in populating a leadership network of influential people, as the following journal entry notes:

> *January 27, 2020*
>
> *More than one person has said: I am the person that people ask for advice/information, not the other way around. In this respect, my methodology has been successful in finding key people.*

Overall, the participants were a genuine pleasure to interview. I suppose that they would not be in their positions, would not have been nominated by their peers, and would not have agreed to meet me, if they were not. Awesome, curious, charming, and even attractive are words used in the journal to describe my participants:

> *January 27, 2020*
>
> *If I haven't said it before, it sure is pleasant and helpful doing these interviews in person. In addition to getting a sense of my participants (so far, 100% awesome), it really helps to discuss and clarify as I go through the interview protocol.*

February 1, 2020

Such a group of really different individuals I'm meeting with. Engaging is probably a good word to describe what this feels like. Curious, critical, challenging, intelligent, insightful. Even the ones who ask hard questions and/or seem critical of the whole enterprise are still game to come along. Have had a lot of interest from people whose various fields/work touch on mine in some way (besides the fact I'm asking each of them to talk about themselves, that is); graph theory, SNA (a lot), leadership, education. Some have expressed interest in seeing results, seeing publications, attending the defense.

March 4, 2020

Have I mentioned how attractive and pleasant my participants have been? Can't I? Charisma is certainly part of leadership, and I have definitely been struck by the general attractiveness of my participants. Does it matter? If anyone asks about other identity variables, this and the first-generation scholar are two good answers…

These positive impressions are, of course, highly subjective. Negative impressions, too, could be subjective. There were some that came across as oppositional, notably younger professors. But not always, there were a handful of doctoral students who were also part-time professors who were quite pleasant. Given the sensitive nature of the investigation, I tried to

avoid any negativity in the research design, but it is possible that less confident participants would be more openly skeptical about this kind of research:

> *March 12, 2020*
>
> *Demographics: It hasn't been mentioned much by participants. Have I mentioned my participants tend to be good looking and charming (in general)? Age hasn't really come up, but I've started to notice that younger people (couple [from this faculty], one [from that faculty]) have been the most oppositional; a danger of a bottom up approach to this type of research could be running into a lot of insecure novice and untrained teachers…*

Whether confidence stems from educational backgrounds, inexperience, insecurity, or other factors is far outside the scope of the research I conducted. I only mention the above because it is an interesting juxtaposition to the overall good-natured and open-minded composition of the participants. It is even possible that my experience put a few of the less experienced and less confident participants on edge, since I began the interviews by explaining how I came to be interested in the topic. With this priming, many of the participants also told a story of their journey into teaching at university, and I noted that:

> *January 27, 2020*
>
> *It's interesting how varied people's paths to -and through- teaching have been*

Conclusion

Through the process of data collection, I learned a lot about doing research, especially because my participants were mostly researchers themselves. Having to explain and defend my research to professors was a rewarding and validating experience, and it helped that they seemed genuinely interested in the work, as well as generally pleasant individuals.

One thing I wish now that I had changed, but was not noted in the journal, was the decision to write the dissertation by publications as opposed to a traditional monograph. When I began my coursework, I had spent years teaching research writing, and had just had my first two journal articles published. Writing the dissertation by article seemed like a strategy to improve the publication section of my curriculum vitae. However, as the research evolved to having a very heavy literature review (about 100 pages at the proposal stage), and with the delays in getting the proposal approved restricting the time available to collect other data to round out the research, having multiple publications became an inconvenience. Not only was much of the literature review writing lost, when it was time to update the literature after five years the references had to be worked into different sections across three different papers. A traditional monograph would have been much simpler and I think more suitable to the data.

Overall, though, the actual data collection process as documented in the journal was successful and positive.

Chapter 6: Conclusion

Summary of the dissertation

The first article started by outlining the history, role, scope, and challenges of TLCs, followed by a review of relevant leadership literature. Highlighting the significance of networks at various levels, collegiality, autonomy, context, and both formal and informal leadership, a conceptual framework is proposed to integrate these essential themes. Considering the evident neglect of informal leadership roles within universities, the scarcity of leadership theory in the literature, and epistemological inconsistencies, the proposed framework incorporates Spillane's distributed leadership, social network analysis, and an epistemology of complexity. This framework aims to address gaps in the current literature while aligning with TLC and leadership studies.

The second article introduces distributed leadership, followed by theoretical foundations of distributed cognition and activity theory. It uses a mapping framework from K12 literature to present higher education research on distributed leadership, highlighting the absence of functional-descriptive knowledge production. Spillane's well-developed perspective on distributed leadership is discussed for its theoretical and practical contributions to higher education leadership. The main argument is that while diverse views on distributed leadership are valuable, the higher education literature lacks an analytical perspective, which can be filled by SDL. SDL, grounded in solid theory, promises to enhance understanding of social phenomena through social network analysis. It goes beyond mere interaction, requiring rigorous application to build a unified body of knowledge. Researchers can focus on specific situational factors like teaching/learning or social justice. Practitioners can use case studies to create rich datasets that visualize leadership practices and interactions within their organizations.

The third article is the real meat of the dissertation. This paper identifies key challenges

for TLCs: unstable leadership, resource constraints, contested areas (epistemology/pedagogy, academic freedom), low priority of teaching, and assessing impact. It suggests adopting an organizational leadership perspective and using distributed leadership and social network analysis (SNA). Using a novel framework and SNA, the study found a broad network of 196 formal and informal teaching leaders within the university, with 142 having over a decade of experience. This network map can help TLCs leverage existing leaders for advice and support, uphold academic freedom, and provide evidence of teaching's value and TLC impact. Key findings include: the network's size and density varied across faculties and departments, no significant correlations were found between centrality measures and demographic variables, though weak correlations merit further study, and, snowball sampling was effective, enabling targeted data collection and face-to-face communication. The study offers a practical application of the framework and highlights areas for future research.

Final thoughts

In the introduction to this dissertation, the following question was posed:

> *If teaching and learning at universities is influenced formally and informally by a network of relatively autonomous colleagues interacting over years within and across institutions, I wondered, could TLCs tap into that network and how could it be modelled?*

The first answer is that, yes the network can be tapped into and in a way it already is. The second answer is through a distributed leadership perspective and using social network analysis.

With the organizational network map in their hands, TLCs can see how they are already tapped into the network, where there are gaps, and which areas can be strategically targeted. The snowball sampled network map in this study included 196 participants, which is the largest sample contributed to the relevant literature to date. This high sample size is not just evidence that the methodology and model were successful. It is also an indication of the foundational work which was done by the TLC over decades of their day to day operations. If the TLC purposive sample had not established their professional working knowledge of the network, they would not have had many participants to suggest. Similarly, as snowball sampling progressed the participants were willing to be involved because they were interested in talking about leadership for teaching and learning from the perspective of the TLC. If the TLC were not well regarded, that would have come out in the interviews. And, of course, TLC events provide networking opportunities that serve to build a stronger organizational network.

For the second question, about modelling the network, Spillane's distributed leadership perspective combined with social network analysis is not a particularly novel approach. This is because Spillane himself has already conducted such research in K12 contexts. However, as Chapter 3 details this is the first study to introduce Spillane's work in a university context. Chapter 2 laid out the background literature that lead to the conceptual framework that models the network theoretically, while Chapter 4 used Gephi to render the network of the case study site. In this way, the dissertation provides a very rich theoretical contribution to TLC leadership research.

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Appendix I: Invitation to participate email

Hello ,

My name is Tylor Burrows, I am a PhD student at the University of Ottawa Faculty of Education. My doctoral research is interested in networks of teaching and learning leadership in higher education, and you have been identified as an 'influencer' within the University of Ottawa community.

I would like to include you on the network map which I am creating, and ask you a few questions to help expand and explain the network of teaching and learning leadership here at uOttawa. These questions are demographic (e.g. your discipline, the length of your employment at uOttawa), network related (e.g. who would you go to, or recommend, for advice or information on teaching and learning?), and exploratory (e.g. what do you think influences your advice and information seeking behaviour?).

If you are open to being interviewed for this purpose, I am ready to meet at a time and place of your convenience. The interview should take around 30 minutes, with an audio recording for accuracy.

If, for whatever reason, you are not interested in being included in the network map of teaching and learning leadership at the University of Ottawa, please be informed that your nomination by a colleague will not be included in the study. You may indicate that you are not willing by

responding to this email. If you choose not to respond to this email, this will also be taken as an absence of informed consent, and you will not be included.

Thanks for your consideration, I look forward to hearing from you.

With best regards,

Tylor

Appendix II: Interview protocol

Preparation

- Ensure that the interview room is appropriate, agreed upon, and available.
- Ensure that the interview guide is available.
- Ensure that materials for recording (written notes and digital recording) are ready.

Before Conducting the Interview

- Introduce yourself and thank the participant for their participation.
- Explain the purpose of the research and how the data will be used.
- Review the consent form and remind them that they can withdraw at any time.
- Inform them that the interview will be digitally recorded.
- Make sure they have no questions or concerns.

Interview Questions

Primary research questions: (1) How can leadership in teaching and learning in one university be understood as a distributed network? (2) How do SNA concepts (such as centrality, betweenness and density) help to illuminate distributed influence within this network and how do they relate to participants' demographic characteristics?

Demographic questions:

1. Faculty/centre (e.g. Faculty of Education, Teaching and Learning Support Service)
2. Discipline (e.g. chemical engineering, philosophy, translation, etc.)
3. Formal role (e.g. dean, professor, director, educational developer, etc.)
4. Current status (e.g. assistant prof, associate prof, full prof, part-time prof, teaching track,

contractual, permanent, other (please specify))

5. Number of years as an educator, or providing education support (e.g. training, consultation)
6. Number of years at the University of Ottawa
7. What professional development related to education have you completed?
8. Have you published research or presented at conferences related to teaching practice?

Network questions:

1. Who at the University of Ottawa *have* you gone to for advice or information about teaching and learning?
    a. If you have a problem?
    b. If you are looking for ideas?
    c. To exchange materials?
    d. Other?
2. Who *might* you go to, or recommend, at the University of Ottawa for advice or information about teaching and learning?
    a. Because they publish and/or present research on their teaching practice?
    b. Because they have a reputation as being a 'good teacher'
    c. Because they have a recognized expertise in a field connected to teaching and learning?
    d. Other?
3. Are you willing to have your name, role, and discipline included on a final network map

provided to Teaching and Learning Support Services for planning and strategy purposes?

Exploratory questions:

1. What do you think influences your information and advice seeking behavior with regard to teaching and learning?
2. Can you recall a specific incident where someone at the University of Ottawa influenced your teaching practice?

Conclusion

- Summarize points from the interview.
- Confirm accuracy of summary.
- Remind participant of the data usage and inquire about interest in member checking.
- Provide contact information.
- Thank the participant.

Appendix III: Letter invitation

Dear Dr. X,

Once in the last six months I've reached out to you by email regarding an ongoing doctoral research project. Although that email stated a lack of response would be taken as declining to participate, you have so far been nominated three times by colleagues at uOttawa as someone they have gone to or would recommend for advice or information about teaching and learning. Since the one email originally sent may have been overlooked for a variety of reasons, and since you are clearly an important part of the organizational network, I am writing again to invite your participation in the network research.

To date [a number of] interviews have been conducted. For your interest, copied below are the original email and an image of the network using completed interviews. I can be reached at [email] or [phone number], if you have any questions or would be open to scheduling an ~30 minute interview in [month].

Yours sincerely,

Tylor Burrows

Appendix IV: Consent form

Consent form

1. Name and institutional affiliation of the researchers

Principal investigator:

Tylor Burrows, The University of Ottawa

613xxxxxxx

tburrxxx@uottawa.ca

Supervisor:

Dr. Ruth Kane, The University of Ottawa

xxx Lamoureux Hall, Faculty of Education, University of Ottawa, ON, K1N6N5

6135625800, extension xxxx

rkane@uottawa.ca

2. Title and purpose of the project

Educational development leadership: A distributed leadership case study of a university teaching and learning centre

While graduate students who are beginning to teach will likely reach out to professors in their immediate orbit, who do professors look to for information and advice about teaching? The purpose of this doctoral dissertation study is to explore pan-organizational networks of leadership for educational development which connect to a university teaching and learning centre, using a distributed leadership perspective and tools from social network analysis.

3. Description of participation:

- Participants will be asked through individual interviews to consider influences and influencers on advice and information seeking behavior regarding teaching and learning
- Participation will consist of a single instance with a duration of up to but no more than ninety minutes; participants will be invited to take part in checking the analysis of the data but are not required to do so.
- Participation will take place at the University of Ottawa, at a time and place of the participant's convenience.
- There is no reason to foresee discomfort or probable harms created by the research.

Participant names and the names of specific faculties and departments will be kept confidential using generic pseudonyms (e.g. Chair 1, Department A).

- Benefits for the participants include the opportunity to reflect on teaching and learning leadership from their perspective, and to observe how their network is situated within the larger university network.
- Information collected will be used for the purposes of the study only. Digital recordings of interviews and interview transcriptions will be made, but only the researchers will have access to them. These files will be kept on a password protected computer and will be kept for seven years, after which they will be destroyed.
- Participants will be invited to make themselves visible on the final network map which will be given to TLSS for planning and strategy. This map will include only the name, discipline, and role of the participant. Participants may choose to decline to be identified as a leader of teaching and learning at the university. Participants may choose to be anonymous to those who they nominate as leaders of teaching and learning at the university.
- A declaration about possible conflicts of interest: The principal investigator has held contracts as a student research assistant with TLSS, and a member of the dissertation committee holds an administrative position which includes oversight of the study site. However, because the nature of the research is not evaluative, but rather exploratory, these are not deemed to be the source of possible conflict of interest.

Are you willing to be identified on the network map of leadership for educational development at the University of Ottawa?

Please circle YES NO

Are you willing to have those you nominated know that you nominated them?

Please circle YES NO

4. Rights of the research participant include:

- The right to withdraw from the project at any time, including withdrawal of data;
- The right to refuse to answer questions without fear of reprisal or ill treatment;
- The right to be informed of how their identities will be protected in the publication of the data;

- The right to be informed of the limits of confidentiality.
- The right to ask the researcher any question about any part of the research being conducted;
- The right to make information requests or complaints about the ethical conduct of the project through the Protocol Officer for Ethics in Research.

5. Description of the compensation (where applicable)

Research participants will receive no compensation.

6. Names of the funding agencies (where applicable)

This research has no external funding.

7. Contact information for the Ethics Office and procedures for filing a complaint

Protocol Officer for Ethics in Research
550 Cumberland St., Room 154, Ottawa, ON
613-562-5387
ethics@uottawa.ca

8. Signature of the participant and researchers[1]

_____ _____

Researcher's signature **Date**

_____ _____

Participant's signature **Date**

[1] The signature of the participant does not mean that he or she has given up any right, but rather that the participants has been informed of the requirements of the proposed research and that he or she agrees to take part in the research project.