Seeing schools as complex systems: Leadership implications in leading professional learning

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Abstract

For too long teachers have had little say in the direction and means of their own professional

learning. In fact, the term is professional learning is often substituted with the term professional

development and based on a deficit model. Traditional professional learning opportunities often

times do not account for context, prior knowledge & understanding or allow the teacher to

deviate from the group. By acknowledging school districts as complex adaptive systems rather

than linear systems, I will argue that when proscriptive rather than prescriptive conditions are

established, teachers and schools are empowered to make context specific decisions and that

patterns will emerge in order to inform whole system directions. Any move towards a model of

professional learning based on the principles of complexity however, need to be well supported

by leadership. Leaders in this model will be required to have a strong understanding of the

necessary conditions that allow for self-organization and emergence to occur. This paper is

designed to provoke discussion amongst, teachers, school based and school district leaders while

also providing tangible steps that could be taken to realize this model for professional learning.

Keywords: complexity, professional learning, complex adaptive systems, leadership

Seeing school systems as complex adaptive systems: A model for professional learning

Introduction

Education systems have long been organized and run in a linear top-down fashion. This hierarchical structuring of education is evident in many ways, whether it manifests through the way curriculum is developed or how decisions are made and implemented around things like technology or assessment policies. One way in which this traditional structuring of education systems is most felt by teachers is through the development of professional learning opportunities. For too long teachers have had little say in the direction and means of their own professional learning. For many, professional learning consists of a series of unrelated events that often times are not connected to the day-to-day work that teachers are taking up in the classroom. There is a growing body of research to indicate that this top-down and standardized model is outdated and does not address the unique contexts in which schools reside (Bolt 2012; Guskey 2002; Zepeda 2012).

Research has indicated that professional learning that is collaborative, job-embedded and incorporates reflection is effective and desirable (Branson, 2012). While models such as action research, professional learning communities and EdCamps contain elements of these principles, I will be argue, that even within these models, the problems of practice remain prescribed to individuals and that unique contextual elements are ignored. This inquiry will explore whether a new model for professional learning is possible? Can individual actions lead to a larger organizational coherence? What are the conditions required for such a model to take root and be sustainable? And lastly, what are the implications for leadership as they engage in any new model for professional learning? Positioning schools as complex adaptive systems as opposed to

linear systems as well as exploring the idea of complexity will help inform the design of this model.

Literature Review

Current State of professional learning

Professional learning for many teachers is something that is selected for them, whether it be a professional learning committee, principal or school district, the individual teacher is often given little say in these opportunities. For many this is evidenced through one-off workshops that expect teachers to take what they have learned and apply it in their classrooms the next day. This model for PD is widely panned in current literature for the lack of transference of learning to the classroom. Bodman, Taylor & Morris (2012) argue that this delivery model is linear and that it does not adequately prepare teachers to make decisions in their own context. Not only that, but it also assumes that the "teacher's role is to replicate and apply knowledge" (p.19). Bolt (2012) also states that this model which often lacks context for a school and is delivered in a single day runs counter to what is deemed to be best practice. The one-off workshop model also assumes that all teachers wish to learn the same thing and in the same way. Information is presented linearly and the lack of teacher input dampens a teacher's professional identity (Bodman, Taylor & Morris, 2012). In addition, transfer rates of teacher learning from these one-off sessions to classroom is low for all teachers, including those who are interested in the learning or who volunteer for the sessions (Showers & Joyce, 1996; Spelman & Rohlwing, 2012).

The professional learning model explained above is widely recognized as being ineffective and through this understanding, new models for professional learning have emerged. Examples include things such as professional learning communities (PLCs), action research and

EdCamps. Each of these models share two important traits that differentiate them from more traditional means for professional learning, they are founded on the principles of collaboration and driven by the participant. PLCs as explained by Wagner et al. (2009) are groupings of teachers that work together and "exist to develop members' capacities, to build and exchange knowledge, to transfer best practices, and to solve 'problems of practice'" (p.75). Shanks, Miller & Rosendale (2012), when discussing action research, address the power of providing the time and space for teachers to come together and to observe and learn from one another. While EdCamps share the common design element, in that it brings strangers together in a collaborative environment to act in the role of leader and learner simultaneously (Fonseca, 2011). EdCamps are participant driven professional learning opportunities. Participants create the schedule and facilitate the sessions. The focus has less to do with presentations, but rather on professional dialogue. This model allows participants to gather around an idea and apply their own context to the larger discussion.

Providing teachers with the time and space to collaborate is largely recognized as being critical to any successful professional learning model. Bolt (2012) discusses how "collaboration with others in communities led to participants' engagement with PD as a process rather than as an event" (p. 288). This process is ongoing and not one that ends after a particular workshop or event, the collaboration should focus on gradual improvement and allow for small accomplishments in which the group can build on. In addition to being collaborative, it is critical that any model for professional learning be job embedded. The reason for this being, that no two classrooms are the same, let alone two schools, or two districts. By providing a model that is participant driven, individuals are able to address the challenges in their own unique context.

Thorpe and Gordon (2012), build on this sentiment stating, "learners both shape what they learn and are shaped by their work context and powerful influences within that context" (p. 1268).

Understanding complex adaptive systems

Designing a model for professional learning based on the principles of complexity theory is highly dependent on recognizing school systems and schools as complex adaptive systems. I would argue that many models for professional learning view school districts as complicated systems opposed to complex systems. A complicated system can be viewed as something like sending a rocket to the moon. In this scenario, formulae is critical, each success will lead to greater assurance in future efforts and there is a high certainty in the outcome. Complex systems can be viewed as raising a child. Here, there is limited use for formulae, raising one child offers no greater assurance with the next and outcomes remain uncertain (Snyder, 2013). Newell (2008), explains that complicated systems are linear and mechanical and eventually run down. He contrasts this with complex systems where these systems appear to defy entropy and continuously evolve and adapt to their conditions. This is echoed by Brown (2011), he looks at how in complicated systems, patterns cannot be identified, but details, parts and subsystems can be understood. Complex systems however are the opposite, patterns can be identified, but details cannot be understood.

Brown (2011) characterizes complex adaptive systems as systems where several interacting agents self-organize and where new properties emerge that are not present with any single individual within the system. This echoes the familiar saying, the smartest person in the room is the room. Both present a complex adaptive system as the sum being greater than any of it's individual parts. Newell (2008) states this even more explicitly by explaining how

appropriate interactions amongst agents "gives rise to adaptive behaviours that transcend those of the system's individuals" (p. 9) and that the understandings of a system can exceed the understanding of any single agent within the system.

The literature is quite clear that complex adaptive systems reside within certain conditions. Horn (2008) describes how the study of complex systems suggests that in the proper environmental conditions, humans quite naturally carry out the required interactions to be self-sustaining. Often times this is done more elaborately than through some artificial means imposed upon the system. Davis and Simmt (2003) speak of constraints that are proscriptive rather than prescriptive. It is through proscription and establishing what must not happen, that boundaries are established for the system. DeWaard, et. al. (2011), builds on this idea and discusses the importance for individuals to be able to make decisions and to act on those decisions. This, they argue is in stark contrast to traditional role of the individual within the school system, they bluntly make their argument by citing Reigeluth (2004), "these core ideas stand in stark contrast to those that characterize the industrial-age mindset about the 'real school': centralization and bureaucracy, standardization (or uniformity), and autocratic management" (p. 15). Another important condition for complex adaptive systems is around the importance of disequilibrium. Davis, Sumara & D'Amour (2012) discuss the importance of stressors within the system. It is through these stressors that the system is compelled to adapt. DeWaard, et. al. (2011) continues along this theme and discusses how important it is for the system to remain open to its environment and that it is through these stressors and disequilibrium that the conditions for self-organization are strengthened. Stressors force actors to come together,

to bond and collaborate in search of a solution. Through these individual actions, patterns being to emerge and a coherence is achieved.

The literature is aligned in explaining complex adaptive systems as systems that involve many different interactions from many different agents. Agents can be many things, including but not limited to the physical school buildings, funding, school structuring, experiences of staff, parent communities and IT infrastructure These interactions cannot be controlled and when they are allowed to happen naturally, patterns begin to emerge. It is through these patterns that a new coherence is formed within the system. Systems informed by complexity are self-sustaining, continuously adapting and run counter to linear frameworks (Fenwick, 2012). This understanding of complex adaptive systems will be important as I look more deliberately to school systems. What are some of the interactions that take place? Are there boundaries to allow for self-organization and emergence? Are there deliberate actions being undertaken that undermine self-organization and emergence? Exploring the literature will help in answering these questions while informing steps towards designing a professional learning model that is teacher directed and continuously evolving to the conditions within the environment.

Understanding schools systems as complex adaptive systems

While there is a large body of literature examining complexity theory and the attributes of complex adaptive systems. It is important for the purpose of this inquiry to better understand the literature in relation to schools, school systems and education. Burns and Knox (2011), explore the idea of a classroom as complex adaptive system. They explain that a class should not be viewed as a space or activity, but rather as a set of interactions. Newell (2008) also makes this point, explaining how teachers need to attune themselves to that teachable moment, that when

classrooms are seen as complex adaptive systems, the teachable moment is no longer the exception, but the norm. These teachable moments arise out of a collection of individual actions working towards a shared purpose. Both authors acknowledge the importance of having the right conditions in place for such interactions to take place and for patterns to emerge. Using the classroom as an example, it is about stepping back and looking for patterns that emerge, to provide students with the opportunity and the authority to make decisions about their own learning. These same principles could be applied when speaking about professional learning and the role of system leadership. Horn (2008) speaks frankly to this issue. He says, that in order to understand schools as complex adaptive systems, we must first allow them to be just that. He argues that it is important to interrupt our thinking that issues can be reduced to a single factor and that we can no longer rely on methodologies of the past when dealing with complexity.

For centuries humankind has attempted to reduce life's complexities to something controllable and knowable (Stanley, 2009). In education this has been evidenced in a variety of ways, whether it is increased funding, more technology, new models for professional learning, classroom composition, assessment practices or a myriad of other things. In most cases these initiatives occur in isolation, without consideration of the other actors within the system. For example, increased access to technology may not be supported with the required professional learning to support teachers. Models for professional learning that focus on increased collaboration and that are job-embedded may not be properly supported due to timetabling, staff resources or like-minded peers within a building. Stanley (2009) explains that when it comes to educational matters, issues need to be complexified rather than simplified. Horn (2008) describes this as a classroom where complexity places the teacher and student at the centre, while

understanding where they fit in relation to the larger system, in this case to other classrooms and individual schools. Newell (2008) uses almost identical language arguing that it may be important to focus on the classroom collective as the "locus of learning in schools" (p. 6). DeWaard, et. al. (2011) perhaps most clearly explains the impact of viewing schools and schools systems as complex adaptive systems. They state that it is through complexity that we will better understand the dynamics of the system that are likely to influence individual changes or the conditions needed for change to occur. Once we understand these dynamics, a new educational balance will occur. A balance that will co-evolve with the individual agents within the system.

Fostering the conditions for self-organization and emergence

Earlier in this paper, the literature discussed models of professional learning that have been viewed as largely ineffective. These models share many similar attributes, from top-down implementation, linear delivery and not being aligned to the context of the individual. Viewing schools and school systems as complex adaptive systems highlight why these existing models are largely ineffective. The literature on complex adaptive systems discusses the importance of self-organization and emergence. These two phenomena are critical for any system to achieve equilibrium. Understanding the conditions for self-organization and emergence to take place will be critical in designing any model for professional learning. Horn (2008) addresses the importance of these conditions by explaining that learning communities can become transformative as a result of interactions that occur within suitable boundaries. Horn (2008) also points out that efforts towards understanding social systems, such as education, could self-organize, adapt and lead to high levels of effectiveness which have largely been ignored or rejected. Fenwick (2012) explains that the conditions required for self-organization and

emergence do not occur spontaneously, it requires the recognition of specialist identities that each individual within the systems brings with them. While complex adaptive systems flourish when they are decentralized and autonomous, it is argued throughout the literature that leadership has to allow for the necessary conditions for self-organization and emergence.

There is a general consensus within the literature around the conditions that must be in place for self-organization and emergence to occur. Davis and Sumara (2008) speak about four required conditions, they are internal diversity, internal redundancy, neighbour interactions and decentralized control. Fenwick (2012) makes reference to these, but also suggests that there are additional elements that are critical. He points to uncertainty, perturbation and feedback loops. DeWaard et. al. (2011) concurs that emergence was often the result of decentralized authority and when individuals were in control of their own learning. Since Fenwick and DeWaard both reference the work of Davis and Sumara, I will focus on their four conditions.

Internal diversity is viewed as a collection of individuals that provide diverse responses. This is perhaps best explained in the context of education as a collection of individuals with unique specializations. Many schools possess this already and can be evidenced through subject level specialists. Internal diversity however, is not going to create the conditions alone required for emergence and self-organization. Fenwick (2012), drawing on the work of Davis and Sumara (2006), discusses the importance of redundancy. This means there must be sufficient overlap within the system, that individuals have shared interests, languages or goals. The third condition required is neighbour interactions. Individuals must be provided the time and space to interact with those around them, both physically and in shared purposes. Lastly, is the condition of decentralized authority. Individuals must be free to connect, organize and drive their own

learning (Fenwick, 2012). Stanley (2009) ties these four conditions together and succinctly explains the role of leadership, whether it be a teacher in the classroom with students or school system leadership with their employees.

> We would do well to let go of being completely in control in the classroom and take advantage of the diversity and redundancy principles of complexity science. This is not to suggest that we need to abdicate our responsibility for planning and facilitating learning (p.4).

Methodology

Collecting literature

As existing literature acted as the main source of data in this inquiry, it was essential that the literature used was current, peer reviewed and relevant to my research. The collection of literature in this inquiry was iterative, meaning that as my understanding around the topic deepened, new search terms were employed leading to a more focused and relevant collection of literature. Multiple types of literature, along with primary and secondary source material were accessed as suggested by Creswell (2012). My initial searches utilized online databases offered through the University of Calgary, primarily ERIC (EBSCO) and Google Scholar, YouTube and published books. Search terms used included "emergent networks", "complexity theory and learning", "professional learning", "professional development", "networked learning", and "emergent learning". It was at this point that collected literature was critically reviewed. Following this initial review, it was determined that another search of the literature using the search term "complex adaptive systems" was required. This search term offered a through line amongst the other search terms as it came up in many articles where the previous search terms

were used. Once again, databases such as ERIC (EBSCO) and Google Scholar were used along with a search for books published on this topic.

Reviewing the Literature

As complexity theory is a relatively new area of study, most peer reviewed articles were published within the last ten years and many within the last five. On the topic of professional learning, articles that were published within the last five years were considered current as there was a greater body of research on this particular topic compared to complexity theory. Initial searches did not exclude based on the title of the journal in which these articles were found, but articles that were found in educational journals were given more prominence. Articles in business journals were also considered highly when journal titles indicated the article was dealing with organizational change and/or decision making. In some cases, academic papers were considered and used within this inquiry. Their use was when it was supported by other literature, cited authors of already collected journal articles and added important data to this study. Videos were also watched on YouTube on the topics of "complex adaptive systems" and "complexity". These videos formed much of my early understanding around these topics and while many are not referenced in this paper, they were accessed and used to help narrow my search and become more familiar with the language within the discipline. The prioritizing of these pieces of literature mirror the priority system proposed by Creswell (2012). Due to the nature of the topic, most of the literature collected was qualitative in nature, however some quantitative data was accessed and used for the purpose of this study.

The relevance of the literature collected was was critically reviewed through three lenses, addressing and describing complex adaptive systems, conditions necessary for emergence and

self-organization and professional learning. The first step in reviewing my collected literature was to look at the title of the article. This level of review initially provided me with many titles and it was clear as I began to read the literature that my collection was too wide. This led to a second step in reviewing the literature and that was reading the abstract of the journal article. This step allowed me to quickly dismiss articles, that while titled with many of the keywords I was searching for, were outside of scope for this inquiry.

Coding the Literature

Most of the literature was reviewed as PDF and read using the iAnnotate application for the iPad. Citations were able to be made directly to the PDF and saved to cloud based storage using Dropbox. This allowed me to access the marked-up PDFs from any location with internet access. For print resources, notes were taken by pen and paper as I read. All citations were able to be exported through email, this allowed me to copy and paste all of my notes into one document prior to coding and organizing them into themes.

It was with this in mind that any notes will be coded based on their relation to the guiding questions. Notes will first categorized by the guiding question they address. Any notes that do not apply to one of the guiding questions will be saved in a separate document and not discarded. This is to preserve any information that may become relevant as the inquiry evolves over time. What may not seem important at the start, may be crucial at another point. After this initial sort, each of these categories will be scanned for themes and sub categories will be established. These sub categories will help focus the paper and ensure they are contributing to my understanding in relation to the guiding questions.

Findings

The data collected through the literature review clearly presents elements of a framework that could allow for individual professional learning actions to lead to larger system goals. While this could appear to many as simply flipping the model from top-down to bottom-up, that would be a misreading of things. The literature supports establishing an environment that is fluid, open and radically contingent. This would run contrary to existing systems where decisions are constrained by process, prescription and bureaucracy. While the literature strongly supports such a model in theory, there is limited evidence within the field of education of this theory being put into action. If a school system were to embark on a professional learning modelled on the principles of complexity, they would be well advised to leverage existing networks, establish appropriate conditions for emergence and self-organization and attune themselves to recognize patterns as they emerge to inform next steps. I will look at each of these in more detail below.

Leveraging existing networks

Throughout the literature there is a strong emphasis on the importance of networks within complex adaptive systems. However, not all networks are equal and not all networks will facilitate self-organization and emergence. Davis, Sumara and D'Amour (2012) discuss four types of networks (figure 1), centralized, decentralized, fragmented and distributed. Depending on the perturbances within the system these networks can oscillate back and forth between these different types. In my own context, the school system can best be described as being a fragmented network. Individuals connect with one another, but often times these networks live in isolation, they are not visible to others and therefore further connections are not made.
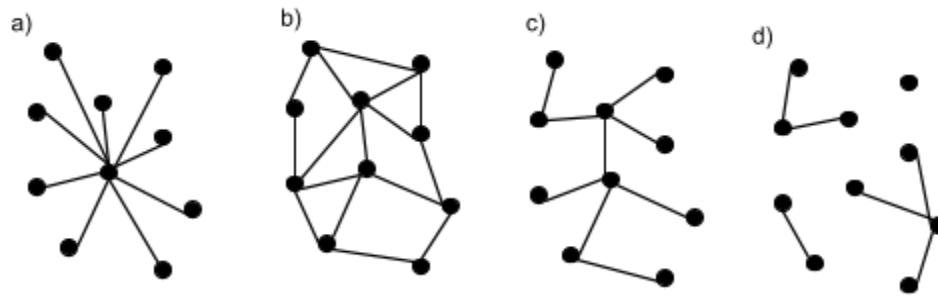
Fig. 1 a) centralized, b) distributed, c) decentralized d) fragmented. Each network is using the same set of dots.

Operating from the premise that self-organization and emergence are most likely when internal diversity, internal redundancy, neighbour interactions and decentralized control are present, the decentralized network provides ideal conditions for emergence and self-organization. Unlike a centralized network, individuals are able to break off and not be tied to any central authority. A decentralized network is also superior to a distributed network as it does not dictate that all actors within the larger network must connect. It allows for greater diversity, redundancy and lives through decentralized control. Understanding that there are already existing networks within a school system provides leadership with the opportunity to simply connect these groups with one another. One way this could be achieved is through the establishment of a network directory. This network directory should act as a repository of the many different networks that individuals are a part of. Great care should also be given to ensuring that these networks are honoured for their uniqueness and that leaders resist the temptation to standardize or vet potential networks and risk the network to become more centralized. The goal with this directory (see Appendix A) should be to expose individuals to existing networks (decentralized control), allow for serendipitous encounters amongst networks (neighbour interactions) and provide a means for people to connect with one another (internal diversity and internal redundancy).

Establishing conditions

The network directory will provide a first step and one of the conditions that will help support any shift from a linear model for professional learning to one that is more fluid and responsive. Another key understanding for leaders should be framing professional learning with proscriptive language, rather than prescriptive language. Instead of telling teachers what they must do, teachers should be told what they must not do. This will provide suitable boundaries and help facilitate conditions for self-organization and emergence. Careful consideration was made when drafting the conditions below, they do not use the term teacher, but instead use individual. This is to create a model for professional learning that is more inclusive of all staff and allow for those in non-teaching support roles to more actively engage in areas of shared interest, increasing diversity and redundancy. For professional learning, individuals would be provided with the following three conditions.

1. Problems of practice cannot deviate from the three-year education plan.

2. Individuals cannot work in isolation.

3. Any learning cannot be kept to oneself.

While these conditions were given considerable thought, it will be important to understand how these conditions are lived in practice. These conditions should be reviewed on an annual basis to ensure they are meeting the needs of the individual and the system.

Davis, Sumara and D'Amour (2012) explicitly state that one cannot force or legislate emergence, they can simply produce conditions where it encourages and supports it. Leadership must pay particular attention to maintaining a porous and flexible environment and eliminate the impulse to control things (Davis, Sumara and D'Amour, 2012), the term porous here is used

deliberately to convey boundaries but still allowing for ideas to flow. Leaders should see themselves as connectors, aggregators, facilitators and nurturers. It is with an eye towards flexibility, that leadership should not look to mandate when and how individuals engage in their professional learning. This could prove challenging for some as a culture of control and accountability have been present for decades within many school systems.

Developing a process

By bounding professional learning by the three-year education plan (see Appendix B), a more inclusive model for professional learning can develop. While individuals will likely be drawn to things that they encounter in their day to day work, it does not preclude individuals working with others such as IT and HR to develop strategies in building organizational capacity in a particular area. Ultimately all members within this professional learning network will be working towards a shared problem of practice. Identifying a problem of practice can be a difficult task, one useful set of questions that could be provided to teachers could be the following from City (2011).

1. Where do I feel stuck?

2. Where am I struggling?

3. How do I know that I am struggling?

4. What situations do we need help collecting data on and thinking about?

These questions could act as a framework for all individuals within the system and facilitate the development of a common language around some of the issues that individuals are identifying within their own contexts. While it is likely that many will look to work with those within their building, there will be a space provided in the form of a discussion forum for individuals to share

their problem of practice and see if anyone would like to explore the issue with them or to link up with others that have similar problems of practice.

As teachers form a professional learning network they will begin to consider strategies they may wish to employ. Strategies could come from a variety of places, they may come from professional learning workshops, external networks, research literature or a colleague. Ultimately it will be up to the individual to determine what action they plan on taking, how they will assess success and reflect on what they have learned. In many ways this process closely resembles that of professional learning communities. The key difference however, is in who the members of these communities are. Leveraging technology and a centralized directory for networks will allow individuals to collaborate with others across an organization or system.

The final piece of this process is the reflective and sharing piece. This reflective process, in the words of Branson (2007) allows people to view things through another's eyes, becoming more critical of your practice and seeking ways to improve. The reason that these reflections should be shared publicly is that it allows others to see what has and has not worked, but also provides people in the comments section to offer advice and feedback. It will be through these reflections that patterns around professional learning will begin to emerge. Individuals will recognize through these reflections, strategies that worked, strategies that did not and also understand the conditions and context in which they were applied. System leaders can also identify common problems of practice and help facilitate connections and focus resources. The system could, instead of developing a three-year education plan from the top and have individuals conform, look to the system and emerging patterns to understand how individual actions can inform the three-year plan.

Discussion

There is a general consensus that linear top-down professional learning that does not recognize unique contexts of the individual is an ineffective model. The literature demonstrated how this understanding has led new models such as professional learning communities, action research and EdCamps. Each of these models contain elements of effective professional learning, but all have drawbacks that prevent any of these reaching their full potential. Whether it be be working towards a prescribed goal from leadership, limiting who individuals can work with or lacking the important feature of being self-directed, all of these models have limitations. By acknowledging schools as complex adaptive systems, complexity science provides a theoretical backing for how organizational decision making, professional learning and even student learning can be reimagined.

At times this inquiry was quite challenging, this was mainly due to the ideas being explored living primarily in a theoretical space. Complexity and exploration of complex adaptive systems is primarily done in the fields of biology and physics and has only recently begun to be applied to the social sciences. Fenwick (2012) cautions against romanticizing of the idea of flow and interconnectivity between things. This was continuously on my mind as I considered my findings. It is my opinion that the findings of this study are valid, but much like the research phase should be considered iterative. The findings here provide a theoretical model for how the ideas of complexity could inform a model for professional learning. It could easily be learned that the proscriptive conditions provided in the findings are insufficient and that chaos ensues. It is for this reason that it is important for leadership to have a solid understanding of complexity

theory and be open to a constant adjustment cycle. It would prove wise to communicate this to the organization prior to undertaking this shift.

Another limitation of this inquiry was not fully exploring the the concept of change management and shaping organizational structure. Future investigation into how to facilitate and manage change within a complex adaptive system would be a worthwhile line of study. Shifting from a top-down linear model towards one that is more decentralized could easily be met with skepticism and not understanding how individuals may perceive such a shift could greatly impact the findings in this study. This should not diminish these findings, but rather serve as a caution to leaders around such a significant change.

Moving forward this inquiry provides a framework with reasonable first steps that can be undertaken to develop a model for professional learning that is responsive to the unique contextual needs of individuals while serving the interests of a larger organization or system. The findings in this inquiry stress the importance of any shift in professional learning as being contingent and iterative in nature. The most interesting of the findings were that in order for such model to be effective, it is essential that the conditions are in place for self-organization and emergence to take place. In particular, the idea of framing professional learning through proscription versus prescription. The proscriptive conditions put forth in the findings should be viewed as contextual and any audience of this report should consider their own context when drafting proscriptive conditions.

Conclusion

The top-down linear model for professional learning that has long been employed in education systems is widely seen as being disconnected from the classroom and ineffective.

Through these understandings, efforts have been made to create models that recognize the contextual conditions in which teachers work and to be more intentional in tying this learning to teacher practice. While theses models have shifted the method of delivery, they continue to see professional learning as something that is planned and then rolled out to schools. Goals and targets are largely established from the top and little opportunity to deviate is provided. I instead propose a model that is situated within proscriptive conditions, supported by networks and technology and allowing for self-organization and emergence.

Through this model, individuals would come together around a shared problem of practice, as these groups come together, patterns will likely emerge that could help inform leadership on where resources could be focused. This model, while largely theoretical, will also greatly rely on a different type of leadership. Leaders in this model, must see themselves as facilitators and connectors. Such a cultural shift in many school systems will likely require effective change management and therefore it is important that introducing this model should not be rushed and be well understood by all who will be involved.

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Appendix A

Network	Description	Connect Thru	Contact
Learning Commons	Teachers interested in and engaging in the shift from a library to a learning commons.	Face to Face on the 2nd Wednesday of each month.	jrdoe@cbe.ab.ca
CBE 182	CBE teachers sharing a 250 word story about learning each instructional day.	weebly.cbe182.com	sssmith@cbe.ab.ca
Iris with Grade Ones	Grade One teachers sharing strategies and challenges around using Iris with Grade One students.	Iris Workspace	jjones@cbe.ab.ca
CBE ILT	Teachers interested in the meaningful integration of technology through effective task design.	Google Plus Community	pdoe@cbe.ab.ca
Jr. High Music Teachers	Jr. High Music Teachers sharing ideas and developing rich experiences in music education	Face to Face (intermittent)	crogers@cbe.ab.ca
CTF	Collection of teachers and administrators sharing how CTF lives in their own context. Members share ideas and sometimes collaborate across schools.	Newsletter/Message Board/Face to Face	cgrant@cbe.ab.ca
Alberta Education Chat	A weekly chat on Twitter involving educators from around the world on topics relevant to education in Alberta	Twitter every Wednesday at 8pm	#abedchat

Appendix B

Outcome: Student Success			
Personalized Learning *Success for each student, every day, no exceptions*	Building Capacity *Capacity building with a focus on results*	Engage Public *Everyone participates in the success of public education*	Steward Resources *Resource management on behalf of student learning*
Instructional design and leadership focus on: - student agency and intellectual engagement - active and effortful tasks designed for the contemporary learner - assessment that informs teaching and learning - students knowing what they know, how they know it, how they show it, and what they need to learn next	Collaborative learning networks focus on: - Intellectual engagement - shared standards of practice - data driven, research informed and job-embedded professional learning - staff knowing the decisions they have made, why they made them, what impact those decisions had, and what is required of them next	Internal and external community members: - actively recognize public education as foundational to a democratic society - acknowledge and accept different roles, responsibilities and contributions based on shared outcomes and engagement - support, practice and benefit from open and responsive communication - accept responsibility for the success of the organization	Decisions at all levels of the organization are: - based on values and priorities - data driven - strategic and responsive - consistent with the learning agenda - made within a coherent framework - sustainable