

ATHABASCA UNIVERSITY

A DRINKING FROM A FIRE HOSE: SUCCESS STRATEGIES AND COPING
MECHANISMS FOR LEARNING THROUGH SYNCHRONOUS MICROBLOGGING
ON TWITTER

BY

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Approval of Thesis

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Dedication

For Ayube and Ayla, of course.

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Abstract

Microblogging has emerged as popular tool for networking and communications among millions of users. The most popular microblogging application, Twitter, allows virtual groups to form spontaneously around shared interests and set times to come together to discuss a topic, resulting in what this study terms synchronous microblogging. These chats can result in an overwhelming intensity of discussion reminiscent of “drinking from a fire hose”. This study explored how social aggregation was characterized in this informal learning environment and identified the success strategies and coping mechanisms that chat participants employed. The study broadened the knowledge of the mechanics of successful synchronous microblogging chats and identified ways to motivate individuals to participate. Twitter chats were characterized by low levels of formality, high levels of topic focus, tight and loose relationship-building, high resource sharing, and high structure. The study was unable to determine whether knowledge can be socially constructed within a Twitter chat.

Keywords: synchronous microblogging, Twitter, community of practice, personal learning network, generative learning community, affinity space, group/net/set, sensemaking, online discussion

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Chapter I – INTRODUCTION

The introduction of digital technologies has opened up new opportunities for individuals with shared interests to find each other and connect online in virtual groups and networks (Gee, 2005; Lewis, Pea, & Rosen, 2010; Tobin, 1998; Wenger, 1998), to share information, and to develop their professional skills and knowledge outside of formal learning courses and conferences. Anderson's (2006) *long tail theory* provides the theoretical background to explain this new affordance where those interested in any topic, no matter how obscure, can easily find and connect with others on a global scale to learn and share virtually for their mutual interest.

A primary application is the use of this capability for continuing education and professional development. Voluntary and continuing professional learning and development is essential for successful participation in our technology-based, knowledge society (Collin, Van der Heijden, & Lewis, 2012). Over time, the range of possible continuing professional development learning activities has broadened from purely formal, classroom training to include a variety of informal learning activities (Collin, Van der Heijden, & Lewis, 2012). For learning professionals, especially those with a technology or eLearning focus, the continually evolving nature of learning and technology makes continuous professional development essential to remain current with best practices and the latest research (Bonzo, 2012).

One means available to support informal learning and sharing is social media (SoMe) microblogging tools like Twitter. Twitter positions itself as a real-time information network that connects users to the latest stories, ideas, opinions, and news

about what they find interesting and to others with similar interests. This is done by following and contributing to conversations delivered in 140 character messages called tweets (Twitter, 2012). The tweets are often labelled with hashtags, designated with a # symbol, for example, *#olympics*, that help Twitter users find and follow particular topic threads.

Twitter has become a medium for virtual groups to form spontaneously around a shared interest and for existing groups to designate hashtags to be used to label and make related Twitter conversations retrievable. From a professional development perspective, the instantaneous nature of Twitter conversations allows for asynchronous discourse by opening up opportunities for both real-time – synchronous – and asynchronous learning within a group. Some groups have set particular times on a regular basis when those interested may come together to synchronously discuss a predetermined topic on Twitter (Conner, 2012; chat2lrn, 2012), resulting in what this study terms *synchronous microblogging*.

This section outlines the statement of the problem encompassed by this research. This section also identifies the significance of the research to the professional learning community and provides definitions of terms used within this report.

Statement of the Problem

Depending on the size and engagement of the group, synchronous microblogging using Twitter has the potential to create an intensity of discussion sometimes reminiscent of “drinking from a fire hose” – a flurry of tweets and retweets scrolling on the screen, ranging from substantive comments to tangential thoughts to friendly or humorous

banter, many with embedded links to websites and rich media content impossible to review in their entirety during the time-limited discussion. But synchronous microblogging also has the potential to sustain rich, interactive learning and create network effects for distributed communities of practice and inquiry and collaborative support.

This pragmatic, mixed methods study focused on a group of learning professionals who participated once a week in a 60-90 minute, synchronous microblogging chat using the Twitter hashtag *#lrnchat*. The purpose of the study was to identify the nature of their social aggregation, the success strategies and coping mechanisms they employed to decipher and make sense of hundreds of rapid-fire tweets in a time-limited discussion, and to determine if and how the synchronous microblogging experience generates socially constructed knowledge or is merely a means of connecting socially and sharing knowledge-related commodities. The study explored synchronous microblogging for professional development learning through questions in two primary areas:

1. *Social aggregation*: How was group membership characterized in an informal environment like a public microblogging site? Were members part of a *personal learning network* (Tobin, 1998), *community of practice* (Wenger, 1998), or other type of learning community or learning space (Gee, 2005; Lewis, Pea, & Rosen, 2010; Dron & Anderson, 2014)? What motivated participants to join this synchronous microblogging chat?

2. *Sensemaking*: How did the participants “drink from the fire hose” of hundreds of tweets in a short amount of time? How did they decipher the meaning of tweets limited to 140 characters? How did they sensemake? What coping mechanisms did they adopt to shift from the concept of reading everything in completeness to skimming the flow and diving deep when a particular comment caught their interest? What skills were required by live microblog chat participants to be successful? What expectations and assumptions did they need to discard? Did this microblogging experience result in the social construction of knowledge?

Exploration of these questions helps to generate an understanding of the success factors necessary to support and sustain learning for professional development through synchronous microblogging. As Twitter and synchronous microblogging are relatively new areas of study with little current theory available, a pragmatic approach mixing quantitative and qualitative research tools was appropriate for developing a stronger understanding of this phenomenon. The significance of this research is outlined below.

Significance of the Research

Cheetham and Chivers (2001) compared the contribution of formal and informal learning to professional development and found that while both are important, and to some extent interrelated, informal learning is the more significant component of competence acquisition over time. As such, informal learning is worthy of further study. A study of human resources development (HRD) professionals found that they relied on independent learning activities (observing others, searching the Internet, and scanning professional magazines and journals) for their informal professional development rather

than interactive learning activities (collaborating with others, sharing materials and resources, engaging in trial and error, and reflecting on their actions) (Lohman, 2005). Interestingly, online discussion was not mentioned as a method of informal learning, perhaps due to its emergent nature at that point in time. Individuals are, however, using online technology more and more in learning and social interaction. Dron & Anderson (Dron & Anderson, 2014) argue that the affordances of the Internet provide new ways to approach education. Technology “has come to form a major role in supporting cooperative work, collaborative understanding, discourse, and individual growth, as media consumes an ever-greater proportion of our daily lives” (Dron & Anderson, 2014, p. 41).

A study of 80 practitioners from 20 professions including corporate trainers compared the perceptions of different forms of informal learning (Cheetham & Chivers, 2001). The study also did not touch on online discussion as a method of informal learning, but did find that networking with others doing similar work was rated as being of average importance. For those who valued networking with others doing similar work, key benefits included comparing notes, solving specific problems, and gaining reassurance (Cheetham & Chivers, 2001). While some individuals mentioned participating in formal networking arrangements involving planned sharing of experiences, Cheetham & Chivers (2001) indicated that they had insufficient data to determine whether the more formal arrangements conferred any benefit.

Despite the importance of informal learning to continuous professional development, little research exists related specifically to the use of synchronous

microblogging for professional development learning. Knowing more about the strategies employed by participants to make sense of, and potentially learn from, highly intense conversational volumes and to cope with other factors limiting participation will help organizations and other groups of like-minded individuals establish and maintain successful professional development learning experiences in a synchronous microblogging environment. While some strategies and mechanisms can be extrapolated from studies focused on use of synchronous learning in more formal academic or professional environments, differences may exist for self-directed learners focused on their own professional development in an informal environment. What is learned from exploring this type of spontaneous microblogging initiative may be transferable back to corporate or academic attempts to instigate such informal learning events within virtual groups. Finally, the constraints and opportunities that accompany very short, 140 character exchanges have been little studied to date.

Discovering whether these types of online discussions result in new knowledge will inform decisions that organizations make around the costs and benefits of investing in internal, private microblogging applications to support learning endeavours. The study's findings will also enable others who are interested in establishing similar synchronous microblogging chats on popular social media platforms to do so in a successful manner that promotes learning. To provide clarity around concepts explored in this study, definitions of key terms are provided in the next section.

Definition of Terms

The terms below are used frequently within this study or have a specific meaning in the context of this thesis.

Affinity space was characterized by Gee (2005) as a space where individuals come together in a provisional rather than institutional online portal around a common endeavour (not race, class, gender, or disability), with easy entry and exit regardless of experience levels, to generate broad and deep knowledge for short-term and temporary interests.

Community of practice, proposed by Wenger (1998), is a group of people informally bound together by shared expertise and passion for a joint enterprise.

Curiosity is a feeling of deprivation which occurs as an individual recognizes a gap in his/her knowledge and is motivated to seek the information that will ameliorate this feeling of deprivation (Lowenstein, 1994).

Generative learning communities, proposed by Lewis, Pea, & Rosen (2010), are informal and inclusive interactions that exist to expand upon public knowledge through dialog and sharing of multiple viewpoints.

Group, proposed by Dron & Anderson (2014), is a distinctive mode of social engagement used for learning, as distinguished from *network* and *set*. Groups are characterized by a limited membership – members are listed – and lines of authority and roles are formal with rules that govern behaviour. The topic focus is determined by the leader(s) or teacher(s). In a group, members come to know and rely on each other

thus enhancing their learning opportunities through collaboration, cooperation and feedback. Resources are controlled by the leaders/teachers and the structure of tasks and activities is formalized and often scheduled.

Hashtag is a word preceded by the pound sign on Twitter, e.g. *#olympics*. A hashtag automatically becomes a hyperlink to search results of tweets that use this hashtag. Individuals with an interest in a topic may find others with similar interests by searching for hashtags on a topic and then following – subscribing to the feed of messages from – individuals who tweet using those hashtags.

Massive open online course or MOOC is a learning opportunity that takes place online, usually without fee, and potentially attracts large numbers (often thousands) of interested students. MOOCs may have predefined timelines and weekly topics, but usually have no prerequisites, no predefined expectations for participation, and no formal accreditation (McAuley, Stewart, Siemens, & Cormier, 2010).

Microblogging is a form of blogging where users publish brief text updates, usually less than 140-200 characters. Twitter is a commercial example of a microblogging application.

Net or network, proposed by Dron & Anderson (2014), is a social aggregation concept distinguished from *group* or *set*. A network is defined by individual nodes and connections (both weak and strong) among players in a social context. Networks cannot be designed like groups, but they can be nurtured and shaped. Membership in a net is much more loose and transitory than membership in a group. The focus emerges through the interests of those in the network.

Personal learning environment (PLE) brings together all the learning opportunities available to an individual from formal educational programmes to informal learning and working place learning to learning from home, learning driven by problem solving and learning motivated through personal interest (Attwell, 2007).

Personal learning network (PLN) is a group of people and assorted tools that are used to guide an individual's learning by pointing out learning opportunities, answering questions, and sharing of knowledge and experience (Tobin, 1998).

Sensemaking is a motivated, continuous effort to understand connections (which can be among people, places, and events) in order to anticipate their trajectories and act effectively (Klein, Moon, & Hoffman, 2006).

Set, proposed by Dron & Anderson (2014), is a social aggregation concept, distinguished from *group* and *network*, composed of people with shared attributes. Membership can be anonymous, but draws together those who share attributes and are interested in a particular topic or theme. Relationships are limited with a larger emphasis placed on developing, sharing, and evaluating artifacts. The structure can vary, either structured around outcomes (notably Wikipedia) or loose providing opportunities for serendipitous exploration.

Social media (SoMe) or social networking sites are web-based services that allow individuals to construct personal profiles, identify other users with whom they share a connection, and share their connections and view the connections of others using the system (Boyd & Ellison, 2007).

LEARNING THROUGH SYNCHRONOUS MICROBLOGGING

Synchronous microblogging is a real-time chat using microblogging tools.

Synchronous online learning is a real-time, technology-based interaction of more than one individual for the purpose of learning.

A *Tweet* or status update is a Twitter message of no more than 140 characters that is published publically online. Users can embed, reply to, favourite, unfavourite, retweet, unretweet and delete tweets (Twitter, 2012).

Twitter is a commercial, real-time information network that connects users to the latest stories, ideas, opinions, and news about what they find interesting (Twitter, 2012).

Chapter II – REVIEW OF THE LITERATURE

Few studies have explored synchronous online discussion, for learning purposes, that takes place outside formal courses and conferences. Little research has focused specifically on fast paced, time-limited, synchronous chat discussions for professional development. Many questions remain unanswered.

This study explored the nature of social aggregation for a global group of like-minded individuals who came together on a regular basis, at a mutually agreed-upon time, on their own time outside of work or school, to hone their professional knowledge, network with other like-minded individuals, and share best practices. The study also aimed to identify success strategies or coping mechanisms that individuals employed to promote their own learning or sensemaking when the intensity of the synchronous discussion became too much to read or explore during a time-limited live chat. Finally, the study explored if and how knowledge was socially constructed through synchronous microblogging chats.

This literature review focused on three key areas related to the study: synchronous online discussion, social aggregation, and sensemaking. Past studies of synchronous online discussion for learning purposes focused mainly on synchronous text chats or audio conversations within formal courses or conferences. These studies were explored in this review with a particular focus on any limitations students identified related to synchronous discussion and coping strategies they employed. Research related to massive open online courses (MOOCs) was identified and reviewed as the most relevant and most transferable to the experience of learning through synchronous

microblogging on a social networking site such as Twitter. MOOC research is relevant as the discussion component of such open online courses are often characterized by large numbers of participants generating large numbers of discussion comments and threads. Methods of coping with the volume and intensity of MOOC discussions may be applicable to the extensive and rapid fire questions and answers inherent in a Twitter chat.

When a group of individuals come together to learn online for their own professional development, voluntarily and outside of a formal learning course or conference, how is group membership defined? The review explored whether defining group membership is valuable, or even necessary, in the new context of social media interactions. The social aggregation concepts of *communities of practice* (Wenger, 1998), *personal learning networks (PLNs)* (Tobin, 1998), *generative learning communities* (Lewis, Pea, & Rosen, 2010) were explored and contrasted with *affinity spaces* (Gee, 2005) and *groups, networks, and sets* (Dron & Anderson, 2014). As this was an exploratory study, the focus was on identifying the characteristics of this type of social aggregation and appropriate explanatory terms for the interactions rather than conducting a detailed social network analysis study.

The review also examined *sensemaking* – how individuals make sense of the chaos of massive amounts of information. The realities of the collaborative social media context of network-based learning have resulted in a shift in the information refinement process from linear to iterative.

Synchronous Online Discussion

Most research on synchronous online text-based learning has focused on use of synchronous chat within courses or conferences. Johnson (2006) explored recent research on asynchronous and synchronous text-based chat in educational contexts and found that few empirical studies had been conducted on instructional effectiveness of synchronous text-based communication, with researchers favouring a case study approach to explore this new area of research. Johnson (2006) found that case study evaluations suggested potential learning benefits associated with synchronous online discussion, but argued that further systematic and objective research was required to substantiate the “anecdotal” results of more qualitative studies.

Johnson’s (2008) empirical study compared the relative benefits of the use of asynchronous and synchronous text-based chat in case-based assignments in a psychology course. Results found no evidence of the instructional superiority of synchronous or asynchronous text-based computer-mediated chat (CMC). Johnson indicated a difficulty in interpreting the reasons provided by students to explain their preferences for synchronous or asynchronous learning as student’s motives were often the same in both cases. For example, students found that discussing cases synchronously forced them to be prepared for the online discussion. The same reasoning was provided by the students who reported a preference for asynchronous discussion (Johnson G. , 2008). While the much more common empirical studies of online asynchronous discussion help to fill a void in the research, synchronous online discussion is still an emerging experience. A more pragmatic approach mixing qualitative and quantitative

methods would have offered an opportunity to explore these conflicting results more deeply and identify more substantive reasons behind the student preferences.

Lobel, Neubauer, and Swedburg (2009) explored the ability of students in an undergraduate course to handle high volumes of synchronous online student-to-student chat interactivity. The students participated in online synchronous discussions that averaged 331 interactions per hour and 22 words per message. The researchers found no indication that students found it difficult to receive, assess, and respond to the information. They also found that while face-to-face interaction was serial, with one comment following and linking back to the previous, online interaction was parallel, with multiple comments on the same topic happening at the same time. These authors claimed that ‘parallel communication’ interactions, instead of resulting in confusion or miscommunication as might be anticipated, resulted in synergistic collaboration and construction of transformative knowledge. This type of parallel communication is very much in evidence in synchronous microblogging chats and there is room to explore whether deep and meaningful knowledge can result from this type of interaction. The current study explored whether the limited number of characters of tweets and the informal nature of Twitter limit the opportunity to construct knowledge collaboratively in similar ways to that Lobel, Neubauer, and Swedburg (2009) found was possible in their study.

Branon & Essex (2001) surveyed a convenience sample of distance educators to identify perceived limitations of online synchronous discussion. Instructors mentioned several challenges including the difficulty of getting participants online at the same time,

the difficulty of moderating larger scale conversations, the lack of reflection time for students, and intimidation experienced by poor typists. As Branon & Essex's findings were based on opinions of distance educators rather than actual experimental observations their results may differ from those experienced by students. Deeper research into the challenges with moderating large scale, high volume, and high participation synchronous discussions would be particularly relevant to the current study, but are lacking.

Studies that have come closest to exploring the success strategies and coping mechanisms for participating in intensive online discussions relate to massive open online courses. McAuley, Stewart, Siemens, & Cormier (2010) identified some factors that limit participation in MOOCs including discomfort with the lack of structure, lack of accreditation reducing the perceived value, lack of digital skills and tools, challenges from global participation related to language and culture, and time zone challenges for synchronous sessions. Regarding information volume, they found that

Learners often find it difficult to let go of the urge to master all the content and read all the comments and blog posts. However, in digital environments where there are no practical limits on scope or multiplicity, this sorting and sensemaking process is key. The process of coping and wayfinding is, in effect, the ontology of the digital environment. Learning to engage selectively and intentionally in the information overload of the digital world is as much a lesson – and key digital literacy – in the MOOC learning process as is mastering any specific content. (McAuley, Stewart, Siemens, & Cormier, 2010, p. 53)

No specific, tactical success strategies or coping mechanisms were identified in this study to explain *how* course participants can approach the content selectively and intentionally to facilitate their learning or professional development.

In a study of a MOOC called PLENK – Personal Learning Environments Networks and Knowledge – Kop (2011) found participants who had not engaged in a MOOC before found its distributed nature to be confusing and the high level of resources and contributions by participants overwhelming. Participants engaged in several coping strategies including a discussion thread with scaffolds and helpful hints as well as a tools wiki. Participants also used Wordle, a visualization tool, to visualize the essence of readings for a particular week. Although large numbers of participants registered for the course, only 40-60 individuals participated actively by aggregating, relating, creating, and sharing new content. In a study of Twitter, Mustafaraj, Finn, Whitlock & Metaxes (2011) referred to this small number of active participants as the *vocal minority* and the large number of mostly silent participants as the *silent majority*. Kop (2011) conducted focus groups with the silent majority, sometimes pejoratively referred to as *lurkers* – those who registered, but did not contribute in a visibly active way. Kop found that certain people need time to digest content in online discussions and that it might not be possible or desirable for them to respond by producing new knowledge within the course time frame. Little research has been completed to explore how much new knowledge is created through synchronous microblogging chats compared to the amount of information that is aggregated, related to, and shared.

Only a few studies have focused specifically on synchronous learning outside of courses and conferences and fewer have focused on the use of microblogging on information networks such as Twitter for learning purposes. In 2008, Holotescu & Grosseck were the first to suggest that Twitter and other microblogging applications could be used for educational purposes. Holotescu & Grosseck (2009) hosted the first formal course on a microblogging site, using the Romanian microblogging site Cirip.eu. They found the microblogging tool was used for different kinds of asynchronous online discourse where participants could assess opinions, examine consensus, look for outlying ideas, and foster interaction about a given topic (Holotescu & Grosseck, 2009).

Lalonde (2011) studied microblogging as a professional development learning tool outside of courses and conferences. Lalonde focused on the role of Twitter in the formation and maintenance of *personal learning networks (PLNs)* (Tobin, 1998). Lalonde's study focused on the use of the hashtag *#edtech* by educators on Twitter, allowing them to engage in dialogue with a network of other educators to access the collective knowledge of their peers. Lalonde's main interest was in exploring the nature of PLNs, including establishment of trust and reciprocity, which extend beyond and outside of Twitter, rather than on the experience of asynchronous or synchronous chat within this microblogging site. Lalonde (2011) found that while professional networks are not uncommon, the scope and scale of these networks have increased with the advent of social networking technologies, such as Twitter. Twitter allows a great diversity of voices to emerge within the conversation on the network. The open nature of Twitter means these learning networks are now no longer confined to closed and private spaces, but are able to be open and public which increases the opportunities for collaboration,

connections, and learning opportunities. While Lalonde moved the research on professional development learning through microblogging forward, he did not explore the synchronous aspect of microblogging nor the success strategies and coping mechanisms needed to handle the intense volume of discussion that comes with a massively expanded professional development conversation, also leaving room for further research.

Budak & Agrawal (2013) studied the factors that affect continued user participation in the educational Twitter chats. As a result of statistical data analysis of thirty Twitter chats over a two-year period, Budak & Agrawal put forward a *5F Model* that captured five different factors that influence continued user participation in Twitter chats. The five factors are *individual initiative*, *group characteristics*, *perceived receptivity*, *linguistic affinity*, and *geographical proximity*. Overall, they found similarities between Twitter chats and traditional groups including the importance of social inclusions and linguistic similarity. They found geographical proximity to be insignificant and that *informational support* was more important than *emotional support* in determining whether users would continue to participate in a chat.

Power (2013) explored the nature of professional learning conversations on Twitter in the context of the *community of inquiry framework* (Garrison, Anderson & Archer, 2000). Through a content analysis of three Twitter chat sessions, Power found that Twitter chats offered more than just social interaction. The study supported the notion of Twitter as “a medium for promoting collaboration among educators in a community of inquiry” (p. 109). Power found elements of dialogue and discussion that led to collaborative conversations presenting various elements of critical thinking: “each

conversation had elements of dialogue (sharing ideas), discussions (making decisions) and debate” (p. 109). The chats led to brainstorming and the sharing of ideas and one chat, which was held over a longer period of time, encouraged “continued, deeper, and wider ranging exchanges between participants that were evident of a deeper cognitive presence or level of critical thinking” (p. 110). Power’s findings “challenge the myth that Twitter is merely a social venue for sharing occurrences throughout ones day; instead, these findings indicated that Twitter has the potential to provide a medium where meaningful structured professional learning can take place” (p. 110).

Overall, Power found that as elements of *cognitive presence*, *social presence*, and *teaching presence* (Garrison, Anderson, & Archer, 2000) were evident in the Twitter chats, an educational exchange of learning did take place. Power suggested that the questions in a Twitter chat must be structured carefully to promote collaborative solutioning around one main theme or there is a risk of them going unanswered. Asking too many questions can take away time necessary for participants to construct their own personal thoughts. In two of the three chats studied by Power the teaching presence was low, making it difficult for the participants to focus on one main theme. In the third chat, the teaching presence was high. In all of the chats, the facilitator or moderator was not a formal teacher, but an individual (or individuals) who used a consistent instructional management approach. The leader took responsibility for identifying and asking the questions that formed the basis of the chat. The leader also provided a summary of key ideas at the end of the chat, resulting in a more focused and valuable discussion.

Power also identified barriers that limited the depth of inquiry of Twitter chats. Specifically, the larger the group size and the higher the number of tweets, the more confusing the discussion. Chats were also made more confusing when participants forgot to include the chat hashtag in responses to questions, resulting in the response not showing up in the Twitter chat stream. *Social noise* – personal social interaction-related comments peppered the chats and required the participant to filter through them to get to the actual chat topic. Similarly, tweets from non-chat participants also showed up in the chat discussion as anyone could use the chat hashtag at any time either to post un-related thoughts or to advertise products or resources to chat participants. Where chat leaders participated as learners as well, Power felt the quality of the chat suffered. Power indicated the facilitator should focus on managing the chat in order to limit distractions for participants. Finally, the use of too many questions promoted too many tangential conversations that took away from the main theme of the chat.

Power's recommendations are valuable for facilitator-dominant chats, but many of the synchronous microblogging chats on Twitter derive their value from their more casual, organic nature – a serendipitous coming together of like-minded individuals in a shared space where they can discuss a topic of common interest. Too heavy-handed management of a discussion, which could result from following all of Power's recommendations, might destroy the unique spirit of the Twitter chat, turning it into just another online moderated discussion.

Other microblogging studies have not included a learning or professional development aspect. Java, Finin, Song, and Tseng (2007) were the first to explore user

intent on Twitter from a topological and geographical perspective. In comparison to blogging, they found that the shortness of microblog posts lowers users' requirement of time and thought investment for content generation, resulting in much more frequent updates than traditional blogging. They found that people microblog based on one or more of four intents: daily chatter, conversations, sharing information/URLs, and reporting news. Java, Finin, Song, and Tseng did not mention learning or professional development as a specific intent of Twitter users and did not address limitations to participation nor the quality of microblog posts compared to blog posts.

In their study of the use of mobile social media for learning, Lewis, Pea, & Rosen (2010) found that while the design of social media sites allows for active participation, the technology is not yet that supportive of the co-creation of knowledge.

Harnessing such dynamic network interactions for learning is challenging in part because they are so flexible and emergent, and in part because the 'upload' mode of media production is so primitive from a creative meaning-making perspective. Although these sites are certainly dynamic, those who study human interaction cannot help but notice that the forms of communication available are for the most part one-dimensional, based in collective circulation of artifacts and individual meaning-making, rather than the co-construction of meaning. (p. 6)

Critics of social media sites such as Twitter are quick to point out the difficulty of communicating, much less learning, in 140 character snippets. For example, this blog posting summarizes some of the typical concerns for those who do not see the value in Twitter:

I really don't care about what someone is doing if that activity can be expressed in 140 characters or fewer... Twitter is designed only to accommodate off-the-cuff comments, which usually are either poorly considered or so heavily abbreviated that they're impossible to comprehend (or both)... Most of what's on Twitter, even on my limited feed, is drivel... And hash, don't even get me started on you. You were just a button on a telephone before Twitter came along. (Pender, 2011)

Before I joined Twitter, I too had dismissed it as a mere medium for social 'chit chat' and regarded the use of Twitter as non-productive waste of time. However, after an all-out campaign by a colleague, I capitulated and started using Twitter more frequently. My colleague suggested that I look at her list of followers and follow those who looked interesting. As most Twitter handles on my colleague's list were thought leaders in learning and development, my Twitter feed quickly became a stream of useful professional development insights. I consider the 140 character tweets, which I can now decipher, to be valuable entrees into further exploration and learning for a given professional development topic and, of course, the possibility of extending the discussion with comments or retweets is always available.

According to Lewis, Pea, & Rosen (2010), in order to make meaning people need to be able to do more than just circulate "commodities". They need to be able to

Create together, to generate narrative, to share contesting ideas. The power of social media for learning lies not in its ability to offer individual expression anytime anywhere so much as in its yet-to-be-realized potential to foster

collaborations, on a scale and in tighter time cycles than ever seen before. (pp. 7-8)

Central to this study is the question of whether synchronous microblogging chats like *#lrnchat* have organically identified a way to support co-creation of meaning or whether such chats still mainly focused on building social connections and circulating “commodities” of learning such as links and embedded media. The nature and value of the Twitter chat experience requires further study. The next section takes a closer look at the literature related to group membership concepts in order to describe this social aggregation experience of a Twitter chat more effectively.

Social Aggregation Concepts

When individuals come together in an online space, such as *#lrnchat* on the Twitter microblogging site, for a synchronous (real-time) online discussion, several relationships and new concepts are created in these new ‘community spaces’. The question of what term or group concept is best used to describe this connection is of interest to me and, I think, to others developing teaching and learning applications using this technology. Several explanatory concepts are available to describe these social aggregations: *community of practice* (Wenger, 1998), *personal learning network* (Tobin, 1998), *generative learning community* (Lewis, Pea, & Rosen, 2010), *affinity space* (Gee, 2005), and *group, network and set* (Dron & Anderson, 2014). (See Table 1.)

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Table 1

Social Aggregation Concepts

Concept	Community of Practice	Personal Learning Network	Generative Learning Community	Affinity Space	Group	Network	Set
Formality	Members are known, informally bound together by shared expertise	Informal, individuals may not indicate that others are in the individual's PLN	Informal, changes over time	Focuses on learning space not membership; ad hoc	Access is limited, members are named	Loose, often transitory formations	People with shared attributes; can be anonymous
Focus	A common purpose or joint enterprise with related learning topics	The unique learning needs of the individual	Interpretive; Focus on dialogue and multiple viewpoints around dynamic topics	Short-term and temporary interests	Determined by leaders (teachers)	Undesigned, emergent	Shared interest in topic or theme
Relationship	Mutual engagement into a social entity, possibly close-knit ties	Hand-selected close relationships valued by individual	Loose and come and go based on who are members at a given time	Loose and come and go based on who visits the space a given time	Members come to know and rely on each other, building trust and commitment	Opportunity for engagement with others outside the participant's known colleagues	Limited social interactions or relationships
Resources	Shared repertoire of communal resources	Point participants to learning opportunities and answer questions based on knowledge and experience	Generate knowledge in shared discussion	Brought to the space or linked to from the space	Provided by leaders (teachers)	Created and curated by participants; accessible within and outside the network	Shared artifacts
Structure	Formal group structure, may be created before members join	Informal and structured by the individual	Informal communication structures; expansive and inclusive	Provisional rather than institutional	Formal with a set pace/method of learning	Unstructured	Structured around outcomes or allow for exploration
Type	Group	Network	Network	Set	Group	Network	Set

To be a *community of practice*, by Wenger's (1998) definition, a group must be a joint enterprise as understood and continually renegotiated by its members. Relationships of mutual engagement bind members together into a social entity and the community of practice must have a shared repertoire of communal resources that members have developed over time. While an informal social aggregation concept, the community of

practice concept describes a more formal membership arrangement than is evident in *#lrnchat* where participants come, go, and lurk – read without participating – without any formal process of identifying themselves as ‘real’ people nor as being part of a community beyond use of a Twitter hashtag. The focus of a community of practice, requiring a common purpose or collective intention, is also not the reality of a synchronous microblogging chat such as *#lrnchat* where individuals may come to the chat with diverse purposes. They may stumble upon or be attracted only to the day’s topic, and never return. The hashtag *#lrnchat* is used outside of the weekly synchronous chat by anyone on Twitter who chooses to use it – often to label tweets that are education-related, but not necessarily focused on adult learning and development. The weekly synchronous chat group is not able to lay claim to the public *#lrnchat* hashtag in any way beyond intensive usage during a 60-90 minute period once a week.

Communities of practice also have more formal and close-knit relationships than are evident in *#lrnchat*. *#lrnchat* is far from being a formal social entity. Most of the members would be hard pressed to recognize others members if they met them face-to-face and meeting face-to-face is unlikely without special effort as the participants are drawn from around the globe. While resources are shared during the chat, they are “of-the-moment” and not captured into a more formal repertoire of shared resources as expected in a community of practice.

In his study of learning through *#edchat* on Twitter, Lalonde (2011) focused on the *personal learning network (PLN)* concept to describe the members of *#edchat*. In a previous study, Tobin (1998) defined a PLN as a network of people who guide an

individual's learning by pointing towards learning opportunities, answering questions, and sharing their own knowledge and experience. A PLN is to be distinguished from a broader *Personal learning environment (PLE)* which brings together all the learning opportunities available to an individual from formal educational programmes to informal learning and working place learning to learning from home, learning driven by problem solving and learning motivated through personal interest (Attwell, 2007). Unlike a community of practice, which has purposes above or beyond supporting learning, a personal learning network's main focus is on making connections to support learning. Lalonde (2011) suggested that a PLN is not necessarily bound by a common practice and can, theoretically, represent as many or as few of the interests as desired by the person constructing the PLN.

In my opinion, *#lrnchat* is not a personal learning network. At best, it is a space where the personal learning networks of all participating individuals overlap. Personal learning networks are just that – personal. They are focused on the unique learning needs of the individual and involve relationships with trusted advisors who use their own knowledge and experience to answer questions and point the learner toward appropriate resources. While members of *#lrnchat* may include each other in their personal learning networks and engage in sharing and question answering within *#lrnchat* as well as outside of it, through virtual or in-person interactions, the chat itself cannot be readily construed as a personal learning network.

Lewis, Pea, and Rosen (2010) proposed the concept of *generative learning communities* which differed from personal learning networks and communities of

practice by their fluidity and expansiveness. Generative learning communities “grow in range of participants, in degree of engagement by those contributing to the dynamic learning interactions of that community, and in expanding the knowledge created and harvested for use by that growing community” (p. 8). These communities are generally informal, not rigidly structured, and place the emphasis on dialogue and multiple viewpoints. According to Ravenscroft (2011), language and dialogues are important in the definition of collective performance and learning.

We will often perform sense making through continuous discourses that co-construct and negotiate meaning. Language and dialogue are the key underpinnings of social behaviour and learning. It is virtually impossible to imagine social processes that are divorced from dialogue processes... Along these lines it is important to remember that our networked social behaviour did not begin with social media, but is instead coevolving with these technologies, which arguably provide social opportunities that are more open, and are used more often, than was previously possible with the traditional methods of communication, dialogue, and discourse. (n.p.)

The generative learning community concept fits the nature of social networking and social media where the environment is one of informality and flexibility with a distinct focus on dialogue. *#lrnchat* is much closer to being a generative learning community than a community of practice or personal learning network, but may have a higher degree of topic focus and structure. Like a generative learning community, *#lrnchat* is informal and membership changes over time. The focus is on dialogue around topics that are

selected based on the input from members. The relationships within *#lrnchat* are loose and participants come and go. The resources of a generative learning community, like the resources of *#lrnchat*, are generated through shared discussion.

Gee (2005) proposed a novel concept, *affinity spaces*, as an alternative to the community- or membership-focused group concepts. With affinity spaces, the focus is on the *space* in which people interact, rather than on *membership* in a community. Gee suggested that the concept of communities implies “belongingness” or close-knit personal ties that are not always a reality in the classroom. This may be even more valid for the experience of engaging around learning purposes through social media. He indicated that the idea of community involves membership, but what membership means differs depending on the situation. According to Gee, when we label a group of people

We face vexatious issues over which people are in and which are out of the group, how far they are in or out and when they are in or out. The answers to those questions vary – even their very answerability varies – greatly across different social groupings. If we start with the notion of a “community” we cannot go any further until we have defined who is in and who is not, since otherwise we cannot identify the community. (2005, p. 215)

The concept of affinity group has many similarities to the synchronous microblog which were explored further by this study.

Dron and Anderson (2014) examined group membership specifically in the context of social learning, differentiating between three types of social aggregation concepts: *groups*, *networks*, and *sets*. (See Figure 1.) The *group* concept put forward by

Dron and Anderson (2014) is similar to a community of practice (Wenger, 1998). (See Table 1.) Groups are characterized by a limited membership - members are listed – and lines of authority and roles are formal with rules that govern behaviour. The topic focus is determined by the leader(s) or teacher(s). In a group, members come to know and rely on each other thus enhancing their learning opportunities through collaboration, cooperation and feedback (Dron & Anderson, 2014). Resources are controlled by the leaders/teachers and the structure of tasks and activities is formalized and often scheduled. The group concept is not closely related to a synchronous microblog which is generally characterized by looser membership and lower formality.

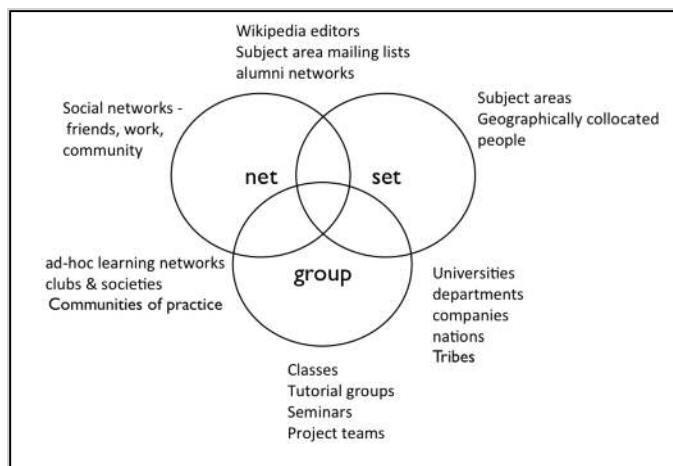


Figure 1. Nets, Sets and Groups from Dron and Anderson (2014, p. 7).

The second social aggregation construct proposed by Dron and Anderson is a *net or network*. A personal learning network (Tobin, 1998) would fit into this category of group membership. Dron and Anderson (2014) defined a network as a type of social aggregation that involves by individual nodes and connections (both weak and strong) among players in a social context. Networks cannot be designed like groups, but they

can be nurtured and shaped. Membership in a net is much more loose and transitory than membership in a group. The focus emerges through the interests of those in the network.

The final concept of social aggregation in Dron and Anderson's (2014) theory of social forms is a *set*. A set is a social form made up of people with shared attributes, for example those who chose to edit a Wikipedia page on a particular topic. Membership can be anonymous, but draws together those who share attributes and are interested in a particular topic or theme. Relationships are limited with a larger emphasis placed on developing and sharing artifacts. The structure can vary, either structured around outcomes or loose providing opportunities for serendipitous exploration.

As a construct that connects mainly in one space (Twitter), categorizing and grouping the discussion around a microblogging site topic label or hashtag, *#lrnchat* does not share the characteristics of a group or net. *#lrnchat* and other similar synchronous microblogging chats do not appear to be communities of practice or personal learning networks. This study provides more insight into the nature of *#lrnchat* as generative learning community, a set, an affinity space or something else that is yet emerging. Focusing the analysis on the "space" of *#lrnchat* where an ever-shifting group of individuals connect and share for their own professional development allows a recognition that membership may shift, but the experience continues on a weekly basis in this synchronous online discussion. This online learning experience can, however, be overwhelming, requiring successful participants to employ success strategies and coping mechanisms to deal with the intensity of this learning experience, as discussed in the next section.

Sensemaking

A challenge for participants in an intensive, synchronous chat is to make sense of hundreds or even thousands of tweets with embedded rich content in a short amount of time. I believe that sensemaking can happen in synchronous microblogging experiences on Twitter and that these experiences should not be dismissed as meaningless ‘chit chat’. Dervin (1998) defined knowledge as the sense made at a particular point in time-space by someone. Dervin describes sensemaking as the mandate of the human condition:

Sometimes, it gets shared and codified; sometimes a number of people agree upon it; sometimes it enters into a formalized discourse and gets published; sometimes it gets tested in other times and spaces and takes on the status of facts. Sometimes it is hidden and suppressed. Sometimes, it gets imprimatured and becomes unjust law; sometimes it takes on the status of dogma. Sometimes it requires reconceptualising a world. Sometimes it involves contest and resistance.

Sometimes it involves danger and death. (Dervin, 1998, p. 36)

Humans, living in a world with gaps in the knowledge available to them, seek out ways to overcome those gaps. According to Siemens (2004), when knowledge is abundant the ability to synthesize and recognize connections and patterns – to sensemake – is a particularly crucial skill in learning. In intensive synchronous microblogging experiences, the quantity of posts can be overwhelming to participants who have not created success strategies and coping mechanisms to make sense of the conversations. Few studies have focused on the specific strategies and tactics learners employ towards this end.

According to Vuori & Okkonen (2012), the traditional information refinement process has several phases: information is produced, edited/refined, and then entered into a system for use. With the introduction of the collaborative setting of social media, this information refinement process became less clear or regular – it moved from binary machine logic to fuzzy human logic. Vuori & Okkonen (2012) found that social media applications allow participants to combine and debate insights, forming a more multifaceted understanding of issues in a more informal manner compared to retrieval of extant information from business information systems. Instead of the linear process followed in traditional information refinement, social media applications enable a process that “can be described as multiple swirls symbolising continuous and simultaneous produsage and interplay” (Vuori & Okkonen, 2012, p. 119). In the social media sensemaking process, the value is no longer just in the destination (producing polished and refined information), but in the journey. The journey, or refining process, is about experience and learning.

Kop (2011) suggested an online learning process that involved four major activities: aggregation, relation, creation, and sharing. Sensemaking happens in the relation step, after aggregation, where the learner gains access to information. Relation involves reflecting on the content and relating it to what he or she already knows or to earlier experiences. This sensemaking is followed by creation where learners create something of their own related to the content. Finally, in the sharing step the learners share their work with others on the network. According to Kop (2011), this participation in activities is vital to learning. Crucial to this study is the question of whether all of these activities – aggregation, relation, creation, and sharing – which are essential for

learning, can realistically take place in synchronous microblogging chats of 140 characters or less.

Curiosity is another strong motivator of learning. Arnone, Small, Chauncey & McKenna (2011) examined curiosity, interest, and engagement in the context of new media technology-pervasive learning environments. They found that technology can both help individuals to follow their curiosity and hinder them from doing so.

Technology can help individuals to make sense of what they find and stimulate deep and meaningful learning. Individuals with a high perception of competence around their information seeking skills and their ability to use technology can sustain their interest and the desire to explore until their curiosity is satisfied and sensemaking is achieved. Kop (2011) found that if confidence levels are low, it is not likely that a person will take up online learning as the technology alone presents a barrier.

Little research has yet been completed to identify whether the participants in online synchronous microblogging chats demonstrate the information seeking skills and technological competence necessary to follow their curiosity and make sense of what they find.

Conclusions

This review of the literature has raised more questions than it has answered related to time-limited, synchronous microblogging for learning purposes. Ample opportunity exists for further research.

As synchronous online discussion is still an emerging experience, further research offers an opportunity to explore this area more deeply. Research is needed around the strategies employed by participants to make sense of, and learn from, highly intense conversational volumes inherent in a time-limited, synchronous microblogging chat. Further studies may help make this type of experience more effective. While some strategies and mechanisms can be extrapolated from studies focused on use of synchronous learning in more formal academic environments and massive open online courses, differences may exist for self-directed learners focused on their own professional development in an informal environment. The question of whether it is possible to construct knowledge socially in 140 characters needs to be answered.

This literature review also explored the concept of social aggregation in an online, synchronous chat and concluded that other concepts such as *generative learning communities* (Lewis, Pea, & Rosen, 2010), *affinity spaces* (Gee, 2005) and *groups, networks, and sets* (Dron & Anderson, 2014) may have more explanatory value than *community of practice* (Wenger, 1998) or *personal learning network* (Tobin, 1998) concepts which have previously been used to describe Twitter chats (Lalonde, 2011; Power, 2013; Megele, 2014).

If learning involves activities of aggregation, relation, creation, and sharing, and if sensemaking takes place in the relation activity (Kop, 2011), sensemaking strategies are key to creation and sharing of learning. Further research is needed to examine how much knowledge is socially created through synchronous microblogging chats, compared to the amount of information that is aggregated, related to, and shared. Measuring new content

created in or by a Twitter chat may provide a means of determining how much learning takes place in this type of chat. Synchronous microblogging chats may support the co-creation of meaning and go beyond just circulating ‘commodities’ (Lewis, Pea, & Rosen, 2010) of learning such as links and embedded media. Certain Twitter chats may have more substance and value than critics perceive (Pender, 2011). The sustained participation in the *#lrnchat* synchronous chat since June 2009 is an indicator that there may be more to this particular type of chat than shallow social conversation. The purpose of this study is to identify the transferable elements of this chat that can help ensure similar initiatives, on both public and private internal corporate microblogging sites, are successful in turning conversations and connections into learning experiences. The ability to identify patterns in massive amounts of information – to “sensemake” – is a key literacy of learning today. Further research is needed to identify how participants in time-limited, intensive, synchronous chats make sense of hundreds or even thousands of tweets with embedded rich content.

Overall, the lack of research around the use of synchronous microblogging for informal learning provides the opportunity for further exploration in this area. Knowing how to structure a synchronous microblog operationally in a way that contributes to a successful learning experience and how to cope with the overwhelming volume of the discussion will open up this type of informal learning to more learners. Exploring which social aggregation concept most readily describes this learning experience will provide researchers with a more precise and explanatory vocabulary as they engage in further research. Finally, opportunity also exists to identify whether this type of informal learning results in the social creation of knowledge or, as critics may suggest, is merely a

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means of shallow and meaningless online social interaction making no lasting contribution to human understanding.

Chapter III – RESEARCH DESIGN

This section discusses the theoretical approach of this study, the justification for, and benefits of, this approach, and the impact of the theoretical approach on the methodology of the study. This section also outlines the research study design including the research paradigm employed, the purpose of the study, the role of the researcher, the characteristics of the participants, and data collection procedures.

This study took a pragmatic, mixed methods research approach combining basic quantitative analysis techniques with a more qualitative approach to data analysis that involved coding and analyzing Twitter chat transcripts as well as transcripts of interviews with a theoretical sample of Twitter chat participants. According to Morgan (2007), a significant shift occurred between 1980 and 2000 that saw qualitative research move from its marginal position from 1960 to 1980 to a position of relative equality with quantitative research. The increased focus on qualitative research was tied to a paradigm shift from positivism to constructivism, or what Morgan called the “metaphysical paradigm”. In his 2007 article, Morgan argued that the metaphysical paradigm was exhausted and should be replaced by the “pragmatic approach” which combines qualitative and quantitative methods at the level of data collection and analysis, focusing on producing socially useful research rather than debating epistemological and ontological viewpoints.

The pragmatic approach (Mead, 1934; Dewey, 1925) has several benefits to researchers. First, pragmatism “sidesteps the contentious issues of truth and reality, and accepts, philosophically, that there are singular and multiple realities that are open to

empirical inquiry” (Feizer, 2010, p. 8). By following a pragmatic approach, the researcher does not have to choose between post-positivism and constructivism and be constrained to use the research methods associated with the chosen theoretical approach. Morgan (2007) described the pragmatic approach as one of *abductive reasoning* which moves back and forth between inductive and deductive approaches when working with data. Rather than dismissing the other approach, the goal is to search for useful points of connection (Morgan, 2007).

A second benefit of the pragmatic approach is one of utility. The overriding aim of the pragmatic approach is utility – a focus on the ‘what’ and the ‘how’ of the research problem (Mackenzie & Knipe, 2006). According to Feilzer (2010), “the notion of utility calls for reflexive research practice. The questions that need to be considered by researchers are “what it is for” and “who it is for” and “how do the researchers’ values influence the research?” ” (p. 8). In the pragmatic approach, the focus is on producing practical, socially useful knowledge. Quantitative results, while generalizable, are often too generic to be very meaningful. Likewise, qualitative results are often too specific to a given context or situation to be transferable to other situations. Morgan (2007) suggested that the pragmatic approach offers transferability – the ability to assess whether what is learned in one setting can be applied in another similar circumstance. Morgan indicated that “I do not believe it is possible for research results to be either so unique that they have no implications whatsoever for other actors in other settings or so generalized that they apply in every possible historical and cultural setting” (p. 72).

Finally, the pragmatic approach is well suited to exploratory research into new and constantly evolving topic areas, particularly those involving human interaction with technology, like the current study. Technology and human response to it change rapidly and a pragmatic research approach offers the flexibility to respond quickly to those changes, modifying and enhancing study methods and incorporating new data gathering techniques so that the results of the study are not outdated before the study is completed. According to Reeves (1996), the eclectic-mixed methods-pragmatic paradigm was one of the most useful approaches for handling the complexity inherent in technology and contemporary society.

In practice, following a pragmatic approach to research results in a potential convergence of quantitative and qualitative methods. The research methodology is not prescribed. A wide range of techniques, both quantitative and qualitative, can be incorporated in an approach that can be as complex and flexible as necessary to address the research topic. Research tools such as interviews, surveys, focus groups, observations, testing, and experiments are available to be used as appropriate. The research question becomes central and the data collection and analysis methods are chosen not because they align to a particular epistemological approach, but because they provide the most insight into the question at hand (Mackenzie & Knipe, 2006).

A pragmatic approach does not require a particular mix of methods, nor that methods are mixed at all (Feizer, 2010). The mixed-methods approach can be used with any research paradigm (Mackenzie & Knipe, 2006). Johnson, Onwuegbuzie, and Turner (2007) argued that mixed methods research is one of the three major “research

paradigms” (quantitative, qualitative, and mixed methods). They defined mixed methods in this way:

The type of research in which a researcher or team of researchers combines elements of qualitative and quantitative research approaches (e.g., use of qualitative and quantitative viewpoints, data collection, analysis, inference techniques) for the broad purposes of breadth and depth of understanding and corroboration.

The advantage of mixing methods, particularly when dealing with complex phenomena, is that multiple methods can help to ‘triangulate’ or ‘bracket’ the information and make it understandable (Reeves, 1996).

Two key characteristics of the pragmatic research approach are flexibility and tolerance for uncertainty. Pragmatism acknowledges that knowledge resulting from research is relative and not absolute, but this perspective differs from the relativism of the constructivist approach:

This commitment to uncertainty is different from philosophical skepticism saying that we cannot know anything but an appreciation that relationships, structures, and events that follow stable patterns are open to shifts and changes dependent on precarious and unpredictable occurrences and events. The acknowledgement of the unpredictable human element forces pragmatic researchers to be flexible and open to the emergence of unexpected data. (Feizer, 2010, p. 14).

However, like the constructivist approach, pragmatic research does acknowledge the importance of the researcher's worldview. Morgan (2007) suggested that the pragmatic approach adopts the metaphysical paradigms acknowledgement that researchers' worldviews influence the research they do. Researchers make choices about what is important and appropriate. Our values and our politics are inherent in how we act (Morgan, 2007). Pragmatists also acknowledge the weakness of their tools and the tentative nature of their findings (Reeves, 1996).

This study followed a pragmatic approach, selecting methods based on the needs of the research question. I acknowledge that my world view as a corporate learning and development professional had an impact on the interpretation of the results. The study focused on producing findings that have utility in the learning and development world outside of this academic study. In the next section, the context of the study is discussed in more detail.

Context of the Study

This study focused on *#lrnchat* synchronous microblog conversations. The first *#lrnchat* Twitter chat took place on April 10, 2009, started by a group of learning professionals (Conner, 2012). The group chose to use Twitter, rather than a dedicated chat or instant messaging (IM) tool because they found the short and fast paced posts refreshing – they wanted to try to say more with less (Conner, 2012). These chats were held on Twitter every Thursday night from 8:30 pm to 10 pm EST (Conner, 2012). Transcripts of *#lrnchat* discussions are archived from June 12, 2009 to present on the *#lrnchat* Blog site (*#lrnchat*, 2009-2012). One of the organizers, Conner (2012),

indicated that *#lrnchat* is for “people interested in the topic of learning from one another and who want to discuss how to help other people learn in formal, informal, social, and mobile ways” (n.p.). The study research methods of the study are detailed below.

Research Methods

As is appropriate for a pragmatic study, I acknowledge that I was a participant in this study rather than an “all knowing analyst” (Creswell, 2007). I am an education professional who has ‘lurked’ on *#lrnchat*, but has never tweeted as a part of the synchronous chat. I have retweeted *#lrnchat* tweets, but have not done so with the tweets that are part of the study data. I have used Twitter actively for my own professional development since January 2012 although I have been an official member of Twitter much longer with minimal active participation. I did not moderate the chats included in this study. They were moderated by a small group of volunteers who established the timing, duration, and structure of the chats including the topics and the questions asked of the participants independent of the control of this study.

This study involved three phases: Phase One involved the collection of Twitter handles for *#lrnchat* participants and basic quantitative analysis of *#lrnchat* participants’ chat involvement using descriptive statistics methods. The purpose of Phase One research was to gain a basic understanding of the mechanical nature of the synchronous microblogging experience rather than to complete an in-depth social network analysis. Phase Two involved coding and analysis of *#lrnchat* transcripts and Phase Three involved interviews with a theoretical sample of active *#lrnchat* participants and subsequent coding and analysis of the interview transcripts. The interview questions

were designed to elicit meaningful statements related to the process of using Twitter for professional development. As the study of the use of Twitter for synchronous microblogging chats was ‘uncharted territory’, having the freedom to let meaning emerge from these new experiences was more helpful than testing theories or hypotheses.

Phase One. Phase One of the study began by analyzing five (5) weekly archived *#lrnchat* microblog chats drawn from a full-text archive of chats held from June, 2009 to December, 2012 (*#lrnchat*, 2009-2012) using basic descriptive statistics. The purpose of this exploratory analysis was to quantify some of the mechanical aspects of the chat, to provide more insight into the nature of this learning experience and help define it. Specifically, Phase One of the study focused on the chats that took place between September 27, 2012 and November 29, 2012. The sample included 3,195 separate tweets with a maximum length of 140 characters each. The topics of the chats, as established independently of this study by the chat moderators, included:

- *Documenting Learning* (September 27, 2012 – 819 tweets)
- *Motivation and Engagement* (October 4, 2012 – 485 tweets)
- *Crisis Learning* (November 1, 2012 – 709 tweets)
- *MOOCs* (November 15, 2012 – 514 tweets)
- *Learning Gifts* (November 29, 2012 – 668 tweets).

The analysis began with listing all *#lrnchat* participants in a spreadsheet by Twitter handle. A participant was defined as any Twitter handle that tweeted, retweeted, or was mentioned or retweeted using the *#lrnchat* hashtag during the 60 – 90 minute *#lrnchat* synchronous microblog chat. Specific actions were captured and counted

including the number of times each participant tweeted, retweeted, or ‘mentioned’ another Twitter handle, as well as every time each participant was retweeted or mentioned by another. The goal was to establish a base level understanding of the nature of the interactions within a chat, rather than to complete a full-blown social network analysis. The study captured how many times participants included links in their tweets or retweets as well as any hashtags (other than #lrnchat) that were including in the tweets. As the #lrnchat synchronous microblogging discussions have predetermined topics and questions identified by a small group of organizers, participant engagement was also tracked at the question level.

The #lrnchat hashtag was used on a regular basis outside of the synchronous chat. Any Twitter user could tweet or retweet using a Twitter hashtag like #lrnchat. During the course of the synchronous chats, other Twitter users occasionally tweeted or retweeted an unrelated post, not knowing that a group was using the #lrnchat hashtag for a synchronous chat on a specific topic. On occasion, Twitter users who knew the chat is taking place would also ‘spam’ the chat, posting often completely unrelated promotional tweets or retweets to gain the attention of the chat group. For the purposes of this study, in Phase One I quantified the number of un-related (non-chat) tweets and retweets to provide an indication of the level of distraction that these tweets and retweets caused as participants tried to make sense of the chat discussion. In later qualitative phases of analysis in this study, I excluded the non-chat participants and their tweets and retweets from the transcript.

Basic quantitative analysis was applied to the data collected related to the chats, identifying mean and median results for various actions. Doing so provided further insight into the nature and patterns of the synchronous microblogging experience. This analysis also helped me to identify the most active *#lrnchat* participants to approach for Phase Three interviews. When Phase One analysis was complete, I moved on to Phase Two, as explained below.

Phase Two. Phase Two of the study began by analyzing and coding five (5) weekly archived *#lrnchat* microblog chats drawn from a full-text archive of chats held from June, 2009 to December, 2012 (*#lrnchat*, 2009-2012). Specifically, this phase of the study focused on the chats that took place between December 13, 2012 and January 17, 2013. The chat topics for each week were:

- *Gifts* – December 13, 2012
- *Resolutions* – December 20, 2012
- *#lrnchat on #lrnchat* – January 3, 2013
- *Visuals* – January 10, 2013
- *Corporate and Academic Learning* – January 17, 2013

I coded the tweets using terms that emerged from the transcripts. Once I had completed an initial coding pass, I then clustered the emergent terms into two topic areas:

- Social aggregation: formality, focus, relationships, resources, structure
- Sensemaking: success strategies, coping mechanisms

Upon the completion of the Phase Two qualitative analysis, I began the final phase of this study, as outlined below.

Phase Three. As data emerged from the coding, the study followed on with Phase Three interviews with some *#lrnchat* participants, based on a theoretical sample (Glaser & Strauss, 1967), to deepen the understanding of their sense of group membership and sensemaking success strategies and coping mechanisms related to the *#lrnchat* synchronous microblog experience. Interview questions for the interviews (see Appendix B) were refined based on the results of the coding of the *#lrnchat* transcripts in Phase Two. Interview text was captured and transcribed and subjected to a similar coding process.

The sampling approach, instruments used, and analysis approach are outlined in the remainder of this section.

Sample

I selected a theoretical sample of participants as the best representatives to help me gain a deeper understanding of the synchronous chat experience. As my objective was to explore authentic, real life experiences and meanings associated with the problem or process, not to control or modify the experience or experiment on the participants, a control group was not required (Creswell, 2007).

I followed the secondary use of data provisions outlined in the Tri-Council Policy Statement, 2nd edition (December 2010). It was impractical to seek consent from the large number of individuals who participated in the *#lrnchat* discussion. Many of these

individuals used Twitter handles that did not reveal their true identities. To protect the identity of the participants in this research report, I substituted a participant number for each of the subjects' Twitter handles. Use of the information without the participants' consent carries no, or very minimal, risk to adversely affect the welfare of the individuals to whom the information relates. (See Ethical Approval, Appendix A.)

For Phase Two, the sample included all Twitter users who tweeted at least once using the hashtag *#lrnchat* during the timeframe in which the five (5) chats took place between December 13, 2012 and January 17, 2013. As it was not possible to identify the *silent majority* (Mustafaraj, Finn, Whitlock, & Metaxes, 2011) of 'lurkers' who may have participated through reading tweets rather than generating content by tweeting themselves, the participants were drawn only from those who had tweeted or retweeted. Particular interest was paid to first-time participants as well as those participants who tweeted indicating they normally lurked.

The participants in Phase Three of this study were drawn from a theoretical sample (Glaser & Strauss, 1967) of active *#lrnchat* participants. Through Phase One quantitative analysis, I identified the top 10 most active *#lrnchat* participants each week. As the top 10 participants varied week to week, I compiled a list of the top 31 participants who had ranked in the top 10 at least one week of the Phase One study. (See Table 3.) These participants formed the sample of participants I wanted to include in Phase Three of the study. My goal was to gain permission to interview at least five (5) of these active participants. As I did not have the contact information for these participants to invite them to be interviewed as a part of Phase Three of this study, I attempted contact through

Twitter direct message functionality. When using Twitter, to be able to send a direct message to another Twitter handle, a user must first follow the other handle and the other handle must follow the user back. Using a Twitter handle that exposed my real name and professional identity, I contacted the top 31 participants by sending them “follow” requests. Seven participants followed me back. I then sent these seven participants private direct messages on Twitter to discuss the possibility of an interview. The message sent to the participants, conforming to the 140 character limit required by Twitter, was: “I am writing my MEd thesis on the use of Twitter for professional development. Could I interview you about your *#lrnchat* participation?”. Six of the seven participants accepted the interview request. One never responded. I then sent these participants the formal invitation to participate in a research study. (See Appendix C). After I received their signed consent forms, I attempted to arrange interview times. Two of the participants were Canadian, two were American, and two Australian. I set up and completed three live interviews via Skype which I recorded and transcribed. As three of the participants were busy with travel or lived in time zones that were difficult to coordinate with my own, I offered these three participants the opportunity to complete written short answer responses to the interview questions in lieu of completing a live interview. These participants did complete the questions and provided me with written responses which they emailed to me. I coded the interview and written response text focusing on comments related to the topics of social aggregation (formality, focus, relationships, resources, and structure) and sensemaking (success strategies and coping mechanisms) which had emerged in Phase Two coding. Motivation and the social

construction of knowledge emerged as additional codes. The instruments used for Phases Two and Three of this study are discussed next.

Instruments and Analysis

The instruments employed in this study included basic descriptive statistics, qualitative coding of online chat transcripts and qualitative coding of interview transcripts and written responses to questions.

The analysis or coding process used for Phases Two and Three involved three steps drawn from the grounded theory coding approach: open coding (identifying general categories), axial coding (interconnecting the categories), and selective coding (identifying a central phenomenon and a coding story or paradigm) (Creswell, 2007). As this was a very exploratory study, I employed this grounded theory method for coding and qualitative interpretation, but not as a research paradigm. I did not focus on developing a substantive theory. The three coding methods are described in more detail below.

Open coding. The open coding process began in Phase Two with the extant chat transcripts and continued in Phase Three with the interview transcripts. While open coding, I reviewed the transcribed text and written interview responses and identified general categories (Creswell, 2007). The codes that emerged in Phase Two were formality, focus, relationships, resources, structure, success strategies, and coping mechanisms. In Phase Three I added additional codes: motivation and social construction of knowledge.

Axial coding. The next step in the grounded theory coding method, axial coding, involves interconnecting the categories that emerged in the open coding step (Creswell, 2007). I clustered the categories of formality, focus, relationships, resources, and structure under the label of “social aggregation”. I clustered success strategies and coping mechanisms under “sensemaking”. Motivation and social construction of knowledge were left as their own categories.

Selective coding. The final step in the grounded theory coding approach used the axial coding results to develop propositions that inter-related the categories in the model. Such a theory can be a narrative statement, a visual picture, or a series of hypotheses. The selective coding “story” connected the categories together into a coding paradigm. (Creswell, 2007, p. 161). In this study, the elements of group membership were recorded in a table and contrasted with the social aggregation concepts put forward by various theorists (Wenger, 1998; Dron & Anderson, 2014; Gee, 2005; Lewis, Pea, & Rosen, 2010; Tobin, 1998) in order to identify the most explanatory concept. (See Table 1.) The results related to motivation and to sensemaking (success strategies and coping mechanisms) were triangulated across the Phase Two and Three studies.

Interviews. The Phase Three interviews in this study asked participants to describe the *#lrnchat* group in terms of membership. I was interested in how they experienced the chat as a process. I listened for a mention of attributes like formality, focus, relationships, resources, and structure that had emerged in Phase Two analysis. The questions also explored the participants’ motivation for participating in the synchronous microblogging experience as well as the success strategies and coping

mechanisms they employed to make sense of the chat messages. Finally, their ability to construct knowledge socially through the chat experience was explored. Information was recorded using interview protocol. See Appendix B for a list of interview questions. The researching findings are discussed in detail in the next three chapters.

Chapter IV – PHASE ONE RESEARCH FINDINGS

The study was conducted in three Phases. The Phase One research findings are discussed in this chapter, while Phases Two and Three are discussed in subsequent chapters.

Phase One was a quantitative analysis of five weeks of a successful Twitter chat, *#lrnchat*, focusing on the mechanical aspects of the chat. The study analyzed 3,189 tweets and retweets issued by 275 unique participants. The study captured or created 9,570 data points, identifying the number of tweets, retweets, and mentions issued by each participant as well as which of these messages were non-chat related. The purpose of this quantitative analysis was to develop a base level understanding of the mechanics of a Twitter chat in order to inform the exploration of the nature of this social aggregation experience.

This Phase of the study gathered information about the number of participants who engaged in the synchronous microblogging chats during the study period, as well as the impact that chat duration had on participant numbers. The pattern of engagement of the top participants, as well as a subset of volunteer ‘moderators’ was examined. How all participants engaged in tweeting and retweeting as well as ‘mentioning’ was quantified. The study also examined how frequently additional information – web links and hashtags – were included in the chat messages. Finally, the study identified the participants’ patterns of responses to the six to eight questions that formed the basis of each synchronous microblog chat. These questions were created and posed by the moderators

of the chat without my involvement. Research findings for each of these areas of exploration are provided below.

Participants

Over the course of the four 90 minute chats (*Sep27DocumentingLearning*, *Oct4MotivationEngagement*, *Nov1CrisisLearning*, and *Nov15MOOCs*) and one 60 minute chat (*Nov29LearningGifts*), a total of 275 unique participants and 293 non-unique (persons who participated in more than one session) participants engaged with the *#lrnchat* hashtag as part of a synchronous microblog on Twitter.

For the purposes of this study, the Twitter handles of all participants with the exception of *@lrnchat* were changed in order to protect the privacy of the participants. In Phases One and Two, I changed the handles to their unique participant number in this study, preceded by the *@* symbol. A normal Twitter handle is composed of a unique set of alphanumeric characters chosen by the participant, preceded by the *@* symbol. For example, my Twitter handle is *@lamiruddin*. Thus, study participants are identified as a participant number preceded by the *@* symbol, for example *@203*. In Phase Three, the six interview and written answer respondents were provided with new fictional Twitter handles from *@InterviewA* through *@InterviewF* to protect their privacy completely.

The number of non-unique participants per week ranged from a low of 41 on October 4, 2012 to a high of 89 on September 27, 2012. (See Table 2.) The organizers decided during the fifth week to experiment with a shorter chat timeframe, moving to a 60 minute format from the regular 90 minute format. I had no control over the change in duration as the chats had taken place before this study began. Surprisingly, the 60 minute

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chat on November 29, 2012 had more unique participants (50) than two of the 90 minute chats. Only 41 participants engaged on both October 4, 2012 and November 15, 2012. While the 60 minute chat did attract somewhat fewer participants than the numbers engaged by all five chats ($mean = 58.6$, $mode = 41$, $median = 54.3$), the duration of the chat appears to have had a minimal impact on the volume of participants.

Table 2

Number of Chat Participants and Chat Duration

Chats	# Participants	Chat Duration (mins)
Sep27 Documenting Learning	89	90
Oct4 Motivation/ Engagement	41	90
Nov1 Crisis Learning	72	90
Nov15 MOOCs	41	90
Nov29 Learning Gifts	50	60
Mean	58.60	
Mode	41.00	
Median	54.30	
Total	293	

The chats were hosted by one or more of a group of seven “moderator” participants who voluntarily took responsibility for identifying weekly themes and questions. They also promoted the chat to their own Twitter followers. The seven moderators were @67, @275, @147, @203, @349, @178 and @60. Of these moderators, five ranked in the top 10 list of participants at least once over the course of the five chat sessions based on their total number of tweets and retweets (actions). (See Table 3.) Three of the participants (@275, @203, and @147) made the top 10 list three to four times and ranked in the overall top 10 list of participants for the five weeks. In

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all, 31 of the 275 unique participants (11%) composed the top 10 list of most active participants during the five chats. This core group of 31 repeat participants sustained the chat from week to week.

Table 3

Ranking of Top 10 Participants per Week and Top Overall Participants

Subject#	27Sep		4Oct		1Nov		15Nov		29Nov		Overall		Moderator
	Rank	Act	Rank	Act	Rank	Act	Rank	Act	Rank	Act	Rank	Act	
@364	1	96			1	85			3	45	1	226	
@275			1	41	8	25	1	54	1	54	2	174	Yes
@203	9	27					3	42	2	51	3	120	Yes
@58	6	32					4	33	4	40	4	105	
@147					2	50	9	25	9	24	5	99	Yes
@92	10	27	6	24					6	35	6	86	
@10	7	32	9	23			8	26			7	81	
@14					5	31	2	48			8	79	
@88	4	36			4	39					9	75	
@280	3	44	7	24							10	68	
@128	8	29	4	26							11	55	
@96	2	54									12	54	
@2					3	40					13	40	
@293									5	39	14	39	
@197							5	33			15	33	
@306			2	33							16	33	
@308	5	33									17	33	
@162									7	32	18	32	
@365									8	32	19	32	
@134							6	31			20	31	
@135					6	29					21	29	
@326							7	28			22	28	
@351			3	28							23	28	
@60					7	26					24	26	Yes
@97			5	25							25	25	
@95							10	24			26	24	
@112			8	24							27	24	
@178									10	24	28	24	Yes
@261					9	24					29	24	
@305			10	23							30	23	

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@295			10	20			31	20
TOTAL	41	27	36	34	37			1,770
	0	1	7	4	6			

They issued 1,770 (56%) of the 3,189 tweets and retweets shared during the chats. The remaining 244 unique participants engaged in 20 or fewer actions in total over the five weeks. Identifying and gaining commitment, both to lead and to participate, from a core group of moderators and regular participants may be an essential element for success of weekly chats.

Tweets and Retweets

During the five weeks of Twitter chats that form the basis of this study, the participants issued 2,048 tweets and 1,111 retweets for a total of 3,159 chat-related actions as Table 4 illustrates. The participants also issued another 30 “non-chat-related” tweets and retweets for a total of 3,189 tweets and retweets including postings that were not part of the official chat.

An example of a tweet is “08:53:57 pm @203: Q2) I write reflections on my blog it documents and enhances my learning at the same time. #lrnchat”

(Sep27DocumentingLearning). A tweet is a statement or message that is composed in 140 characters or less that is viewable in the Twitter stream of the followers of the Twitter handle that issued the tweet. In Twitter chats like #lrnchat tweets form the questions and the answers to questions. Tweets (as compared to retweets) are indicators of new content being contributed to the chats.

An example of a retweet is “09:53:29 pm @351: RT @92 a8) Supportive trainers, comfortably paced learning, & having clear objectives [reduce anxiety about

learning]. #lrnchat” (Oct4MotivationEngagement). Participants retweeted a tweet by clicking the retweet button in their Twitter application or by manually copying the tweet and adding RT to the beginning of the tweet to indicate that they were resending someone else’s tweet. In this example, @351 has retweeted a tweet originally composed by @92. Doing so sent @92’s tweet to @351’s followers – the vast majority of whom are not formal participants in the synchronous chat, thus expanding the potential conversation and insights beyond the active participants. @92 also received a notification that his or her tweet had been retweeted. The volume of retweets may indicate engagement as it indicates approval and/or that the re-tweeter acknowledges the value of the tweet and wishes to disseminate it to a larger audience. While a slightly more passive action than tweeting, retweeting does engage the participant in the conversation. The participant might add a few words (as permitted by the 140 character limit) to a tweet before retweeting or retweet it “as is” to show support or approval of the comment made in the tweet. This retweeting to an exponential number of others following the participants represents another level of dissemination and “conversation” that emerges from, but may not be further connected to those following the hashtag.

Table 4

Participant Tweets and Retweets

Chats	# Tweets	Tweets / Min	% Tweets	# Tweets / Participant	# RTs	RTs / Min	% RTs	#RTs / Participant	Total #Actions
Sep27 Documenting Learning	472	7.87	58.49%	5.30	335	3.72	41.51%	3.76	807
Oct4 Motivation/Engagement	348	3.87	72.35%	8.49	133	1.48	27.65%	3.24	481
Nov1 Crisis Learning	402	4.47	57.35%	5.58	299	3.32	42.65%	4.15	701

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Nov15 MOOCs	386	4.29	75.83%	9.41	123	1.37	24.17%	3.00	509
Nov29 Learning Gifts	440	7.33	66.57%	8.80	221	3.68	33.43%	4.42	661
Mean	409.60	5.56	66.12%	7.52	222.20	2.71	33.88%	3.72	631.80
Median	405.80	5.02	66.34%	8.00	221.60	3.02	33.66%	3.74	646.40
Total	2,048			37.59	1,111			18.58	3,159

The number of tweets per Twitter chat ranged from a low of 348 (*Oct4MotivationEngagement*) to a high of 472 (*Sep27DocumentingLearning*). The 60 minute session generated more tweets (440) than the mean (409.6) and median (405.80) for all five chats. The number of retweets for the 60 minute chat (221) were close to the mean (222.2) and median (221.6) of all five chats and well above the low of 123 retweets during the November 15, 2012 chat. The shortened format did not drastically reduce the volume of actions within the 60 minute session in the fifth week (*Nov29LearningGifts*) resulting in 661 total actions, 5.8% higher than the volume of actions over the first four weeks (*mean = 624.5, median = 605*).

When the number of tweets and retweets per minute is examined, it becomes clear that that shortened length of time was associated with the intensity of tweets and retweets. The same number of questions generated a similar number of answers even when posed within a shorter timeframe. Specifically, the 60 minute chat averaged 7.33 tweets per minute compared to 5.56 (mean) and 5.02 (median) tweets per minute for all five chats. Likewise, the shorter chat generated 3.68 retweets per minute as compared to the mean (2.71) and median (3.02) retweets per minute for all five chats.

Over the course of the five weeks of chats, tweets outnumbered retweets two to one, with tweets making up an average of 66.12% of the actions (*median* = 66.34%) and retweets the remaining 33.88% (*median* = 33.66%). This held true even for the 60 minute chat on November 29, 2012, with 66.57% tweets and 33.43% retweets. While tweets were essential to the chat, forming the initial answers to the questions, not every tweet drew a retweet. Retweets were used to respond to a tweet or to engage in and extend the questions into conversations. The volume of retweets might be an indicator of the level of engagement of the participants in back and forth discussions with each other. 43 (15.41%) of the 275 unique participants never engaged in retweets, preferring to answer the questions or make statements only using tweets. (See Table 5.) 71 (25.82%) of participants engaged only in retweets, sharing other participants' comments or adding their own additional comments to statements made by others. The highest number of chat participants (93 or 33.82%) engaged in both tweets and retweets.

Table 5

Types of Interactions

Type of Interaction	# of Participants	%
Tweets only	43	15.64%
Retweets only	71	25.82%
Tweets and retweets	93	33.82%
Not-chat	21	7.64%
Was Mentioned (WM), Was Retweeted (RWT) only	47	17.09%
	275	100.00%

Retweets sometimes lagged the pace of the conversation. Participants who were slower at reading the chat stream, or those who were not part of the chat but followed someone who was part of the chat, sometimes retweeted a posting well after the other participants had moved on to the next question. The tweets most effective in this manner were often written so that they made sense out of context - they were complete and not merely a conversational fragment.

The number of tweets per participant per chat resulted in a mean score of 7.52 (*median* = 8). The lowest numbers of tweets per participant were found in the chats with the highest numbers of participants and highest number of tweets. The September 27, 2012 chat, which had the highest number of participants (89) and the highest number of tweets (472) averaged the lowest number of tweets per participant at 5.3, implying that the higher number of participants may have inhibited some participants from engaging fully. Or perhaps, as in a face-to-face gathering, the larger the number the less pressure to add comments as other participants make a similar comment and no further elaboration is required.

Some of the participants were not participants at all. 68 participants (24%) were not directly involved in the chat. Of these participants, 21 (7.64%) engaged in intentionally spamming the chat with promotional tweets and retweets unrelated to the content. The other 47 participants (17.09%) were either mentioned (WM) or retweeted (WRT) by chat participants even though they were not actively involved in the chat, or were using the #lrnchat hashtag for legitimate and meaningful tweets or retweets not

realizing that a synchronous chat was underway using that hashtag. (See Table 5.) More results related to the ‘mention’ function are found in the next section.

Mentions

When a participant issued a tweet and included another participant’s handle, the participant issuing the tweet was considered to have made a ‘mention’. The participant whose handle was included in the tweet was considered to have been ‘mentioned’. This study tabulated how many times participants made mentions (*#Mentions*). An example of a mention is “09:47:23 pm @261: @151 any stats you know of that show accuracy of social media vs news media? #lrnchat” (*Nov1CrisisLearning*). In this example, @261 made a mention of @151, directing the question to this particular participant. If a participant mentioned multiple handles in one tweet, this was still counted as one mention for purposes of this study.

Participants made a total of 755 mentions during the five chats, ranging from a high of 239 (*Nov14MOOCs*) to a low of 89 during the 60 minute chat (*Nov19LearningGifts*) with a mean score of 151 and a median of 136.5 mentions. (See Table 6.) Mentioning another participant was a way of recognizing another’s contributions to the conversation and inviting further dialogue. The shorter timeframe of the 60 minute chat may have had a slight impact on the amount of back and forth engagement that was possible with only 1.48 mentions per minute during the 60 minute chat compared to a mean of 1.85 mentions per minute in the 90 minute chats. Each participant made approximately 2.83 (*median = 2.43*) mentions per chat, with a high of

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5.83 during the November 15, 2012 chat (*Nov15MOOCs*) and a low of 1.69 during the November 1, 2012 (*Nov1CrisisLearning*) chat.

Table 6

Mentions Given and Received

Chats	#Mentions	#Mentions per Participant	#Was Mentioned	#Was Mentioned per Participant
Sep27Documenting Learning	196	2.20	239	2.69
Oct4MotivationEngagement	109	2.66	137	3.34
Nov1CrisisLearning	122	1.69	158	2.19
Nov15MOOCs	239	5.83	289	7.05
Nov29LearningGifts	89	1.78	111	2.22
Mean	151	2.83	186.80	3.50
Median	136.50	2.43	172.40	3.01
Total	755	14.16	934	17.49

The study also tracked how many times individual participants were mentioned by another participant (*#Was Mentioned*) – i.e. another participant included the “mentioned” participant’s handle in a tweet. For example, in the November 29th chat, @58 mentioned @275 in this tweet: “09:23:22 pm @58: @275 actually I’m good on challenges for the moment. I would like the time you offered though. How much will that cost me? #lrnchat”. This is different than a retweet as the participant who made the mention was not sharing something that the participant who was mentioned had already tweeted. This was a new tweet in which a particular participant’s handle was included to ensure the participant saw the tweet in the midst of the Twitter stream. Participants were mentioned by others a total of 934 times over the course of the five weeks of chats, with an average of 186.8 mentions received (*median = 172.4*) during each chat. Participants

were mentioned as many as 7.05 times during the session (*Nov12MOOCs*) with low participation (41 participants) and as few as 2.19 times during the November 1, 2012 chat (*Nov1CrisisLearning*). On average participants were mentioned 3.5 times (*median* = 3.01) per session. The frequency in which a participant is mentioned during a chat may be related to the individual's standing within the group or their level of group membership, with fewer mentions indicating a looser connection to the other chat participants and more mentions indicating closer ties. Further study in this area is warranted.

Sometimes the mentions were accidental. For example, less experienced participants sometimes used @lrnchat instead of #lrnchat, substituting the handle when they meant to use the hashtag. Participants needed to add the #lrnchat hashtag to tweets to tag them as part of the chat. By using @lrnchat instead, they were “mentioning” @lrnchat. @lrnchat received 46 mentions over the five chats, most of which served no purpose and should have been substituted with the #lrnchat hashtag. For example, “09:02:50 pm @47: @lrnchat A3) Motivation keeps it real and meaningful. #lrnchat” (*Oct4MotivationEngagement*).

When making a mention, the participants needed to type the handle of person they were mentioning accurately. In one chat, the participants accidentally typed part of a handle wrong, using LRN instead of LND as part of the participant's handle. As this participant was not on the chat that week, the other participants were trying to draw him in. Misspelling the handle resulted in the intended recipient not receiving a notification

of the mention. Unlike with email where a misaddressed message will “bounce back”, tweets were issued as-is with no notification when incorrect handles were used.

755 (23.6%) of the 3,195 messages in this phase of this study contained a ‘mention’. This is lower than the average number of mentions found in overall Twitter messaging participation. Hong, Convertino & Chi (2011) analyzed a sample of Twitter messages over a four-week period (April 18 – May 16, 2010) and found that 49% contained mentions. The lower frequency of mentions found in the *#lrnchat* sample may be the result of the participants engaging with others around a shared topic of interest rather than having a shared social relationship. They might not know the other participants well enough to mention them. Further study in this area would help to identify the reasons for the discrepancy in chat results compared to Twitter messaging at large.

Those non-chat participants (17.09%) who were mentioned or retweeted even though they were not involved in the chat were often previous *#lrnchat* participants who were not able to make the chat during the current week, experts whom the chat participants were recommending to other chat participants, or individuals the chat participants thought might be interested in the current chat topic. Mentioning individuals was a way to draw them into the synchronous chat. The individuals received a notification on Twitter that someone had mentioned them. If they received the notification while the chat was still going on, they might take a look and consider engaging. Another way to draw individuals into the chat is through the use of hashtags, as explored in the next section.

Hashtags and Links

Hashtags are words, with no spaces, preceded by the # symbol. They were used to label tweets with a particular topic. An example of the use of a hashtag was found in this tweet where *#sandy* is used to refer to Hurricane Sandy: “08:42:13 pm (@244: A1) I was amazed at the impact social media played in *#sandy* – public officials, emergency mgmt, – not all accurate but timely *#lrnchat*” (*Nov1CrisisLearning*). Using hashtags like *#sandy* helped to draw others into the chat if the hashtag was one that others might be searching or following at that moment. The use of hashtags may be a key contributor to the viral and exponential potential of microblogging, and skillful use of hashtags by moderators and/or participants can help to draw attention to a synchronous microblogging chat as it happens, increasing the number of participants very quickly.

That said, hashtags other than *#lrnchat*, which was the required hashtag for the chat, were used rather sparingly in the Twitter chats that were a part of this study. During the five weeks of chats, only 171 hashtags, excluding *#lrnchat*, were included in the chat messages. (See Table 7.) The hashtags ranged from a low of eight (*Oct4MotivationEngagement*) to a high of 59 (*Nov1CrisisLearning*) where the upcoming *#devlearn* conference was mentioned multiple times by 15 unique participants. The mean number of hashtags used per chat was 34.2 (*median = 36.1*). Use of the *#lrnchat* hashtag allowed for dissemination of the chat content to a large potential number of participants – anyone who chose to search for or follow the hashtag, during or after the chat. In the chats, hashtags were used sparingly with only 125 of the total 3,189 chat messages containing a hashtag, an average of 0.0391 hashtags used per tweet. This

is much lower than the average number of hashtags used per tweet in regular Twitter messaging. Hong, Convertino & Chi (2011) analyzed 65,556,331 tweets and found that 11% contained hashtags. Hashtags may not have been used frequently as it might have been hard to identify meaningful hashtags on the fly, given the pressures of keeping up with the fast pace of the chat stream. Further research in this area could clarify why participants do not use many hashtags during a chat.

Table 7

Links and Hashtags

Chats	#Links	#Links per Participant	#Hashtags	#Hashtags per Participant
Sep27Documenting Learning	31	.35	38	.43
Oct4MotivationEngagement	12	.29	8	.20
Nov1CrisisLearning	25	.35	59	.82
Nov15MOOCs	32	.78	10	.24
Nov29LearningGifts	25	.50	56	1.12
Mean	25	.45	34.2	.56
Mode	25	.35	-	-
Median	25	.40	36.1	.49
Total	125	2.27	171	2.81

Non-chat participants contributed 69 (40%) of the 171 number of hashtags even though they only contributed 7.64% of the tweets and retweets. For example, this not-chat (spam) tweet contains almost entirely hashtags: “08:34:08 pm @232: #bones #dwts #glee #gossipgirl #graysanatomy #idol #lrnchat #mlearning @220 #sharktank #survivor #teachers #theoffice #thevoice #xfactor” (Nov29LearningGifts). Such tweets likely functioned as a distraction for chat participants. This was examined in more detail in Phase Two of the study.

The participants shared a total of 125 links over the course of the five weeks of chats, or a mean of .45 links per participant in the same period. In a study conducted in 2010, Hong, Convertino & Chi (2011) found that 21% of Twitter messages included URLs. A 2014 study found that 10% to 15% of tweets include a link (Madrigal, 2014), perhaps indicating that the amount of links used in Twitter messages is declining. In the current study only 4% of the total tweets included links indicating that the nature of a Twitter chat, in particular the fast conversational pace, does not offer enough time to share or peruse many links. The focus, instead, is on asking and answering questions, as discussed next.

Questions

The *#lrnchat* Twitter chat was structured around a weekly topic and six to eight questions plus an introduction and wrap up activity. The three November sessions were formed around six questions, the September chat had seven questions, and the October session included eight questions. The topics and questions were identified in advance by the moderators, based on contributions submitted to them from participants. Each question was posed by *@lrnchat*, for example, “09:48:23 pm *@lrnchat*: Q8) *What reduces anxiety about learning? #lrnchat*” (*Oct4MotivationEngagement*). Each question was designated with a short code to indicate the question number. In this example “Q8” represented question eight. The convention was for participants to append a short code to indicate which question they were answering. In this example, “09:49:13 pm *@306*: A8) *Expectation management! I think expectations are the real source of anxiety. #lrnchat*”.

(Oct4MotivationEngagement) @306 added “A8” to the beginning of this tweet, indicating that it was a response to Q8.

The chats warmed up with Q0, an opportunity for participants to introduce themselves and indicate what they had learned during the past week. The introductory question in the *#lrnchat* Twitter chat remained the same during all five weeks:

“08:33:18 pm @lrnchat: Q0. We always begin with this: What did you learn today? If not today, then this week? #lrnchat” (Sep27DocumentingLearning). The participation in the Q0 introductory question was slightly lower, at a mean of 76, than the next few questions as some participants were late to join the chat and others may have preferred to wait to join in when the questions specifically related to the week’s topic began. (See Table 8.) Using the same opening question each week may have helped regular participants prepare their first response in advance.

Table 8

Number of Actions per Question per Week

Chats	Q0	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Qwrap
Sep27Documenting Learning	100	134	157	90	97	88	47	41	-	49
Oct4MotivationEngagement	52	91	82	53	51	22	35.00	26	37	29
Nov1CrisisLearning	100	111	93	137	96	63	-	62	-	36
Nov15MOOCs	47	69	98	68	81	56	55	-	-	32
Nov29LearningGifts	81	113	94	96	61	105	63	-	-	46
Mean	76.00	103.60	104.80	88.80	77.20	66.80	50	43	-	38.40
Mode	100.00	-	-	-	-	-	-	-	-	-
Median	78.50	107.30	96	89.40	79.10	64.90	50	42	-	37.20
Total	380	518	524	444	386	334	200	129	37	192

The level of active engagement or actions (tweets and retweets) over the series of questions that structured the Twitter chat had a slightly positive skew as can be seen in Figure 2. The mean scores for actions across the five chats were higher for Q1 and Q2 and declined through the remaining questions with the wrap up question receiving the fewest responses on average. Participants often checked out early. For example, this participant left during Q4: *“09:08:42 pm @268: sorry all, got to bail early. Great chatting with you all and can’t wait till next time! #lrnchat”* (*Oct4MotivationEngagement*). Other participants may have also dropped off early without signing off.

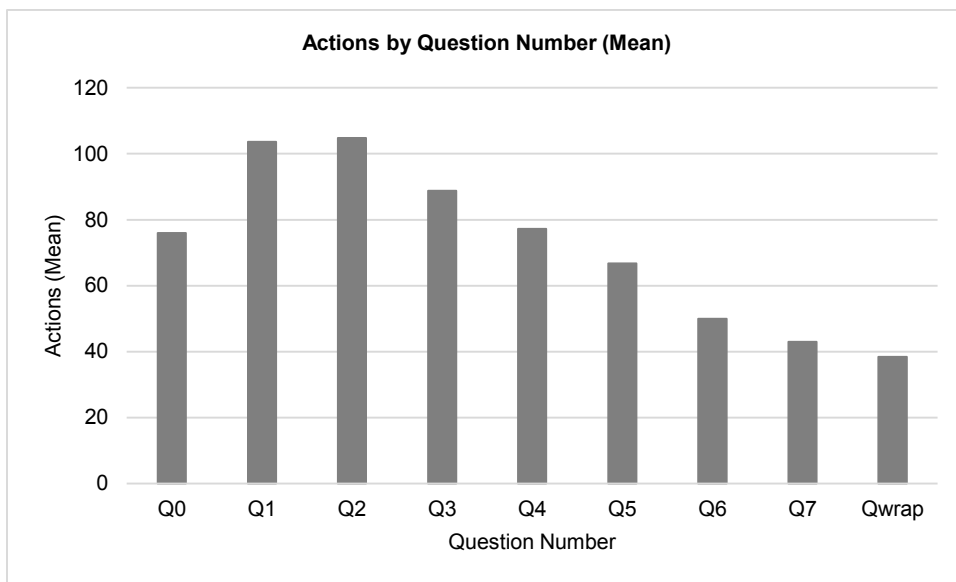


Figure 2. Number of tweets and retweets (actions) by chat question number.

Front-loading the chats with the highest quality questions by the chat organizers may have helped to drive the higher levels of participation in a Twitter chat. Asking the most crucial questions at the start of the chat might help to ensure that these questions are addressed by the largest number of participants.

Summary

Phase One's quantitative analysis of five weeks of *#lrnchat* Twitter chats identified patterns of behaviour including volumes of actions (tweets, retweets and mentions), use of links and hashtags, and patterns of responses to the questions of which each synchronous microblog chat was composed. Overall, a shorter timeframe (60 minutes compared to 90 minutes) for the chats resulted in more active unique participants, a higher volume of actions (tweets and retweets), a higher intensity of tweets and retweets per minute, and a lower usage of "mentions" to extend the conversation. A core group of repeat unique participants sustained the chat from week to week. Identifying a core group of committed participants or moderators may be key to a successful chat.

The chats were made up of twice as many tweets as retweets, with the tweets functioning as the questions and the initial answers to the questions. The lowest number of tweets per participant were found in the chats with the highest number of participants and the highest number of tweets. The higher number of unique participants may have inhibited some participants from engaging fully, perhaps due to timidity or merely due to the inability to "get a word in" or say something unique before someone else made the same statement. This may also be reflective of participants having trouble 'drinking from the firehose' – handling the high conversational volume. Shorter chat length also reduced the amount of back and forth engagement that was possible through use of mentions.

Retweets functioned as conversation extenders where participants would either retweet a tweet without changing it, indicating their support for the comment, or they

would add a few words of agreement, disagreement or question to provoke further conversation. Hashtags and links were used very sparingly in chat-related messages compared to the general average use in regular Twitter messaging.

The chats were structured around questions identified in advance by the moderators. Participation was lower for the initial introductory question, but highest for the next two questions (Q1 and Q2). From Q3 onwards participation declined steadily through the remaining questions, suggesting that moderators should include the most engaging or crucial questions at the beginning of the chat. It may be that active followers decreased over the length of the session, or suffered from fatigue, which again suggests the value of front loading the most important questions.

Phase Two built on the Phase One quantitative analysis of the Twitter chat experience by exploring chat transcripts using qualitative techniques, as detailed in the next section.

Chapter V – PHASE TWO RESEARCH FINDINGS

Phase Two was a qualitative analysis of a different sample of five weeks of *#lrnchat* Twitter transcripts focusing on participants' comments and actions related to social aggregation. The study analyzed 2,396 tweets and retweets posted using the *#lrnchat* hashtag during Twitter chats conducted between December 13, 2012 and January 17, 2013. Findings emerged related to group membership including the formality of the group, the degree of topic focus, the amount of relationship-building that was evident, the level of resource sharing, and the amount of structure built in to the discussion. Phase Two also provided insight into success strategies and coping mechanisms participants employed to handle the intensity and high volume of the conversational stream that makes up the *#lrnchat* Twitter feed.

Formality

Analysis of the transcript of five weeks of *#lrnchat* indicated that the synchronous microblogging experience involved a low level of formality. The chats included frequent uses of humour, emoticons, casual language, and short forms or acronyms characteristic of Twitter exchanges. Participants introduced themselves in an informal manner, sometimes used nicknames, and came and went from the chats early or late without repercussions from the group. While participants mentioned *#lrnchat* as a component of their personal learning networks (PLN) (Tobin, 1998), they did not equate *#lrnchat* with their PLNs.

Humorous comments were peppered throughout the chats, creating a casual atmosphere that was generally friendly and inviting to returning participants and

newcomers alike. For example, in response to the December 13th chat's opening question, "08:32:21 pm @lrnchat: Q0. We always begin with this: What did you learn today? If not today, then this week? #lrnchat" @205 responded with "08:33:17 pm: #lrnchat Q0) learned about a washable USB keyboard, after spilling a drink on mine {grinning emoticon}" (Dec13Gifts). The overall tone was self-deprecating and accessible, making it easy for new participants to join in the conversation. In response to the question "08:36:21 pm lrnchat: 1) What's good about #lrnchat? What makes you join our chats?", @128 responded "08:39:57 pm: A1. The wicked wit! #lrnchat". Likewise, @349 tweeted "08:37:07 pm: A1. I come for the free drinks. #lrnchat (oh wait this might be the wrong group) {grinning emoticon}" (Jan3#lrnchatOn#lrnchat).

While the number of lurkers could not be documented by the study, lurkers would occasionally 'out' themselves, introducing themselves to the chat. For example, @101 tweeted, "08:35:11 pm: Q0 Actually participating in these chats (rather than just lurking) is delightfully fun. #lrnchat" (Jan10Visuals). Each week a few new participants would announce themselves. These announcements were usually made at the beginning or end of the chat, not in the middle, perhaps indicating that the new participants were proceeding cautiously with their new connection to the group, taking care not to contravene group norms. Most were welcomed immediately by returning participants or moderators. For example, on December 20th, a new member, @43 tweeted, "08:45:33 pm: First time participating in #lrnchat" and drew this response from @275, a regular contributor to #lrnchat: "08:47:40 pm: @43 welcome! jump in #lrnchat". @108 tweeted in the January 17th chat: "08:33:06 pm: Hello from New Mexico. 1st time on

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#lrnchat. H.S. ELA, PBL, 1:1 #newtech school. #lrnchat” and was greeted with these replies:

- 08:33:31 pm @92: *Welcome! RT @108: Hello from New Mexico. 1st time on #lrnchat. H.S. ELA, PBL, 1:1 #newtech school. #lrnchat*
- 08:33:55 pm @203: *@108 welcome to #lrnchat! #Lrnchat*”

Even when new participants joined the chat late, they were usually welcomed. In the January 17th chat, another new participant tweeted, a half hour into the chat: “09:01:56 pm @170: *Hello all! First time at #lrnchat A4) Learning depts could utilize real world data/situations to support the concepts being presented*”. This tweet drew several welcome messages:

09:02:58 pm @308: *@170Welcome! Great community here. #lrnchat*
...
09:19:22 pm @203: *@170 welcome to the chat! #Lrnchat*
...
09:19:52 pm @92: *RT @@203: @170 welcome to the chat! #Lrnchat*

Figure 3. Welcoming messages directed by veteran chat participants to first-time chat participants.

New participants also received messages of encouragement from returning participants when they made valuable comments like in this example from December 20th:

09:22:20 pm @62: *@148 {name withheld}, I love your optimism. We'll get along famously! Welcome to the #lrnchat family {grinning emoticon}*
09:26:18 pm @148: *@62 Thank you...it's the only way. Glad to be here. #lrnchat*

Figure 4. Message of encouragement from veteran synchronous microblog participant to first-time participant.

Returning participants who joined late were not penalized although they were sometimes lightly teased like this January 3rd exchange:

08:52:07 pm @280: *Hey all, late but here. #Lrnchat*
08:52:56 pm @203: *"@280: Hey all, late but here. #Lrnchat" << about time. Now we can start. {winking emoticon}*

08:53:36 pm @280: @203 Tru dat! #Lrnchat

Figure 5. Teasing message from veteran #lrnchat participant to other veteran participant who joined the chat late.

If the comments the participant made about being new were not clear or were lost in the Twitter stream due to heavy volumes of tweets, they did not receive a formal welcome. On January 3rd, @27 slipped a mention of being new to the chat into an answer to another question: “08:40:25 pm: #lrnchat a1) offers lots of ideas and today is the first opportunity for me”. No one noticed this person was new and no one shared a welcoming comment. That did not stop this particular person from participating actively in the chat, but might have been off-putting or intimidating to less confident or comfortable participants. To compensate for this type of oversight, one of the moderators regularly made a statement at the beginning or end of each chat with a blanket welcoming message for those who were new. For example, @275 tweeted this at the beginning of a chat: “08:31:59 pm: yay, it’s time again for the memestream extravaganza that is #lrnchat, duck or join! welcome to new and returning participants” (Jan3#lrnchatOn#lrnchat). The same moderator made a similar statement at the end of the January 10th chat: “09:26:57 pm: thanks to new and returning participants for another wise and witty #lrnchat” and again on January 17th this participant tweeted: “09:28:35 pm: thanks to new and returning #lrnchat participants for another fun, fast and fulfilling session!”. Overall, the synchronous microblogging experience appeared to be inclusive regardless of expertise, status, gender, ethnicity, etc.

The informality of the chats was also underscored by the frequent use of emoticons – indicators of tone and emotion conveyed through the use of keyboard characters. For example, the use of a colon “:” and a right parenthesis “)” resulted in a

smiley face ☺ being generated by the Twitter software. In one chat @205 included a smiley face at the end of a tweet to indicate humour: “09:22:38 pm @6: @lrnchat #lrnchat comfortable shoes for ILT training. I suggest #NineWest. Comfort makes happy trainers {grinning emoticon}” (Dec13Gifts). Sometimes participants used other methods of emphasis to indicate emotion or meaning as well. For example, @101 used asterisks around the word “*laugh*” to indicate humour: “08:55:33 pm: Q3 Never EVER use Screen Beans clip art if you want your work to be taken seriously *laugh* <http://t.co/r3X8dUQY> #lrnchat” (Jan10Visuals). This participant used “*cynical*” in the same way: “09:05:50 pm @10: A4)Corporate learning is not to be confused about how you taught in secondary schools! (*cynical*) #lrnchat” (Jan17CorpAcademicLearning). Another participant used the hashtag #sarcasm to convey that subtlety of meaning: “08:57:11 pm @298: Protecting students’ research! #sarcasm > “@lrnchat: Q1) What does Academia, specifically Higher Education, do well? #lrnchat” (Jan17CorpAcademicLearning). Such tonal cues were necessary to help avoid misunderstanding given the entirely textual method of communication provided by the Twitter chat.

#lrnchat tweets were also characterized by very informal language, necessitated by the requirement to keep tweets to 140 characters or less. For example, @352 who had recently moved to California from Chicago retweeted: “09:13:31 pm: I’m goin all NorCal on you guys now! RT @143: @352 ooh silicon valley now! Don’t u sound fancy? {winking emoticon} #lrnchat” (Dec13Gifts). Likewise, in response to the December 20th question, “09:17:22 pm @lrnchat: Q6) What are some things you’d like to see change in 2013 (about yourself, your field, your workplace)? #lrnchat”, @67 replied, “09:18:32

pm: a6) You guys got all night cuz there's a lot I need to change in 2013... #lrnchat".

The use of “you guys” and “cuz” indicated a casualness of conversation that was inviting and non-intimidating. The low formality of the chats also came through in tweets like this one about the benefits of #lrnchat: “08:38:35 pm @153: A1) Where else do I have the chance to engage with passionate professionals in my field while wearing pajamas in my home office? #lrnchat” (Jan3#lrnchatOn#lrnchat).

As the participants were generally drawn from the professional field of learning and development, the group did have a shared professional language which could be considered more formal, but the way the language was used remained casual. For example, the acronyms SCORM and AICC were used in the following exchange, but were embedded in a playful dialogue from the January 3rd chat:

08:57:07 pm @95: And here I was hoping never to hear of SCORM or its spawn again. There goes THAT resolution. #lrnchat
 ...
 08:58:19 pm @352: I've now got SCORM running thru my head in tune to the Monty Python Spam skit! #lrnchat
 ...
 08:59:38 pm @205: @275 @352 #lrnchat lets not forget the AICC song

Figure 6. Playful dialogue incorporating professional language (SCORM and AICC acronyms) into casual messages.

The participants also introduce themselves in casual ways. For example, the following introductions were very informal in keeping with the general tone of Twitter:

- “08:33:27 pm @6: @lrnchat {name withheld}, LMS admin, social media addict, e.learning junkie, adult ed sponge #lrnchat” (Dec13Gifts)
- 08:33:18 pm @153: {name withheld} from Orlando, FL ... Learning experience designer, strategist, leader, curator, jungle cruise skipper ... #lrnchat” (Jan3#lrnchatOn#lrnchat)

- “08:34:40 pm @29: #lrnchat and from the great white north of Saskatoon Saaskatchewan Canada. For you USAers go to montana turn north, drive for hours” (Jan3#lrnchatOn#lrnchat)

The participants often did not share their full identities at the beginning of the chat. The convention at the end of the chat was for participants to reintroduce themselves and share any “shameless plugs” or promotions with the audience. Those who reintroduced themselves at the end were more likely to share their real identities and link to external websites for more information or services.

Lalonde (2011) focused on the *personal learning network (PLN)* (Tobin, 1998) concept to describe the relationship between members of synchronous microblog chats. Personal learning networks (PLNs) were considered by Lalonde somewhat interchangeable with Twitter chats. The participant commentary from the #lrnchat indicated that while Twitter chats were not PLNs per se, they did form the basis of a PLN. A PLN, however, went beyond the scope of a Twitter chat and a Twitter chat was not a PLN. PLNs were mentioned periodically within the chat providing this study with the participants’ own perspectives on the relationship between a PLN and a Twitter chat. @305 tweeted “09:04:50 pm: A4)I hope to learn a lot from my PLN, I am always looking for new sources #lrnchat” (Dec20Resolutions). This participant was using #lrnchat to expand the participant’s PLN. Likewise, in response to the December 20th question posed by @lrnchat, “09:02:46 pm: Q4) How will you learn in 2013? Are there new sources you plan to learn from, or learn more from? #lrnchat”, @14 responded: “09:09:40 pm: @lrnchat I will learn from my new colleagues and my PLN. And other

new experiences I encounter. #lrnchat". This participant's PLN was outside of *#lrnchat* alone. @203 said it best: "08:45:28 pm: A1) *#lrnchat* is really the birthplace if [sic] my virtual PLN" (Jan3#lrnchatOn#lrnchat). Another participant agreed in the same chat: "08:43:50 pm @147: 1. I do not have a peer group in my physical work world; *lrnchat* is essentially the base of my PLN *#lrnchat*". Many participants recognized the importance of a PLN, but *#lrnchat* did not equal their full PLN. @179 tweeted: "09:02:08 pm: q3 – encourage PLN development. Lots of experts out there with talent + knowledge to share. *#lrnchat*" (Jan17CorpAcademicLearning).

Overall, in this synchronous microblogging chat, frequent use of humour, emoticons, casual language, short forms, acronyms, and nicknames evidenced low levels of formality. The chat was not formal and anyone could join any week or anytime during the chat. New participants were welcomed readily and those new or returning participants who joined the chat late or left the chat early suffered no repercussions. Participants were not required to expose their real identities beyond what they already shared through their personal Twitter handles which may or may not explicitly identify a "real" person. The low level of formality is not surprising given the nature of Twitter as a microblog with a 140 character limit on communication. Participant comments confirmed that while *#lrnchat* might have been a component of their personal learning networks (PLN), they did not equate *#lrnchat* with their PLNs. *#lrnchat* was a forum for discussion, but not a group or certainly not a community of practice outside of Twitter given the constantly morphing collection of individuals who participated. Key to the success of *#lrnchat*, however, was a core group of dedicated volunteer moderators who would be considered a more formal group with closer ties than the larger audience that

tuned in each week. The moderators produced the chat for both themselves and others to engage in and consume. These participants also played a key role in establishing the focus of the chats, as discussed next.

Focus

One of the key elements contributing to the success of *#lrnchat* discussions was the relatively high degree of topic focus. The moderators chose a topic for each week based on suggestions submitted to them. These topics were advertised through tweets from *@lrnchat* prior to the chat. While the topics were quite clear from week to week, some disagreement arose over the purpose of *#lrnchat* and its overarching focus.

The topics for the five weeks in the study sample were *Learning Gifts*, *Resolutions*, *#lrnchat on #lrnchat*, *Visuals*, and *Corporate versus Academic Learning*. Selecting appealing topics on a weekly basis was not an easy task and required the commitment of a small group of moderators. As *@275* indicated, “08:57:01 pm: a2) ongoing trial to find *#lrnchat* topics that meet diverse audience interests: moderators don’t always agree either {winking emoticon}” (*Jan3#lrnchatOn#lrnchat*). In response to a question on January 3rd about overdone topics: “09:02:17 pm *@lrnchat*: 4) What topics have been done to death and you’d like to see us avoid? *#lrnchat* how *#lrnchat* could be improved”, *@205* tweeted: “09:03:10 pm: Q4) None, I think you can continue to learn from revisiting topics. *#lrnchat*”. As the large majority of participants changed from chat to chat, repeating a topic was acceptable in the eyes of some participants as the diversity of the participant group would result in different responses each time.

The weekly topic was promoted on Twitter prior to the session by @lrnchat and other returning participants or moderators. For example, at the start of the December 13th chat, @221 tweeted to followers: “08:33:06 pm @221: Haven’t started your Christmas shopping yet? Join us in #lrnchat and get some good ideas from other professionals!” (Dec13LearningGifts). Likewise, another participant tweeted: “08:35:29 pm @177: #lrnchat starting now. join the conversation on academic and corporate learning tonight” (Jan17CorpAcademicLearning). Sometimes participants invited others to join either by mentioning them – including their handles in a tweet – or by adding a particular hashtag that might draw the attention of others interested in that topic. For example, @14 tweeted to promote a particular #lrnchat using the #etmooc hashtag: “09:09:44 pm: L&D peeps in #etmooc might be interested in tonight’s #lrnchat (in progress) on the differences between Academic and Corporate Learning” (Jan17CorpAcademicLearning).

While the topics of each weekly chat were quite clear, sometimes tension arose around the focus of #lrnchat more generally. In particular, the participants engaged in a lively discussion around what aspect of learning and education should be the focus of #lrnchat given that education ranges from K-12 to higher education and adult/corporate education. In the January 3rd Twitter chat focused on #lrnchat itself as the topic, participants did not agree on the purpose of #lrnchat or the type of participants they would like to have and engaged in an almost heated discussion. Some participants, in particular @147, wanted to keep #lrnchat discussions focused on the facilitation of learning (a constructivist approach) as opposed to the delivery of training (a more

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behavioural focus) with a corporate slant rather than an academic one. Others disagreed.

(See Figure 7.)

08:46:14 pm @147: 2. More topics that are about learning. I'm not interested in this being #rainchat #lrnchat
...
08:46:46 pm @112: Q2) More presence from academic world. Seems we have more representation from corporate training wrld #lrnchat
...
08:47:49 pm @147: @112 sorry, disagree. I want to see wider gulf between education and workplace learning. #lrnchat
...
08:48:41 pm @92: @147 alright, I just looked up #trainchat and unless you're Mr.Conductor, I don't get it. #lrnchat
...
08:49:29 pm @349: Agree with {name withheld}. The 2 are quite different. RT @147: @112 sorry, disagree.... education and workplace learning. #lrnchat
...
08:49:36 pm @147: @92 I don't want to talk about 'training'. #lrnchat
...
08:50:16 pm @92: @147 unfortunately, training is what brought me here #lrnchat
...
08:50:35 pm @50: "@147: @92 I don't want to talk about 'training'. #lrnchat" amen.
...
08:51:00 pm @275: a2) resolving the continual tension between learning, education, and training (which may mean accepting all?) #lrnchat
...
08:51:10 pm @71: I understand the corporate vs academic thing but I think they benefit from each other, great opportunity to bridge the silos #lrnchat
...
08:51:33 pm @147: @50 thanks. I've stopped coming to the chats if they're about training. #lrnchat
...
08:51:35 pm @337: #lrnchat Part of the problem is that higher ed is prep for corp ed, so there's crossover. There are still common topics/principles bet. Both
...
08:51:40 pm @147: @71 not me #lrnchat
...
08:51:53 pm @112: MT @349: Agree w {name withheld}. 2 r quite diffnt. RT @147: ... Diffrent, but adds mo perspectives – cn lrn from each other2 #lrnchat
...
08:52:07 pm @71: splain me training vs learning #lrnchat
...
08:53:32 pm @92: @147 maybe I'm in the wrong place then. #lrnchat
...
08:57:15 pm @203: @92 as individuals yes, but the chasm between academia and the workplace is hard to bridge. Worth discussion, but hard. #lrnchat
...
08:58:08 pm @147: @95 Amen. I'm fighting #trainchat. Losing. #lrnchat
...
08:58:12 pm @95: @203 I've got nothing against academia, or the education world, but thruout my corp career have seen very little overlap. #lrnchat
...
08:58:24 pm @275: @203 @92 don't agree, chasm twixt academy and org share many issues, better crosstalk seems good #lrnchat
...
09:01:53 pm @95: @275 To be fair, a lot of "learning professionals" in corp world have same lack of understanding of learning. ;-| #lrnchat
...
09:07:36 pm @203: @147 #lrnchat should acknowledge education under it's umbrella without needing to become #ed chat
...
09:11:48 pm @147: @203 I was answering the question honestly. #lrnchat
...
09:13:34 pm @203: "@147: @203 I was answering the question honestly. #lrnchat" < of course you were. So was I. {winking emoticon}

...
09:14:07 pm @214: @104 @50 Congrats for sucking me into this. While I know how the terms are used, I believe the terms mislead. #lrnchat
...
09:17:57 pm @214: MyPOV: Training is the right term to describe an outside-in approach to sharing known quantifiable content. Push. #lrnchat
...
09:19:56 pm @214: MyPOV: Learning is an inside-out process originating w/learner's desire to know. #lrnchat
...
09:20:05 pm @280: @214 unless u can do a Vulcan mind meld creating any sort of 'learning' is senseless and always misleading. U get my vote #Lrnchat

Figure 7. In-depth discussion of over-riding topic focus of #lrnchat synchronous microblog chat with disagreement arising over whether the chat should focus on “training” or “learning”.

Determining the focus of a Twitter chat is key to developing a successful chat. After this lack of clarity arose, the participants decided to devote an entire chat to corporate versus academic learning on January 17th.

The success of #lrnchat was due in no small measure to the commitment of a small group of moderators who consistently fulfilled the crucial task of identifying a compelling weekly topic. This clear weekly topic brought a high degree of focus to the discussions. That said, discussions surrounding the overall focus of the chat did not result in consensus. As #lrnchat was composed of a constantly morphing set of individuals attracted on a weekly basis by different learning and education-related topics, lack of agreement on the overriding topic focus of the chat was understandable. This dichotomy between high and low focus was also mirrored when examination turned to the nature of #lrnchat relationships as discussed next.

Relationships

The Twitter chat relationships were tight and fluid at the same time. Some participants in #lrnchat had been involved since the beginning of the chat in June 2009. Others joined for the first time during one of the weeks encompassed by this study. Each week the chats included several standard questions that welcomed the participants and

invited them to introduce themselves and share more about themselves with the other participants, building relationships.

The chats were structured so that participants were invited to introduce themselves at the beginning and the end of the chats and many did so. The first statement by the *#lrnchat* moderator was always friendly and inviting, varying between the statements, “08:30:43 pm *@lrnchat: Hello everyone and welcome to #lrnchat. How have you been?*” (*Dec13LearningGifts*) and “08:30:56 pm *@lrnchat: Hello everyone and welcome to #lrnchat. We’re glad you’re here.*” (*Jan10Visuals*). This opened the chats on positive notes. Participants responded by sharing personal information or pleasantries that helped to connect them to others in the group. This type of ice-breaking or initial relationship building is often referred to as *phatic communications* and has been observed in other types of mediated communications (Rourke, Anderson, Archer, & Garrison, 1999). For example, in response to one of these questions *@205* tweeted “08:31:36 pm: *#lrnchat Been great doing lots of last minute work to complete EOY projects*” (*Dec13LearningGifts*). Like in-person greetings, typical conversation starters often came up. This exchange on December 13th brought up weather:

08:48:29 pm *@349: By the way. Good thing I have the parka on tonight. Doing #lrnchat from my car in a parking lot. #dedication.*
 ...
 08:49:29 pm *@280: @349 That's ridiculous. #Lrnchat*
 ...
 08:49:44 pm *@107: RT @349: Doing #lrnchat from my car in a parking lot. #dedication.>>talk about dedication. you should find a bar #lrnchat*
 ...
 08:50:46 pm *@111: Was 50 here in Chicago today. Not normal, but I like it. #lrnchat*
 ...
 08:52:01 pm *@349: @280. Ya and you know its snowing and so cold here too. Cold enough to put a second story on the igloo. {winking emoticon} #lrnchat*

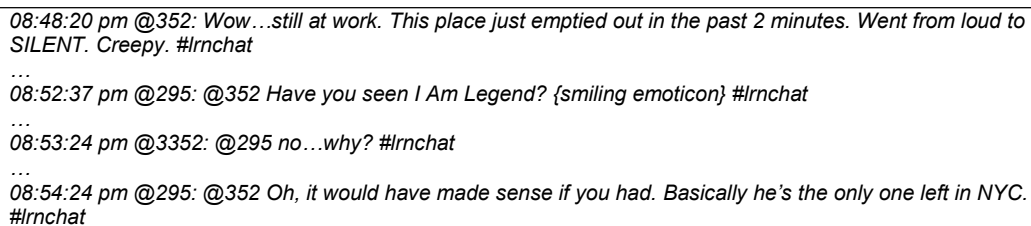
Figure 8. Chat excerpt demonstrating use of the weather as a generic conversation starter.

Participant even included mentions of the weather in introductions:

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- 08:38:36 pm @104: Hello all. {name withheld} here freezing in LA – 50 degrees? ugh. #lrnchat (Jan10Visuals)
- 08:49:19 pm @10: Hello everyone.Happy new year! Stinking hot day 41c or 106 so trying to keep cool.Hope I haven't missed much #lrnchat (Jan3#lrnchatOn#lrnchat)
- 08:36:11 pm @305: Evening lrnchatters, {name withheld} from cold, wet Detroit #lrnchat (Dec20Resolutions).

This thread on December 13th referenced movies, another generic conversation starter:



08:48:20 pm @352: Wow...still at work. This place just emptied out in the past 2 minutes. Went from loud to SILENT. Creepy. #lrnchat
...
08:52:37 pm @295: @352 Have you seen I Am Legend? {smiling emoticon} #lrnchat
...
08:53:24 pm @3352: @295 no...why? #lrnchat
...
08:54:24 pm @295: @352 Oh, it would have made sense if you had. Basically he's the only one left in NYC. #lrnchat

Figure 9. Chat excerpt demonstrating use of movies as a generic conversation starter topic.

These brief, often light-hearted exchanges could be classified as phatic communications in that they served to build collegiality and helped the participants to become more comfortable with sharing deeper thoughts as the chats continued.

After the initial welcome message, @lrnchat invited participants to introduce themselves, further developing relationships. The first introductory question remained consistent from week to week: “08:31:26 pm @lrnchat: Please introduce yourself. Name, specialties, interests, etc.? #lrnchat” (Dec13Gifts). Regular participants knew this question was coming and often had witty responses prepared such as these from the December 20th chat:

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- 08:32:46 pm @275: {name withheld}, learning experience design evangelist, speaker/author/consultant, genial malcontent, Walnut Creek CA #lrnchat
- 08:33:45 pm @317: @lrnchat hey guys, {name withheld} Charlotte NC. Consultant, author, 3x chat instigator. Passion for learning | delinquent in being at #lrnchat

The second introductory question (Q0) was also consistent from week to week:

“08:32:36 pm @lrnchat: Q0. We always begin with this: What did you learn today? If not today, then this week? #lrnchat” (Dec20Resolutions). As the participants were assumed to be learning and development professionals, ostensibly dedicated to lifelong learning, this warm up question generated many engaging comments and prompted the participants to reflect on their past weeks and share their observations, often in a lighthearted way: “08:33:19 pm @275: a0) learned today that cleaning books out feels good, but you don’t get much from the used book store! #lrnchat” (Dec20Resolutions) and “08:34:33 pm @92: I learned that SouthPark churns out an episode start to finish in 6 days. Incredible! #lrnchat” (Jan10Visuals). Sometimes the answers to A0 generated responses that helped participants get to know each other better like this exchanges from January 17th:

08:35:16 pm @92: a0. I learned lines alway get crossed, eventually...#lrnchat
...
08:36:22 pm @261: @92 well now sounds like there's a story to that comment. You have some lines crossed? #lrnchat
...
08:37:38 pm @92: @261 nothing too serious, but every now and then people need a reminder of where they can go and where they cant. #lrnchat

Figure 10. Answers to the introductory question, “We always begin with this: What did you learn today? If not today, then this week?” demonstrated that this question helped participants get to know each other better.

The final relationship-building question posed by the @lrnchat moderator always came at the end of the chat: “09:25:27 pm @lrnchat: QWrap) It’s that time again. Please re-introduce yourself. (Shameless plugs welcome.) #lrnchat” (Dec20Resolutions). Healthy self-promotion was accepted and encouraged in these last few minutes of the chat, providing a payoff for those participants who joined the chat partly to promote their own consulting practice, products for sale, or other business or initiative. Participants sometimes included links to their websites or to resources they thought would be valuable to the other participants: “09:27:26 pm @153: QWrap) {name withheld} from Orlando, check out L&D Global Events – <http://t.co/L6bfQ9nX> | Happy Holidays! #lrnchat” (Dec13LearningGifts).

A moderator consistently ended with a friendly sign-off inviting participants to the next chat: “09:30:42 pm @lrnchat: Goodnight everyone, and thanks for another great #lrnchat. See you next Thursday, for our last chat of 2012!” (Dec13LearningGifts). Others often joined in with their own final, friendly farewells, further developing relationships at least with the core group that returned on a weekly basis: “09:31:44 pm @111: Have a great week finishing up your holiday preparations everyone! #lrnchat #elearning” (Dec13LearningGifts) and “09:40:16 pm @39: RT @92: huge thanks to the facilitators who make #lrnchat happen! I know it’s work but it does make thursday pretty awesome. thank you” (Jan3#lrnchatOn#lrnchat). Occasionally, spammers or other Twitter users who were not actively participating in the chat used the sign-off invitation for self-promotion, an approach frowned upon by the moderators. For example, on January 17th this participant tweeted only at the end of the chat to promote another related

Twitter chat: “09:30:42 pm @20: Qwrap) {name withheld} in Minneapolis- joined late, hi all! Join us next Thursday morning for #chat2lrn #lrnchat”.

Overall, #lrnchat did not just use one warm up question to build relationships at the beginning of the chat. #lrnchat found a formula that worked – an initial greeting that signalled the opening of the chat, an invitation to share introductions, a warm up question that prompted the participants to connect their experiences in the past week with the chat – an easy question that required no special expertise or knowledge to answer, and a closing invitation to participants to reintroduce themselves and “plug” their business or other initiatives. #lrnchat moderators built a comfortable and welcoming environment. New participants did not realize who the moderators were or how close their relationships were. Anyone could stumble upon the chat and join in. The chat had both a long-term, tightly connected core, some of whom had met in-person at conferences or through other professional engagements, as well as a loosely connected array of participants who might only dive in once and never return. Both classes of participants come together seamlessly to share resources, as discussed next.

Resources

Despite the 140 character limitation to #lrnchat synchronous microblog tweets, participants shared a wide variety of resources with others including links, tools, books, products, blogs, suggestions of Twitter handles to follow, professional associations, events and webinars, and professional techniques.

Shared resources were cited by #lrnchat participants numerous times as something they valued about the chat: “09:12:12 pm @95: Value to lrnchat for me:

quick exposure to lots of people; shared links; insight into someone via his/her comments. #lrnchat” (Jan3#lrnchatOn#lrnchat). While participants did share links (see Table 9 for an example), some thought that they could share even more: “09:15:12 pm @92: there’s been talk of sharing links and stuff but that’s usually fairly limited. could we incorporate more? #lrnchat” (Jan3#lrnchatOn#lrnchat) and “09:16:55 pm @275: @10 up to participants to share links! #lrnchat” (Jan3#lrnchatOn#lrnchat).

Participants frequently shared or “name dropped” tools that might be useful to others. See Table 9 for an example. @112 mentioned that #lrnchat was valuable because it was a place to “09:16:44 pm: Q5) Get good opinions on new learning/dev tools too #lrnchat” (Jan3Gifts). Likewise, participants shared products that others might buy. See Table 9 for an example. In response to the question: “09:09:28 pm @lrnchat: 5) How does or can #lrnchat help expand your learning beyond just our weekly chats?” (Jan3Gifts) several participants also indicated that the chat provided suggestions of books to read:

- 09:11:22 pm @275: a5) often pointers to others thing to read #lrnchat
- 09:12:54 pm @235: A5) Definitely added to my reading list #lrnchat
- 09:12:59 pm @203: RT @275: a5) often pointers to others thing to read #lrnchat.

This implied that the participants would follow up after the chat – referring back to the transcript – to identify books they wanted to look up and acquire.

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The participants also indicated that the chat was a valuable source of blogs and Twitter handles to follow. (See Table 9.) In a discussion on January 3rd, several participants mentioned that #lrnchat helped them to expand their learning beyond the weekly chats by making them aware of other blogs, thought leaders, and Twitter handles they could follow:

- 09:11:40 pm @6: @lrnchat A5) having great learning professionals to follow on twitter! #lrnchat
- 09:11:49 pm @178: 5 Links to blogs or articles – mentioned books – and finding new folks to follow #lrnchat
- 09:12:17 pm @123: MT @349: I look to peeps in #lrnchat for expanded learning. blogs, tweets, etc. ... #lrnchat
- 09:16:54 pm @71: gives me access to lots of different thinking and innovators #lrnchat

Participants also shared professional associations (see Table 9 for an example), products, and other events and webinars that would support their learning: “09:22:00 pm @349: Love to hear of free webinars that I can participate in. I try to share/tweet those I come across. #lrnchat” (Jan3#lrnchatOn#lrnchat).

Table 9

Examples of Resources Shared by Participants

Type of Resource Shared	Example
Links	08:31:03 pm @280: RT @295: RT @287: 10 Books For Lrn Professionals To Read In 2013: The #eLearning Coach http://t.co/huY7mmc8 #isd #Lrnchat (Dec13Gifts)
Tools	08:37:06 pm @205: Q1) Gifts for ILT trainers would be prezzie for creating great presentations #lrnchat (Dec13Gifts)
Books	08:38:02 pm @205: #lrnchat Q1) A book by Garr Reynolds to create some cool presentations – very visual and engaging (Dec13Gifts)

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Products	08:41:47 pm @180: @147 Mr. Sketch ...totally the best markers ever! just the mention of them brought back the smell memory of purple grape (Dec13Gifts)
Blogs	08:56:53 pm @205: Q3) Go to the rapid elearning blog and follow the amazing @346 (Dec13Gifts)
People to Follow	09:13:54 pm @221: Starting following @109 after being introduced to them through #lrnchat! Letting education be known thru the digital world {grinning emoticon} (Dec13Gifts)
Professional Associations	09:01:35 pm @203: Q3) An eLearning Guild Membership #lrnchat (Dec13Gifts)
Events	09:28:29 pm @110: RT @153: Check out the L&D Global Events Calendar for PLENTY of learning opportunities (http://t.co/L6bfQ9nX) #lrnchat (Jan3#lrnchatOn#lrnchat)
Techniques	08:41:09 pm @178: Provide information and a job-aid – the London train map #lrnchat http://t.co/V18cCfxO (Jan10Visuals)

The sharing of resources sometimes went beyond the chat with participants indicating they were able to continue the discussion with their own work teams or family members as a way of extending their own learning:

- 09:10:35 pm @205: Q5) Cascading the messages to my team and others in our fields – sharing is caring {grinning emoticom} #lrnchat (Jan3#lrnchatOn#lrnchat)
- 09:10:57 pm @153: A5) I often invite team members to #lrnchat and continue the discussion at work. #lrnchat (Jan3#lrnchatOn#lrnchat)
- 09:12:22 pm @71: 5) when it is good it is very good and I carry it into the week and discuss topic with work teams #lrnchat (Jan3#lrnchatOn#lrnchat)
- 09:30:01 pm @128: The Yellow Giraffe – outta here! Thanks for another fun chat. Will be sharing with my 4 prof parents and prof sister! #lrnchat (Jan17CorpAcademicLearning)

During the January 3rd chat, several participants mentioned a desire to increase the resource value of the chats by incorporating guest “speakers” or hosts:

- 09:01:48 pm @352: *Can we have a guest speaker? Like a CIO or IT head and talk to them about the things we constantly bring up? #lrnchat*
- 08:46:16 pm @6: *@lrnchat introducing guest participants from specific industries as “special speakers” #lrnchat*
- 08:48:19 pm @153: *A2) Special guest hosts #lrnchat*
- 08:51:08 pm @178: *Q2) Guest #lrnchat host with topics generated by the guest from guest area of research/expertise. #lrnchat*

This suggestion was put forth by several participants, but not implemented in the chats that form the basis of this study. Such guest hosts, especially if they were “big name” thought leaders, were thought to attract more participants to a chat. An unsuccessful experience including such a thought leader was related by one participant in the Phase Three study. (See Table 15.)

The shared resources prompted participants to follow their curiosity as @68 mentioned: “09:13:20 pm: Q5. *Piques curiosity and spurs further research. Love it! #lrnchat*” (Jan3#lrnchatOn#lrnchat). Participants came to #lrnchat looking for recommendations of techniques to use, tools to buy, blogs and other Twitter handles to follow, and professional associations to join. Often they took these resources back from the chat to share with other professional colleagues. The next section discusses the findings related to the structure of the chats.

Structure

The Twitter chats that formed the basis of this study had a moderate degree of structure driven by the use of pre-determined questions combined with light moderation.

Questions were solicited from the members and a number-based naming convention was used to help participants distinguish between questions. Appropriately for informal discussion the structure would occasionally give way to the passion of discussion, despite the identifiers used for questions and corresponding answers. Participants who delved deeply into a discussion related to a particular question sometimes had difficulty extracting themselves from the conversation and moving on to the next question, prompting reminders from other participants as to the current question number.

The questions were planned in advance as they were too difficult to develop in the middle of the chat: “09:08:05 pm @275: @92 @153 q’s are planned in advance, too hard to converge on good ones on the fly #lrnchat” (Jan3#lrnchatOn#lrnchat). Each weekly topic was discussed using questions that were posed to the participants at regular intervals during the chat. For example, the January 17th Corporate versus Academic learning discussion questions were:

- 08:35:36 pm @lrnchat: Q1) What does Academia, specifically Higher Education, do well? #lrnchat
- 08:43:21 pm @lrnchat: Q2) What do Organizational Learning Departments do well? #lrnchat
- 08:51:14 pm @lrnchat: Q3) What could does Academia, specifically Higher Education, do better? (and how?) #lrnchat
- 08:59:32 pm @lrnchat: Q4) What could Organizational Learning Departments do better? (and how?) #lrnchat

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- 09:07:30 pm @lrnchat: Q5) *What could Academia, specifically Higher Ed, learn from Organizational Learning Programs? #lrnchat*
- 09:15:22 pm @lrnchat: Q6) *What could Organizational Learning Departments learn from Higher Ed? #lrnchat*
- 09:22:31 pm @lrnchat: Q7) *What could Organizational Learning and Higher Ed learn from K-12 Education? #lrnchat*

While the questions were highly structured, #lrnchat was moderated very lightly – the @lrnchat handle did not comment or direct the conversation beyond launching each question. Participants were free to take the questions in whatever direction felt most natural. @275 tweeted, “08:37:32 pm: a1) love that #lrnchat isn’t convergent on questions, but divergent, always learn new perspectives” (Jan3#lrnchatOn#lrnchat).

The questions for each chat were solicited from the membership in the week prior to the chat. Anyone could submit a question, but the responsibility for creating the final questions fell to volunteer moderators. In response to the question on January 3rd, “08:44:28 pm @lrnchat: 2) *What could make #lrnchat better? All thoughts are welcome*”, the dialogue turned to having better questions and the need for participants to “step up” and help the moderators develop questions each week:

08:47:52 pm @71: 2) *really thought provoking questions that build a conversation. Sometimes we have been a little too light for me. #lrnchat*
...
08:49:14 pm @147: 2. *More people stepping up to provide topics + 5-6 questions. It’s on the moderators almost ever week. Help us. #lrnchat*
...
08:49:20 pm @203: A2) *More input from the #lrnchat community on both topics and questions*
...
09:00:54 pm @147: @287 *I meant instigating in terms of doing things instead of waiting for the moderators to do it. #lrnchat*
...
09:02:23 pm @275: a3) *issue with topics is coming up w/ 5-6 questions around it that are different enough to spark convos, and yet remain themed #lrnchat*
...

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09:09:16 pm @95: @153 I agree w/ @275. Hint: good way to get a good topic is to write 5-6 Qs & send to the lrnchat coordinators. #lrnchat
...
09:20:24 pm @147: Be the change: Give us a theme + 5 questions you'd like to do. #lrnchat
...
09:26:42 pm @203: Accepting the challenge to submit topics and questions? Please reach out to @275 @147 @67 or @203 #lrnchat
...
09:27:00 pm @275: thanks again to new and returning participants for another lively #lrnchat! Look forward to your topics and 5-6 questions... (nudge nudge {grinning emoticon})

Figure 11. Participant discussion of the importance of good questions to the success of a synchronous microblog chat.

One newer participant suggested the questions should be sent in advance so that participants could prepare, but this was not implemented during the study period:

“09:12:08 pm @92: 5. knowing the topics in advance #lrnchat. b/c I’m new-ish to the industry it would give more of a chance to get to Q’s 4-6, #lrnchat (Jan3#lrnchatOn#lrnchat).

Participants were not always in agreement with the questions. Sometimes the questions were phrased in a way that did not lead the conversation where the participants wanted to go. For example, @364 tweeted: *“08:51:22 pm: A2) The problem with this question is that we haven’t learned these things...yet but it doesn’t mean we wont. #lrnchat” (Dec20Resolutions).* In another case, a participant commented on the high volume of questions: *“09:25:49 pm @351: q7) Really? 7 questions in a 1-hour chat? This really is a (wonderfully) overwhelming session this evening. #InformationOverload #lrnchat” (Jan17CorpAcademicLearning).*

The convention was for participants to reinforce the question structure and make the question threads clear by, in at least some of their responses, including the answer number that corresponded to the question number. For example, for question one (Q1) participants answering the question included A1 (for answer one) somewhere in their responses. In the January 10th chat, the question was: *“09:09:31 pm @lrnchat: 5) What*

are barriers you encounter when trying to use more visuals? #lrnchat” (Jan10Visuals).

In response to this question, one of the participants tweeted: “09:10:53 pm @368: a5) *Visuals are not resource neutral. That stuff costs \$\$.* #lrnchat”. By including the answer number in a response, participants made it easier for others who were trying to keep up with a particular question to skim through their Twitter feeds and identify related responses. This was an emergent way of compensating for Twitter’s lack of threaded discussion functionality. Use of the question and answer numbers helped to separate conversations into threads at a more granular level than just using the hashtag to call out tweets on particular topics.

Once a question was posed, several other participants generally retweeted the question as a signal to themselves and the other participants that it was time to move on to the new question. Thus these served as a textual cue for turn taking. Often it took a minute or two for the full transition to the next question to take place. In the Figure 12 example, @lrnchat posed the fifth question of the January 10th chat, “*What are barriers you encounter when trying to use more visuals*” at 09:09:31. The text in bold indicates posts related to question five and the non-bold text indicates posts related to previous questions. Several other tweets related to the previous question came through in the 30 seconds following the introduction of the fifth question before several participants retweet the fifth question. The first answer to the fifth question was tweeted at 09:10:39, 68 seconds after the question was initially posed. In a face-to-face conversation, participants might perceive it to be rude to continue to answer a previous question for a full minute after a moderator had posed a new one. In Twitter chats, there is a lag and overlap between questions and answers as participants must read the question – picking it

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up by skimming the stream. With the volume of tweets scrolling down the screen this is no easy feat. In this particular example, the last answer related to the previous question (4) came in at 9:13:13, almost four minutes after the moderator switched to question five.

09:09:31 pm @Irnchat: 5) What are barriers you encounter when trying to use more visuals? #Irnchat
09:09:32 pm @29: #Irnchat. sorry for being late q4) white space is an important visual
09:09:45 pm @169: Worst kind RT @203: Q4) Images for images sake. #Irnchat
09:09:59 pm @282: q4) when there's 5 charts on one slide. am i supposed to be able to read those? #Irnchat
09:10:00 pm @112: RT @Irnchat: 5) What are barriers you encounter when trying to use more visuals? #Irnchat
#Irnchat
09:10:18 pm @293: RT @Irnchat: 5) What are barriers you encounter when trying to use more visuals? #Irnchat
09:10:18 pm @112: Q4 This is nitpicking, but using images together that don't have linking features (colour, style, or design style) drives me nuts #Irnchat
09:10:18 pm @92: RT @Irnchat: 5) What are barriers you encounter when trying to use more visuals? #Irnchat
09:10:33 pm @351: q4) No-nos or pet peeves when it comes to visuals: using them as sledgehammers to make points already made #Irnchat
09:10:39 pm @305: RT @Irnchat: 5) What are barriers you encounter when trying to use more visuals? #Irnchat
09:10:49 pm @29: @92 #Irnchat Stock art like anything else serves a purpose. not everyone has the time budget or skill to build their own
09:10:53 pm @112: Q5) Marketing some comes across your course and has a hissie fit. #Irnchat
09:10:53 pm @368: a5) Visuals are not resource neutral. That stuff costs \$\$\$. #Irnchat
09:10:54 pm @135: @205 mixing types of visuals can be done but watch flow and relevancy #Irnchat
09:11:16 pm @92: a5) using visual from one group for the duration of a document/presentation. #Irnchat

Figure 12. A chat excerpt demonstrating the timelag involved in switching questions. The first answer to question 5 (Q5) came 68 seconds after the question was posed as participants were still distracted by ongoing answers and debate related to question 4 (Q4).

Sometimes a particular question generated intense discussion and the participants had difficulty moving on. Sometimes other participants made attempts to remind others of the current topic if they had gotten particularly off track such as this tweet: “09:01:55 pm @349: Reminder of the current question. 3) What topics would you like to see

#lrnchat explore this year?” (Jan3#lrnchatOn#lrnchat). This again points to the “fire hose nature” of this medium and the need to understand mechanisms that users evolve to deal with it as will be discussed in Phase Three.

Overall, the *#lrnchat* discussion was highly structured with pre-determined questions. The moderation, however, was light and the moderator did not prevent participants from continuing the discussion of a previous question even though a new question had been introduced. The discussions were, for the most part, able to tail off organically and shift to the next topic. Occasionally other participants would provide a gentle reminder of the current question to try to keep to the structure and move everyone forward. Other success strategies and coping mechanisms like this one are discussed further in the next section.

Success Strategies and Coping Mechanisms

To make their Twitter chat experience successful and overcome the inherent challenges of the Twitter chat experience, participants mentioned numerous strategies they implemented proactively prior to a chat. I labeled these proactive actions “success strategies”. They also mentioned numerous actions they took reactively after a chat which I labeled “coping mechanisms”.

The challenges surfaced by the participants within the chat transcript that formed the basis of this study included:

1. Annoying followers with high volume, nonsensical tweets
2. Low personal connections in a virtual forum

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3. Conversation limited to 140 character tweets
4. The group being small and non-diverse
5. Participating from time zones around the world
6. Distractions from responsibilities (family, work, etc.) outside the chat
7. Slow typing speed made it difficult to keep up with the conversation
8. Catching up with the chat if joined late
9. Feed was too fast and volumes were too high
10. Forgot to use hashtag
11. Thinking on feet
12. Others said what they were going to say
13. Spam
14. Forgot that chat was happening
15. Intimidated by topic
16. High time commitment

For each of these challenges, participants indicated success strategies – proactive measures they took prior to the chat to overcome the challenge – and/or coping mechanisms – reactive responses to compensate for the challenges. (See Table 10.)

Table 10

Success Strategies and Coping Mechanisms Employed by Participants to Overcome Challenges to Learning through Synchronous Microblogging

	Challenge	Success Strategy Prepared in advance	Coping Mechanism Reaction during or after
1.	Flood Twitter feed with chat tweets – risk annoying or losing followers	Warn followers in advance	
	Example	<i>08:43:15 pm @14: I'm in #lrnchat tonight Twitter pals. Sorry for any temporary feed clogging. (Dec20Resolutions)</i>	

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2.	Low personal connections in a virtual forum	Follow other participants on Twitter (including #lrnchat Twitter list) Read their blogs Meet in-person at conferences	
	Example	<p>09:26:08 pm @214: If you're not on the #lrnchat list & should, pls let me know. http://t.co/SSkC4nkr. Always a fantastic stream! (Jan3#lrnchatOn#lrnchat)</p> <p>09:12:59 pm @153: A5) If you like someone's input, make a connection and engage them outside of #lrnchat (Jan3#lrnchatOn#lrnchat)</p> <p>09:29:50 pm @135: #lrnchat thanks everyone. Hope to meet some of you at Learning Solutions in Orlando (Jan10Visuals)</p>	
3.	140 character limit is a challenge	Extend chat beyond Twitter	Write concisely
	Example	09:00:13 pm @95: @349 Agree re: what people actually are doing. Another vote for blog or similar vs 140-char bite. #lrnchat (Jan3#lrnchatOn#lrnchat)	08:39:46 pm @275: a1) admit I kinda like the challenge of saying something meaningful in a few short words #lrnchat (Jan3#lrnchatOn#lrnchat)
4.	Group is small and non-diverse	Invite others to join by sharing with followers in advance of chat	Invite followers to join chat after it has started
	Example	08:50:58 pm @92: a2. I think it could benefit from more participants, we need to spread the word! #lrnchat (Jan3#lrnchatOn#lrnchat)	09:30:59 pm @172: RT @14: L&D peeps in #etmooc might be interested in tonight's #lrnchat (in progress) on the differences between Academic and Corporate Learning (Jan17CorpAcademicLearning)
5.	Time zone	Finding a chat that is suitable to their time zone or getting chat to change time	Stay up late or join late/leave early
	Example	08:47:01 pm @121: 2) Knowing full well that that we can never please everyone...A different time slot. #lrnchat (Jan3#lrnchatOn#lrnchat)	08:54:40 pm @264: @203 doing ok, it's almost 2am here so might not last the pace on #lrnchat tonight/this morning (Dec13Gifts)
6.	Other responsibilities outside of chat were a distraction	Plan to participate from somewhere without distractions	Come late, leave early, dive in and out – others tolerate this
	Example	08:49:44 pm @107: RT @349: Doing #lrnchat from my car in a parking lot. #dedication.>>talk about dedication. you should find a bar #lrnchat (Dec13Gifts)	09:25:56 pm @261: Ugh apologies #lrnchat- ters. My 10 yr old got whacked in the mouth on the way to bed. Dealing with the fallout... until next week. (Jan17CorpAcademicLearning)
7.	Typing speed	Use keyboard with mobile devices	
	Example	<p>09:00:33 pm @10: Argh. Got a Samsung Tablet for Xmas and cant type quick enough to contribute to #lrnchat conversation #shakesfist</p> <p>09:05:08 pm @104: @10 you need a bluetooth keyboard, I have one with my iPad and use it when I need to type quickly #lrnchat (Jan3#lrnchatOn#lrnchat)</p>	
8.	Missed some of chat when joining late	Ask others for a recap	Read transcript
	Example	09:23:59 pm @67: Hi #lrnchat! Just busting free for the evening. Have we reinvented ourselves yet? (Jan3#lrnchatOn#lrnchat)	09:33:52 pm @233: QW/rp) So disappointed I missed so much of tonight's session. Looking forward to the recap. {name withheld} in Chicago – over and out! #lrnchat (Jan17CorpAcademicLearning)
9.	Feed was too fast and volumes too high	Do not read everything – skim and dive	Read transcript

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		Use feed reader	
	Example	<p>09:22:30 pm @203: @10 don't try to read it all. That's a recipe for a headache. #Lrnchat (Jan17CorpAcademicLearning)</p> <p>09:23:14 pm @351: @10 @136 TweetChat is another great tool for trying to track and participate in this sort of live exchange. #Lrnchat (Jan17CorpAcademicLearning)</p>	<p>09:09:29 pm @147: @95 people new to twitter have said they read the transcripts, but I would think that'd be more daunting than live chat #Lrnchat (Jan3#LrnchatOn#Lrnchat)</p>
10.	Forgot to use hashtag		Repost tweet
	Example		<p>08:34:41 pm @275: a0) that I *still* can leave off the hashtag (doh!) #Lrnchat (Jan10Visuals)</p>
11.	Hard to think on feet	Ask for questions in advance	Relax and do not try to be perfect
	Example	<p>09:12:08 pm @92: 5. knowing the topics in advance #Lrnchat. b/c I'm new-ish to the industry it would give more of a chance to get to Q's 4-6. #Lrnchat (Jan3#LrnchatOn#Lrnchat)</p>	<p>09:09:06 pm @275: @349 repeat after me "this is not a test" #Lrnchat (Jan3#LrnchatOn#Lrnchat)</p> <p>09:23:07 pm @282: q6) well, I have a bunch of faves but for some reason the minute u asked the question their names escaped me. #feelingstupid #Lrnchat (Jan10Visuals)</p>
12.	Others said it better		Acknowledge and/or retweet
	Example		<p>08:54:37 pm @308: @351 yes. You said it much better than I did. {grinning emoticom} #Lrnchat (Jan17CorpAcademicLearning)</p>
13.	Spam	Structure chat so plugs are at end only	Ignore or react with humour – sarcasm – make unwelcome
	Example	<p>09:25:27 pm @Lrnchat: QWrap) It's that time again. Please re-introduce yourself. (Shameless plugs welcome.) #Lrnchat (Dec20Resolutions)</p>	<p>09:14:32 pm @95: Handy feature of twitter chat: you can spot marketeers busily self-promoting despite no conex whatsoever to topic. #Lrnchat (Jan3#LrnchatOn#Lrnchat)</p>
14.	Forget that chat happening	More reminders or emails to notify participants about chat – use of email list	Apologize if joining late
	Example	<p>09:24:12 pm @153: @349 we are working on improving the Twitter feedback to bring more reminders to you #Lrnchat (Jan3#LrnchatOn#Lrnchat)</p>	<p>08:54:52 pm @352: Hi you guys...sorry I'm late! Whatcha chattin bout? #Lrnchat (Jan3#LrnchatOn#Lrnchat)</p>
15.	Intimidated by topic	Research in advance	Lurk rather than tweeting
	Example	<p>09:07:38 pm @349: I should have looked over the transcripts for 2012. I feel unprepared for the questions. #Lrnchat (Jan3#LrnchatOn#Lrnchat)</p>	<p>09:04:47 pm @92: 4. so far I haven't been bored with a topic but I have sat back b/c it was over my head. #Lrnchat still want to learn! (Jan3#LrnchatOn#Lrnchat)</p>
16.	High time commitment	Reduce duration of chat	Join late or leave early
	Example	<p>09:27:13 pm @67: Love the 60 minute format, people! Let's hear it for the hour! #Lrnchat (Dec20LearningGifts)</p>	<p>09:04:45 pm @352: I come in late and I leave early. Sorry guys, but gotta go!!! This is {name withheld} in Chicago signing off #Lrnchat (Jan3#LrnchatOn#Lrnchat)</p>

Since most of the participants were active Twitter users, many with large numbers of followers, their participation in the chat also generated a “firehose effect” in their

followers twitter feeds. To avoid annoying their followers or even losing followers due to the volume of tweets they would be sending out during the chat, participants issued warnings to their followers and apologizing in advance to let them know to expect a lot of tweets that would not make sense unless the followers were also part of the chat. To compensate for the low personal connections inherent in this type of online forum, the participants sometimes followed the other participants on Twitter so that they could read their tweets and interact outside of the chat. The participants also sometimes followed other participants' blogs and even made arrangements to meet in-person at conferences.

The success strategy suggested by some participants to help overcome the challenge of the 140 character limit to communication on Twitter was for participants to extend the chat beyond Twitter into a blog or Google+ hangout. This suggestion was not implemented during the course of this study. It is likely that the unique characteristics of microblogging such as concise statements, lack of impact on email inboxes, synchronous and asynchronous capability, and exponential outreach, etc., provide unique affordances not available with other tools. Instead participants coped by focusing on being as concise as possible with their tweets. Given the relatively small and non-diverse nature of the group, the participants promoted success by publicizing the chat and inviting their followers to join.

Some *#hrnchat* participants suggested changing the timing of the chat, but this was not implemented during the course of this study. A synchronous Twitter chat, being global nature, has no optimum timing. The chat will always take place at an inconvenient time for someone in the world. To cope with the challenges of chat timing, participants

reported staying up late, joining the chat late, or leaving early to accommodate the demands of conflicting schedules outside of the chat. Knowing that other responsibilities were a distraction, some participants planned to participate from places without distractions. Participants, especially those participating from tablets, mentioned struggling to keep up with the chat as making comments without a keyboard was a slow means of input. The chat had a high time commitment (generally 90 minutes) and the participants experimented with a 60 minute session to reduce that commitment.

When participants joined late, rather than skim through the Twitter feed themselves, some returning members had built a strong enough connection with the other members to be comfortable asking others to catch them up. This worked best when done with humour. This is a typical exchange when returning participants join late:

```
Jan 17 - 09:03:57 pm @280: Good evening. {name withheld} here. What we talking? #lrnchat
...
Jan 17 - 09:04:56 pm @203: RT @280: Good evening. {name withheld} here. What we talking? < academia vs
org learning in a cage fight #Lrnchat
...
Jan 17 - 09:06:11 pm @280: @203 whose winning? #lrnchat
...
Jan 17 - 09:06:30 pm @275: RT @280: @203 whose winning? #lrnchat < we are, they're both losing
```

Figure 13. Exchange between two chat participants, one of whom joined late and turned to the other for a recap to help catch up with the conversation.

If participants forgot the chat was happening they also coped by apologizing when joining late. Some suggested that more reminders or emails to notify the participants about the chat would be a proactive way to help them remember.

For latecomers, the ability to review an asynchronous transcript was valuable although daunting as well. In the January 3rd chat, participants discussed the value of the transcript:

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09:08:18 pm @95: @349 My hunch (completely w/o evidence) is that the transcript (a good idea) gets read maybe 4 times per week. #lrnchat
...
09:09:16 pm @349: @95 True, but I will admit I've looked to it to see the questions I've missed or refresh on a response. I value it. #lrnchat
...
09:09:29 pm @147: @95 people new to twitter have said they read the transcripts, but I would think that'd be more daunting than live chat #lrnchat
...
09:10:00 pm @203: @95 @349 I'd agree with your transcript estimate. #lrnchat
...
09:10:02 pm @275: @147 @95 agree that reading transcripts would be harder for me than live chat (no chance to respond! {grinning emoticom} #lrnchat
...
09:10:30 pm @95: @147 Agree re the daunting. I think their greatest value to is find that reference (or crack) you'd meant to save. #lrnchat
...
09:10:30 pm @235: I find the transcripts harder to follow. #lrnchat
...
09:10:33 pm @153: A5) I consistently pull references to other materials (books, websites, tools) from the discussion for review later #lrnchat
...
09:22:08 pm @214: Thanks to every #lrnchat -er for your ongoing participation. I don't have many of these Thurs eve drop ins anymore but love reading thru.

Figure 14. Participant discussion of the value of reviewing the #lrnchat transcript after the chat to see questions the participants missed or to find references or websites they want to review.

While reading the transcript provides a way to recap any parts of the chat the participants missed, the actual text is extremely long and rather cryptic. As questions are interspersed it can be a challenge to decipher the content.

In most of the chats, participants referenced the overwhelming nature of the chat volume on the Twitter feed. On January 17th, they had an extended discussion about how to cope:

09:04:35 pm @149: Between #Lance, #CasinoHamOnt, and #lrnchat, my twitter feed is like trying to drink from Tew Falls.
...
09:09:54 pm @92: @10 @136 This chat seems to be cruising right along! #lrnchat
...
09:14:47 pm @351: Oops; missed another 5 minutes of content RT @92 This chat seems to be cruising right along! #lrnchat
...
09:15:06 pm @136: @319 I did a paradigm shift without a clutch, unfortunately #lrnchat @10
...
09:17:01 pm @10: @136 Thanks for that link, I'll check it out. Tweet conversation going too quickly for me to digest it all #lrnchat
...
09:19:22 pm @136: @10 I haven't done this in a while and it takes some effort – a real skill to monitor all these threads #lrnchatJan 17 - 09:18:38 pm @170: @136 my first time at #lrnchat too! It is intense!!!
...
09:20:15 pm @136: @170 you have to find your own rhythm {grinning emoticom} #lrnchat
...
Jan 17 - 09:23:21 pm @136: @10 hey, I'm just on the web interface right now – dipping in and ignoring 90%

```

#lrnchat
...
09:22:23 pm @275: @136 @170 don't try to drink from the firehose, just sip #lrnchat
...
Jan 17 - 09:22:30 pm @203: @10 don't try to read it all. That's a recipe for a headache. #Lrnchat
09:27:05 pm @170: RT @275: don't try to drink from the firehose, just sip #lrnchat << great advice for #lrnchat
and life!
...
09:29:13 pm @112: RT @170: RT @275: dont try to drink from the firehose, just sip << great advice for #lrnchat
and life! #lrnchat
...
09:29:13 pm @203: QWrap) thanks for a great rapid-fire chat everyone! {name withheld} from NY. Hope to see
some of you at #ASTDTK13! #Lrnchat
...
09:30:58 pm @107: Thanks for helping me to survive my 1st #lrnchat! Hope to learn lots of new tidbits
again...Gonna spend some valuable time reflecting! =)
...
09:35:59 pm @170: Great chat about Corporate Trng vs. Higher Ed on #lrnchat lots of new things to think about!!
Adding to things-to-do on Thursday

```

Figure 15. Extended discussion of participant strategies for coping with the high volume of tweets and retweets in a Twitter chat.

Even experienced participants were sometimes overwhelmed by the volume of tweets: “08:38:29 pm @92: how am I already baffled?...#lrnchat” (Jan10Visuals). Trying to keep up with the high speed of the chat caused participants to make mistakes, like writing a tweet and forgetting to add the #lrnchat hashtag so that the tweet missed the chat stream. Some participants found it difficult to ‘think on their feet’ and would have liked it if the questions had been shared in advance so that they could have prepared. As this was not the practice of #lrnchat during the period of this study, the participants advised newcomers to relax and not try to write the perfect post. If they took too long to write their posts they sometimes found that others had already made the point they were planning to make. A few mentioned lurking rather than tweeting as they were intimidated by a given topic.

Spam postings were another challenge for the chat participants. The #lrnchat moderators tried to set the chat up for success by structuring it in such a way that ‘plugs’ or self-promoting comments were kept to the end of the chat. Participants generally ignored spam tweets or, if they acknowledged them it was with humour or sarcasm.

Overall, for every challenge posed by the synchronous microblog format, participants or moderators were able to implement some form of formal or informal success strategies (proactive measures) and coping mechanisms (reactive responses) to allow the participants to learn through the chat format.

Summary

Twitter was not designed with learning through synchronous chat in mind, but motivated individuals have used it to come together with other like-minded professionals and have adapted it to those purposes.

The results of Phase Two found the Twitter chats were characterized by low levels of formality, high levels of topic focus, paradoxically tight and loose relationship-building, medium levels of resource sharing, and high structure. Low levels of formality were evidenced by frequent use of humour, emoticons, casual language, short forms, acronyms, and nicknames. While the moderators ensured a high level of topic focus from week to week by identifying clear topics, the overall purpose and topic focus of the chat itself resulted in less consensus. *#lrnchat* developed relationships by use of consistent welcoming and ending messages including introduction invitations at the start of the chat and invitations for participants to re-introduce themselves and engage in self-promotion at the end of the chat. The relationships varied between a highly connected, long-term group of participant/moderators and very loosely connected participants who might participate in the chat only once and never return. Participants shared a wide variety of resources with others including links, tools, books, products, blogs, suggestions of Twitter handles to follow, professional associations, events and webinars, and

professional techniques. The overall nature of social aggregation in a Twitter chat is something different than a PLN which is informal and composed of hand-selected people who help meet an individual's learning needs.

Participants also mentioned many challenges inherent in the Twitter chat experience itself. For many of the challenges, the participants indicated potential success strategies – proactive measures they took prior to the chat to overcome the challenge – and/or coping mechanisms – reactive responses to compensate for the challenges. The nature of group membership in Twitter chats and the success strategies and coping mechanisms employed by participants to engage in successful learning experiences are discussed further in Phase Three results.

Chapter VI – PHASE THREE RESEARCH FINDINGS

Phase Three involved qualitative analysis of interview transcripts and written short answer responses provided by a theoretical sample drawn from the top ten participants per week, as identified in the Phase One quantitative analysis. (See Table 3.) The interview questions probed the participants' motivation for participating in the Twitter chat. Similar to Phase Two, Phase Three surfaced participant comments related to group membership including the formality of the group, the degree of topic focus, the amount of relationship-building that was evident, the level of resource sharing, and the amount of structure built in to the discussion. The Phase Three questions also related to sensemaking, including strategies the participants used to make sense of the discussion and cope with the volume of tweets typical of a *#lrnchat* Twitter discussion, as well as their opinion of whether the synchronous chat experience resulted in socially constructed knowledge. (See Appendix B).

Motivation

Phase Three participants were asked what prompted them to participate in *#lrnchat*. Their motivations included pursuing their own professional development, making global connections, curiosity about the technology and the experience of synchronous chatting, and desire to interact with experts in the field. (See Table 11.)

Table 11

Participant Motivation for Joining #lrnchat

Motivation	Example
Professional	@InterviewA: It was an avenue for professional development that I didn't really see elsewhere.

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development @*InterviewC*: Probably two or three years ago I started participating in #lrnchat and it was really because I had switched roles from performance consultant to training manager. In that I was introduced to technology and the need to become more familiar with technology, whether it be WebEx environment or whether it be leveraging conference call technology or elearning technology. And of all of those the elearning technology probably was the most intimidating. So I heard about #lrnchat - somebody had mentioned it either in an ASTD group or somewhere else, I can't remember exactly. And so I decided to join it one evening and, um, and so I did it more to improve my skills and my knowledge around leveraging technology. Probably a second motivation was really learning more about social media and how you could leverage it in a training environment. And I'm still a novice, but I am learning every day.

Global networking @*InterviewA*: No, maybe just for my money and to be involved with the conversation across the, well really across the world at the same time is pretty staggering and the fact that you know we're all following a certain set of questions at the exact same time I think is a tremendous tool that not enough people take advantage of

 @*InterviewD*: Great way to network with people in my field overseas

 @*InterviewF*: I have found interacting with other learning professionals around the world such a rewarding experience that I continue to participate.

Experiment with technology @*InterviewB*: So, so in part I was already familiar with what you could and could not do within the Twitter context and I was curious to see how this might work out because as I was saying in our previous answer to this question, it's difficult to sustain a conversation either over time or through a larger audience on Twitter. You know, you just don't have the ability to fit in a lot of nuance and so I was curious about what it might turn out to be. And I was actually originally fairly skeptical, skeptical of the idea but I had you know regard for the people who were involved in kicking it off. So that was kind of my motivation for joining. Let's see what happens and what can I get talking to people some of whom I already have regard for.

 @*InterviewD*: My main driver was to participate in a real time tweet chat and "see it for myself". It was for my own experience and development to use a social tool to network and find some new ideas to apply to my work – and meet some people and have a bit of fun!

Access to experts @*InterviewB*: I'd been on Twitter for a while when #lrnchat first came up and I knew several of the people who were involved in getting it off the ground like {name withheld}, {name withheld} and {name withheld}. And most of them I knew almost exclusively through online connection. I

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don't think I'd met {name withheld} by the time it started. I had not met {name withheld} I know that.

@InterviewE: Really interested in the people who were involved

@InterviewF: What attracted me to #lrnchat were the main organisers: {name withheld} and {name withheld}. I have met both {name withheld} and {name withheld} in person, and I really respect their knowledge and experience as well as their friendliness. So initially I just wanted to support what they were doing with #lrnchat and maintain contact with them.

@InterviewC: Some of them I've connected with and I'll follow them for a while. @203 is one that comes to mind I think that I can mention names here. But there's certain people in this #lrnchat that are nationally known. When I went into that, I did not realize that. I had a friend of mine here recently who was talking about a conference that was coming up and I looked at a lot of the speakers and <laughs> a lot of them were from #lrnchat. So these folks who are participating, these are serious folks. And they are very knowledgeable and so when they put out a link I usually find it by reading it I get more knowledge and I learn from that.

Some participants indicated that they were interested in participating in *#lrnchat* due to a desire for further professional development. One participant was new to his role and engaged in *#lrnchat* as a way to increase his level of technical competency. Other participants were attracted to *#lrnchat* by its global nature. The chat provided a way to connect with individuals from the same field in other countries. Several of the participants indicated that they were curious about the technology and the experience of participating in a synchronous chat, so *#lrnchat* was a means to learn more about synchronous microblogging. Finally, several of the participants indicated that they personally knew or were aware of the main organizers of the chat who are well-known within learning and development circles. The participants had high esteem for these individuals whom they considered experts in the field, and were interested in an

opportunity to learn more from them through the chat experience. The participants were also attracted by the chance to get to know these experts more personally which they felt was possible through engaging in a Twitter chat. The nature of group membership is discussed in more detail in the next section.

Social Aggregation

Similar to Phase Two, in the third phase of this study I also analyzed the interview and short answer responses for comments related to group membership, particularly around formality, focus, relationships, resources, and structure. The findings of Phase Three validated the Phase Two results. (See Table 12.) The results of both phases indicated that the synchronous microblogging chat experience is characterized by low levels of formality and the same paradoxically tight and loose nature of relationships. Participants reported feeling close to each other, or to ‘thought leaders’ who were participating, even though they had never met in-person.

Table 12

Comparison of Social Aggregation Characteristics Identified in Phases Two and Three

	Phase Two (content analysis)	Phase Three (participant perception)
Formality	Low	Low
Focus	High	High
Relationships	Tight/Loose	Tight/Loose
Resource Sharing	Medium	High
Structure	High	Medium

While the interview participants indicated a high degree of topic focus from week to week, due to the structured questions, they also indicated a desire for still higher topic focus and greater depth to the conversations. The interview participant's perceptions of the amount of resource sharing was higher than what was evidenced by the Phase Two study, in particular their perception of the number of links and hashtags included in chat tweets was higher than the actual number identified in Phases One and Two. The participants also indicated that the level of structure was tempered by the low level of central authority employed by the moderator. Overall, the Phase Two and Phase Three findings related to social aggregation were consistent.

The first question of Phase Three was, "Please describe what being a member of *#lrnchat* is like." The responses confirmed the results of Phase Two, with the participants describing *#lrnchat* as having a low level of formality. *@InterviewB* indicated, "Well, I think there's an interesting angle to that which is that in one sense there's no such thing as membership in *#lrnchat*. As you know, anybody who happens to trip across the hashtag, um, can start following that". Likewise, *@InterviewE* noted that, "It is a very casual relationship – I have met some great people and that is the real benefit. I don't feel any pressure around this membership or obligation". Finally *@InterviewC* contrasted Twitter chats like *#lrnchat* with more formal association membership and found that Twitter chats are much less formal:

Membership in *#lrnchat* is, I don't consider myself a member so much as I consider myself a frequent visitor. And it's a kind of group where you can come in and out of without feeling the total obligation of membership so to speak. And

so typically when I think of membership I think of having to pay dues, I think of having to contribute, I think of having to give to the organization and sometimes serve in the organization. But #lrnchat to me is a little different. I don't pay dues to attend. If I don't show up nobody calls me to ask where I was or why I haven't been showing up. If I do show up it's appreciated and you're just a part of the group. And so membership I think in #lrnchat for me is a little different. I am a member of other groups like ASTD local chapter and also a Toastmasters group. In both of those I paid to be a member. And I have served in leadership roles in those groups, but those expectations are not there with #lrnchat in my view.

...You mentioned membership and I said I don't think of it as membership. I have become an advocate of #lrnchat. So when I attend conferences with ASTD. I'm a leader within the chapter, president-elect for the {location withheld} chapter. If there's an opportunity to talk about a venue for people that are interested in technology and social media and learning and development, I will tell them about #lrnchat. And I've had several people who have joined the sessions as a result of that... I consider myself a frequent visitor, not a member, but I've thought of myself also to be an advocate for it because I think it's a great place for a different experience in learning that you won't get anywhere else.

Twitter chats do not have the same level of formality as other group types as participants are free to come and go with no long-term obligations for continued participation.

In terms of focus, participants found the high degree of niche subject focus to be professionally valuable. @InterviewA was motivated to participate in the chats due to the

subject focus, indicating that “they were discussing stuff that I thought was very interesting. Relevant to my professional career but also to my personal interests.” The same participant found focusing on the same questions with others to be valuable: “we’re all following a certain set of questions at the exact same time I think is a tremendous tool that not enough people take advantage of, but you know plenty of people abuse unfortunately.” In describing *#hrnchat*, some participants perceived a slightly lower level of subject focus than I identified in the Phase Two qualitative analysis. *@InterviewC* found the questions rather general:

A lot of times the chats were very, they were very open-ended in terms of the questions. And so for example, I participated tonight and, you know, quite frankly, sometimes I’ll walk away from it if you were to ask me what we talked about it may not... <laughs> it may be so fresh that I’m not really able to answer that because, I mean you say what did you really learn from that?

Likewise, *@InterviewB* touched on the lack of depth of the conversation, rationalizing that Twitter chats are not the place for deep discussions:

There will not be a great deal of depth, which, usually frustrates the very analytical or the very serious. But I don’t think, I don’t think it’s the place for that. Um, you can’t, you can’t do that. You know, you can’t, you can’t hold people’s attention necessarily in that unless you really had a very small and disciplined group. Those are the things, and if you don’t like the topic that’s fine, you know, come back next time if you’re curious around the field around which the Twitter chat focuses because as you know there’s hundreds and hundreds of Twitter chats.

Both participants, while desirous of engaging in deeper conversations in the course of their professional work, had set their expectations lower for Twitter chats and, having done so, were as a result very satisfied with the experience. With the lower investment in time and resources required to participate in a Twitter chat, the results do not have to be stellar to be worthwhile. The subject focus was high enough to be relevant professionally, and the opportunity to discuss professional topics with like-minded individuals, including global experts, seemed to outweigh the lack of depth. The perception of the degree of relationship-building evidenced in these Twitter chats is discussed further in the next section.

Relationships. Participants indicated that much of the motivation for participating in #lrnchat was rooted in a desire to interact with other likeminded professionals. New participants found the experience welcoming and returned again because it became fun. (See Table 13.)

Table 13

Participant Perspective on Relationship-Building Aspect of #lrnchat

Relationships	Example
Likeminded	<i>@InterviewA:</i> I started using Twitter just to kind of follow people in the learning environment...
Individuals	<p data-bbox="397 1396 1317 1480">So that's how I got started. I was looking for something to kind of develop and discuss with likeminded folks.</p> <p data-bbox="397 1522 1317 1753"><i>@InterviewA:</i> It's interesting because it allows me to have a direct connection to some considerable thought leaders. Some people that are prevalent in the community... in the learning community that I would never have the opportunity to otherwise. So it's kind of exciting when I see them you know recognize comments that I put in there. Um, you know it kind of validates a little bit of my own thoughts I guess.</p> <p data-bbox="397 1795 1317 1841"><i>@InterviewB:</i> Even prior to #lrnchat a lot of my professional connections had kind of moved from</p>

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the formal, ah, professional organization kind of thing where you meet people in conferences and local chapters and things like that to many more virtual connections, first via Facebook and then later via Twitter. So that I'd been on Twitter for a while when #lrnchat first came up and I knew several of the people who were involved in getting it off the ground like {name withheld}, {name withheld} and {name withheld}. And most of them I knew almost exclusively through online connection. I don't think I'd met {name withheld} by the time it started. I had not met {name withheld} I know that. So, so in part I was already familiar with what you could and could not do within the Twitter context and I was curious to see how this might work out... So that was kind of my motivation for joining. Let's see what happens and what can I get talking to people some of whom I already have regard for.

@InterviewE: Really interested in the people who were involved.

@InterviewF: What attracted me to #lrnchat were the main organisers: {name withheld} and {name withheld}. I have met both {name withheld} and {name withheld} in person, and I really respect their knowledge and experience as well as their friendliness. So initially I just wanted to support what they were doing with #lrnchat and maintain contact with them. Since then, I have found interacting with other learning professionals around the world such a rewarding experience that I continue to participate.

@InterviewF: Being a member of #lrnchat is about being a part of a community. It's good to know that there are plenty of other professionals out there like you with the same questions and the same challenges, but also with perspectives and ideas that you wouldn't have thought of yourself. It feels good to share and learn from each other.

@InterviewD: Great way to network with people in my field overseas

Welcoming *@InterviewA:* Everybody was quite welcoming.

Atmosphere *@InterviewB:* What I have noticed is among the people who are regulars, names that I recognize time and again and I recognize several dozen people who are frequenters of #lrnchat is when somebody new comes in and says gee, what is this chat really about, somebody will give, two or three people will give them a quick summary and a couple people will send them a link to the home page so they get some idea of what's going on. So it's fairly welcoming to people who actually want to participate... If you're a new person, at your, either new in your field or new to the idea of conference going and you go to the conference you can feel hesitant and my experience has tended to be people are fairly welcoming to having someone come up and

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join. It's not all that exclusive.

@InterviewC: I found myself kind of, not, well I should say seeking some sort of feedback loop in terms of comments that I was making seeing that some people liked those comments or they appreciated those comments. And I think that in turn kind of built my confidence to continue to come back. I think if I'd experienced just the opposite where if somebody said oh you're stupid or that's the craziest thing I've ever heard or what planet did you come from or are you from Texas <laughs> then I think I might not have come back to the Twitter chat or to #lrnchat.

Fun *@InterviewD:* My main driver was to participate in a real time tweet chat and "see it for myself". It was for my own experience and development to use a social tool to network and find some new ideas to apply to my work – and meet some people and have a bit of fun!

@InterviewD: Fun! It's like being welcomed every week to a collegiate group of friends whom I never met personally but it's where you go every week for your own piece of personal and professional development

@InterviewA mentioned that "I started using Twitter just to kind of follow people in the learning environment... So that's how I got started. I was looking for something to kind of develop and discuss with likeminded folks." Once *@InterviewA* joined, the participant realized that the chat attracted and provided access to experts in the field:

It's interesting because it allows me to have a direct connection to some considerable thought leaders. Some people that are prevalent in the community... in the learning community that I would never have the opportunity to otherwise. So it's kind of exciting when I see them you know recognize comments that I put in there. Um, you know it kind of validates a little bit of my own thoughts I guess.

Providing this kind of direct interaction with ‘celebrity’ Twitter participants is one of the keys of Twitter's success and one of the paradoxes when examining the nature of relationships in Twitter chats. Participants can feel very close to the others involved in the chats and gain access to experts they would never be able to contact otherwise, but the nature of the relationship differs person to person. Twitter provides an entrée into the development of a close relationship, or the illusion that such a relationship has been established by virtue of the ‘follow’ function.

Other participants, rather than being surprised to find well known individuals participating in *#lrnchat*, were actually drawn to the chat precisely because they knew these individuals were participating. *@InterviewB* indicated that:

even prior to *#lrnchat* a lot of my professional connections had kind of moved from the formal, ah, professional organization kind of thing where you meet people in conferences and local chapters and things like that to many more virtual connections, first via Facebook and then later via Twitter. So that I'd been on Twitter for a while when *#lrnchat* first came up and I knew several of the people who were involved in getting it off the ground like {name withheld}, {name withheld} and {name withheld}. And most of them I knew almost exclusively through online connection. I don't think I'd met {name withheld} by the time it started. I had not met {name withheld} I know that. So, so in part I was already familiar with what you could and could not do within the Twitter context and I was curious to see how this might work out... So that was kind of my motivation

for joining. Let's see what happens and what can I get talking to people some of whom I already have regard for.

Despite being a text-based, 140 character limited discussion, the participants did indicate that some elements of relationship-building were present. *@InterviewB* found it was possible to “get some idea how does this person think? What is this person saying? What are they sharing? Ah, so you get some insight into the individual.” Twitter chats have the paradoxical ability to provide a feeling of intimacy with others, including experts, while the participants have never actually met them.

Many of the study participants also indicated that *#lrnchat* had a welcoming atmosphere. *@InterviewA* mentioned that “everybody was quite welcoming”. *@InterviewB* elaborated on this by indicating that when new participants join “two or three people will give them a quick summary and a couple people will send them a link to the home page so they get some idea of what's going on. So it's fairly welcoming to people who actually want to participate... If you're a new person, at your, either new in your field or new to the idea of conference going and you go to the conference you can feel hesitant and my experience has tended to be people are fairly welcoming to having someone come up and join. It's not all that exclusive.” *@InterviewC* found that positive feedback from the other participants “kind of built my confidence to continue to come back. I think if I'd experienced just the opposite where if somebody said oh you're stupid or that's the craziest thing I've ever heard or what planet did you come from or are you from Texas <laughs> then I think I might not have come back to the Twitter chat or to *#lrnchat*.”

Overall, the responses from the interview participants confirmed the tight and, at the same time, loose relationship experience in Twitter – the ability to feel close to those with whom you are interacting without actually meeting them in-person. As participants built relationships with each other, they also shared resources, as discussed next.

Resources. Participants found *#lrnchat* to be a valuable source of new resources, tools and ideas. *@InterviewB* used an analogy of conference sessions to describe *#lrnchat* resources:

So I don't think that the *#lrnchat*, coming back to our actual topic here, is necessarily going to be, ah, your primary source for information about things that are new, but it's more like, um, I guess to say going back to the conference analogy. I go to a conference and I find a third of the sessions that I sign up for I judge really worthwhile, that's fine for me, you know. I'll pick some sessions and I'll go there and they'll turn out not to be what I expected, but I can see the variation. Ok, that wasn't for me, too bad. And I'll go to some sessions and they really die and that's too bad. <laughs> And then I'll go to some because I don't know anything about topic x so I want to hear somebody talk about topic x. And I go there and perhaps I find some additional resources. Now I know somebody who is familiar with this and I can follow up with them. And you've got all of those things, I think, within the *#lrnchat* context, you know.

The power of the Twitter chat is that it can condense the experiences of a live conference down into 140 character bite-sized pieces that still retain at least some of the value of a live interaction. Participants indicated that *#lrnchat* provided other Twitter handles to

follow and mentioned or linked to tools and techniques that were new to the participants. Some participants even shared academic papers. (See Table 14.)

Table 14

Participant Perspective on Resources Aspect of #lrnchat

Resources	Example
Handles to Follow	<i>@InterviewB:</i> You may decide I'm going to start following this person
Tools	<i>@InterviewB:</i> Here's a place that I can perhaps come across somebody with great experience with some tool or some technique or some topic that I, myself, might not be that familiar with.
Links	<i>@InterviewB:</i> Some of the best contributors will link to resources that you can go and evaluate for yourself. <i>@InterviewB:</i> I'm not only going to share things and share my opinion, I'm going to share here's a resource that I have found helpful. Here's a link somewhere else. <i>@InterviewC:</i> I think boy that was a really good response, I need to hold on to that one. So I think learning takes place there as well. The other part I think has been valuable to me from it is I'm getting so many ideas about books to read, or people will put in sometimes in the tweets, they'll put in a link to a website, a link to an article, a link to a Harvard Business Review, a link to a video, a link to something that helps stimulate the thinking and further the thinking on whatever the topic is. And sometimes it's unrelated. So they may be promoting their own books, something that they've done and, um, and they they'll create a link there.
Academic sources	<i>@InterviewB:</i> He occasionally will dip in now and share stuff that he's done with regards to here's some educational research from peer-reviewed publications that supports x-y-z. So that's that's the kind of thing and I think this is a skill people begin to adopt when they are more active online.

The participants perceived that *#lrnchat* was a valuable source of links. This perception is, however, not supported by the Phase One qualitative analysis of *#lrnchat* transcript

which found that of the total number of tweets in the study's *#lrnchat* sample, only 4% contained links. This is lower than the 10% to 15% of chats found to contain links by Madrigal (2014) and the 21% identified by Hong, Convertino and Chi (2011).

Nonetheless, the participant responses in Phase Three did validate the significant level of resource sharing that is accomplished in a Twitter chat, even if those resources are merely mentioned rather than linked to. This is interesting in that the conversational nature of the synchronous chat may be more useful than the non-interactive sharing of resources common in asynchronous microblogging. The final element of group membership analyzed in this phase of the study was structure, as detailed in the next section.

Structure. The conversational nature of *#lrnchat* is promoted by a numbered questioning system used to structure the chat. Participants new to the chat quickly realize that questions are numbered and that they should label at least some of their answers with the corresponding answer number for easier flow of the conversation. *@InterviewA* indicated “at some point I saw somebody answer a question or send out a tweet with a number associating to it and a hashtag”. (See Table 15.)

Table 15

Participant Perspective on Structure Aspect of #lrnchat

Resources	Example
Low Control	<p><i>@InterviewB</i>: With Twitter chat there's very little authority. There's very little control. I remember some training and development guru who sat in, self-defined guru let's say who sat in on a Twitter chat and was quite disconcerted because he didn't see that the experts got to give their opinion. Anyone could speak up at any time. There was no talking stick so to speak. And he was right. There isn't any of that. There isn't necessarily an authority. I'm sure in some chats they try to keep much more closely to whatever the guiding principles are, but you can't control it. It's Twitter! So people are going to wander in and out and you have to expect a certain amount of</p>

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noise and confusion.

Question	<i>@InterviewA</i> : And at some point I saw somebody answer a question or send out a tweet with a
Numbering	number associating to it and a hashtag
	<i>@InterviewA</i> : Now specifically with #lrnchat they have a numbered system for questioning which makes it fairly easy

Lack of Depth	<i>@InterviewB</i> : It's difficult to sustain a conversation either over time or through a larger audience on Twitter. You know, you just don't have the ability to fit in a lot of nuance and so I was curious about what it might turn out to be.
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Conversational	<i>@InterviewB</i> : It's too hard to control the flow. That said, I don't see it that way. The analogy I make is, um, like the bar at a conference hotel, you know like for CSTD or something like that. After the main part of the conference, so you're wandering through the bar. You can tell there's a whole bunch of people who've been at the same conference you're at because they've got the stickers or handouts or something like that. And they're sitting around talking. They may be strangers to you, but some of them were presenters. Some of them were people you've bumped in to. And it's not hard to include yourself in some conversation if you so choose. And if the topic doesn't interest you well then you just kind of move on to another group or you think ok well <i>@InterviewC</i> : I think the stimulation of the conversation and the dialogue within the chat. There's something about being asked questions that make you think. And you're not judged. Sometimes you are actually rewarded <laughs> on answering the questions whether it's a good response or a bad response or and equal response. Rewarded in kind of a, kind of a strange way in that with Twitter they'll retweet it or they'll favourite it. Or you may even get a dialogue and somebody connects with you on Twitter because of the dialogue that took place that night.
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The #lrnchat chat moderators assert very little central control. *@InterviewB* mentioned a particular incident that highlights this:

With Twitter chat there's very little authority. There's very little control. I remember some training and development guru who sat in, self-defined guru let's

say who sat in on a Twitter chat and was quite disconcerted because he didn't see that the experts got to give their opinion. Anyone could speak up at any time. There was no talking stick so to speak. And he was right. There isn't any of that. There isn't necessarily an authority. I'm sure in some chats they try to keep much more closely to whatever the guiding principles are, but you can't control it. It's Twitter! So people are going to wander in and out and you have to expect a certain amount of noise and confusion.

Overall, the Phase Three participant responses are consistent with the findings of Phase Two: the chats, despite being conducted in 140 character bursts, are highly structured around questions and conventions. However, the interview participants did indicate that the chat is less structured than some more formal online learning experiences given the low level of central authority. In the next section, the results of the sensemaking elements of the study are shared.

Success Strategies and Coping Mechanisms

The Phase Three questions also probed the proactive actions the participants took to set themselves up for success when trying to make sense of the high volume of tweets as well as the reactive actions the participants took to cope with the often overwhelming stream of the *#lrnchat* Twitter feed. I also asked a question to identify whether, in the opinion of the participants, the chat socially constructed knowledge. The specific Phase Three sensemaking questions were:

1. *Sensemaking*: With the high volume of tweets in a chat and the short length of them, what strategies did you use to make sense of the discussion?

2. *Sensemaking*: What would you recommend those new to Twitter chats do to have a successful chat experience?
3. *Sensemaking*: In your experience participating in the *#lrnchat* Twitter chat, can you think of any examples where the chat generated new knowledge?

Overall, the participant responses confirmed the findings of Phase One related to success strategies and coping mechanisms. Participants mentioning success strategies such as doing advance research to learn about Twitter chats in advance of participating, setting up a Tweet reader, and adjusting for any time zone differences. When the chat starts, participants recommended focusing on the chat by removing other distractions, participating in the introductions then sitting back and watching first. Once new participants have grasped how the chat works, the participants indicated they should join in and tweet, follow others and involve other colleagues in the chat. In terms of coping mechanisms, the participants recommended avoiding arguments, reading quickly, favouriting tweets for later reference, not reading everything, and reading the transcript once the chat finished. These results are explained in more detail in the following two sections.

Success strategies. Success strategies are proactive actions the participants took to set themselves up for success when trying to make sense of the high volume of tweets and the overall Twitter chat format. Participants indicated that those new to *#lrnchat* could succeed by preparing ahead of time by learning about Twitter chats and how they work and make sure they adjust for time zone differences. (See Table 16.)

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Table 16

Participant Perspective on Success Strategies Employed in #lrnchat

Success Strategy	Example
Focus	<p><i>@InterviewA:</i> There's usually maybe three or four participants that I try to focus my attention on a little bit more. Because there are branching conversations as part of the larger conversation and I just kind of don't go down those rat holes quite as much so I just focus on the handful that make leading conversations.</p> <p><i>@InterviewB:</i> One strategy is don't try and do everything because you can't. The comedian Steven Wright said one time 'you can't have everything, where would you put it'? <laughs> And so I think that really applies to Twitter, you know and people think oh oh there's all those gems and they'll mark stuff favourite, favourite, favourite, favourite, favourite. And then they go into their favourites and they have 4,000 favourites and they discover that the favourites is just the junk drawer of the Internet.</p> <p><i>@InterviewB:</i> So that lets you filter and now you can focus on just what's inside the chat.</p> <p><i>@InterviewC:</i> I think for me it is staying involved. I find myself I kind of hunker down here and I know for an hour I'll be on it. So if I haven't eaten I'll put a sandwich on the table. If I don't, I'll make sure I have something to drink. Sometimes since it's Thursday night and we're getting ready for the weekend I may even have a glass of wine <laughs> and so that relaxes me.</p> <p><i>@InterviewB:</i> The first principle is you can't make sense of everything. It's just not possible. You know there's 700/800 tweets in an hour. That's more than 10 a minute. Um, and so as a result you have to be content with a) letting things flow by.</p> <p><i>@InterviewC:</i> It does, I think, for me it relaxes me in a way because it's a chance for me just to really think and listen to the questions and to respond. Think about what my response would be and sometimes I try to think of clever responses and sometimes I just try to, you know, put forward straight forward responses.</p> <p><i>@InterviewC:</i> I think in terms of having a good experience again, I would say kind of position yourself to be there just like you would in a meeting for the next hour. Because if you start multi-tasking and you start reading your Facebook and you start going to the other room to get some more food. Or you start picking up the phone, you know you get a phone call, and divert from</p>

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that then you really lose your momentum in the chat. So I would suggest to somebody who's new to treat it kind of like a meeting. I'm going to be here for the next hour, I'm going to participate, I'm going to be engaged, I'm going to be involved. And I think what you get from that is the return on that will come back to you because you did that.

Introductions *@InterviewA:* They offer... or they ask for introductions at the very beginning so maybe jump in with an introduction and then just kind of sit back and watch stuff goes.

Tweet
Readers *@InterviewB:* I use Tweetchat myself in a Twitter chat just to filter out everything else that's not in the hashtag and the advantage of Tweetchat for me is that it automatically appends the hashtag so I don't forget.

@InterviewC: Well, first and foremost I used TweetChat. And the reason I used TweetChat is it allows me to view the continuous feedback loop or the different messages that are coming across from different people. It also allows me to input my messages and then see responses to those or to either tweet, retweet or favourite different comments that are coming through the messages. So, it took me a little while to kind of figure out the TweetChat. I've heard there's other technologies that do similar things but I've tended to stick with TweetChat and it's just because it's easy to do it. Now what I can't do is walk away for too long of a period of time and I become disconnected from the conversation. So TweetChat allows you to kind of stay tuned and sometimes you can pause it so that it will pause at that moment and then when you move it on it all the sudden different chats come up from the last where you left off and you can quickly kind of scroll down and kind of get the feel of the conversation. But if you're gone for more than five or ten minutes you really lose your kind of energy in the conversation.

@InterviewD: I had been using Hootsuite for a while and people confirmed that they used tools like this or Tweetchat. I was lucky to use this tool from the start so I didn't find it so daunting. However, I have seen others who give up because they feel lost with it all and in those cases, I've been more than happy to show them Hootsuite and encourage them to give it another go. However, when I saw Storify, this changed things immensely because I could go back through the chat as someone had curated the conversations and edited components so I was able to make more sense of it and really have time to sit, think and reflect. Also some tweets had URLs to further content and it was great to go back through these and really explore and dig into those tweets.

@InterviewE: Find an aggregator like tweetchat.

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@InterviewF: I use the tchatio tool to cascade the tweets in real time, and I let them wash over me. I'll read some of them as they flow past, and I tend to keep an eye out for particular people whom I get a lot of value from. I'll respond to some of the tweets, and when I do I'll focus my attention on the to-and-fro discussion that follows from there.

Learn First *@InterviewB:* Do your homework. Learn how to, either learn how to participate in a chat like that or ask how to participate.

@InterviewB: First of all you need to find out so what is the Twitter chat, how does it work so you can participate. So you need to understand the idea that there's a hashtag and then it's helpful to find out, to discover that there are tools that help you focus just on that hashtag. You can make a column within Tweetdeck just to follow it

@InterviewB: You have to learn to be comfortable in the online mode

Sit Back *@InterviewC:* Well, I think the first time you do it it probably is a good idea just to sit back and watch. Just to see what happens. Because there is this fear that if I say something, I think especially the first time, if I say something it may go against the grain of the folks in the group, or they may not understand where I am coming from, or they may even perceive me as somebody who is kind of trying to, um, divert the group. So I think as a new member I would suggest the first time I would just sit there and watch it and see what happens. And sure, go ahead and introduce yourself and if you feel comfortable responding respond. But also feel free just to watch and to observe and see how people respond.

@InterviewA: Because the first couple times that I watched it was almost like a neck breaking speed at the speed that some of these tweet threads go. But once you have an opportunity to kind of follow things to see the pattern, to see the cadence of the conversations, it would be a lot easier.

@InterviewA: I would sit back for maybe the first experience in there.

@InterviewB: Then the third thing I'd say would be to sit in for, you know, let's say 20 minutes at least of the chat. Watch if flow and you begin to spot the pattern of here's the question and now here's a bunch of people either repeating the question, here's some people starting to answer the question and gradually you can see people either responding to or following up on someone else's answer and you begin to see little braided mini threads, um, in the overall stream and then they kind of fade away and then something else comes up. Ah, so I guess they in part it's go into

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it with the expectation that it's going to be varied. And that means the quality will vary quite a bit and there might be some inside jokes.

@InterviewF: I would suggest firstly that they simply observe a #lrnchat session to see how it goes, to get used to the nature of the event.

Join In

@InterviewB: And then don't be, don't be too shy about joining in or sharing your experience because it may be that the experience you have or the link you have is of real value to the people in the chat.

@InterviewB: Don't be scared to share something. Everybody has got some experience that they are bringing to this and as trained learning professionals, part of what makes us better at what we do is some self-reflection. That's part of the sensemaking, right? So what is part of the self-reflection is what have I been doing, or what do I know about this topic that I can either share or ask?

@InterviewB: Now the risk will be somebody will come along and say holy crap didn't you know you can do this far easier doing x-y-z? But if I don't step forward and take a risk of that I'm never going to find out about x-y-z or I might not find out about it for two years. And there's also the possibility that I have found something, or I have grappled with a problem in a way that's interesting or helpful to somebody else. That's a part of the professional, um, sharing of information without necessarily trying to posit yourself as a guru.

@InterviewF: I would suggest firstly that they simply observe a #lrnchat session to see how it goes, to get used to the nature of the event. Then, in the next session, I would suggest they have a go at answering each of the chat-master's questions. Don't feel down if no one responds: it's not that they don't appreciate what you have to say, but more likely that they have nothing to add. The more you contribute, the more you'll get back. However don't just talk "at" the crowd: reply to other people's tweets and RT and favorite the ones that you agree with. By participating actively (and politely!) you'll become a respected member of the community.

Follow Others

@InterviewB: If in the context of the chat I find somebody is making a lot of sense or I'm learning things I didn't know, or I'm interested in why somebody says what he or she does, I will decide to start following that person. Or, I might even, you know, and this can happen even in the midst of the chat because I've learned I don't have to listen to the whole chat. It's not like this is the only time somebody is ever going to tell you how to do x. Somebody else somewhere is going to

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have something useful to say about this thing probably later on.

Involve Others *@InterviewD*: Do it with someone else nearby. I encouraged my work colleagues to get involved and the experience was much better because we could talk about it while we were participating. Also we could share our own thoughts or tools and show each other what we were doing to stream, find, respond to tweets. Sure, you can get them to read about Tweet Chats but in all honesty, why? You can get them to view a screen cast on YouTube but again why? Just get them in and mucking around – but as a social activity because guaranteed, they'll pick up on what they need to pick up and they'll love the experience for next time when they're alone.

Adjust for
Time zones *@InterviewB*: #lrnchat for me it's kind of funny that you chose me to follow up with because I used to be on the east coast. I was in Maryland. And since I have moved to Vancouver Island, um, the timing is really bad for me. And lately, you know, if I get half a #lrnchat every three or four weeks that's pretty good. And that's just the way things are. I've wondered about whether I want to, you know, try and help to promote another one that might happen in a more west coast friendly time zone which is a possibility or, just, that's the way it is cause there's only so many #lrnchats you can have in a day.

@InterviewD: In Australian time, it's Friday lunchtime so it's a good time and great way to end the week and puts me in a great mood for Friday afternoon before I knock off for the weekend.

Experienced participants recommended that those new to the chat should participate in the introductions, then sit back and study the flow of the chat before engaging very actively. Once they understand how the chat works, they should participate actively, rather than just lurk, to get the full benefit of the experience. The participants also mentioned that they are more successful when they focus on the chat and remove other distractions. *@InterviewC* indicated:

I think for me it is staying involved. I find myself I kind of hunker down here and I know for an hour I'll be on it. So if I haven't eaten I'll put a sandwich on the

table. If I don't, I'll make sure I have something to drink. Sometimes since it's Thursday night and we're getting ready for the weekend I may even have a glass of wine <laughs> and so that relaxes me.

@InterviewA recommended focusing specific participants within the chat rather than trying to read every comment: “There's usually maybe three or four participants that I try to focus my attention on a little bit more. Because there are branching conversations as part of the larger conversation and I just kind of don't go down those rat holes quite as much so I just focus on the handful that make leading conversations.” *@InterviewB* suggested focusing on particular thread of conversation rather than trying to read every comment:

One strategy is don't try and do everything because you can't. The comedian Steven Wright said one time 'you can't have everything, where would you put it'? <laughs> And so I think that really applies to Twitter, you know and people think oh oh there's all those gems and they'll mark stuff favourite, favourite, favourite, favourite, favourite. And then they go into their favourites and they have 4,000 favourites and they discover that the favourites is just the junk drawer of the Internet.

Most of the participants indicated that they use a tweet reader, like TweetChat or Hootsuite to make it easier to consume the comments in the chat. The participants also indicated that following other chat participants helps to broaden the chat experience.

@InterviewD suggested participating in the chat with a live group in the same room, so that the discussion could be expanded and made more practical by prompting discussion

with colleagues: “Do it with someone else nearby. I encouraged my work colleagues to get involved and the experience was much better because we could talk about it while we were participating. Also we could share our own thoughts or tools and show each other what we were doing to stream, find, respond to tweets.”

In addition to proactive strategies to increase the chances of a successful learning experience, participants also mentioned coping mechanisms they employed to deal with the realities of the Twitter chat learning experience. These coping mechanism findings are explored next.

Coping mechanisms. Coping mechanisms are the reactive actions the participants took to cope with the often overwhelming stream of the *#lrnchat* Twitter feed and the Twitter chat format. Coping mechanisms included avoiding arguing, reading quickly, sitting back for the beginning of your first chat, favouriting tweets for later review, read the transcript, and not reading everything.

Participants mentioned that a starting point for successful participation is to be polite and not argue. (See Table 17.)

Table 17

Participant Perspective on Coping Mechanisms Employed in #lrnchat

Coping Mechanism	Example
Avoid Arguing	<i>@InterviewB</i> : If you join a Twitter chat and you know they're talking about a topic that is no interest to you, or maybe you disagree with the fundamental premise but you don't feel like fighting about it with people. They're not talking to you! So you just shut up or you leave and you decide whether you're going to join again or not. You don't start arguing about it.

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@InterviewB: It's not quite as welcoming to people who spam with links to things that are really tangential. But most people also don't yell and scream about that because I think that's sort of troll feeding. And instead they block them, you know which is a good way to do that.

Read Quickly *@InterviewE*: I read really quickly, luckily.

Favourite *@InterviewB*: I will often favourite a Tweet so I can go back to it later and investigate a little
Tweets more.

@InterviewB: If you're using some tool like Tweetchat or even Tweetdeck and you've got the favourite capability then if you think you want to hang on to it you can just mark it as a favourite and then go in later and sort of weed through your favourites to see what's going on.

Read *@InterviewB*: I've very rarely gone back to the transcript although I imagine there are people
Transcript who do go back there. It's really hard to read a Twitter chat transcript. I've done a couple of
sessions where I went back and counted and there might be 700 or more tweets in a one hour or
hour and half time frame. And so it's very hard in context to follow that and see threads because
there will be three or four threads intertwining as person A responds to person B while person C
responds to person D. But that's part of the value for me.

@InterviewB: If you think you missed something that's important you can always go back to the transcript and try and find it again.

Don't Read *@InterviewF*: I don't try to read all of the tweets individually.

Everything

An ability to read quickly came in handy for one participant although another recommended not trying to read everything. Favouriting tweets for later reference made it easier for one participant to keep up. The 'favorite' function in Twitter allows participants to 'bookmark' a tweet they want to be able to find later by clicking on a star icon. The person who issued the tweet receives a notice when their tweet is favourited and the person who favourites the tweet can click on a "Favourites" button to see a list of

all of the tweets they have bookmarked. In addition to these suggestions, another participant mentioned that there is a transcript that participants can refer to after the chat if they wanted to follow up on details of a particular tweet.

Socially Constructed Knowledge

The final sensemaking question asked whether the participants thought the chat generated new knowledge. Four of the six interview subjects indicated that they felt new knowledge was generated in the chats. Two indicated they did not think new knowledge was created. The examples provided by the four participants who felt new knowledge was created all related to them coming up with ideas that were prompted by chat discussion. For example, *@InterviewD* indicated:

By far, one tweet chat gave me an idea for {name withheld}, a meetup group I have created for learning professionals across all industries. Someone in San Francisco, sent me a link to {name withheld}'s book... and I immediately loved the concept. So much so that I immediately bought a couple of the domain names, set up a Meetup group www.meetup.com/{namewithheld} and started running informal social learning and networking events for people to learn through each other with each other. We now have 166 members running meetups in Newcastle, Sydney, Melbourne, Adelaide and Brisbane. I recently have had interest from external parties on partnership approaches. So through a *#lrnchat* I was able to create {name withheld} and for that, I'm thankful that a community of learning practitioners gave me the ideas to apply in my own contexts.

No participants gave an example of social construction of knowledge that happened among several individuals during the chat itself. (See Table 18.)

Table 18

Participant Perspective on Knowledge Generated by #lrnchat

New Knowledge Generated?	Example
Yes	<p><i>@InterviewC:</i> But tonight they talked about really collaboration in learning and what, you know, what helps us to engage in learning and what kind of helps us not be engaged in learning. That wasn't the words they used in all, but I found myself having to think and I think that's the real clever piece of #lrnchat is it requires me to think about what my position is on a specific topic. So let's say the topic is, um, learner engagement and how you create a good experience for a learner. And so all of a sudden I start thinking and I put it out what I think to be some pretty good ideas around it because I've been doing... involved in learning and development for a number of years. But then I think the learning also comes not only from thinking, but also from seeing what others are responding. And so somebody else may trigger something, and tonight a lady on the chat actually triggered something that the response was well it comes from all these different things and she gave specific examples. For example it comes from learning and training sessions, it comes from coaching, it comes from feedback, it comes from observation, it comes from performance goals. And so all of those things there may not be totally brand new to me, but it's a reminder that those are the critical pieces of the equation for the question that was asked anyway. And so, so my comments make me think.</p> <p><i>@InterviewC:</i> And so to me that's kind of a follow up activity and sometimes I'll go back through and just click on some of the links to see if somebody is promoting their own website, I now have some new knowledge around what other people are doing and what they're thinking.</p> <p><i>@InterviewD:</i> By far, one tweet chat gave me an idea for {name withheld}, a meetup group I have created for learning professionals across all industries. Someone in San Francisco, sent me a link to {name withheld}'s book... and I immediately loved the concept. So much so that I immediately bought a couple of the domain names, set up a Meetup group www.meetup.com/{namewithheld} and started running informal social learning and networking events for people to learn through each other with each other. We now have 166 members</p>

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running meetups in Newcastle, Sydney, Melbourne, Adelaide and Brisbane. I recently have had interest from external parties on partnership approaches. So through a #lrnchat I was able to create {name withheld} and for that, I'm thankful that a community of learning practitioners gave me the ideas to apply in my own contexts.

@InterviewE: Many many times – lots of links from colleagues on MOOCs had me sign up for my first MOOCs.

@InterviewF: I can't think of any examples whereby the #lrnchat generated new knowledge collectively – the event is too rushed and constrained for that. However, I think each #lrnchat helps to create new knowledge individually. I know for myself that I think about different people's perspectives and the diversity of answers during the chat, and I continue to reflect on them afterwards to make sense of them. In this way I have expanded my thinking on popular topics such as motivation and innovation, and also on less celebrated topics such as information overload and learning from travel. It's not like doing a course or reading a book whereby you'll get a huge dump of new content – instead, you'll pick up a nugget or two, change the way you think about something, and become aware of opposing points of view. The weekly chat is a regular reminder that you don't know everything, and what you do know is probably wrong much of the time!

No *@InterviewA:* No, I would say no. New knowledge to the world? No. New knowledge to me? Yes. It's opened my eyes to a few different things whether it's different resources out there or perspectives maybe on topics that I don't have otherwise, but I don't know that we really stumble upon any ground breaking material as a team with it.

@InterviewB: It may be because I have been in the training learning field for a long time, the relative newness is probably somewhat small.

@InterviewB: {name withheld} is a person who is really familiar with research and at one point he came in to #lrnchat and actually he was somewhat dismissive of it because he didn't see any learning going on from his point of view

Overall, this study found that more than half of the participants felt that new ideas were prompted as a result of the chat discussion. The study was not, however, able to

determine a clear example of socially constructed knowledge being generated in a collaborative way during a synchronous microblogging chat.

Summary

In addition to validating the findings of preceding study phases, Phase Three provided some new information about what motivated participants to take part in a Twitter chat. Participants noted desires to pursue their own professional development, make global connections, follow their curiosity about the technology and the experience of synchronous chatting, and desire to interact with experts in the field. Additional context provided by the interview responses related to group membership validated the findings of low formality and tight/loose relationship-building while tempering the level of focus and structure slightly from high to medium and suggesting higher levels of resource-sharing than evident in Phase Two. Overall, the results were consistent with Phase Two findings. Phase Three also contributed a few additional success strategies and coping mechanisms that participants employed to success in the Twitter chats. While participants were divided in their opinions, more than half did indicate that they had come up with new ideas as a result of the chat. The study was, however, not able to resolve whether knowledge was or can be socially generated in a Twitter chat. The examples of knowledge creation that were provided did not include socially generated knowledge creation between several individuals during the chat itself. Overall finding of all three phases of the study are shared in the next chapter.

Chapter VII – DISCUSSION, CONCLUSIONS AND IMPLICATIONS FOR PRACTICE AND FURTHER RESEARCH

The advantage of mixing methods, particularly when studying complex phenomena, is that multiple methods can help to ‘triangulate’ or ‘bracket’ the information and make it understandable (Reeves, 1996). This pragmatic study mixed both quantitative and qualitative methods to provide insight into the use of synchronous microblogging as a means to self-directed professional development. The study involved three Phases – Phase One was a quantitative analysis of Twitter chat transcripts while Phases Two and Three were qualitative analyses of Twitter chat transcripts and interview responses respectively. The findings of this study are applicable to those considering organizing or participating in synchronous microblogging for professional development learning. The overall results of the study are group into three areas of exploration: social aggregation or group membership concepts, the success strategies and coping mechanisms leaders and participants can apply to make the synchronous microblogging experience engaging and effective, and the motivating factors that influenced individuals to take part in the chats. While the study found that participants generated new ideas individually as a result of the chat experience, the study was unable to determine whether knowledge can be socially generated in a synchronous microblogging experience. The opportunity remains open for further research in this area.

Social Aggregation

This study found that Twitter chats were characterized by low levels of formality, high levels of topic focus, paradoxically varied (tight and loose) relationship-building,

high resource sharing, and high structure. The findings relating to group membership help to clarify the characteristics of synchronous microblogging chats and identify how to describe them accurately. Specifically, while previous studies (Lalonde, 2011; Power, 2013; Megele, 2014) have referred to Twitter chats as personal learning networks or communities of practice, after comparing the characteristics of *#lrnchat* with various group membership concepts, this study has found that such synchronous microblogging chats most closely resemble *sets* (Dron & Anderson, 2014) and *affinity spaces* (Gee, 2005). (See Table 19.)

Table 19

Comparison of Group Membership Types to #lrnchat

Concept	Community of Practice	Personal Learning Network	Generative Learning Community	Affinity Space	Group	Net	Set	#lrnchat
Membership	N	Y	Y	Y	N	Y	Y	Informal
Focus	N	N	N	Y	N	Y	Y	Debate on common purpose, high focus on topic
Relationships	N	N	N	Y	N	Y	Y	Tight and loose
Resources	Y	Y	Y	Y	Y	Y	Y	Medium/ high resource sharing and knowledge development within chat
Structure	N	N	Y	Y	N	N	Y	Chat is structured formally around questions; moderator are identified, but impose little authority

Twitter chats are not, and should not be, characterized as communities of practice (Wenger, 1998), personal learning networks (Tobin, 1998), generative learning communities (Lewis, Pea, & Rosen, 2010), or groups or nets (Dron & Anderson, 2014). The study also found ways for participants and leaders in *sets* like *#lrnchat* to set

themselves up for success and cope with the challenges inherent in this type of informal learning opportunity, as discussed next.

Success Strategies and Coping Mechanisms

The study also identified proactive actions (success strategies) and reactive actions (coping mechanisms) that chat participants used to have a successful synchronous microblogging experience.

Organizers can set their Twitter chats up for success by doing the following:

- Establish a core group of dedicated participants who will promote and sustain the chat over time
- Provide the topic and/or the chat questions in advance so that the participants can research the topic and prepare more effective responses
- Invite participants to share self-promotional tweets only at the end of the chat
- Issue reminders of chat time and topic several times during the week leading up to the chat
- Keep the duration of the chat to 60 minutes or less
- Front load the chat questions with the most crucial or engaging questions at the beginning of the chat to create the best opportunity for robust discussion and counter the tendency of participants to leave the chat before the end
- Invite others to join the chat by sharing it with their followers in advance of the chat time

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- Ensure the timing of the chat meets the needs of as many participants as possible
- Use other hashtags to draw participants into the chat

Participants in a Twitter chat, can increase their opportunity to engage in a successful learning experience by taking the following proactive steps:

- Warn their followers in advance that they are participating in a chat, so as to not irritate them with the ensuing deluge of tweets
- Follow other chat participants and extended the chat beyond Twitter where possible through reading blogs, messaging participants, and, in some cases, even arranging to meet others in-person at conferences
- Adjust their schedules to make the chat fit into their plans, despite the time zone challenges inherent in a global chat
- Participate in a distraction-free environment
- Use a keyboard for easier typing on mobile devices
- Avoid trying to read everything - skim the stream and dive deep when a particular tweet or thread interests them
- If you know the topic in advance, do some research so you are prepared to contribute to a deeper discussion

In addition to identifying proactive success strategies, this study also identified coping mechanisms – reactive actions participants took to deal with the challenges of the chat format and functionality. Specifically, the study found that successful participants coped with the chat format by learning to:

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- Write concisely
- Read the transcript after the chat
- Relax and try not to craft perfectly worded tweets
- Ignore spam
- Apologize for joining late; only ask others for a recap if you have a pre-established relationship
- Retweet tweets if someone beats them to saying something
- Lurk (read the tweets without responding), if intimidated by the topic or discussion
- Include the chat hashtag, but do not feel pressured to include many topic-related hashtags as most participants do not do so
- Mention resources you think will be useful to other participants, but do not feel you must include specific links as most participants do not do so
- Do not spam the chat with non-chat related tweets
- Dive in and out of the chat if other responsibilities interfere momentarily
- Repost a tweet if they forget to include the hashtag the first time they send it
- Research the Twitter chat to learn about the chat norms in advance of participating
- Set up a tweet reader
- Participate in introductions then sit back and watch the first chat
- Avoid engaging in arguments
- Read quickly

- Favourite interesting tweets for later reference

Following these success strategies and applying these coping mechanisms will help individuals and organizations achieve successful professional development learning experiences in a synchronous microblogging environment. The final finding from this study, relates to participant motivation, as discussed in the next section.

Motivation

When asked about their motivation for participating in *#lrnchat*, the interview subjects indicated they were interested in pursuing their own professional development, making global connections, curious about the technology and the experience of synchronous chatting, and desirous of interacting with experts in the field. Participants were more motivated to participate in chats of shorter duration, as evidenced by the higher number of active unique participants and higher intensity of tweets and retweets that were part of the 60 minute chats as compared to the 90 minute chats. Further study of what motivates learners to participate in synchronous microblogging chats is warranted to help organizations develop engaging chats and to help individual learners identify a synchronous microblog as an learning experience appropriate to their own personal motivations. Chat organizers may consider increasing opportunities for these motivating factors in their own formulations of Twitter chats. Other implications for further research and practice are discussed below.

Implication for Further Research and Practice

The increased understanding provided by this study of the elements that contribute to a successful synchronous microblogging chat will help organizers and chat participants engage in such learning experiences more effectively.

Twitter chats, involving interactions between large numbers of participants and high volumes of textual content, lend themselves to social network analysis. This type of study would provide more insight into the group patterns and configurations inherent in this type of synchronous microblogging experience.

The study was not able to identify examples of knowledge created socially through synchronous microblogging chats, as compared to information that was aggregated, related to, and shared. Further studies into collaboration and group innovation using synchronous microblogging are called for to explore this topic more thoroughly.

Several other results would be better explained through further research. The lower frequency of mentions found in the *#lrnchat* sample, as compared to Twitter messaging in general, may be the result of the participants engaging with others around a shared topic of interest rather than having a shared social relationship where they would ‘tag’ their friends and colleagues with a message. The participants might not know the other participants well enough to mention them. The frequency in which a participant is mentioned during a chat may also be related to the individual’s standing within the group or their level of group membership. Further study in this area would help to identify the reasons for the discrepancy in chat results for ‘mentions’ compared to the results in

Twitter messaging at large. Similar explorations are also possible related to the use of hashtags and links in Twitter chat messages. Like mentions, hashtags and links were also used much less frequently than in general Twitter conversations.

Another area of potential further research relates to the ‘moderator’ role. How does one become a moderator for a Twitter chat and connect with others who also want to engage in this way? What motivates moderators to sustain the chats over time, what are the time commitments to lead a synchronous microblogging chat, and what relationship exists between moderators?

This study has increased the ability of researchers to use an appropriate social aggregation concept to explain synchronous microblogging as they engage in further research around this emerging experience. These Twitter chats most readily align to the concept of *set* (Dron & Anderson, 2014) or *affinity group* (Gee, 2005) and should not be termed *communities of practice* (Wenger, 1998) or *personal learning networks* (Tobin, 1998).

Overall, this study has broadened the knowledge of the mechanics of successful synchronous microblogging chats, identified ways to motivate individuals to participate in such chats, identified a group membership format, and provided numerous success strategies and coping mechanisms for “drinking from the fire hose” that is a Twitter chat. The most crucial coping mechanism was summed up nicely by @275 in the January 17th chat: “@136 @170 don’t try to drink from the firehose, just sip #lrnchat”.

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APPENDIX A – Athabasca University Research Ethics Approval



MEMORANDUM

DATE: June 30, 2013 (memo issued August 12, 2013)

TO: Laurie Amiruddin

COPY: Dr. Terry Anderson (Research Supervisor)
Alice Tieulié, Acting Secretary, Athabasca University Research Ethics Board
Dr. Debra Hoven, Chair, Athabasca University Research Ethics Board

FROM: Dr. Vive Kumar, Chair, Athabasca University Research Ethics Board

SUBJECT: **Ethics Proposal #13-13C: “Drinking from a fire hose: Sensemaking strategies for learning through synchronous microblogging”: x-ref CDE-13-04**

Thank you for providing your revised application (submitted June 30, 2013), that included the supplemental information inserted into the appropriate sections, arising from the June 28, 2013 delegated review by the Athabasca University Research Ethics Board Chair. Your cooperation in revising and furnishing additional information requested was greatly appreciated.

On behalf of the Athabasca University Research Ethics Board (AU REB), I reviewed the resubmission and am please to advise that this project has now been granted **FULL APPROVAL** on ethical grounds.

This approval of your application will be reported to the Athabasca University Research Ethics Board (REB) at their next monthly meeting. The REB retains the right to request further information, or to revoke the interim approval, at any time.

The approval for the study “as presented” is valid for a period of one year from the date of this memo (to June 30, 2014). If required, an extension must be sought in writing prior to the expiry of the existing approval. **A Final Report is to be submitted when the research project is completed.** The reporting form can be found online at <http://www.athabascau.ca/research/ethics/>.

As implementation of the proposal progresses, if you need to make any significant changes or modifications, please forward this information immediately to the Research Ethics Board as soon as possible via rebsec@athabascau.ca.

If you have any questions, please contact the Research Ethics Administrator at rebsec@athabascau.ca.

Athabasca University Research Ethics Board

University Research Services, Research Centre
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APPENDIX B – Interview Questions

1. *Motivation:* What prompted you to participate in #lrnchat?
2. *Membership:* Please describe what being a member of #lrnchat is like.
3. *Sensemaking:* With the high volume of tweets in a chat and the short length of them, what strategies did you use to make sense of the discussion?
4. *Sensemaking:* What would you recommend those new to Twitter chats do to have a successful chat experience?
5. *Sensemaking:* In your experience participating in the #lrnchat Twitter chat, can you think of any examples where the chat generated new knowledge?

APPENDIX C – Consent Form

Personalized e-mail invitation to participants who express interest in participating in the study:

Dear <TITLE>. <NAME>,

My name is Laurie Amiruddin and I am a graduate student in the Master of Education in Distance Education program at Athabasca University. I am currently conducting my Master's thesis research on use of synchronous Twitter microblogs chats for professional development.

The purpose of the study is to identify the nature of group membership in #lrnchat, the success strategies and coping mechanisms participants employed to decipher and make sense of hundreds of rapid-fire tweets in a time-limited discussion, and whether the synchronous microblogging experience generated new knowledge or was merely a means of connecting socially and sharing knowledge-related commodities.

Despite the importance of informal learning to continuous professional development, little research exists related specifically to the use of synchronous microblogging for professional development learning. Knowing more about the strategies employed by participants to make sense of, and potentially learn from, highly intense conversational volumes and to cope with other factors limiting participation will help organizations and other groups of like-minded individuals establish and maintain successful professional development learning experiences in a synchronous microblogging environment. The results of this research study will also inform decisions that organizations make around the costs and benefits of investing in internal, private microblogging applications to support learning endeavours. What is learned from exploring this type of spontaneous microblogging initiative may be transferable back to more formal corporate or academic attempts to instigate such learning events within virtual groups. Identifying how to generate the same level of energy and enthusiasm in a group to promote professional development may be of vital importance to learning approaches in our increasingly connected world.

You have been identified as an active #lrnchat participant since you have tweeted or retweeted using the #lrnchat hashtag at least once between 8:30 pm to 10 pm EST on Thursday during the study period between September 27, 2012 and January 17, 2013.

This study is comprised of an approximately 30 minute phone interview with #lrnchat participants. The interview will be recorded with your permission. Your name will be removed from the transcript to ensure privacy and your responses will be identifiable only by the interview number. All data will be securely stored and password protected and deleted upon project completion. I will share an electronic copy of the final thesis report with all participants.

LEARNING THROUGH SYNCHRONOUS MICROBLOGGING

Please note that participation in this study is voluntary. You are invited to participate and may withdraw from the study at any time. If for any reason you decide to withdraw, your data will not be used and deleted immediately. Participation or nonparticipation will have no bearing on any aspect of your personal or professional reputation and will not be publicized on Twitter or any other social media forum.

The existence of the research will be listed in an abstract posted online at the Athabasca University Library's Digital Thesis and Project Room; and the final research paper will be publicly available.

The research may also be used for future publication of presentation in academic or professional journals and conferences.

This study has been reviewed by the Athabasca University Research Ethics Board. Should you have any comments or concerns regarding your treatment as a participant in this study, please contact the Office of Research Ethics at 1-780-675-6718 or by e-mail to rebsec@athabascau.ca.

If you have any questions, please do not hesitate to contact me or my research supervisor Dr. Terry Anderson at:

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Please fill in the following consent form and return to lamiruddin@gmail.com.

I consent to participate in this study.

Name _____ Date _____

I refuse to participate in this study.