

Twitter and Professional Development for Educators

by

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ABSTRACT

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21st century tools and Web 2.0 digital technologies have engaged educators and students from traditional learning models into a new learning paradigm. Twitter can be a particular vehicle for enhancing professional development for educators. This study focused on who are the teachers, their initial motivations for using Twitter, and how they use Twitter for professional development. The research methodology involved tweeting a link to an online survey which included both closed and open-ended questions.

Research findings show that educators value Twitter as a vehicle for professional development. Twitter is appreciated for its self-service and immediate approach to learning. Being connected to other colleagues and experts across the world is seen as a great advantage. The ease in which to access constant, current, and large amounts of resources, ideas, and methodologies helps teachers improve their professional development on a continuous basis. Educators and teachers should consider using Twitter as an enhancement to their current professional development practices. This will not only increase their knowledge and skills in specific subject areas but will also motivate them into a seamless culture of life-long learning.

DEDICATION

This thesis is dedicated to my wife, Judy Doyle, who made this possible through her constant support all the way through this journey.

I would like to thank my advisor, Dr. Richard Hechter, for his guidance and wisdom throughout the undertaking of my thesis.

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Twitter and Professional Development for Educators

Chapter I - Introduction

Statement of the Problem

“Educators and systems spent the 20th century perfecting the 19th century model of schooling...In the 21st century, many are still trying to perfect the 19th century model” (Heppell, 2005). Today’s educators and students are exposed to an abundance of information and paradigms unheard of even one generation ago. With 28 years of classroom teaching experience since 1986, I have encountered significant variations in the learning environment and teaching pedagogy.

In 1918, Franklin Bobbit wrote *The Curriculum* and developed curricula based on a factory-style efficiency model. He professed this idea across areas of learning in suggesting, “efficient management of the social factors is as vital as technical efficiency” (Bobbit, 1918, p. 87). The teacher gathered, filtered, and gave the information to the students. This was often done in a top-down, linear, and asynchronous fashion mirroring the ideas of the industrial society where efficiency was the goal. Students were sorted according to age and large numbers were placed in one classroom to be taught by one teacher. A general outcome of this model was economies of scale because of its efficiency, or possibly, its inefficiency. Memorization, rules, and guidelines were followed to enhance this model.

This practice of efficiency in education was followed for the most part in the 20th century. Although there has been the ebb and flow of the progressive movements of educational theories, such as child-centered ideas from Carl Rogers of the 1950s, this model remained fairly consistent. The school system for the most part still groups children by age for the classroom and

the majority of classes are run between 9 a.m. and approximately 3:30 p.m. In addition, the passageway of teacher training and professional development has remained mostly intact by mirroring this efficiency model. Professional development (also referred to in this study as PD), is the advancement of expertise and skills for success in a particular profession. In Canada, for the past 40 years, teachers receive their education degrees in approximately four or five years. What follows throughout their careers is a development in skills and pedagogy which can lack focus. Even though technologies have vastly changed in the last 100 years, this general efficiency model continues to be the framework for professional development for a majority of teachers. The current allocation of professional development (PD) in Manitoba usually has five specific days, or approximately 2.5% of the school year dedicated for K-12 teachers (Manitoba Education, Going to School in Manitoba, 2013).

However, today we have a different learning paradigm for both the educator and student. I believe what is happening today can be shown by my Honeycomb Model I created as shown in Figure 1 (based on 21st century learning which will be further explained). The following diagram is based upon my experiences of nearly 30 years of classroom teaching and how the dynamics of learning have evolved, especially with the changes in technology.

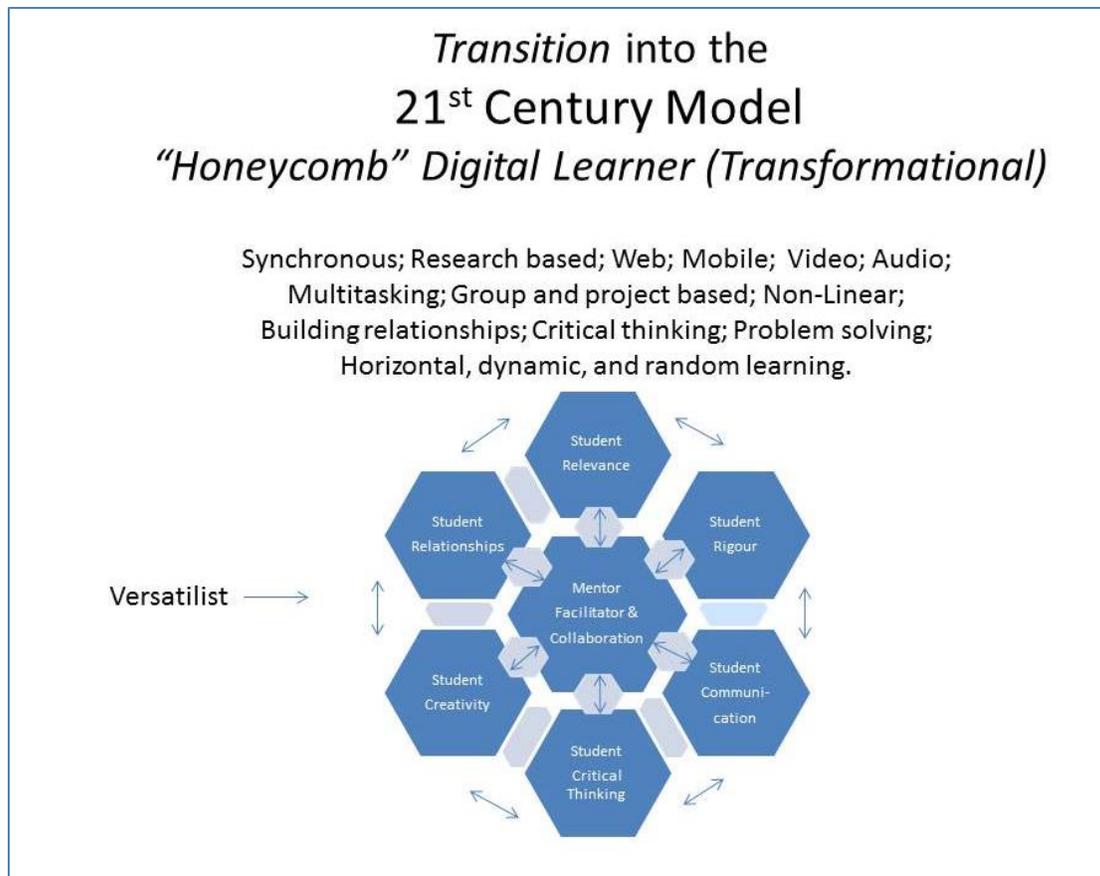


Figure 1. The Honeycomb Digital Model. This diagram illustrates the relationship change between the teacher and student and how information is shared by learners in the 21st century.

New technologies in the 21st century have changed the learning and teaching paradigm such that the teacher is no longer in control of the information. The teacher’s role as a mentor and facilitator is becoming more valuable (Elam & Duckenfield, 2000). Other studies have found a distinct change in the role of the teacher as moving closer to a facilitator (Archambault, Wetzel, & Foulger, 2010). The facilitator/mentor guides and coaches the student given so much information is available anywhere and any time. The educator also becomes a versatilist because he or she must adapt to the current situation and information. A versatilist is a person with a specialty in a certain area who remains adaptive to changing roles in the school and work place

environment. For example, it may not be in a teacher's best interest to dedicate all of his or her time to learning a specific programming language in computer science, such as COBOL, which is no longer generally used. It might be more effective to learn two or three languages but not have extreme detailed knowledge in all three because of the fluidity of new knowledge.

Therefore, how does the educator learn and adopt this new role? How does the teacher enhance his or her own learning once the formal teacher training is completed to fit this new role? How does an educator keep up with the changing technologies that are thrust upon himself or herself?

Today, individuals have powerful tools available for global communication, collaboration, and creation of material. In addition, many of these applications are free of financial cost. Within the 21st century learning context, Web 2.0 refers to the Internet where the sharing of ideas and material is its value (O'Reilly, 2005). Web 2.0 tools are free software programs that break the traditional mold of educational applications (Solomon & Schrum, 2007). These tools often offer similar applications such as Microsoft Office (word processing, spreadsheets, presentation programs). However, Web 2.0 also offers similar Web-based programs which are available across the world and in multi-platforms. This allows for greater sharing and collaboration where educators and students can work on the same file anytime and anywhere. This has further led to online communities for sharing ideas and in turn, enhancing the knowledge and skills of teachers.

Whether it be Twitter, Massive Online Open Courses (MOOCs), wikis, blogs, or Google, students are using these tools and educators will benefit in being prepared. However, preparation is a complex matter and it is difficult to predict what skills and knowledge will be needed even within the next five years. The Organization for Economic Co-operation and Development (OECD) education Director Andreas Schleicher stated, "Rather than just learning to read, 21st

century literacy is about reading to learn and developing the capacity and motivation to identify, understand, interpret, create and communicate knowledge” (Schleicher, 2010).

The Partnership for 21st Century Skills developed a framework for the foundations and skills as needed by the new digital learner (www.p21.org, 2013). A summary of this framework is provided below.

What is 21st century learning?

- 21st century learning is about collaboration, communication, creativity, and critical thinking.
- It is built on the foundation of the original three Rs (reading, writing, arithmetic), however, it is also about the new three Rs: relevance, relationships, and rigour.
- It is global and geared towards production, not consumption.
- It is a new pedagogy, basically a new way of life and learning.
- It is leaving traditional learning and entering transformational life-long learning.

What are examples of Web 2.0 and 21st century tools?

- Twitter (social media and micro-blogging)
- MOOCs (online and blended learning)
- Facebook and Edmodo (social media and file sharing)
- Wikispaces, Pinterest, and Blogger (online collaboration and blogging)
- YouTube and Voicethread (video, audio and image sharing)
- Google Apps and Open Office (file, video, presentation sharing, desktop publishing)
- Skype, Prezi, Pixton, and Animoto (communication, video, animation and presentation tools)

Teachers should properly use the new tools available to enhance their own teaching, self-directed professional development, and connections in professional learning networks (PLNs). It is this idea that I am very interested in studying.

Of the previously mentioned tools, Twitter is an all-encompassing social network. It is used for professional development, communication, collaboration, and real-time global networking. However, its use by teachers for professional development ranges from non-existent to everyday dedicated practice.

What is Twitter?

The Canadian media philosopher and educator, Marshall McLuhan once stated in the 1960s that, “The future of the book is the blurb,” (McLuhan, M., 1986). This was indeed a visionary statement given the birth of Twitter. Forty-two years later, in 2006, Twitter was created by Jack Dorsey (Picard, 2012). It is a micro-blogging tool that allows users to text a maximum 140 characters. This makes a “tweet.” Tweets can be in the form of text, links, photos, and short videos. Twitter is one example of social media and it is one that is growing at an extremely fast rate given its many advantages. Twitter allows a user to follow or be followed by friends, family, media, or anybody or any organization with a Twitter account. In reality, many people use Twitter to get information from around the world instantly. Others use it for professional purposes and personal use.

Although Twitter has “grown up,” it still seems to be misunderstood by some people. Since its inception, Twitter has evolved into more practical uses. For example, it is no longer just a medium for venting or sharing personal thoughts. Twitter can allow users to access or share vast amounts of information from any field (Heaps & Buchanan, 2013). Whether it be for personal use, for use in the classroom, or for professional development, Twitter has become a powerful global tool of knowledge and influence.

Why is Twitter more beneficial to teachers than other 21st century tools?

Based on the literature expanded upon in chapter 2, the following is a list of reasons why Twitter can benefit educators for professional development:

- Twitter is technically limited to 140 characters, however, links can be created leading to articles, papers, video, audio, and websites that provide much larger content. Therefore, if the user has an interest in pursuing a tweet for greater elaboration, they can by clicking on the link or the person that sent the tweet.
- Twitter, with its immediate global reach, is an excellent source for facilitating professional learning networks. It is very easy to begin your own learning network through a few searches of experts in your field of interest. Lists are created in Twitter to organize like-minded individuals into a specific group. Twitter offers some of the easiest functions of any Web 2.0 tool to create these networks.
- Twitter provides a vast pool of easily accessible resources and talents so that teachers can expand their own professional development any time and anywhere.
- Twitter allows the direct following of experts in any profession or area of interest. The simplicity is key as one only needs to type in the name of the person to find their Twitter username.
- Twitter is an efficient mechanism for surveys and for quickly gathering opinions (Conole & Alevisou, 2010).
- Twitter is an excellent tool for educators to back-channel at conferences and instantly share ideas and other thoughts. It has been used as a successful tool for engaging discussions in educational contexts (Conole & Alevisou, 2010).
- Twitter is very fluid, mobile, and collaborative. The popularity of smartphone and mobile use will continue to increase as costs diminish. Smartphone use is also having an increasing influence in the educational field (Cochrane & Bateman, 2010).
- Twitter handles, or usernames, are becoming a common method of contacting individuals. As were telephone numbers, email addresses, and home addresses, a Twitter username is providing a simple way to contact a person.

- Twitter is used by a very large group of young people, including those who will be future educators. It is second nature especially for the younger generations to use social media therefore it is important to be part of this new communication vehicle.

Research Problem

The new technological and pedagogical paradigms do not equate to teachers automatically learning this new 21st century educational and professional development model. One particular challenge for educators is acquiring the new methodologies and skills in the fast-changing world of digital technology. A California study found that over half of the teachers that departed from the classroom felt that they did not have proper professional development (Futernick, 2007). These teachers felt that their PD was not in line with the needs of their classroom situations. Professional development was also viewed as fragmented, disconnected, and irrelevant to the situation of the classroom (Lieberman & Mace, 2008). In addition, these authors cite a MetLife (Metropolitan Life/Harris Interactive, 2003) national survey that indicated only 42% of American teachers felt that their administrators gave adequate professional development. Lieberman and Mace also cite the American National Board for Professional Teaching Standards which discovered that less than 50% of American teachers were satisfied with the quality and quantity of opportunities for professional development at their schools (Leadership Survey; Leadership Board for Professional Teaching Standards, 2001). In addition, these authors noted the fragmentation of PD because it was offered at times when it was more convenient to the employer than to the employee.

As mentioned earlier, the allocation of professional development dedicated for K-12 teachers in Manitoba includes five days out of about 200 school days in the school year (edu.gov.mb.ca, 2013). This is often no longer meeting the complete needs of the educator given

the complexities of teaching due to the limited allocated time. In addition, money available for professional development for teachers is limited.

Traditional models of professional development include information that is often given from a person or persons outside the teacher's particular school. These tend to be theme specific and given to large groups en masse. These models often do not give direct and relevant experiences for a teacher's professional development (Kaliban et al., 2011). On the other hand, self-directed professional development through an online process can meet the needs and complexities of today's educators through targeted skill development (King, 2011).

If teachers and learning methodologies are to remain relevant and effective for students, updated strategies and skills need to be developed. Professional development is constrained today as continuous training is needed to meet the new demands of the student and administration (Hooker, 2008). Divisional PD days are often too broad-based and expensive to serve the specific needs of the teacher. Teacher professional learning networks need to expand and be adaptive. How can teachers improve their professional development model with this new 21st century dynamic? How does Twitter specifically fit this need? If professional development is effective in this particular area, it is important to know why teachers are drawn to Twitter, who these teachers are and how they use it.

Purpose of the Study

To understand effective teacher professional development, it is important to understand the activities that teachers are engaged in which provide meaningful experiences. Although the Internet has provided a vast data base of material for professional development, many teachers still find it difficult to find effective and quality pedagogical and skill related resources and

practices. Given the wide range of new technologies, networking connections, and media literacies, how are 21st century tools and specifically Twitter improving teachers' professional development?

Research Questions

To examine the demographics, characteristics, (who) and the motivations of the teachers using Twitter for professional development and to study the Twitter practices of these educators in relation to professional development (how).

The three major research questions are:

1. Who are the teachers (demographics) and what are the characteristics of those educators that participate in Twitter for professional development?
2. What draws K-12 teachers and other educators to participate in professional development using 21st century learning Web 2.0 tools, and specifically Twitter?
3. How do K-12 teachers and other educators participate in professional development using Twitter?

Further sub-questions include:

- How does Twitter enhance and facilitate professional development? What practices are teachers using?
- How does Twitter facilitate professional learning networks?
- In what ways does Twitter enhance the participants' skills?
- What types of resources do teachers find on Twitter?
- How is Twitter sustaining the educators' interest in its continued use for PD?

By gaining insight into these answers, Twitter may offer a greater potential for facilitating and enriching professional development for educators. By knowing the motivation, demographics, and characteristics of these teachers and how teachers use Twitter for their professional development, a more systematic approach can be developed to provide a more effective PD model for the 21st century.

Significance of the Study

Considering the time, energy, and money that are spent on professional development and technology, there is a surprising lack of empirical evidence linking greater use of digital technologies and increased learning (Ritchell, 2011). Teachers' professional development must be able to engage the educators and feel it is important for themselves, and consequently the students. There is a lack of direction for teachers to take advantage of the 21st century Web 2.0 tools and new media technologies, such as Twitter. It is important that research in this area be done because there is little published research on Twitter use and its effectiveness in education (Greenhow & Gleason, 2012).

Twitter is seen as a useful tool for developing a professional learning network (PLN) and participants found value in a Twitter-based PLN in helping individual self-directed professional development (Deyamport, 2013). However, it was felt by some teachers that Twitter did not help their professional development because of the lack of time to tweet and technological confidence. There was also a lack of interest for some teachers in using Twitter (Deyamport, 2013). It is evident that there needs to be research into who are the educators and how they are using Twitter to improve their professional development. In addition, most published research does not address the reasons why teachers started to use Twitter and why others have not.

Answers to these questions can help to develop strategies for teachers to get engaged with Twitter and professional development in a timely and meaningful way.

Before the mainstream influence of digital technology came into play in the 1980s, broadcasting was the normal mode of delivering information. For example, mainstream Canadian television stations such as the CBC and CTV delivered nearly all the news information for the general masses. Today, we have a much more narrowcasting approach to delivering information and learning (Doyle, 2006). There are hundreds of television stations targeting very specific groups of people, such as HGTV for people who want to renovate their homes. This narrowcasting methodology has bled into the educational system where hundreds of specialized optional courses are now available at large high schools. Personalization and customization is a normal method of implementation today. Examples of this are also seen in the thousands of available apps for mobile devices and thousands of websites serving every possible niche market. To be more effective, professional development needs to follow this personalized and flexible methodology so that educators can upgrade skills specific to their areas of interest. This “Twitterization” of a self-service approach to professional development for teachers may indeed fill a void for a very large number of educators.

Conceptual Definitions

The following are general Twitter terms that will be used in this study. A more comprehensive list is provided in Appendix E.

@: This sign is part of your username, such as @JaneDoe938. It is used to call out usernames in Tweets. If the @ sign is used before the username, it becomes a link to a Twitter profile.

Direct Message, or DM: This is a private tweet between a sender and recipient. This is useful when you want to contact a person but not have your tweet sent to everybody publicly.

Favourite: When you particularly like a tweet, you can “favourite” it and a star will appear next to it. It will then be placed in your Favourites section so that it makes it easy to find at a later date.

Follow: When you follow somebody, you are subscribing to their tweets.

Follower: This is when another person or organization follows you. If you don't want to be followed by a particular account, you can easily block it.

Handle: A Twitter handle is the username and the corresponding URL, such as <http://twitter.com/misterdoyle>

Hashtag: Earlier known as the “pound” symbol #. This is used to mark topics in a tweet. It acts as a filter and is a very powerful tool in Twitter. An example is #edchat.

Mention: Mentioning another user in your tweet by including the @symbol before the username. Getting mentioned is a sign that people like your tweets.

Name: This is the name a person can use which can be different from the username. If you want people to know who you are it is important to use your real name.

Profile: This is a page giving information about the user.

Protected Account: This is a setting that can be made so that only approved followers can follow you.

Reply: A tweet that is posted as a reply to another tweet. It starts with the @username.

Retweet: A tweet that is sent again by yourself or another person. This is used to share information about a good tweet. Also known as an RT.

Tweet: The act of posting a message or a message that is posted via Twitter. It must be 140 characters or less.

Twitter Feed (or News Feed): This is the area where all the tweets are posted in chronological order.

Username: This is the specific name used for a Twitter account, such as @JaneDoe68.

Summary

21st century tools and Web 2.0 digital technologies have thrust people and educators into a new global learning paradigm. Traditional models of learning for both the student and teacher are rapidly changing. It is necessary for those in the educational field to remain skilled and knowledgeable in the current learning and teaching methodologies, and in communication methods.

Twitter is a particular vehicle for enhancing professional learning networks while adopting a new approach to professional development. It provides a pool of research material, resources, and talents so that teachers can develop their own professional development any time and anywhere. This is also free of financial charge outside of the cost of a digital Internet-ready device. Today, students and educators are socially networked and enjoy sharing online both professional and personal material and ideas. Twitter engages individuals for enhanced learning, and provides new literacies for learning and professional development. The hope is that this study will provide effective professional development strategies for teachers by revealing their motivations, characteristics, interests, and practices with Twitter for their professional growth.

Chapter II - Literature Review

Overview

This chapter consists of information relevant to the purpose of using Web 2.0 tools and specifically Twitter among educators for professional development. New technologies have created a ubiquity in digital learning, mobile devices, and a continuous upgrading of skills. The speed in which new ideas and learning methodologies are generated has created a necessity to learn in new and innovative ways. Current information and resources for professional development are now available in a constant stream because of the Internet and now with Twitter. The literature of Web 2.0 and professional development provides context to the current use and changes for teachers and professional learning and growth. Twitter and professional development, although a relatively new area, is beginning to provide data about its effectiveness for teacher growth. Online professional development facilitates the collaboration among educators within a professional learning network. This provides valuable data on how Twitter can be more effective for teacher PD. New digital literacy research also gives insights into the personal growth of teachers' efficacy of Twitter and PD.

Pan and Franklin (2011) cite that K-12 education has had constant growth in technology integration since the 1980s (Culp, Honey, Mandinach & Bailey, 2003). The integration of Web 2.0 tools (blogs, wikis, podcasts, social networking, sharing sites, and course management systems) helps students develop the skills needed to collaborate with people worldwide. However, these authors report a low level of self-efficacy in using Web 2.0 tools. It was discovered that the teachers' self-efficacy, professional development, and school administration support was positively correlated with the use of Web 2.0 tools. The findings suggest that there is

a large gap between teachers and students when using Web 2.0 tools. Teachers are sporadically adopting these tools but a well-designed professional development system is needed to improve the self-efficacy of educators (Culp, Honey, Mandinach & Bailey, 2003).

A reason for the lack of research in the area of Twitter and education is that schools have been slow to embrace social media (Casey, 2013). Technology costs, digital citizenship and ethics have been obstacles to infusing social media and Twitter in schools. Some people still feel that Twitter is of little value and a waste of time. Although some tweets may be seen as frivolous, there are numerous ones that are very interesting and valuable for professional use. Perhaps Steven Johnson, the author of *The Invention of Air*, said it best when he was quoted saying, “This is what the naysayers fail to understand: it's just as easy to use Twitter to spread the word about a brilliant 10,000-word New Yorker article as it is to spread the word about your Lucky Charms habit” (Picard, 2012). On a local level, I was the first teacher in the Pembina Trails School Division to request to have Twitter unblocked from the divisional high school filter in 2012. As of early 2014, Twitter is still blocked in most elementary and middle schools in the Pembina Trails School Division. Statistics on the percentage of high schools that block Twitter from schools were not available.

Even though Twitter is not available for staff or students in many schools, its influence and power are growing. On November 7th, 2013, Twitter had a stock market IPO (Initial Public Offering) and offered its share at \$26 each. By the end of the day, the share value increased to \$45.10, or a 73% increase (Pepitone, 2013). Twitter was valued at 31.5 billion dollars that day which provides an indication of the influence and power Twitter can deliver in the future.

There are several factors or themes that can be studied to analyze the effectiveness of Twitter use by educators for professional development. There is a paradigm shift in the way a teacher can augment his or her professional knowledge base through Twitter, when compared to the traditional methods of professional development. Web 2.0 and K-12 teacher practices offer insight into how educators are using the new 21st century digital tools. More specifically, Twitter and K-12 teacher practices provide a background into the motivations of using this new “anytime, anywhere” medium for professional development.

Professional learning networks provide teachers with new opportunities to share resources and ideas with similar-minded people. Studying Twitter as a motivator for engaged learning can provide information as to its effectiveness for professional development and how it is used by teachers. In addition, given the newness of Twitter, it can provide valuable new skills and literacies for teachers while augmenting professional development. These themes are separated into three related areas:

- a) The demographics and characteristics of teachers using Twitter for professional development.
- b) The motivation for K-12 teachers and other educators to participate in professional development using Web 2.0 tools.
- c) Participation in professional development through Twitter for K-12 teachers and other educators.

a) The demographics and characteristics of teachers using Twitter for professional development.

Research into who are the educators that use Twitter for professional development, along with the characteristics of these teachers, is very limited. In May of 2014, a Google search of “characteristics of teachers using Twitter for professional development” resulted in no hits. An ERIC search of “characteristics of teachers using Twitter for professional development” resulted in one find. This was an article called “‘Follow me’: Networked professional learning for teachers” (Holmes, Preston, Shaw, & Buchanan, 2013). However, this article only studied the efficacy of Twitter for professional development and did not delve into the characteristics of the users.

Most studies researching the characteristics and backgrounds of teachers and PD use more general terms. For example, “7 Effective Characteristics of Teachers Using Technology” is a common type of generic result that would be highlighted when doing a Google search on teacher characteristics and PD and technology. However, it would be valuable to know who are the teachers using Twitter for PD. Knowing their educational backgrounds, their areas of expertise, and their interests would provide important information when developing effective and targeted professional development programs for teachers using Twitter. Data on age, gender, area of interest, geographic location, and Twitter use would also be important to know when developing PD programs.

Although digital technologies have been mainstream for well over a generation, research into the specific use of professional development using Twitter by teachers is fairly limited (Ritchell, 2011). A major reason for this is because Twitter has only been in existence since 2006. In addition, during the first two or three years of Twitter’s existence, celebrities, more than educators, were using Twitter to promote their careers. An example is that Hollywood actor Ashton Kutcher was the first person to have one million followers on Twitter on April 18th, 2009

(Griggs & Sutter, 2009). Although celebrities continue to have huge amounts of followers, news and educational organizations, and educational leaders are currently gaining large numbers. CNN had 15 million followers, Huffington Post Education had over 100,000 followers, the international education association, ASCD, had 75,000 followers, and Alec Couros, a leading Canadian educator from Saskatchewan, had approximately 50,000 followers in January, 2014 (Twitaholic, 2014).

Given the large growth in Twitter, more studies are becoming available. As of January 1, 2014, there were 645,750,000 active registered Twitter users, which is about 10 percent of the world's population (Statistics Brain, 2014). There are 9,100 tweets per second, or 58 million per day in the world. There are 135,000 new Twitter users each day. Interestingly, 40% of Twitter users do not tweet but use it to simply read other tweets (Statistics Brain, 2014). In addition, Twitter's growth in 2011 from 2010 was 31.9% compared to 13.4% for Facebook (Dugan, 2012). Twitter also experienced massive growth in the last three years. In 2011, it was reported that 18 million U.S. adults accessed Twitter every month, a 44% increase since 2008 (Gerstein, 2011).

There are several studies into the general use of social media, including Twitter, and its practice in education. In universities and colleges, Twitter users are of greater numbers. Casey (2013) cited from a study in 2011 from Dalstrom et al. that students identified as frequent users averaged 112 tweets a day. In 2012, only 15% of university faculty members were not acquainted with Twitter. Even so, few researchers have studied the use of Twitter by K-12 educators (Forte, Humphreys, & Park, 2012). At the same time, 49% of university educators using Twitter mentioned sharing information with colleagues as a main purpose of Twitter (Faculty Focus, 2010).

Identifying and defining the role of social media were viewed as a problem for those in education. Ninety percent of adults between the ages of 18 and 29 participate in online social networking. Seventy-eight percent between the ages of 30 and 54 use social networks (Pew Research Center, 2013). In addition, many educational institutions view social media as a negative (Anderson, Quitney, & Rainie, 2012). Their survey which took over 1,000 respondents from a conference invitation stated 39% felt that universities will “not be much different” between 2012 and 2020. Apprehension has delayed effective use of social networking in K-12 schools (Goldfarb, Pregibon, Shrem, & Zyko, 2011). Connectedness, reciprocity, and individualized professional growth were major themes that emerged. The rapidity of the flow of information was instrumental as a reason for using Twitter. Tweets were found to provide emotional support for educators. Training teachers using Twitter was also viewed as important (Casey, 2013).

b) The motivation for K-12 teacher participation and professional development using Web 2.0 tools.

A Google search of “Web 2.0 and professional development” in April of 2014 gave a response of 35.3 million hits. This generally indicates that there is no lack of information in this general area. Since 2005, Web 2.0 tools have been used by students and integrated to various degrees in schools by teachers (Pan & Franklin, 2011). Online professional development material is available and should be used by teachers to augment skills and knowledge in teaching pedagogy and classroom learning.

There is value in exploring Web 2.0 use for professional learning (Burden, 2010). Career-long professional development is viewed as a requirement for the modern teacher because of the

changing complexities of the global educational landscape. Burden states five key features of Web 2.0 technologies that are of major value to a teacher. These are user-generated publishing, collaboration, re-purposing, multi-literacies, and research. User-generated publishing includes Web 2.0 tools such as blogs and wikis which allow for quick and easy editing and publishing. It is made even more powerful with the ability to link to social networks such as Facebook and LinkedIn. Collaboration is achieved through tools such as Second Life and the key to success is the vitality and participation of the community. Open source content (where the user adds to the collection of information), such as Flickr, Picasa (photosharing), video sharing (YouTube), and document sharing (Google Docs), allows for sharing and editing of files and collaboration. Re-purposing refers to the open education resource and open licensing agreements, such as source code. This provides flexibility among software platforms and greater global use. Multi-literacies are expanded through greater use of visuals, audio, video, text, and media around the world. Inquiry and research in a Web 2.0 world will radically alter how teachers think about the processes of knowledge itself. The shift from static and bounded material moving to the animated and personalized versions will challenge teacher learning.

Burden (2010) also states that teacher learning concentrates on experience, reflection, and construction. Web 2.0 technologies, such as Skype and Google liberate teachers from their physical constraints and create a multiplicity of dimensions for various types of professional learning. A key question is which Web 2.0 tools are most effective in generating learning contexts. The Web 2.0 environment is playing a huge role in disrupting traditional learning and teaching patterns (Ala-Mutka, Punie, & Redecker, 2008). The authors stated that new technologies, and especially social computing, are giving new opportunities for education and training. These opportunities are allowing teachers to experiment with digital and media

technologies. These authors believed that creating and participating in teacher networks should likewise be part of teaching training.

Tu, Blocher, and Ntoruru (2008), suggest that Web 2.0 is a web technology that enhances creativity, sharing, and collaboration among users. This has led to web-based communities such as wikis, blogs, and professional review communities. Collective intelligence is considered a main goal for individual learners and their communities. Web 2.0 technology is enhancing this process due to the collaborative nature of the sharing tools and scaffolding processes. Long-term review communities were seen as more valuable than short-term ones and the cultivating of personal profiles allowed for greater comfort among users. Highlighting Web 2.0's tools through tutorials, activities, and social functions, along with modeling privacy mechanisms would further expand a professional learning network.

Facebook is a popular example of a Web 2.0 tool and online social network. Providing support for beginning teachers is an ongoing focus of educator preparation programs (Staudt, St. Clair, & Martinez, 2013). The authors state that traditional professional development often encourages ineffective passive learning but the Internet offers greater chances to promote and support teacher learning. Online communities are no longer a phenomenon, and although Facebook has more users, Twitter is gaining ground. Staudt, St. Clair, and Martinez believe that mobile devices are the next step in online interactions. They cite ABI Research forecasts where in 2013, 140 million (U.S.) subscribers will be using cellular phones to keep track of their online social networks. Given that new teachers are obviously younger in general, it is reasonable to assume that mobile learning will be even more ubiquitous in the coming years.

Educators are asking the question about what type of professional development is most useful to inservice teachers while considering multiple literacies and digital literacies (Beach, 2012). Beach mentions that current professional development is often not effective in supporting teachers to transform their instruction. “One-shot” workshops with little direct connection to the classroom or follow-up have minimal impact on teachers (Jaquith, Mindich, Wei, & Darling-Hammond, 2011). Effective PD works around a teacher’s schedule, includes ongoing coaching and active learning, along with specific integration of subject matter and collaboration with colleagues. Beach states that as our technology and communities change, schools and the mechanisms within them need to change to improve PD and the use of digital tools in the classroom. Professional learning communities can be facilitated through Web 2.0 tools such as Blackboard, Moodle, Edmodo, Facebook, Google, and Twitter. Beach states that successful PD can foster learning for a teacher’s entire career. PLNs that are developed through blogs, Twitter, wikis, podcasts, and other Web 2.0 tools allow for current material to be shared very quickly. It is more important how the tools are used, rather than which ones are being used. Through this process, online professional learning networks and communities can improve the quality of learning and teaching.

Researchers are finding that teacher professional development needs are not standard (Bauer, 2010). Professional learning networks can be easily developed using free Web 2.0 tools. Using blogs, wikis, Really Simple Syndication (RSS), podcasts and folksonomies can enhance a PLN. RSS creates threads to automatically send content to the user. In a sense, Twitter is a form of RSS. Blogs, short for web logs, offer written text, audio, and video for online consumption. Blogs are often stories written by individuals. Wikis, meaning “quick” in Hawaiian, are fast ways to build web pages. Folksonomies are collaborative tagging, social classification, and

social indexing. Keywords are used to organize and link data. Web 2.0 tool examples include Diigo and Delicious. Bauer notes that Twitter is increasingly valuable for PLNs with the use of tweets, hashtags for filtering, and extended conversations. It is noted as a method to enrich a professional life. Twitter has recently developed the ability to tag images that link to other people. Web 2.0 tools allow for the personalization, sustainability, and increasing the scope of PLNs.

Web 2.0 tools are being used but more research is needed to study methods and multi-perspective approaches to theory building and the enhancement of teacher practices. A theoretical framework will help in developing professional development using Web 2.0 tools (Archambault, Wetzel, & Foulger, 2010). Technology, Pedagogy, and Content Knowledge (TPACK) provides a framework of connections for teachers and technology, pedagogy, and content. These authors stated a perceived change in the instructor role given the integration of Web 2.0 tools. Forty-five percent of respondents saw the instructor role more as a facilitator. This had many implications for teacher education programs and teachers in general when applying pedagogical skills for the 21st century. Professional learning is needed to address this issue given the changing role of teachers because of the new technologies.

Information and communication technologies (ICT) are a pervasive part of working and private lives and they are accepted as continual and rapid (Prestridge, 2009). There is a relationship with the teachers' experience in an online environment between the development of a learning community and engagement in critical discussion. The online community offers teachers a space to share their beliefs and practices. Prestridge believes there is like-wise a greater emphasis on learning in the virtual domain, as opposed to face-to-face meetings among teachers.

Educational leaders need to use online professional development as a viable option to improve teacher practices (McNamara, 2010). Online PD is viewed as valuable by teachers because it is convenient, accessible, self-paced and can differentiate learning. It can also provide reflection among teachers in a PLN. McNamara states that teachers thrive on the sharing of ideas in job-alike situations. This improves their knowledge of curriculum and instructional strategies. Twitter is a good example of how these goals can be reached through this medium.

Building social capital is one way to improve the PD engagement of teachers. This involves connecting educators and reducing the feeling of alienation among teachers when it comes to professional development (Casey, 2013). Casey used a mixed methods research technique to study social capital as a framework to demonstrate the importance of Twitter to educators. This involved professional growth and relationship building. The main question was whether the use of Twitter related to social capital. Social capital was defined as a model to describe relationships and social networks among people.

Part of a teacher's professional development is finding ways to engage the student in and outside the classroom. Twitter is viewed as an informal, active, and 24/7 classroom tool (Kassens-Noor, 2012). This study explored the ways students apply, create, and retain knowledge when using Twitter as compared with traditional classroom methods. Kassens-Noor additionally noted that since Twitter is a new educational tool, empirical evidence on the benefits for teaching with Twitter was limited. Kassens-Noor also cited from Hicks and Graber (2010) that Web 2.0 tools may have created a new "learning and information reality" because of the ubiquity and immediacy of information that is available. One empirical study involving 125 students in a first year seminar course found that Twitter increased student engagement and grades (Junco et al., 2011). Junco et al. also felt that it was important for educators to focus on

the Web 2.0 mentality instead of the technology to help continue this positive impact of Twitter on learning.

Kassens-Noor (2012) found Twitter to be an effective collaborative tool. However, tweets were viewed as a hindrance to reflective thinking because of the 140 character limitation. The study indicated that Twitter can help combined knowledge creation better than the traditional system. Peer-to-peer learning was better using Twitter because of the fast and collaborative aspects of this tool. The study noted that Twitter did enhance informal learning because of its fluid nature.

Twitter helps educators and students learn new skills and literacies. Before the explosion of digital technologies in the 1980s, nearly all information was gathered from scans, a printed book, newspaper, or magazine. Teachers and students needed to physically visit a library and use, for example, hard copy ERIC files before the mainstream advent of the Internet. Today's students who were born after 1985 only know of the Internet and digital technologies. Schools, however, have been slow to adapt to the new digital realities. Although social media such as Twitter and Facebook have become very popular with students, schools have often been purposefully banning social media from schools (Watson, 2012). Watson notes that there are educators that still view literary texts as the only value in educational pedagogy even though the importance of social media has grown. Twitter and social media have crossed the boundaries of private and public conversations. This has resulted in new adaptations of language and meaning in communication. Watson concluded that Twitter and Facebook are presenting new ways to represent a voice, and in turn educators must necessitate a new pedagogy that is socially cognizant and inclusive of technologies.

Twitter can also be used pedagogically to help students in terms of collaboration, communication, and participation within the practice of new media (McCool, 2011). It was noted that some educators already use Twitter in the classroom and this medium was seen as a positive force in class participation and feedback. Other positive results included collaboration, classroom community and a social presence. The success of using Twitter was related to the professor's specific goals in mind. Creating detailed objectives and instructions to follow the integration of Twitter was very helpful. For distance learning, Twitter helped to increase online ambient awareness. This resulted in a "humanizing experience." Twitter was used to specifically enhance digital literacy and develop meta-discussions. McCool's study concluded that although Twitter can provide excellent collaboration and communication, it was very important to give students the opportunities to leave a positive digital footprint and become socially adept communicators.

There are calls for more research to be done in the area of Twitter and literacy, also known as "Twitteracy" (Greenhow & Gleason, 2012). These authors note that more large-scale and in-depth studies are needed to analyze tweeting practices and methodologies. More research was needed in the area of teachers' integration of Twitter in schools and in the technological pedagogical content knowledge. This would in turn lead to more information about the efficacy of teaching using Twitter and in the teacher's professional growth.

c) How do K-12 teachers participate in professional development using Twitter?

The ubiquity of the Internet and mobile devices today help make Twitter a seamless process for keeping current with the latest information. Smartphones allow Twitter users to be connected almost anywhere at any time. In fact, the problem may be more of when to disconnect from Twitter and to not always be following the latest person, tweet, or trend. Since it is

relatively easy to keep in touch with other Twitter users, the ability to augment professional development is greatly facilitated. Twitter helps teachers create and maintain professional connections outside their schools (Forte, Humphreys, & Park, 2012). These teachers then become channels for new learning practices that flow in and outside the workplace. Teachers are using Twitter to pass resources and respond to other educators' requests. These authors note that teachers discovered new ideas on Twitter that improved their practices and used social media with the students. These teachers viewed Twitter as a progressive resource for regular activities in school. It was also stated by the researchers that the teachers were frustrated if policies prohibited them from using social media such as Twitter.

Traditional models of professional development include information that is often given from a person or persons outside the teacher's particular school. These tend to be theme specific and given to large groups en masse. These models often do not give direct and relevant experiences for a teacher's professional development (Kaliban et al., 2011).

Some educators feel that Web 2.0 technologies and Twitter can provide school administrators the opportunity to give teachers professional development (Davis, 2012). Davis investigated the perception of K-12 teachers who participated in #edchat discussions for professional development. It was found that these sessions enhanced the sense of belonging and positive attitudes toward teaching.

For changes to occur in the classroom, technical and pedagogical support is needed. Professional development should include all educators so that nobody is limited in expanding their learning and teaching methods. Self-directed teacher professional development is viewed as crucial because it supports life-long learning, it seeks out experienced educators, and it provides

support for professional development across a wide range of subjects (Hooker, 2008). In addition, teacher professional development should be a continuous succession of exploration, reflection, and application of ideas and practices (Tinker, Howritz, Bannasch, Staudt, & Vincent, 2007). Twitter, as mentioned, does meet the criteria for continuous support of professional development in an “anytime and anywhere” environment.

Twitter is a valuable tool for new teachers to find information. Many new teachers have a lack of resources for the courses they teach. Twitter can act as a conduit for current and relevant information for their course preparation. It offers an informal vehicle for the collection and sharing of information (Risser, 2013). According to Risser, a distinct advantage was that Twitter would bring the information to the teacher as opposed to having the teacher search for the material.

Twitter is found to be a community of supportive, friendly, and knowledgeable people. This always-present network offers a new method of professional development that provides a shared commitment and competence (Wesley, 2013). This includes education tips and tricks, resources, and connections through hashtags. The online community results in discussions, relationship building, and learning from each other. Wesley discovered that Twitter users identified themselves as not just educators and technology fans, but also as people who liked to learn. Interestingly, many teachers made the distinction between themselves and those other teachers that did not use Twitter for self-learning. In addition, Wesley noted that the practice of sustained interaction, sharing of ideas, debate, and the contributions to a knowledge base helped maintain this Twitter community.

Twitter provides access to conversations. This allows for people to easily search and find other people to follow around the world. Using tweets, keywords, hashtags, and mentions, people can research material that is current and relevant to their area (Ovadia, 2009).

Given the fluidity and quick access to current information, Twitter certainly has the potential to reach and engage many teachers across the world. One qualitative study of 45 scholars found that educators who used Twitter (Veletsianos, 2012):

1. Shared resources and information relating to their professional practices.
2. Shared information about their classrooms.
3. Requested help and offered suggestions to others.
4. Participated in social discourse.
5. Engaged in digital identity.
6. Pursued to make connections with others.

Veletsianos (2012), discovered that the scholars sought to actively connect and network with others and were conduits between people. Some sought to connect with beginning teachers and experienced teachers and provided recommendations on who to follow. Connections were made at a deeper level by engaging in discussions on various pertinent topics. The information also crossed into other online areas such as YouTube and blogs.

Twitter is an excellent method to pass and receive information to a large audience. Sometimes this was done in conjunction with blogging which further increased the motivation of teachers to use online resources (Lalonde, 2012).

A professional learning network is either a formal or informal learning network where individuals want to communicate and share ideas for the specific reason of active learning.

Although it is based on a professional association, a PLN can develop social relationships which further enhance the willingness of teachers to share information.

As mentioned earlier, there is surprisingly modest empirical research done specifically in the area of the effectiveness of technology and Twitter in education (Ritchell, 2011). This includes Twitter infusion in the classroom and its use for online professional development for educators. Vast amounts of money are spent on technology, but often it is done without much thought. One reason is simply to keep pace with other schools. The St. James-Assiniboia School Division in Winnipeg, Manitoba, for example, announced in May of 2013 that every student in grades 6 to 8 would get Apple iPads. The superintendent of this school division, Ron Weston, acknowledged this initiative by saying “There are school divisions across Canada who do it on a school basis” (Winnipeg Free Press, 2013).

Although there are gaps in the research of Twitter and professional development in education, more studies are coming out regarding this subject. Twitter has been found to help teachers communicate and share resources amongst each other (Lalonde, 2012). Lalonde noted that Twitter’s ability to offer instant and ubiquitous access was seen as a positive to creating a connectedness with other teachers. Since conversations are public, this creates an open space for ambient participation by individuals. The ambient environment refers to the ability of Twitter to let people simply listen or observe conversations which allows for learning. This was especially true for strangers who wanted to “listen in” or add a short comment. This creates an enveloping and fluid atmosphere for PLNs. Lalonde also mentions that Twitter was viewed as a powerful tool for PLNs because of the collective knowledge that can be accumulated by a large group of followers in the network. As the network of people grows, the more valuable it becomes. Sharing resources was the most common method of accessing this collective knowledge. Even though

Twitter only allows 140 characters, the ability to create links to other websites, audio, or video, made it much more powerful. People with large number of followers in their PLN felt that Twitter helped them to solve problems quickly.

Lalonde (2012) noted that the specific use of hashtags, retweets, and lists helped to expand teachers' PLNs by exposing them to other people that they do not follow or do not have following them. The hashtag was viewed as an excellent way to filter their information so teachers could have more control over their PLN.

Twitter helps strangers create a community of collaboration dedicated to enhancing learning and education through a PLN (Ferguson, 2010). Social networking, including Twitter, allows experts to follow a community which facilitates the complexities of conversation (Keuler, 2012). Professional learning networks offer connections with like-minded individuals for continued professional growth. Twitter enhances these connections to be global, direct, and give opportunities to share educators' information, thoughts, ideas, and expertise. It allows for quick communication, collaboration, and reflection with other educators (Cox, 2012; Killion, 2011).

Twitter is seen as a useful tool for developing a PLN and participants found value in a Twitter-based PLN in helping individual professional development (Deyamport, 2013). However, it was felt by some teachers that Twitter did not help their professional development because of the lack of time to tweet and technological confidence. There was also an absence of interest for some teachers in using Twitter (Deyamport, 2013). Deyamport's main question was to study in what ways Twitter PLNs could enhance a teacher's professional development. It was found that Twitter did help the individual professional needs of some, but not all participants. Half of the participants felt that Twitter did enhance their professional development goals and the

other half found limited use of Twitter. A large group of teachers in the school did feel that professional development was not focused on the individual needs of the teachers. Most believed that social media, such as Twitter, could enhance their learning.

The traditional, non-online professional learning community can result in difficulties for teachers to meet face-to-face during busy teaching days. The inherent lack of time is a problem for organized professional learning. Professional development suffers when there is no system for collaboration among educators (Dufour & Eaker, 2010). Twitter can be a way to facilitate this collaboration through online professional learning networks. Since time and area are essentially irrelevant, tweets can be sent, received, and read at the convenience of the teacher. In addition, news feeds, tweets, followers and following people is completely up to the user therefore the information and resource material can be tailor-made for the individual. Given Twitter's flexibility to a person's schedule, its sustainability is more assured. There is also a corresponding shift from knowledge management to the user. In 2008, an open-access online technology course was offered at the University of Saskatchewan. By the end of the course, the number of non-registered students out-weighed the number of registered students by ten to one. This provided some evidence of the potential of online and informal learning through learning communities. This may in turn result in a sustained learning community and increased professional development (Couros, 2010). Learning connectivism, a term which refers to connecting with technology, is a growing aspect of our learning. Today, learning takes place in a much more informal way. The linear method of learning methodologies are changing (Siemens, 2005). Twitter is certainly a tool which facilitates this informal learning process.

It was found that Twitter enhances structured learning environments such as conferences. It allows for micro-connecting and back-channeling among educators across the world in real-

time. Micro-blogging is viewed as a supplemental method in discussing topics and exchanging thoughts. It contributes to spontaneous ideas and communication, therefore, motivating teachers to collaborate among each other in personal learning networks (Reinhardt et al., 2009).

While it was detected that Twitter can facilitate professional learning networks, it is noted that the teachers' schedules at school limited the time for professional discussions (Davis, 2012). Especially for elementary teachers, most of the day is spent in contact time with students. This leaves a very small percentage of the day during school hours that can be used for professional growth and connecting in professional learning networks. It was also found that school teachers did not get enough professional development opportunities (Wei, Darling-Hammond, & Adamson, 2010). Between the years 2004 and 2008, over half of the U.S. public school teachers participated in fewer than 17 professional development hours a year. Davis furthermore cited that Kear (2011), found a lack of research with regards to education and social networks even though the potential for connecting with communities was excellent.

Twitter was found to provide positive social change and improve self-directed learning for teachers (Power, 2013). Power examined professional learning conversations using Twitter through the Community of Inquiry (CoI). The CoI framework furthers understanding of cognitive, social, and teaching presence in constructivist learning environments. Social media offers a vehicle to enhance the scope of collaboration. Power explained that Twitter provided a chance to read, comment, and enhance someone else's reading. The large community and fluid nature also allow for a continuous evolution of ideas through Twitter. However, Power says that Twitter has not been studied from the realm of understanding how this medium sustains online conversations. He likewise notes that through an ERIC search, 42% of studies focused on the generalities of Twitter and 31% focused on the use of Twitter with students. In addition, if a

teacher did not share the same professional focus as other teachers, he or she will feel alienated and stressed (Gaikwad & Brantley, 1992). In this case, any amount of technology or online facilitating would not help a teacher's professional development.

Other studies report that Twitter is an effective tool for professional development and collaboration with students (Grosbeck & Holotescu, 2008). These authors identify that Twitter facilitates a personal learning network by providing engaging practices such as informal immediate feedback from collaborators around the world. It also changes the dynamics of learning through real-time global on-going conversations which can lead to building a true educational community and further professional development. The 140 character limit focuses the writers in summarizing very succinctly the ideas they are conveying. Twitter can be used to disseminate teachers' publications and sources by locating original sources and fostering professional connections. This included following other professionals and live coverage of events.

Grosbeck and Holotescu (2008) noted that Twitter was viewed as a possible distraction for some students. It was felt that it extended a teacher's work day because of being "on" all day and it can intrude into personal life. To be effective, teachers need to be flexible and open to what works and doesn't work. It was important that teachers be motivated and work together and not in competition. Finally, Grosbeck and Holotescu found that Twitter was meaningless without the will to share, engage, provoke, and discuss.

There have been few empirical studies into the learners' goals, aspirations, and outcomes when using a personal learning network (Sie et al., 2013). However, these authors identify seven factors that play an important role in professional development and professional learning

networks. These are sharing, motivation, perceived value of the network, feedback, personal learning, trust and support, peer characteristics and peer value. Collaboration, innovation, status, social media, and reciprocity play a role in the success of a PLN. Twitter offers all of these. Sie et al. note that it is normal today for professionals to develop their own PLNs as part of their occupation. Twitter is also noted as a vehicle for motivating people for more professional growth.

The Internet, and technology in general have uprooted the traditional methods of communication and the learning models. This in turn should be reflected in education and the way people learn. PLNs today can be much more fluid. Computer network-based learning will occur when people input information into organizations which create pods of knowledge. These pods then return the information to other individuals for continued learning (Siemens, 2005). Today's students are connected world-wide through texting, Facebook, and Twitter, which make it easy to communicate in seconds. This demographic situation offers a great opportunity for participation in professional learning networks and professional development for a new generation (Menn, 2011).

Conclusion

The literature demonstrates that technology has completely changed the methods of learning, sharing, and acquiring information. Teachers and other educators need to adapt to this new digital model and embrace the new media and technology. This in turn will help to facilitate professional development for educators across the world. Overall, 21st century Web 2.0 tools and Twitter have helped to enhance communication, collaboration, and reflection for teachers through new and current resources and other support groups. Twitter offers a “24/7” environment

where teachers can find and share resources with other educators. Professional learning networks for educators have been greatly improved and expanded because of this. Student engagement, teacher engagement, and new skills and literacies have been enhanced because of Twitter.

Few studies, however, have been done into finding out exactly who is using Twitter and how it is specifically used for professional development. Twitter has led to more self-directed and informal learning. However, it must be noted that some teachers are still not convinced that Twitter can help their professional development. Some believe the limitations, such as the 140 character limit, are a detriment to effective practices. More studies are needed to understand who and how teachers are using Twitter for their professional development so that effective models for Twitter and teacher professional growth can be established.

Chapter III - Methods and Procedures

Overview

The use of Twitter and professional development today can be somewhat of a disjointed effort without a systematic approach to improve methods of teaching. My research allowed for the collection of information so that improved standard practices could take place among individuals for professional development. A survey design was used to gather information about who is using Twitter and how it is used by educators for professional development.

The Internet is viewed as the most efficient method to find, send, and receive data (Clark & Maynard, 1998). It provides an economical and relatively quick method for providing and receiving data, allowing for greater potential for a large number of participants in a survey.

A survey is a study in which data are collected to describe the characteristics and practices of a population (Orcher, 2007). This was used to describe who and how the participants used Twitter for professional development. An online cross-sectional survey examined the demographics (who), and the practices (how) of Twitter users in education in relation to professional development. Online open-ended questions were also used for more concise responses as to the practices of Twitter and professional development. A cross-sectional design is an appropriate methodology because it is used to study attitudes, characteristics, practices, and experiences at a single point in time (Creswell, 2005).

Participants

Recruitment. A web link for the survey was distributed through myself and third-parties. These third-parties were two Twitter users with many followers. “Many followers” would be

considered a minimum of 1,000 people and a majority of these followers are teachers and other educators. One of the third-party individuals was an educator from Canada and the other from the United States. These two people were asked if they wished to send the request for filling out the survey. A letter of invitation is in Appendix B. It was not difficult to find third-party people because many have been using Twitter for professional development and are interested in the results of the survey themselves.

Through a tweet, the link was given to complete the form. The tweet was:

If you are interested in Twitter and professional development for educators, please consider completing this survey. Thank you. *LINK HERE*.

The tweet was short given the limitation of 140 characters. The two third-party individuals were asked if they would tweet the above. Given the educational prominence of the two third-party individuals, the participants who answered the survey were a good representation from the educational field. The tweet for the request to complete the survey was sent once by each of the two third-party individuals. I sent the tweet out three times over the two week period, overlapping the same time frame. The tweets were equally distributed by being sent in the morning, afternoon, and evening as to make them visible at different times of the day. This is important because some followers may only read tweets at a certain time of the day. This survey was intended to be completed one time by the participant.

The link for the survey was also twice tweeted by myself using the following educational hashtags: #edchat, #edtech, and #mlearning. The tweet was slightly altered because of the hashtag. The tweet read:

If you are interested in Twitter and professional development for educators, please consider completing this survey. #edchat *LINK HERE*.

By adding the hashtag, the request was sent to other Twitter users and educators across the world who were not necessarily following me or the third-party individuals. This resulted in a larger pool of Twitter users that saw the request within the particular hashtag.

When Twitter users initially signed up for an account, they accepted the Twitter policy that all tweets are public. Therefore, by this acceptance, Twitter participants have acknowledged the fact that tweets are public domain. Once the Twitter users clicked on the link for the survey, information appeared about the purpose and the informed letter of consent. If they agreed to the information, they continued with the survey.

Study Participants. The survey data was collected from anybody over the age of 18. Before the survey began, the users were asked if they were over 18 years of age. If not, it was assumed they clicked on the option button “No.” This then sent them to another page which terminated their participation. Since Twitter can be used by anybody, the participants were from anywhere in the world. They were anonymous, as they were not asked their name or username. Although the data was collected from any participant, the target population was educators which included teachers, professors, school administrators and coordinators. This was the group of people for whom the survey was most relevant since the questions were directed towards educational factors and methods. The representative population was educators from Canada and the United States since the request was sent out to followers that were mostly Canadian and American.

Most respondents had Twitter accounts although this was not a prerequisite since people can read tweets without having an account. It was also possible that the tweet was emailed to other people. The same applied if the link was posted on a personal website. Once the tweet was

sent, there was no way for the researcher to control if and where the tweets travelled to other online destinations. It was quite possible that the survey request was retweeted by others during the survey time frame. The sample population was generally K - 12 teachers, college and university educators, school administrators, and coordinators. A majority of respondents were female. In 2012, male Twitter users comprised 17% of Internet users and females comprised 15% (Duggan & Brenner, 2013).

The participants were willing and able to take part in the online survey. Although it was not guaranteed that the target population was fully representative, it did offer very useful information. The online survey did allow for a moderately large number of participants (153) to explain their experiences with Twitter and PD.

The survey tweet request was technically sent around the world since Twitter is available to anybody with access to the Internet. Using hashtags, the request did not need to come from a follower or from following someone else. By targeting specific groups within educational hashtags such as #edchat and #mbedchat, the pool of potential participants was large. This method also helped to narrow the focus of the representative population of educators. The short online interview section provided greater details into the practices of how Twitter was used for professional development. This approach allowed for a large sample population along with a more in-depth analysis through the online interviews.

Measurements and Procedures

Data Collection. The purpose of the survey was to identify the practices of Twitter use by educators that were found to be effective for professional development. Every measure was taken to ensure standardization. An invitation to take part in the survey was extended to those

interested in professional development using Twitter. All participants were over the age of 18. The participants answered anonymously and there was no conflict of interest since the researcher had no connection with the participant in the area of authority. The conditions of the survey were standardized and consistent as it was accessed from a link from a tweet and answered online. The time frame for being able to access the survey (the two-week period from August 22 to September 5, 2014) was the same for everybody. It was also accessible at any time during the day or night so that participants answered at a time that was convenient for them. Some questions, such as one about Twitter chats, were first asked in a check box question format. Further in the survey, the participant was asked to elaborate in an open-ended question about Twitter chats. If the answers were not answered in an associated way (i.e. participant did not check Twitter chats as one of his or her functions but later gave details about using Twitter chats), their survey was not used. There was also a combination of option buttons, check boxes, a Likert scale, and open-ended questions to provide alternate forms of reliability.

To ensure content validity, each question on the survey was matched to answer one of the three main research questions. Note in the survey in Appendix A that the end of each question is marked with a RQ1, RQ2, or RQ3 – in reference to which of the three main research questions was being answered. Triangulation was used to corroborate validity. For example, observing a parallel between the Likert *strongly agree* statement of “Twitter helps in collaboration with my colleagues” and a high number of followers/following indicated trustworthiness in the answer. This was also corroborated with the question about the frequency of tweets sent out. Another question asked about the frequency of hashtags which was corroborated with the open-ended question about the types of hashtags the participant used.

The methodology for answering the research questions was through a combination of an online survey and a short online interview-type process. This approach of an online survey and online interview research method enhanced a comprehensive collection of accurate information. In addition, having the survey done online followed the spirit of Twitter in keeping the information succinct and to the point. In addition, the survey only took between six to eight minutes to complete, therefore the participant was more apt to provide meaningful answers. Finally, given that the survey was anonymous and voluntary, there was no reason for the participant to feel pressured to complete the survey and consequently give invalid information.

The online survey used Google Forms. The advantages of Google Forms included:

- Participants did need to have a Google account (or any account) to complete the form. There was no sign-in process.
- There was no maximum number of participants since Google Forms does not have a limit to the number of entries.
- Participants were anonymous.
- Google Forms is multi-platform allowing for data entry from any type of Internet-ready digital device.
- A link to the form from a tweet, email, or website was available for the participant. In addition, the link did not necessarily need to be given from the researcher.
- There was much flexibility with the creation of the form. Multiple check boxes, option buttons, drop-down lists, text boxes, and paragraph comment areas were used without any minimum or maximum characters.

- The participant information and data collection were directly entered into a Microsoft Excel-compatible spreadsheet for analysis.
- The information was completed any time, and anywhere in the world where there was an Internet connection.

Attitudinal measures about Twitter and teacher Twitter practices were collected through the online survey. The online interview allowed the participant to elaborate on their answers about who, how, and why he or she used Twitter to enhance their professional development. Performance measures or behavioural observations were not used in this online web-based survey. No audio or video recording took place.

Participants were encouraged to answer all the questions in the survey, however, only the ones marked with an asterisk were required to be filled out.

The closed-ended question portion of the online survey was comprised of questions first asking about age, gender, years and area of experience in education. Check boxes (where more than one box could be checked) were included for questions regarding the participant's educational training, position in education, main area of teaching or work, and what Twitter activities and applications he or she participated in. A five-point Likert scale system (Strongly Agree, Agree, Neutral, Disagree, Strongly Disagree) was used to answer questions about the participant's use, approaches, the advantages, the disadvantages, sharing, professional development, collaboration, resources, hashtag use, and Twitter chats. The full survey questionnaire is featured in Appendix A.

The short online interview-type process consisted of answers entered by the participant in text (paragraph) boxes. There was no limit to the text amount. This resulted in more specific and

reflective answers compared to the closed-ended questions. The opinions of the participants acted as a guide for best practices in using Twitter for professional development for educators. In addition, because most participants were working professionals, their responses were relevant to the data that needed to be collected. Questions asked in this part were: What drew you to Twitter? Do you feel that Twitter provides a better way to deliver professional development? Do you use hashtags? If so, which ones and why? Do you participate in Twitter chats? If so, how do these enhance your PD? Who are some of the educational leaders that you follow on Twitter for professional development?

Although the qualitative open-ended questions collected the data in a spreadsheet format, it is important to note that programs such as Microsoft Excel can be excellent tools for qualitative work. Excel allows for large data manipulation, analysis, and presentation (Meyer & Avery, 2009).

I, the researcher, had the form stored in a Google Drive folder. This folder was a limited shared folder where participants were directed to through a hyperlink on the Internet via a tweet, website, or email. This link allowed the user to answer the questions using a multitude of data types as previously mentioned. Once the form was completed, it was submitted and the data was stored in a spreadsheet in the Google folder. No participant had access to this data. Only I, the researcher, and my advisor, Richard Hechter, had access to the contents of the Google Drive folder. I was the only person who collected, compiled, and analyzed the data.

The Google Forms vehicle provided a reliable and consistent tool for data collection and analysis. Since it was web-based, anybody in the world using an operating system platform, such

as Windows, Mac OS, or Linux, was able to complete the survey. The only requirement was Internet access through a network, cellular, or Wi-Fi area.

Radio buttons, also referred to as option or multiple choice buttons, allowed the user to only select one answer. This was important in the case of questions that only had one possible answer, such as an age range or how many years the participant had taught in the classroom. The anonymity of the participants was kept confidential for privacy. No data was shared with other participants or individuals outside the study while the data was being collected.

Data Analysis. Standardization of the data collection and analysis was adhered to. Once the participant completed the online survey through Google Forms, the data was collected to a folder in my password-protected Google Drive. The data file was then downloaded to my password-protected private computer in a CSV format. This format was then opened and compiled in a Microsoft Excel spreadsheet.

The analysis from the first section of closed-ended questions provided information about the demographics of Twitter users in the education field. Data showed areas of interest, characteristics, and backgrounds of the individuals. This helped answer the first research question with regard to who is using Twitter for professional development. The demographic questions allowed for closed-ended answers through option buttons and some check boxes.

Google Forms allowed the researcher to choose which questions required an answer. Without an answer to the required questions, the participant could not continue to the next question. At this point, the participant could choose to abandon the survey. This is important to note because missing data results in incomplete information and subsequently makes it more difficult to arrive at any conclusions. Descriptive statistics were utilized to indicate general

themes found in the results. Reporting of the data was given through tables, figures, and charts, along with descriptive text.

The online interview gave deeper and more concise information about why and how educators were using Twitter for professional development. This section dealt with the third question of how teachers are using Twitter for professional development. This section gave indications about how Twitter engages and improves teacher connections through this new method of developing professional learning networks. There were some check box questions in the survey that also answered questions about how Twitter was being used. As with the initial section of the survey, the data was on the same Google form, saved in CSV format, and analyzed in Microsoft Excel. Significant statements and keywords from the online interview were coded, segmented, and grouped into themes using qualitative research methods.

It is important to note that the qualitative data from the open-ended questions follow the spirit of Twitter. The link to the survey was tweeted. The participants most likely felt comfortable in answering the questions because of their previous online experiences, at least in terms of the technology. With this in mind, the analysis followed a “Twitteresque” format when coding the data because the information was gathered from participants in a more horizontal style. The online interview consisted of five open-ended questions and it was not based on deep face-to-face interviews. Reporting on the motivations, demographics, characteristics, and Twitter methodologies followed a modified case study approach since Twitter was the bounded system. This allowed for a holistic description of the phenomenon of Twitter. The analysis also had ethnographic qualities because the “Twittiverse” can be viewed as a culture by itself, especially when looking at Twitter for PD by educators. Shared beliefs, values, practices, and even

language can be detected among Twitter users. These summarized findings, personal reflections, and comparisons with the literature are part of Chapter V.

Ethical Considerations. The TCPS 2 Certificate for research ethics had been completed by the researcher. (See Appendix F for the certificate.) Permission from the University of Manitoba Research Ethics Board was granted before any research began. (See Appendix G for the ENREB approval certificate.)

Participants agreed to a letter of informed consent before they began. (See Appendix A for the Letter of Consent.) This letter of informed consent was on the first page of the link if participants chose to do the survey. The letter stated that all names would be anonymous in the published report. The letter informed them that they could stop being part of the survey at any time. No incentives were offered to complete the survey or interview. The letter included the purpose of the research, what procedures were involved, what were the potential risks (no known risks), it addressed privacy concerns, their rights, and the benefits of completing the survey. It was stated that there were no associated costs and that all participants must be 18 years of age.

If the participant agreed to the letter of informed consent, he or she (if over the age of 18) clicked on the “Yes” option button, which lead them directly to the survey. If they clicked on the “No” option button, they did not have access to the survey. It was assumed that the participant would answer this question honestly as there was no way to check the authenticity of their age.

The Google form information was stored in a non-sharable folder online. Twelve months after the completion of the survey (September 5, 2015), the information is to be deleted. An Excel spreadsheet with the information from the Google form will be kept on the hard drive on

my private computer. The two third-party individuals sending the tweet are not related to me nor do they work in the same school division as I do (Pembina Trails School Division).

Summary

The focus of this study was to provide information about who and what educators are doing with Twitter for professional development. Providing a link to the survey from a tweet was very apropos as the research is about Twitter and professional development for teachers. Having two third-party individuals and myself tweeting the request to complete the survey resulted in 153 respondents. The survey was divided into two sections, one with closed-ended questions and the other with open-ended questions. Three main questions were asked. This included the collection of demographic information such as gender, age, number of years teaching, subject areas, and grade levels currently teaching. The second question dealt with what drew the respondents to Twitter for professional development. The third question asked how the participants were using Twitter for PD. Using open-ended questions for this third query allowed for greater elaboration in the answers. The following chapter will present the results of the survey.

Chapter IV - Results

The purpose of this research was to identify who is using Twitter for professional development among educators, their motivations, and how they participate in it. To arrive at the answers, a tweet to an online survey was used to send out the questions. Teachers and other educators were asked to provide demographics, their reasons for being drawn to Twitter and professional development, and how they were using it to their benefit. The survey comprised of short and long answer questions where the participant could elaborate on their use of Twitter.

The reporting of the results will begin with the demographics, followed by the motivations, and how Twitter is being used for professional development. The majority of the survey's open-ended questions dealt with this final question. The research questions of the study were:

1. Who are the teachers (demographics) and what are the characteristics of those educators that participate in Twitter for professional development?
2. What draws K-12 teachers and other educators to participate in professional development using 21st century learning Web 2.0 tools, and specifically Twitter?
3. How do K-12 teachers and other educators participate in professional development using Twitter?

The display of the results will be reported in the form of a pie chart where proportions are valuable to note. A bar chart will be used when reporting data in a summarized numerical fashion. A table will be used when displaying important numerical data.

The survey included 10 demographic questions for greater insights into the background of the participants. Eleven Likert scale questions and one open-ended question were used for

discovering the motivations of using Twitter for professional development. Two short answer questions, seven number scale questions, and four open-ended questions were used in reference to how educators participated in professional development and Twitter.

The survey was open to anybody over the age of 18, however, the focus was on educators answering the survey. This was realized through the delimitation of using a tweet sent out to my followers, of who the majority are educators. The tweet to the survey was also sent by one Canadian educator who has over 62,000 followers and an American educator who has over 65,000 followers. The tweet requesting to complete the survey was retweeted several times by my followers. The survey was open to the public from August 22, 2014 to September 5, 2014. This two-week period was chosen because this was the preparatory pre-school time period for most Canadian teachers. In addition, most American teachers had returned to school for one or two weeks already. The survey coincided with the beginning of the first week of school for K-12 and university classes in Manitoba. Therefore, most of the participants were either beginning to prepare for a new school year or were already teaching classes and administering schools.

Note that all percentages in this study (excluding tables) are rounded off and represented by whole numbers. The numbers noted in parentheses after a percentage score are the actual number of respondent answers.

First Research Question:

The first part of the survey consisted of demographic questions which answered the research question:

- **Who are the teachers (demographics) and what are the characteristics of those educators that participate in Twitter for professional development?**

A total of 153 participants answered the online survey. Fifty-seven percent (87) were female, 42% (64) were male and 1% (2) preferred to not answer.

The age breakdown of the participants included 1% (2) between the ages of 18 and 24 years, 39% (59) between 25 and 40 years, 50% (76) between 41 and 55 years, and 10% (16) over the age of 55 years. Figure 2 indicates the breakdown of age categories by percentage. Exactly one half of all participants fell within the age range of 41 to 55 years of age.

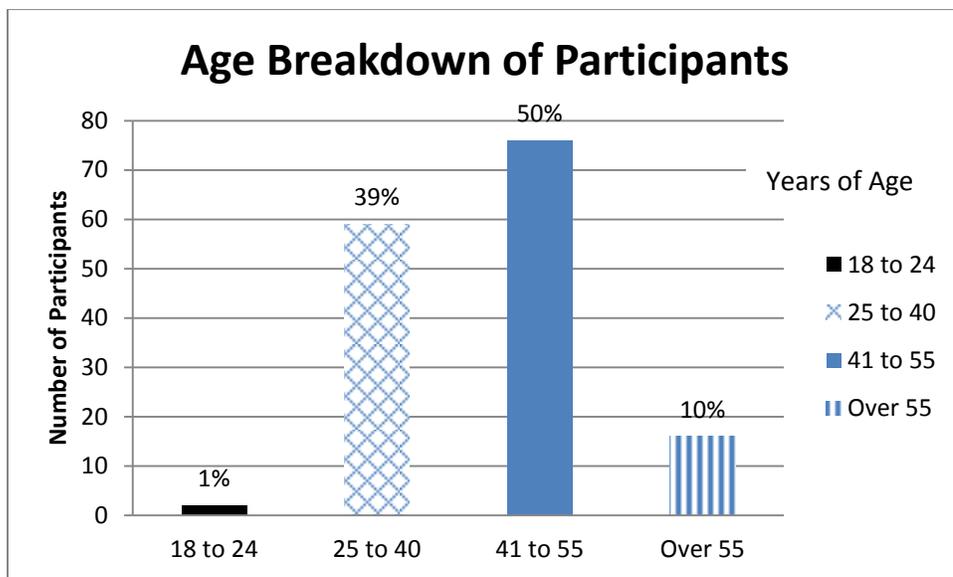


Figure 2. Age Breakdown of Participants. This figure indicates the range of ages of the participants in the survey by percentage.

Participants in the survey originated from several areas of the world, including 10 countries from 5 continents. As Figure 3 indicates, 57% (87) came from Canada, 30% (46) from the United States, 8% (12) from Australia, just over 1% (2) from the United Kingdom, and just under 1% (1) from each of the following countries: Costa Rica, Italy, Columbia, Romania, Oman, and Sweden.

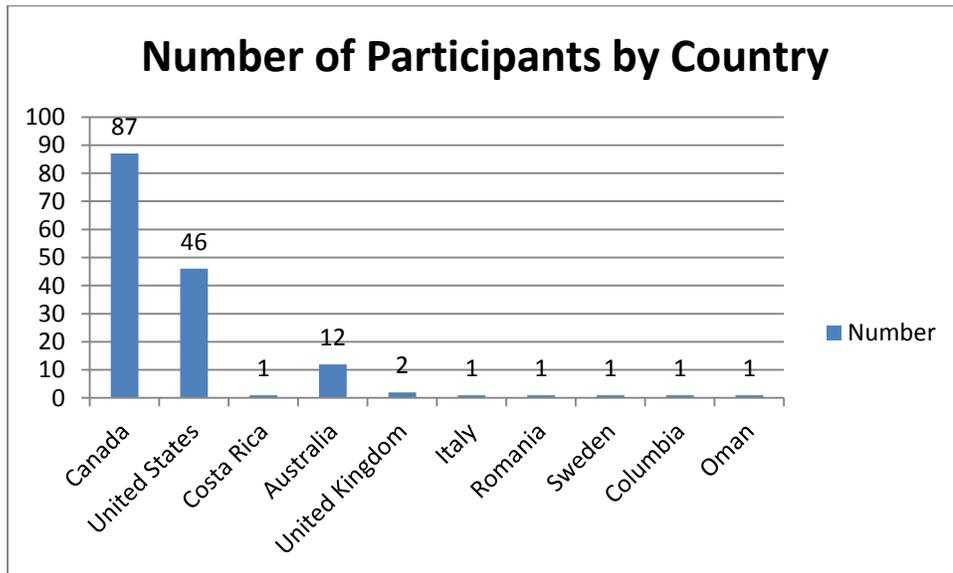


Figure 3. Number of Participants by Country. This figure displays the number of respondents by country of origin.

The majority, or 87% (134) of all respondents originated from North America (Canada, The United States, Costa Rica). Survey replies came from six Canadian provinces: Manitoba (65%), British Columbia (10%), Ontario (9%), Alberta (9%), Saskatchewan (6%), and Quebec (1%). In addition, there were 25 states from the United States represented in the survey which is exactly half of all the states. Table 1 illustrates from which continent and country the respondents lived and displays a breakdown from which province or state the participant originated from.

Table 1
Respondents by Continent, Country, Province, and State.

Area:	Respondents by Country (Total: 153)	Respondents by Province and State	Percentage by Province and State
North America:			
Canada:	87		
Manitoba		56	64.8%
British Columbia		9	10.2%
Ontario		8	9.1%
Alberta		8	9.1%
Saskatchewan		5	5.7%
Quebec		1	1.1%
United States:	46		
Texas		5	10.9%
Michigan		5	10.9%
New York		3	6.5%
New Jersey		3	6.5%
Iowa		3	6.5%
North Carolina		2	4.3%
Wisconsin		2	4.3%
Connecticut		2	4.3%
Virginia		2	4.3%
Maryland		2	4.3%
North Dakota		2	4.3%
Pennsylvania		2	4.3%
Nebraska		1	2.2%
Colorado		1	2.2%
Illinois		1	2.2%
Ohio		1	2.2%
New Mexico		1	2.2%
West Virginia		1	2.2%
Utah		1	2.2%
Missouri		1	2.2%
Kentucky		1	2.2%
Rhode Island		1	2.2%
New Hampshire		1	2.2%
Indiana		1	2.2%
California		1	2.2%
Costa Rica	1		
Australia:	12		
Europe:			
United Kingdom	2		
Italy	1		
Romania	1		
Sweden			
South America:	1		
Columbia	1		
Asia:			
Oman	1		

Ninety-five percent (145) of the respondents indicated they had been or are a classroom teacher. Five percent (8) indicated they were never a classroom teacher.

Of the 145 respondents that specified they had been or are currently a classroom teacher, 11% (16) taught 0 to 5 years, 38% (55) taught 6 to 15 years, 42% (61) taught 16 to 30 years, and 9% (13) taught over 30 years. Figure 4 displays this proportion of years taught by percentage.

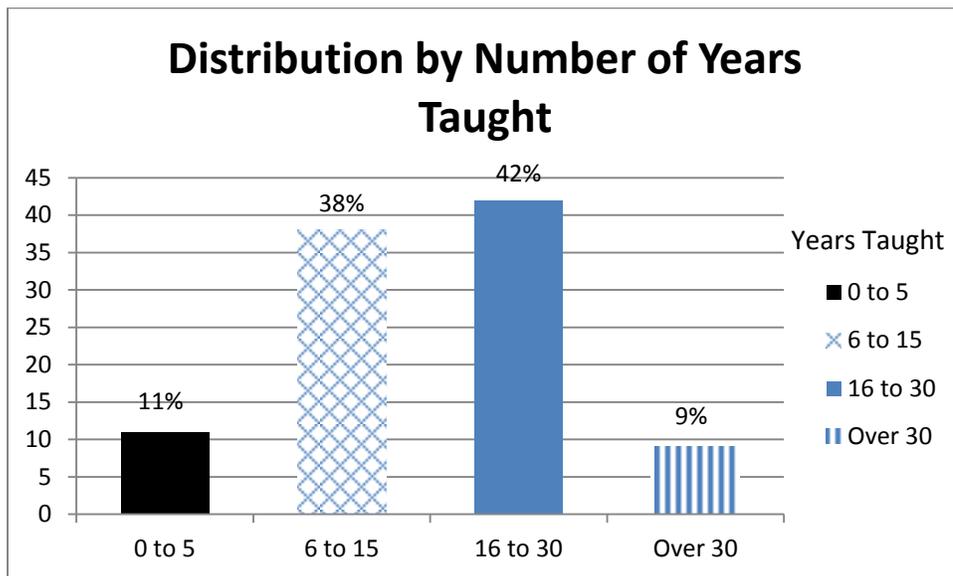


Figure 4. Distribution by Number of Years Taught. This figure displays the percentage breakdown of years taught within each of the four categories of experience.

Forty-three of those 145 respondents indicated that presently they were not a classroom teacher. Of those, 95% (41) are still in the educational field and 5% (2) do not work in the educational field.

When asked about educational training, respondents had the opportunity to choose more than one option with check boxes. Figure 5 shows the percentage breakdown of educational training. Four percent (8) indicated they were presently in school, college, or university. Thirty-

eight percent (69) had a Bachelor’s degree(s), 12% (20) had a Post-Baccalaureate degree(s), 39% (71) had a Master’s degree(s), and 7% (12) had a PhD. A large percentage (46%), had more than one university degree given that 39% had a Master’s degree and 7% had a PhD.

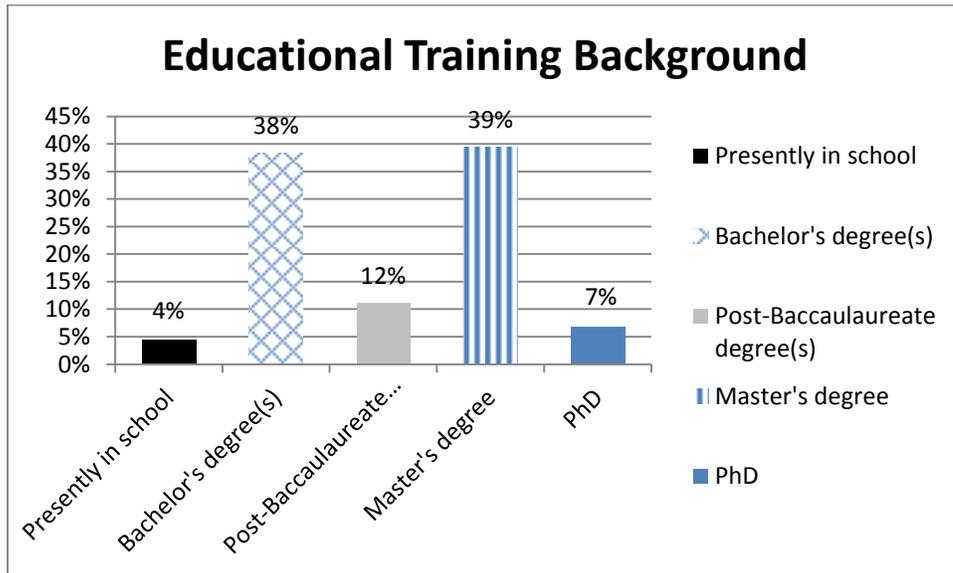


Figure 5. Educational Training Background Percentage. This figure indicates the percentage distribution of educational training of the respondents.

The participants identified their current position(s) in education by percentage. None of the participants indicated they were pre-service teachers. Figure 6 indicates that 61% (93) were teachers, 6% (9) were support services, 26% (41) were administration, and 7% (10) were “other.” Other positions included assistants, coaches, labour relations officers, ICT specialists, consultants, and researchers.

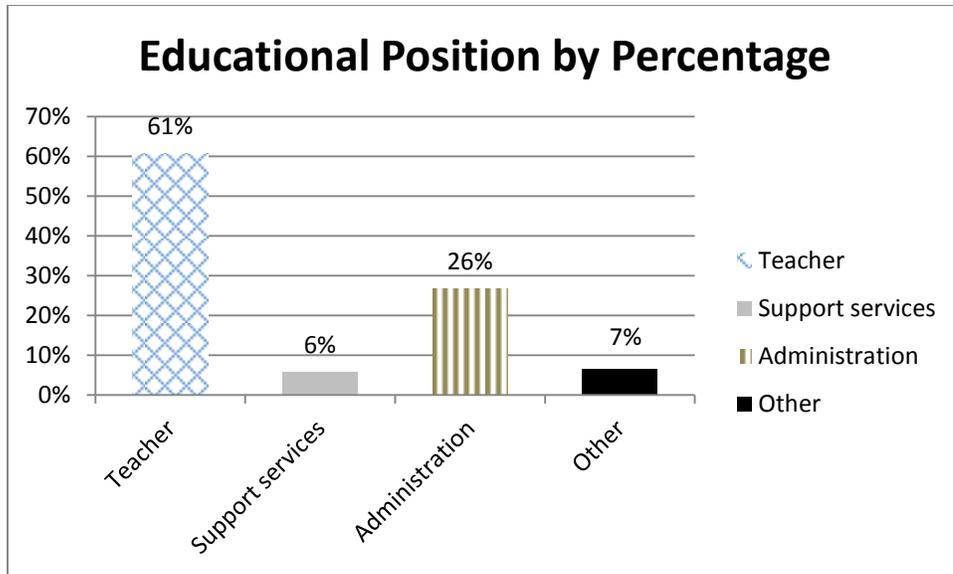


Figure 6. Educational Position by Percentage. This figure indicates the percentage breakdown by educational position of the respondents.

Figure 7 summarizes by percentage the grade levels taught by those participants who indicated they were classroom teachers. Of the 112 total respondents who taught in the classroom, 17% (19) said they taught elementary (grades K to 4), 15% (17) taught intermediate (5 or 6), 19% (21) taught middle years (7 or 8), 40% (45) taught high school, and 9% (10) taught university or college.

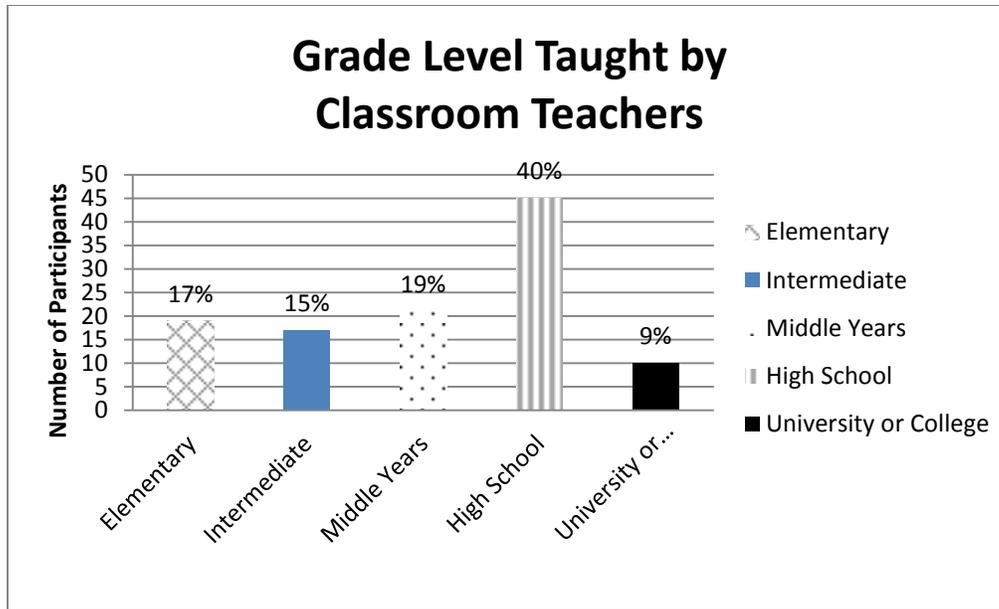


Figure 7. Grade Level Taught by Classroom Teachers. This figure indicates the grade level categories that the classroom teachers taught in.

Participants were asked their main subject area(s) of teaching or work at the present time. Since check boxes were used, respondents could choose more than one option. There were seven different subject area options. Two hundred and thirty-eight options were chosen in total. Figure 8 shows that 6% (14) identified that they taught in the practical arts/arts area. Eight percent (20) indicated they taught in the business/technology area, 19% (44) taught English, 16% (37) taught math, 30% (71) taught sciences, 18% (42) taught social sciences, and 4% (10) taught physical education. All participants chose at least one of the seven subject area options. Nearly half the participants chose “Sciences” as one of their subject options ($71 \div 153 = 46\%$).

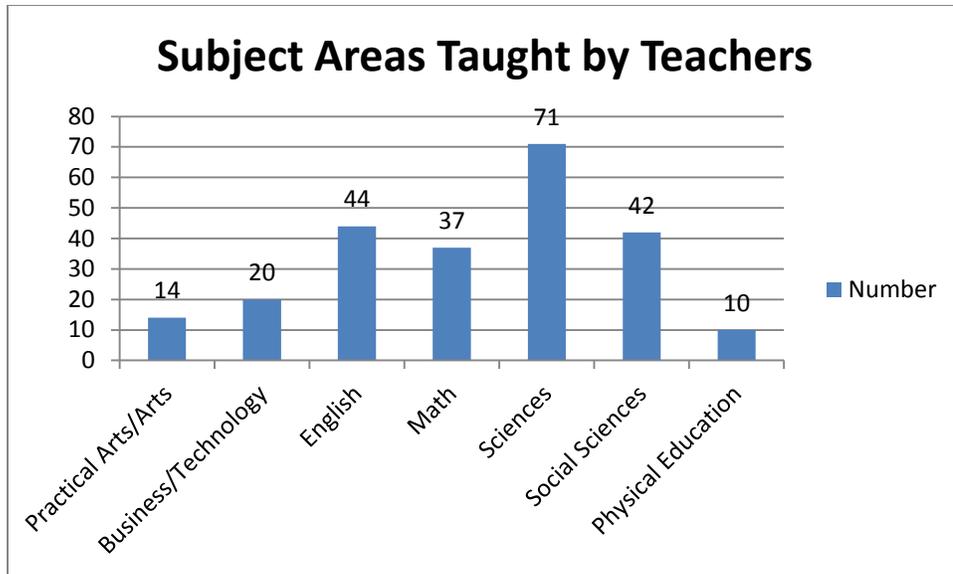


Figure 8. Subject Areas Taught by Teachers. This figure displays the number of subject areas that teachers taught in the classroom or workplace. More than one option could be chosen.

Respondents were asked how many Twitter followers they had and how many followed them. The highest number of followers of any participant was 9,500. This same participant had the highest number following at 7,000 Twitter users. The respondent with the fewest followers was one. This same respondent was following four people. Table 2 illustrates the breakdown among the followers and following in comparison to the median and average. The average number of followers per participant among the 150 people who responded to this question was 735. The average number of people the respondents followed among the 151 people who responded was 740. The median for the average participant with followers was 300. The median for the average participant following other Twitter users was 417.

Table 2

Median and Average Number of Followers and Following for Each Participant.

Status of Average Twitter Participant	Median	Average
Number of Followers	300	735
Number of Following	417	740

Figure 9 displays the range of followers within four categories. The percentage of respondents with over 1,000 followers was 17 (26). Twenty-three percent (34) had between 500 and 999 followers. Forty-one percent (62) had between 100 and 499 followers and 19% (28) had under 100 followers.

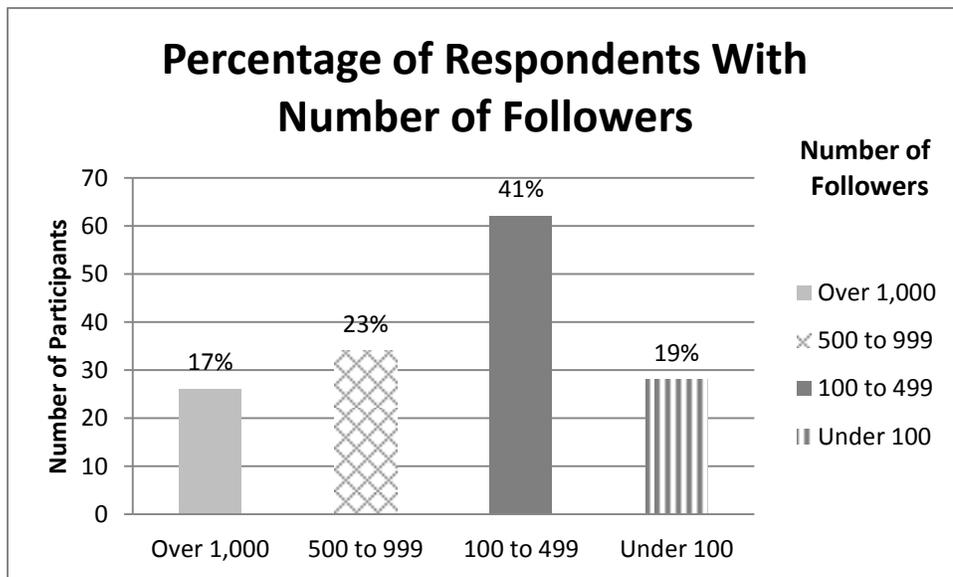


Figure 9. Percentage of Respondents with Number of Followers. This figure displays four categories of the range of followers by the respondents.

Figure 10 displays the range of Twitter users following a participant in this study. Twenty-one percent (32) had over 1,000 Twitter users following a respondent. Twenty-one percent (32) had between 500 and 999 users following a respondent. Forty-one percent (61) had between 100 and 499 users following a respondent. Seventeen percent (26) had under 100 users following the respondent.

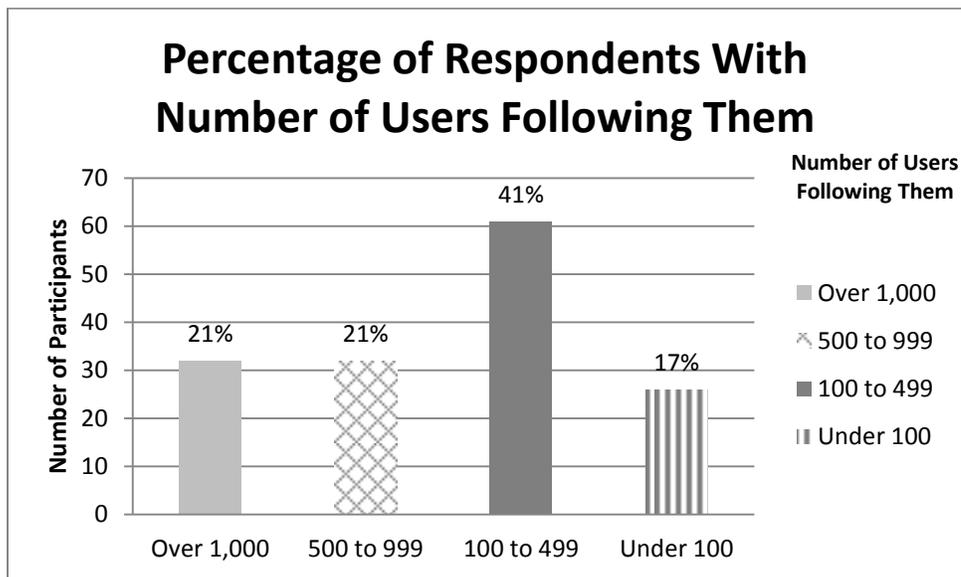


Figure 10. Percentage of Respondents With Number of Users Following Them. The figure displays by category, the number of Twitter users following a respondent.

Second Research Question:

While it is important to know who are the Twitter users and their characteristics, it is very useful to know what draws people to Twitter. A second research question included:

- **What draws K-12 teachers and other educators to participate in professional development using 21st century learning Web 2.0 tools, and specifically Twitter?**

A Likert scale was used to measure the reasons of what drew Twitter users to this social medium. Five levels in the scale were used from strongly agree, agree, neutral, disagree, to strongly disagree. Eleven statements were in the Likert scale. In addition, one open-ended question was used to receive more elaborate feedback on the reported findings. The following are the statements that were used in the Likert scale.

The first statement was “Twitter helps with collaboration with my colleagues.” As Figure 11 indicates, nearly half, or 46% (70) strongly agreed with this statement. Thirty-four percent (52) agreed with the statement, 14% (22) indicated they were neutral, 5% (7) disagreed with the statement, and 1% (2) strongly disagreed with the statement. Four out of five respondents, or 80% either strongly agreed or agreed with this statement.

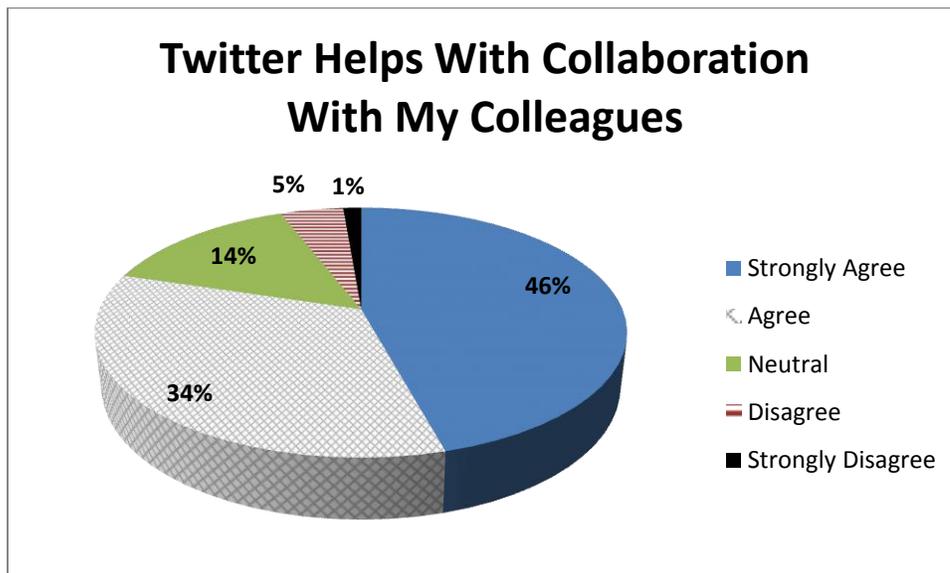


Figure 11. Twitter Helps With Collaboration With My Colleagues. This figure indicates the percentage breakdown of the respondents for this statement using a Likert scale.

The second statement was “ Twitter saves time in sharing information.” Figure 12 shows that just over half, or 52% (79) strongly agreed with this statement. Thirty-seven percent (57)

agreed, nine percent (13) were neutral, two percent (3) disagreed, and one percent (1) strongly disagreed with this statement. The majority, or 89% either strongly agreed or agreed with this statement.

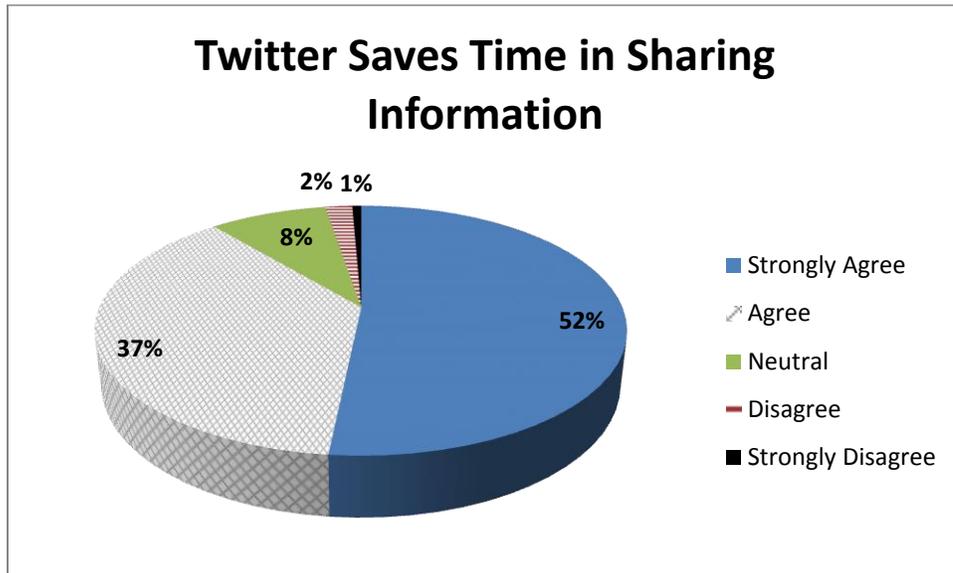


Figure 12. Twitter Saves Time in Sharing Information. This figure indicates the percentage breakdown of the respondents for this statement using a Likert scale.

The third statement was “Twitter keeps me current with educational material.” Figure 13 illustrates that 71% (109) strongly agreed with this statement. Twenty-seven percent (41) agreed with this statement, less than one percent (1) felt neutral, less than one percent (1) disagreed, and less than one percent (1) strongly disagreed with this statement. An overwhelming majority, or 98% either strongly agreed or agreed with this statement.

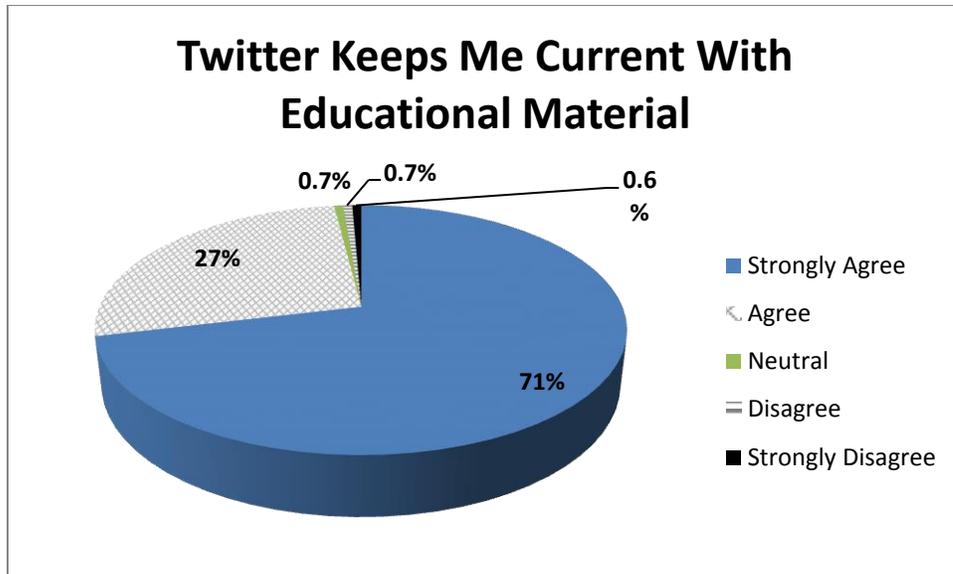


Figure 13. Twitter Keeps Me Current With Educational Material. This figure indicates the percentage breakdown of the respondents for this statement using a Likert scale.

The fourth statement was “Twitter helps me find new educational leaders.” As Figure 14 summarizes, 70% (107) strongly agreed with this statement. Twenty-five percent (39) agreed, four percent (6) were neutral, zero percent disagreed, and one percent (1) strongly disagreed. This was another overwhelming majority, or 95%, that either strongly agreed or agreed with this statement.

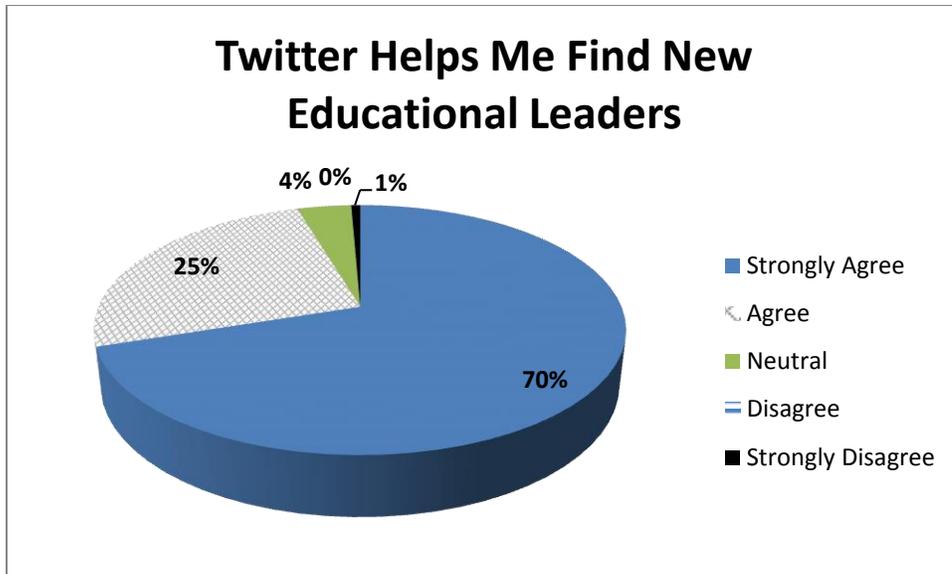


Figure 14. Twitter Helps Me Find New Educational Leaders. This figure indicates the percentage breakdown of the respondents for this statement using a Likert scale.

The fifth statement was “ Twitter connects me with people that I would have never met otherwise.” Eighty-three percent (127) strongly agreed with this statement, as shown in Figure 15. Fifteen percent (23) agreed, one percent (2) was neutral, zero percent disagreed, and one percent (1) strongly disagreed. Ninety-eight percent either strongly agreed or agreed with this statement.

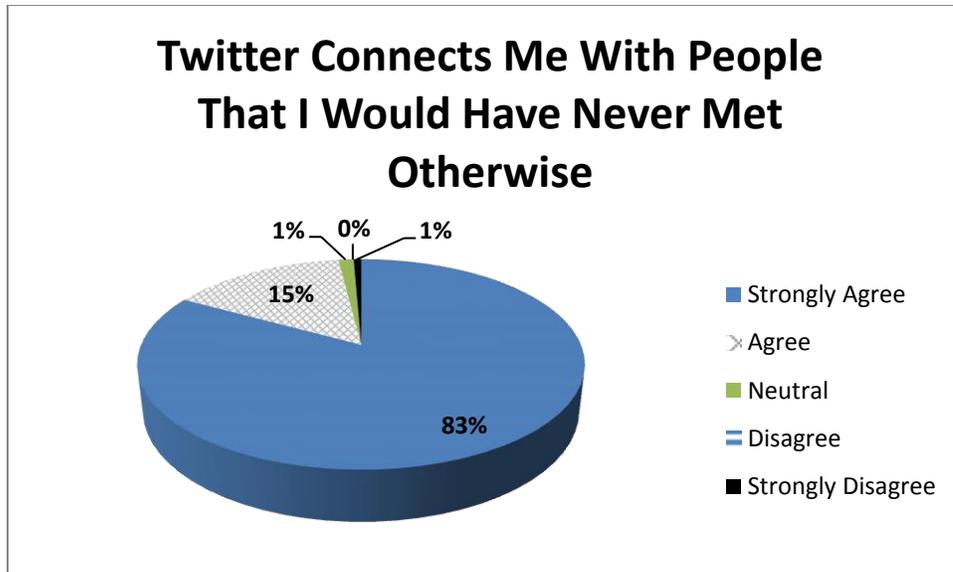


Figure 15. Twitter Connects Me With People That I Would Have Never Met Otherwise.

This figure indicates the percentage breakdown of the respondents for this statement using a Likert scale.

The sixth statement was “I get encouragement from others.” Figure 16 shows that 29% (45) strongly agreed with this statement. Forty-six percent (71) agreed, 21% (30) were neutral, 3% (5) disagreed, and 1% (2) strongly disagreed with this statement. Three quarters, or 75% of the respondents either strongly agreed or agreed with this statement.

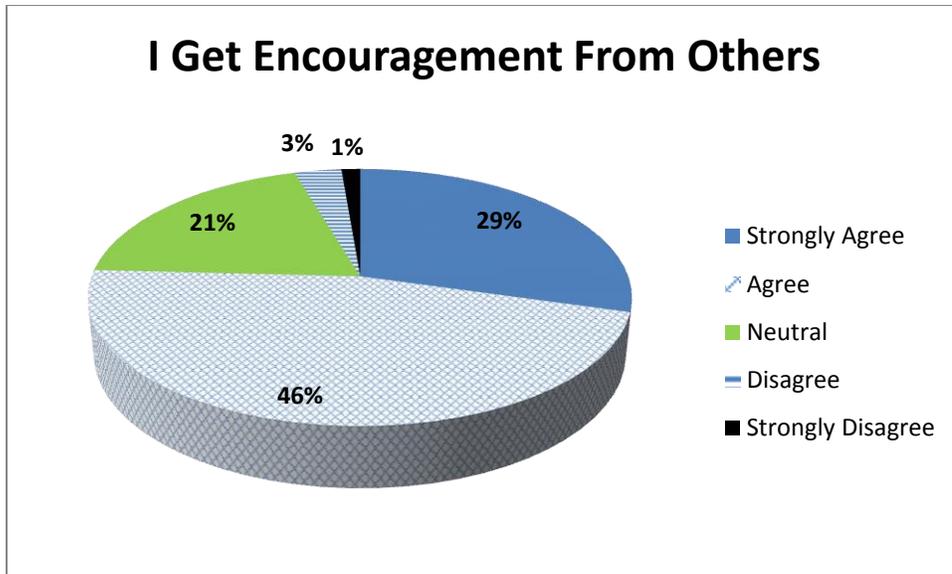


Figure 16. I Get Encouragement From Others. This figure indicates the percentage breakdown of the respondents for this statement using a Likert scale.

The seventh statement was “I feel more connected as a teacher because of Twitter.” Figure 17 illustrates that half, or 50% (76) strongly agreed with this statement. Thirty-seven percent (57) agreed, 11% (17) were neutral, 1% (2) disagreed, and less than 1% (1) strongly disagreed with this statement. A majority, or 87% either strongly agreed or agreed with this statement.

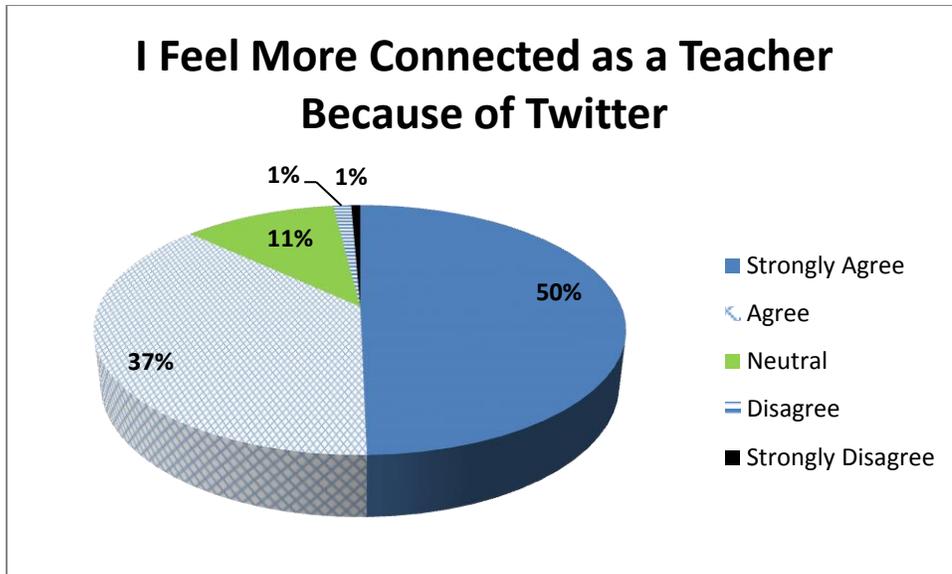


Figure 17. I Feel More Connected as a Teacher Because of Twitter. This figure indicates the percentage breakdown of the respondents for this statement using a Likert scale.

The eighth statement was “I prefer Twitter for PD over traditional PD methods.” Figure 18 shows that 25% (38) strongly agreed with this statement. Thirty-three percent (50) agreed, 30% (45) were neutral, 11% (16) disagreed, and 3% (4) strongly disagreed with this statement. A slight majority, or 58% either strongly agreed or agreed with this statement.

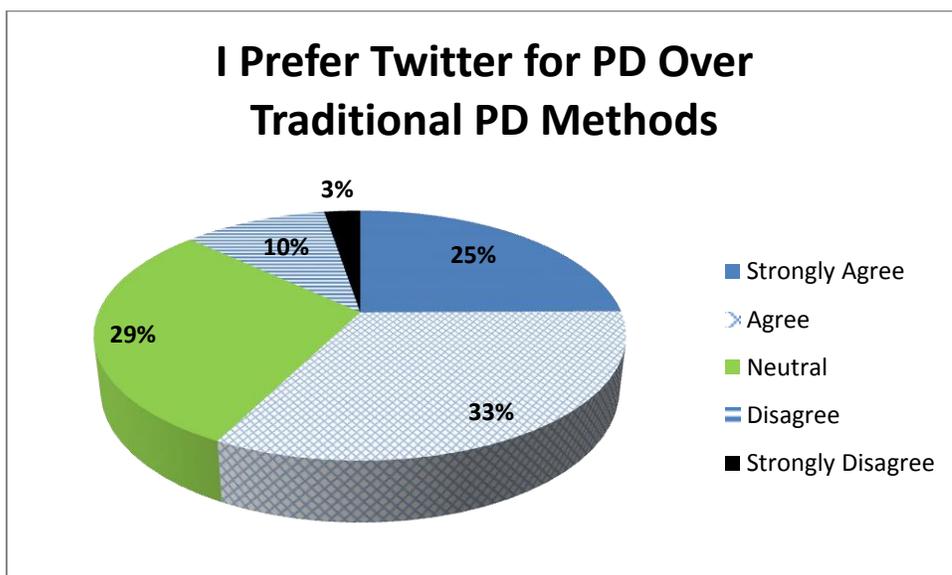


Figure 18. I Prefer Twitter for PD Over Traditional PD Methods. This figure indicates the percentage breakdown of the respondents for this statement using a Likert scale.

The ninth statement was in the form of the question “Does Twitter enhance your use of Web 2.0 tools such as blogs, wikis, YouTube, etc.?” As Figure 19 indicates, 37% (56) strongly agreed with this question. Forty-five percent (69) agreed, 11% (18) were neutral, 5% (7) disagreed, and 2% (3) strongly disagreed with the question. A majority, or 82% either strongly agreed or agreed with this question.

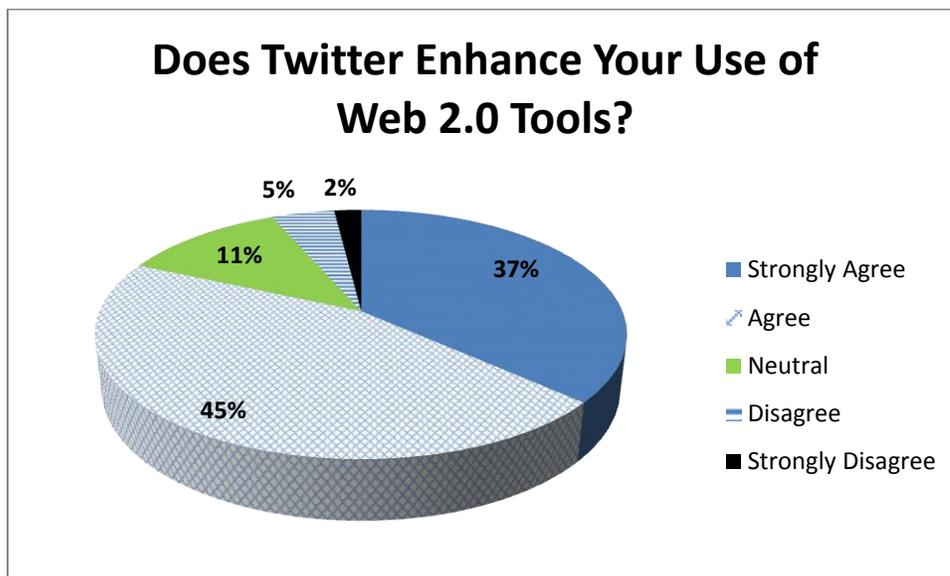


Figure 19. Does Twitter Enhance Your Use of Web 2.0 Tools? This figure indicates the percentage breakdown of the respondents for this question using a Likert scale.

The tenth statement was “Twitter increases my classroom subject knowledge.” Twenty-eight percent (42) strongly agreed with this statement, as illustrated in Figure 20. Forty-eight percent (74) agreed, 18% (28) were neutral, 6% (9) disagreed, and 0% strongly disagreed. Just over three-quarters, or 76% either strongly agreed or agreed to this statement.

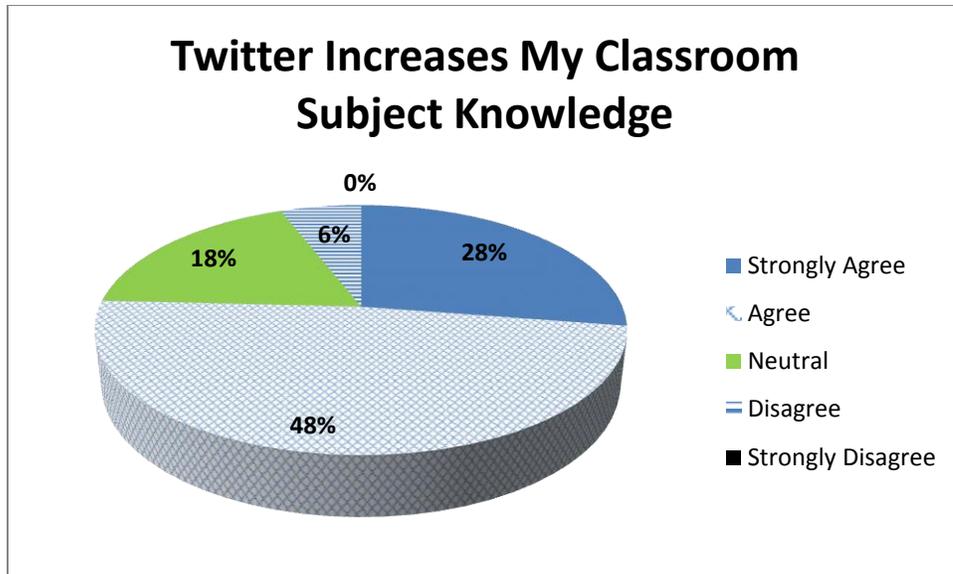


Figure 20. Twitter Increases My Classroom Subject Knowledge. This figure indicates the percentage breakdown of the respondents for this question using a Likert scale.

Figure 21 summarizes the findings of the final Likert statement, "Twitter enhances my professional development." Sixty-one percent (93) strongly agreed with this statement. Thirty-one percent (48) agreed, five percent (8) were neutral, two percent (3) disagreed, and less than one percent (1) strongly disagreed with this statement. A majority, or 92% either strongly agreed or agreed with this statement.

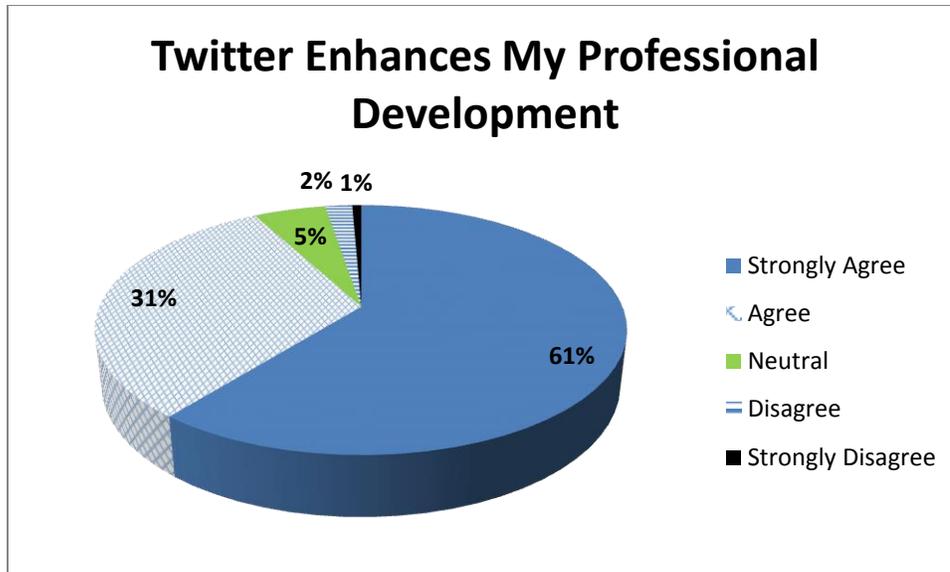


Figure 21. Twitter Enhances My Professional Development. This figure indicates the percentage breakdown of the respondents for this question using a Likert scale.

One open-ended question was asked in reference to what drew people to Twitter and professional development. (All quotes from the participants are represented as specifically written by the respondent.) It asked:

What drew you initially to Twitter? Preferably list or explain at least three things.

Answers were coded by keywords and themes were grouped by the number of instances these keywords occurred. All 153 respondents answered this question and the information was thorough and complete enough for analysis. All respondents will be referred to as “participant” 1, 2, 3, and continue in this fashion.

“Being connected.”

The most common word used by the respondents in this open-ended question was “connect” or a derivative of it. Fifty-three times the words “connect, connecting, or connection”

were used by the 153 participants. The Internet is a connection of networks and Twitter is a connection of Internet users and the respondents felt that connecting was a major factor in drawing them to Twitter. Participant 4 said that Twitter helped “find and connect with others.” “Connection to my colleagues” from participant 11 was another common theme where the respondents felt Twitter connected them to other teachers, whether it be locally or globally.

Participant 14 from northern Manitoba not only said that Twitter gave her “the ability to connect with like-minded educators” but also mentioned that Twitter makes her “feel less isolated” when teaching in a more remote area. Participant 16 said that this social media allowed him to “connect to thousands of strangers” from an international educational conference. Participant 48 noted that she could connect to “big-name people and experts around the world for free.” Participant 57 said that he could connect with not only teachers, but students. In terms of Twitter accounts, participant 63 noted that she kept one “for fun” and another professional account to “connect with others that share my interests.” Participant 74 noted she liked to make a “connection with other people I have not met,” realizing the potential of meeting educators that she would not otherwise connect with. Staying with this same theme, participants 82 and 84 said that Twitter gave the “ability to connect globally” and “to connect in a new way with people all over the world.”

“Connecting with colleagues, educators, and professionals.”

The specific connection to colleagues and professionals was also very prevalent. Participant 113 said, “to connect with educators as well as professionals from science and business” and participant 110 mentioned that Twitter gave the opportunity to “connect and catch up with former colleagues.” Participant 128 referred to “connecting with other educators – a

wealth of resources from folks in similar areas of interest.” Another example of the importance of connecting, especially from more difficult locations, came from participant 144. He said, “The need to make connections. Hutterite communities like mine are located in (often isolated) rural areas, making it harder to make connections with ‘outsiders’. Twitter has allowed me to break down those walls and participate in the give-and-take culture that has enriched my teaching experience.”

The word “educator” was used 25 times by the 153 participants when giving reasons for being drawn into using Twitter for professional development. This was either used in context of connecting with “other educators,” as indicated by participant 7, or hearing from another educator, such as from participant 8 saying, “at a conference I heard an educator explain that is was a good resource.” In addition, “connecting with other educators,” was noted by 16 different participants. Participant 40 indicated that “@toddwihitaker [sic] said that is was the best for PD and every educator should be on it.” Participant 60 mentioned that because Twitter was popular among educators, she decided to try it, even though she wasn’t initially convinced of its use. She said, “For a long time I resisted Twitter – the image did not appeal. Then as my PLN grew I realized that Twitter was popular among educators, so I had to find out why. I didn’t get it at first BUT after 6 months of active use, I get it.” Participant 91 noted, “motivation and encouragement from fellow educators” are what drew her to Twitter. Participant 104 felt that since many others were using it, that she should too, saying, “primarily the fact that a lot of educators seemed to be using it.”

Related to the word “educator” was the word “colleague” which appeared 25 different times in this question. A colleague was an educator, however, the participant knew the person specifically and was motivated by this individual for using Twitter for professional development.

Some started using Twitter because of a recommendation from a colleague. Participant 3 said, “a colleague suggested it. Once I found other psychology teachers I could follow, I found valuable resources that I could use in the classroom. I loved how quickly I could find resources!”

Participant 9 also said, “educational colleagues suggested Twitter as a PD enhancer” and participant 19 felt “motivated by seeing a colleague, who I looked up to, use it heavily and speak highly about it.”

“Encouragement”

Getting encouragement from others can be a great motivator. Teachers often work in isolation in their classroom, and receiving encouragement from colleagues can have a very positive impact. Existing Twitter users sometimes started an account based on the encouragement of others. Encouragement from colleagues was mentioned eight times, such as from participant 109 who said, “friend and former colleague started an account for me. The principal and fellow colleagues encouraged use and connections.” Participant 100 said one of Twitter’s draws was to “catch up with former colleagues.” Participant 151 said she “attended a session where colleagues were tweeting about a session, so I decided to sign up.”

“Community”

In the same genre of educators and colleagues, the word “community” was used eight times to describe another reason for the attraction to Twitter and professional development. Community was used to describe a shared environment with diversified people of like-minded ideas. Participant 5 gave the reason “...the concentration of people from the educational community, the diversity of people and information and the ability to learn something new

whenever I had a few minutes to spare.” Another liked the aspect of connecting with a specific community. For example, participant 6 enjoyed “connecting with my teacher-librarian community locally, nationally, and internationally.” The community could be in reference to a particular time and objective, as participant 39 said, “sharing pictures with my community during a construction project.” In what some people may feel is an ironic statement given the millions of people globally that use Twitter, participant 77 noted that Twitter “was a more intimate community – you really felt like you were getting to know your connections.” Whether the terms used were community, colleagues, or educators, the idea of connecting was always at the forefront of using Twitter for professional development.

“Professional Learning Networks (PLNs).”

The term PLN, or professional learning network, was mentioned eight times. PLNs are often formal or informal communities of like-minded people. As stated by participant 8, “once I started tweeting, I found a PLN of like-minded people that challenged the way I think.” The flexibility and PLNs were observed by participant 27 who expressed, “I was on maternity leave and knew I had time to explore and learn how to use it (Twitter) to develop my PLN.” Suggestions from superiors played a factor as participant 37 noted, “my supervisor suggested using Twitter as a PLN.” Live Twitter chats played a factor for participant 92 noting that she used “live chats for PLNs.”

Professional development was mentioned 26 times from the respondents with regards to the reason they were drawn to Twitter initially. Participants mentioned using Twitter for “professional development sessions,” “PD about connected education,” PD about teacher technology,” “an easy way to keep up with fellow teachers in terms of PD,” and using Twitter as

“a PD enhancer.” Respondents were also initially drawn to Twitter because of its flexibility such as in the case of participant 21 saying that she wanted a “desire for more informal and regular PD.” This flexibility allowed for more immediate PD. Participant 114 noted that Twitter allowed her “to be introduced to the latest PD and educational research.” Participant 119 felt that Twitter allowed him to “provide PD opportunities and stay current with events.” Others evolved into using Twitter for PD. Participant 134 stated, “Initially, I just wanted easy access to local/global news. Then I started following people/professionals in my life (doctor, trainer, charities...). Then, I discovered the power of Twitter for PD and connecting with other educators. Now I use it primarily for education.”

“Sharing and communicating.”

Sharing, collaborating, and communicating were mentioned a total of 20 times. Since Twitter is a social media, the drawing power of these three objectives is not surprising. The term social media was mentioned eight times as a reason for being initially drawn to Twitter. Participant 13 mentioned that her “principal wanted to communicate quickly and efficiently with families.” Participant 28 said it was “a different way to communicate with the students.” Participant 93 noted Twitter was “a means to communicate and share PD.” Twitter was viewed as another way to send out information, as participant 144 noted, “I’m working on starting a blog and will use Twitter to announce new blog entries to increase readership and spread of ideas” (in reference to the complexities of communicating at a greater depth).

Within the similar scope of communication, sharing was mentioned 14 times when noting one of the draws of Twitter. Some examples of what participants said were, “I discovered the advantage of following experts and people that share my fields of interest,” “share what my

school is doing,” “wanted to share my interests,” and “wanted to share my educational activities with others.” Participant 130 wanted to “share what I/my students were doing in the class.”

Related to sharing was the idea of collaboration, as participant 140 noted, “wanted to collaborate with individuals outside my personal circle.”

“Using resources.”

Using resources was a major reason for being initially drawn to Twitter for professional development. Twitter offers a global and immediate data base of a vast amount of educational material as the respondents have discovered. Participant 3 said, “I loved how quickly I could find resources.” Participant 7 liked that “there was a culture of sharing resources.” Others mentioned, “they could find material on what I teach,” and Twitter helped for “looking for immersion resources.” Participant 64 noted the vastness of material by saying, “I started to discover education tags and found that it was a HUGE pool of interesting resources and articles.” Another mentioned how Twitter helped to get “resources for uses of new technology at my school (iPads).” Participant 128 also mentioned about “a wealth of resources from folks in similar areas of interest.”

Five respondents mentioned that their superior had them drawn to Twitter. Participant 148 mentioned that Twitter was used as an “application from a school principal for communication and increased engagement with parents.”

“Curiosity and fun.”

Finally, curiosity and fun were mentioned 13 times as an initial draw to Twitter. Participant 45 noted he started using Twitter in 2009, “at first it was curiosity into what it was.”

Participant 128 said, “curiosity – was wondering what all the fuss was about. Lurked for the first 6 months.” Participant 51 mentioned, “Initially I was drawn because of television personalities who use Twitter for fun and entertainment purposes.” Participant 118 simply stated, “I thought it would be fun.”

There were many different reasons why people were initially drawn to Twitter as noted above. Certainly some of the main reasons were because of the connectivity and being surrounded by like-minded people for the benefit of feeling part of a community and sharing of ideas and resources.

Third Research Question:

- **How do K-12 teachers and other educators participate in professional development using Twitter?**

To answer this question, two closed-ended questions were asked, which included the possibility of choosing several check boxes as options. In addition, seven questions were asked regarding the frequency of using tweets, retweets, reading tweets, replying to tweets, mentioning users, using hashtags, and tweeting a link. There were four possibilities of frequencies ranging from never, 0 to 7 times per week, 8 to 50 times per week, and over 50 times per week. These questions on frequency helped to determine how involved the participant was in using Twitter and how many different aspects of the Twitter tools that were used.

There were also four open-ended questions in reference to this last research question.

1. “Do you feel that Twitter provides a better way to deliver professional development? If so, why and how? If not, why not?”

2. “If you use hashtags, which ones are the most effective and why?”
3. “Do you participate in live Twitter chats? If so, which ones? If you participate, why do you find live chats useful? If you don’t participate in live Twitter chats, why not?”
4. “Who are some of the educational leaders (or organizations) that you follow on Twitter for professional development? Why do you find these leaders useful?”

The interview-type online questions gave the opportunity for participants to elaborate on how they use Twitter for professional development. Coding and grouping responses into themes resulted in common threads coming from the participants.

Figure 22 summarizes the first closed-ended question, “What tools or activities do you use with Twitter?” Six specific tools were listed as options. This included: 1) Website links, audio, video; 2) Online documents; 3) Live Twitter chats; 4) Email; 5) Personal links; and 6) Classroom information for students. Since check boxes were used to answer this question, more than one answer was possible. A total of 543 options were chosen out of the 153 respondents. This was an average of 3.5 options chosen per respondent. Twenty-six percent (143) indicated that they used website links, video, and audio files. Nineteen percent (105) used online documents. Documents were any digital files, such as, Word, PDF, or other file formats containing information. Seventeen percent (95) participated in live Twitter chats. Ten percent (52) used email links from Twitter. Fifteen percent (84) created their own links to tweet. Twelve percent (64) utilized Twitter for classroom information for students. Zero percent noted “other” uses. There was a fairly even distribution of activities or tools used by the participants with utilizing website links along with audio and video as the most popular use at 26%.

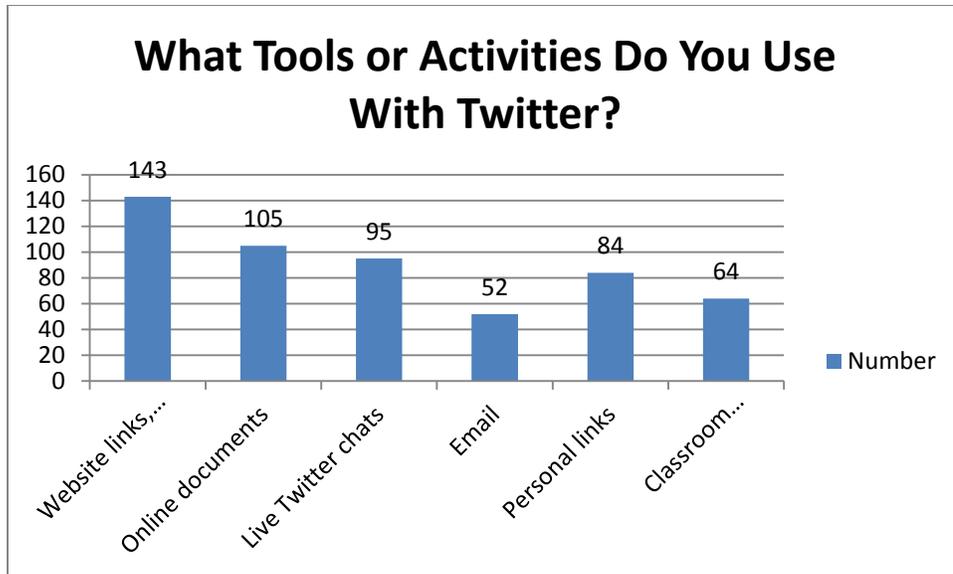


Figure 22. What Tools or Activities Do You Use With Twitter? This figure indicates the number of times a participant chose one of the six listed tools.

The second check box statement was “Check below any Twitter applications that you use or have used.” Figure 23 shows the results of this statement. Nineteen percent (81) used TweetDeck, 4% (17) used Pocket, 15% (65) used TinyURL, 8% (32) used Paper.li, 11% (50) used Scoop.it, 20% (85) used Instagram, 10% (41) used Vine, 14% (58) used Twitter lists, and 0% noted “other.” There were 429 chosen options out of 153 respondents, therefore an average of 2.8 applications from the given list were used by each respondent. The greatest number of respondents for a particular application was Instagram, which is a photo sharing program. TweetDeck, the second highest number, is a Twitter organizing program for the desktop or mobile device.

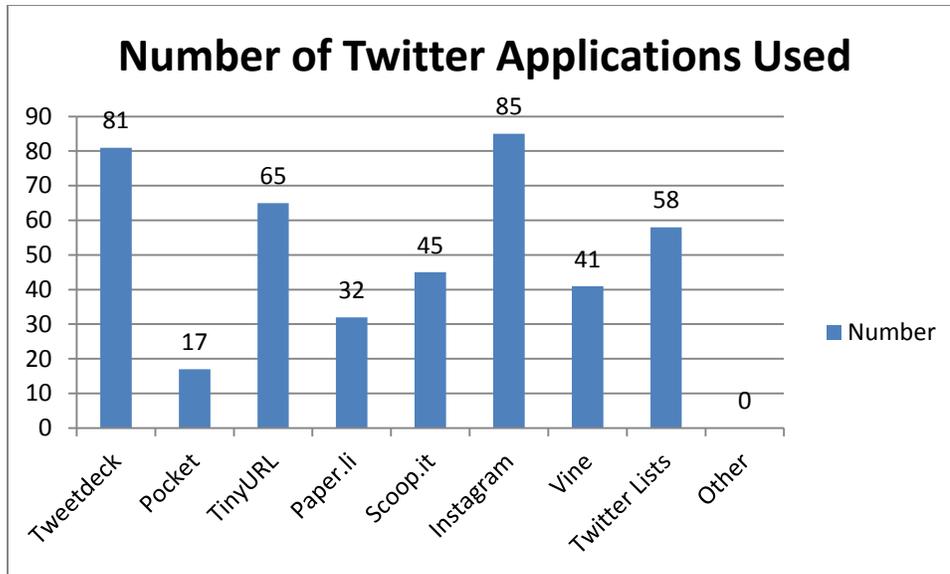


Figure 23. Number of Twitter Applications Used. This figure indicates the number of respondents that have or are using the particular Twitter application listed above.

A scale question was used to estimate the frequency of certain Twitter uses. The question “Please check what applies to you most accurately. Per week, how many times do you tweet?” This answer helped to determine the involvement of the particular respondent in using Twitter.

Figure 24 illustrates the findings of the first question, “Per week, how many times do you tweet?” Seven percent (10) said they never tweet. Fifty-three percent (82) said they tweeted one to seven times per week. Thirty-five percent (54) indicated they tweeted 8 to 50 times per week. Five percent (7) said they tweeted over 50 times per week. It is interesting to note that although the respondents use Twitter, seven percent indicated they do not tweet.

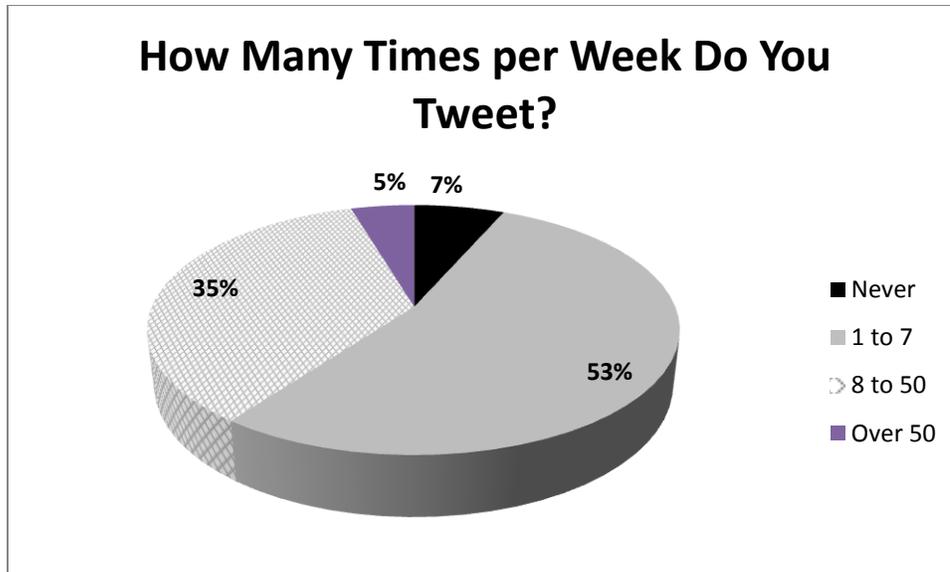


Figure 24. How Many Times per Week Do You Tweet? This figure indicates the number of times a respondent tweeted during an average week.

The second question was, “Per week, how many times do you retweet?” Figure 25 displays the answers to this question. Five percent (8) said they never retweeted. Forty-four percent (67) indicated they retweeted one to seven times a week. Forty-five percent (69) noted they retweeted 8 to 50 times a week and six percent (9) said they retweeted over 50 times per week. The results between the tweeting and retweeting were similar.

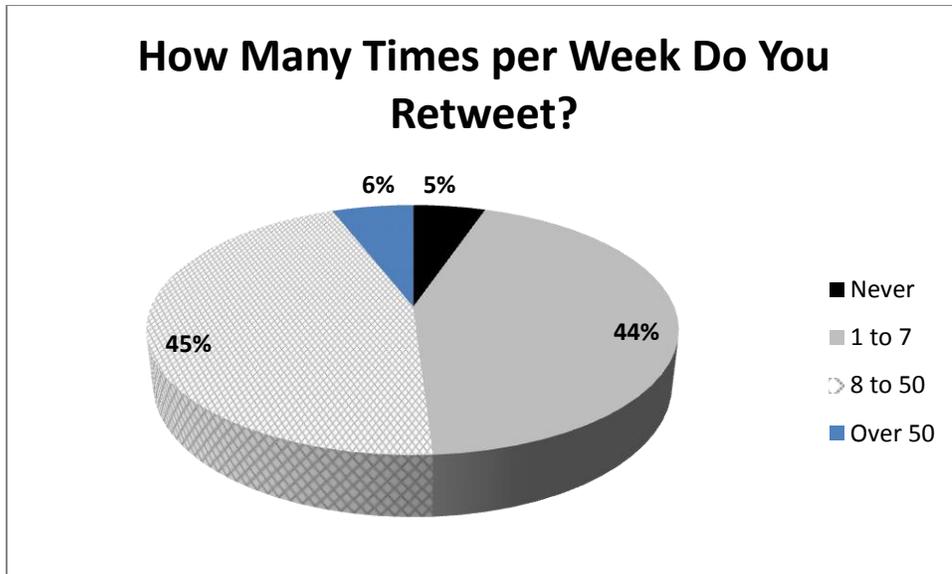


Figure 25. How Many Times per Week do You Retweet? This figure indicates the number of times a respondent retweeted during an average week.

Figure 26 summarizes the findings of the third question, “Per week, how many times do you read tweets?” All respondents indicated that they read tweets. Eleven percent (17) read one to seven tweets per week. Thirty-seven percent (57) read 8 to 50 tweets a week, and just over half the respondents, or 52% (79) read over 50 tweets per week.

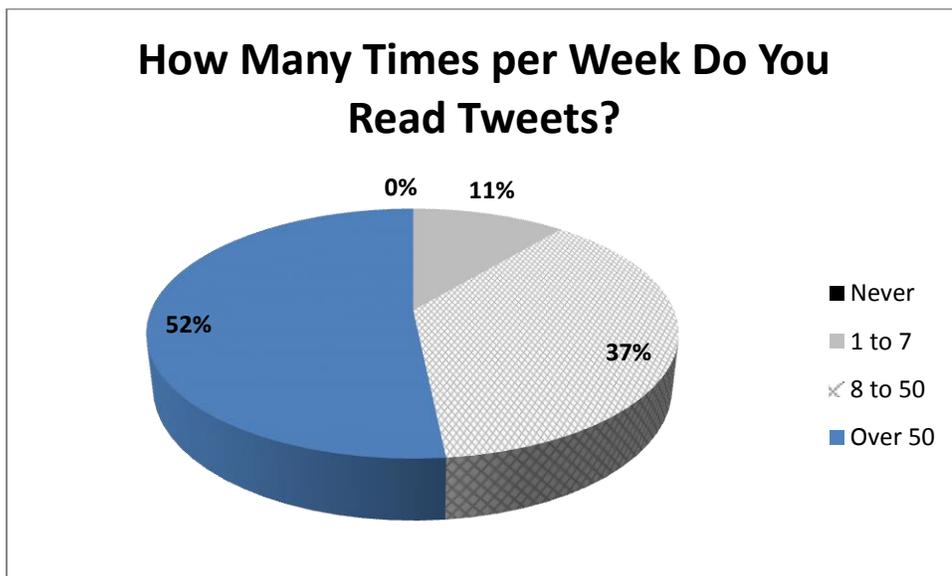


Figure 26. How Many Times per Week Do You Read Tweets? This figure indicates the number of times a respondent read tweets during an average week.

The fourth question asked, “Per week, how many times do you reply to a tweet?” Figure 27 displays the results of this question. Eleven percent (16) said they never replied to tweets. Nearly two-thirds, or 61% (94) noted that they reply to tweets 1 to 7 times per week. Twenty-seven percent (41) indicated they reply to tweets 8 to 50 times and just over 1% (2) said they replied to tweets over 50 times per week.

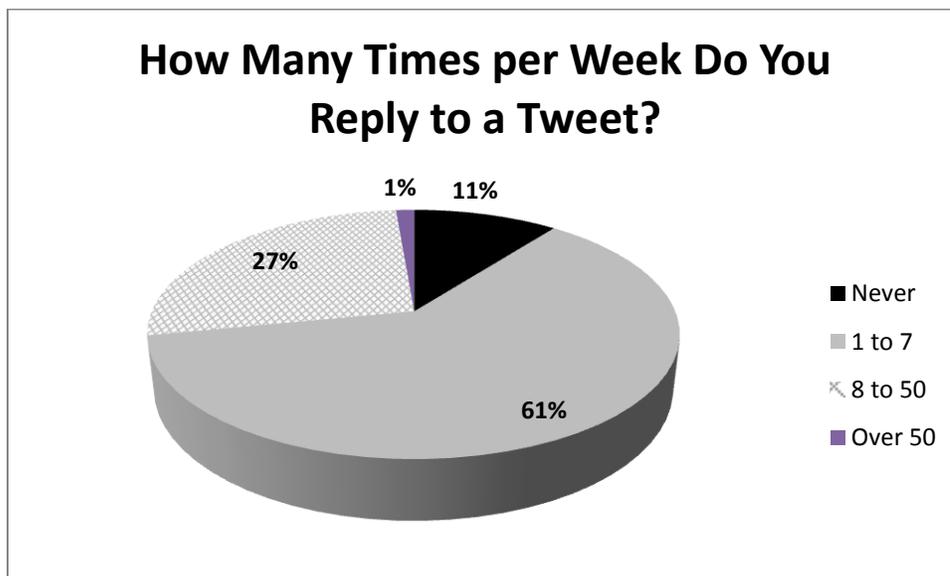


Figure 27. How Many Times per Week Do You Reply to a Tweet? This figure indicates the number of times a respondent replied to a tweet during an average week.

The fifth question was, “Per week, how many times do you mention a user?” As shown in Figure 28, 16% (24) said they never mentioned a user in a tweet. Fifty-six percent (85) indicated they mentioned a user one to seven times per week. Twenty-eight percent (42) said they mentioned a user between 8 and 50 times per week, and just over one percent (2) noted that they mentioned a user over 50 times per week.

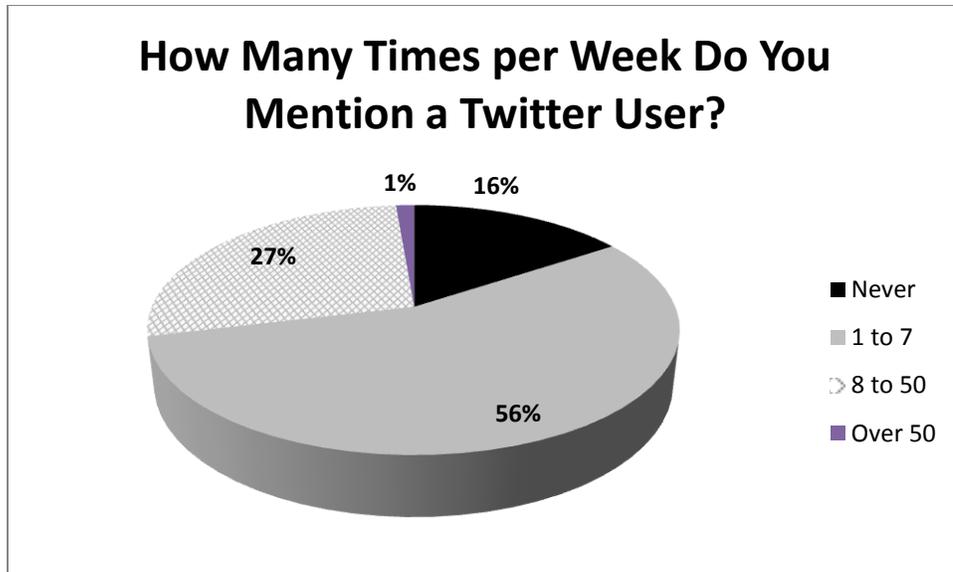


Figure 28. How Many Times per Week Do You Mention a Twitter User? This figure indicates the number of times a respondent mentioned a Twitter user during an average week.

The sixth question was, “Per week, how many times do you insert a hashtag in your tweet?” Figure 29 shows that 11% (17) never used hashtags in their tweets. Almost half, or 48% (74) noted that they use 1 to 7 hashtags in their tweets during an average week. Thirty-four percent (52) said they use hashtags 8 to 50 times per week, and seven percent (10) indicated they use hashtags over 50 times per week.

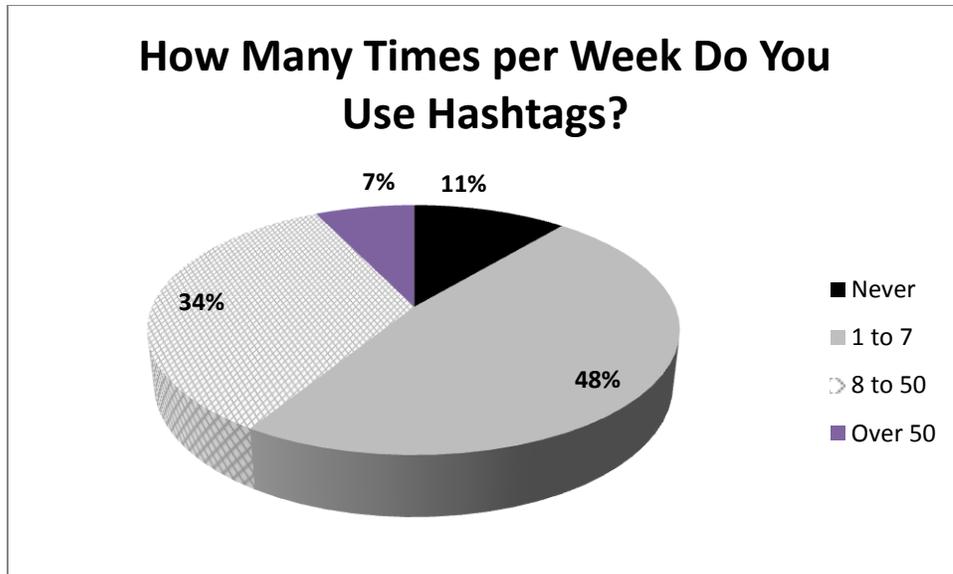


Figure 29. How Many Times per Week Do You Use Hashtags? This figure indicates the number of times a respondent used a hashtag in a tweet during an average week.

The final question asked, “Per week, how many times do you tweet a link to a website, article, or video/audio?” As illustrated in Figure 30, seven percent (12) indicated they never linked to a website, article, or video/audio. Nearly half, or 48% (74) noted that they linked to a website, article, or video/audio one to seven times per week. Thirty-eight percent (58) said they linked to a website, article, or video/audio 8 to 50 times per week. Six percent (9) indicated they linked to a website, article, or video/audio over 50 times per week.

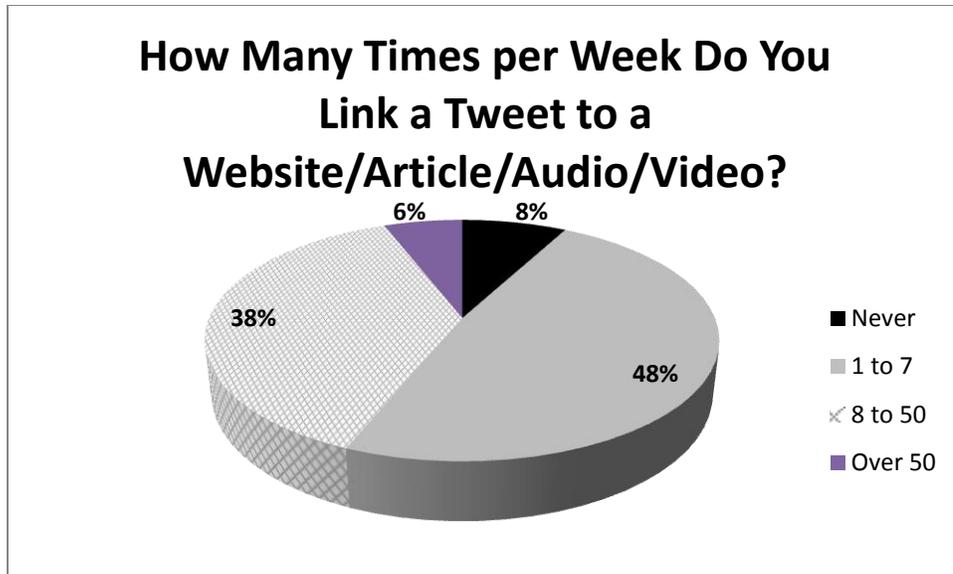


Figure 30. How Many Times per Week Do You Link a Tweet to a Website/Article/Video/Audio? This figure indicates the number of times a respondent linked a tweet to a website, an article, a video, or audio file during an average week.

The Four Open-Ended Questions for Third Research Question

There were four open-ended questions to answer “How do K-12 teachers and other educators participate in professional development using Twitter?”

The first open-ended question was:

Do you feel that Twitter provides a better way to deliver professional development?

If so, why and how? If not, why not?

As displayed in Figure 31, out of the 153 respondents, 37% (57) answered yes to the first question, 9% (14) said no, 51% (77) were not sure or it depended on the situation. Three percent (5) did not answer the question. The number of respondents that felt Twitter provided a better way to deliver professional development out-numbered the ones that disagreed with this

statement by a four to one margin (57 to 14). However, half the respondents were undecided as to whether Twitter did provide a better way to deliver professional development.

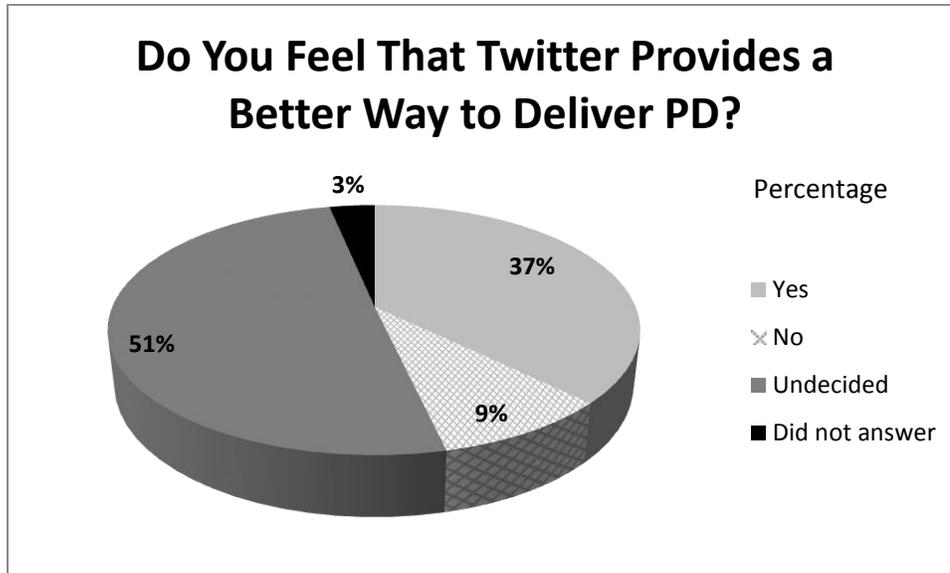


Figure 31. Do You Feel That Twitter Provides a Better Way to Deliver PD? This figure displays the percentage of respondents that felt Twitter provided a better way to deliver professional development.

“Networking, collaborating, and connecting with experts.”

Several themes came out from this question. One recurring theme and the most common was one of being connected with others as the major reason why Twitter was better for professional development over the traditional methods of PD. Ideas such as networking, anywhere, every day, and reaching more people were emphasized. Participant 8 mentioned, “it provides many more connections and better individual feedback.” It was felt that Twitter connects attendees together at conferences. Participant 16 noted, “having a hashtag for an event helps attendees connect and sometimes meet face-to-face.” Being “connected” was mentioned 28 times by respondents. It was felt by these participants that this connection was ongoing and it

connected educators to their particular fields. “Connecting to a community of readers is helpful,” this was noted by participant 41. Participant 65 felt Twitter allowed an “easy connection to staff.” Another participant felt that Twitter “allows for immediate connections to forward thinking ideas and PLCs (Professional Learning Communities).”

A connection to experts was viewed as an advantage to using Twitter. Since teachers cannot have colleagues always available in their own schools for expert material, Twitter was viewed as a place to get valuable information. Participant 70 noted that Twitter “provides unique opportunities to create connections with those outside your school based network.” Twitter enhanced the probability of making new connections, as a participant stated, “it enables me to be updated and make new connections.” Another mentions that they made connections with people that they would have never met without Twitter. Participant 144 also states that “Twitter is a tool that provides an excellent opportunity for learning and making meaningful connections that would not be possible otherwise. However, at the same time, participant 101 mentioned, “as easily as it can connect people, it can distance or disconnect educators from their local PD opportunities.” Therefore a word of caution was applied in this case when emphasis is put on connecting at a non-local level.

Along with connecting, networking and sharing were closely related to this theme. Participant 68 stated, “I love the networking, the Twitter chats and the sharing which have helped me to keep updated about my teaching topics.” Participant 97 expressed, “I do believe Twitter offers a better way to deliver PD. It brings a large network and community of practice to your desktop, and does so when and where I need it.” The Twitter networking was also viewed as very important, especially in small schools where staff, expertise, and resources are limited. Participant 108 stated, “It is a good option for me as a teacher in a school with only 5 teachers.”

Following the similar theme of connecting, sharing was a major factor in stating the advantage of Twitter for PD over the traditional methods. Participant 18 noted, “it allows for a more varied cross-section of educators and others sharing ideas and discussing important topics. It seems as if people are more willing to share on Twitter than in-person PD.”

Sixteen respondents mentioned Twitter was advantageous when sharing with others who have a common interest in subjects. The ease in which to share material was also mentioned, as participant 81 noted, “because you can get so many opinions, ideas at once. I love the Twitter chats on specific topics. It’s easy to share ideas.” However, participant 82 cautioned that the sharing is good when connecting with the correct people. The participant stated, “When you follow the right people, a lot of good information is shared.” Participant 104 noted that the sharing was free which was an important advantage. This person specified, “Twitter allows connections without regard for time and space. You can find people with shared interests from all over the world and connect instead of picking from a narrow pool or paying thousands of dollars to travel to conferences.” Participant 148 particularly liked the delivery system of sharing and noted that, “Twitter is an effective way to deliver just about everything.” Following the same idea, another stated, “I have had the experience of seeing a cool image or video link, which inspired dialog with other teacher followers and then it spilled over into staff meetings. I like how I can access ideas and explore quickly, which matches the real world’s demanding fast pace. You can read the log and find the exact person to continue connecting with.” It is these keywords of connections, networking, and sharing that played a major role in having teachers see Twitter for PD as an advantage over the traditional model of professional development.

Related to the area of networking was the idea of being able to collaborate with experts. Twitter and PD are excellent ways to retrieve information and ideas. Participant 24 said, “PD can

come from a much broader pool of experts.” Another participant noted that Twitter allows for “unlimited content, choice, best practices, and connections to experts.” Participant 40 also mentioned, “you can find whatever you want. The Twitter world has so many opportunities for help and collaboration that it is amazing.” On the other hand, participant 117 did not feel that Twitter provided collaboration. This respondent said, “Twitter is very egocentric, limited characters reduce higher order expression and discussion. It does not lend itself very well to enabling or recording collaboration for future collaboration and reference.” Another issue with collaboration includes the problem that Twitter is blocked in various schools. Participant 140 noted, “Twitter can be a useful tool. However, in our school, Twitter is currently blocked, so this inhibits collaboration during school hours.” This same respondent noted that collaboration can be limited since many Twitter users are simply readers, and not contributors to tweeting. The participant stated, “Also, many in schools do not use Twitter at all, or are like me, more ‘readers’ than ‘providers’ – which does not foster using media platforms like Twitter between and among staff in our current school setting.”

“Easy access to information and people.”

A reason that making connections with others was viewed as a major reason for using Twitter for PD was the fact that this social media offers very easy access to other users. Twitter is free, easy to set up, and a global multi-platform based network. The word “access” was mentioned by 16 different participants as a reason why Twitter was a good PD tool for them over the traditional PD methods. Participant 5 said, “It gives me access to people at any time and as a social learner that’s important to me.” Another participant mentioned the isolation factor and how Twitter provides a new access method to others. He indicated, “I live up north so it isn’t easy to go to traditional PD sessions so this allows for me to easily access PD.” Participant 28

stated, “Twitter provides a better way to deliver professional development because it is easy to access resources. It provides an opportunity to see more ideas in a shorter time period - more tweets from more voices, easier to sift through tweets.” Participant 48 simply stated, “It is quick and easy and I can access it (Twitter) when I have time.”

Access to educational leaders and with specific subject-based peers was viewed as a great benefit when using Twitter for PD. Participant 41 said, “Twitter is part of my PLN because it offers access to leaders in the educational field. As an English teacher, I find that connecting to communities of readers is also helpful...I connect with writers.” The simple and global access is a convenience for users when looking for professional development material. Participant 108 noted, “...it is convenient as there isn’t the travel and I can access a bigger network.” Although Twitter does provide this easy access, one respondent felt that Twitter offers the potential for this easy access and not necessarily a guaranteed simple access. The participant stated, “I don’t know if it’s better (Twitter for PD over traditional methods) but the potential is definitely there because of the quick and easy access to authentic (for the most part) resources and the incredible access to a broad and diverse group of professionals.” Twitter’s access was viewed as a way to match today’s fast pace of change and therefore meeting the demands of new technological realities. This participant noted, “I like how I can access ideas and explore quickly, which matches the real world’s demanding fast pace. Sometimes I won’t share in person, but online it is much easier. You can read the log and find the exact person to continue connecting with.”

“Personalized, global, and immediate.”

Some of the mainstays of Twitter’s popularity are its global, immediate, and personalized aspects. We are moving to a greater self-service world where the user chooses his or her own

particular needs and niches. Having the specific service or material come to the user is a more prominent feature of the Internet today. This theme is reflected by the participants' answers as to why the majority preferred Twitter as a professional development system over the traditional methods. Keywords such as "portable," "on demand," "my own time," "own pace," "autonomy," "individualize," "differentiated," "personalized," "instant," "immediate," "global," "international," "tailored," "choices," "options," "current," and "flexible" came to the forefront very often from the respondents. These particular keywords appeared 49 times from the respondents.

Participant 8 indicated that Twitter was better for PD because "it was more personalized. It is more differentiated. It provides better individual feedback. It is more flexible and can be done at different times. It is unlimited." This statement summarizes the feelings of these participants in reference to the tailored PD an educator can get from Twitter. Another respondent said, "it provides more personalized PD because teachers choose the topics they are interested in and follow people they'd like to learn from." Similarly, participant 91 noted, "Twitter provides a more personalized, just-in-time delivery of professional development that meets the educator's individualized needs."

Flexibility and individuality were viewed as great assets for Twitter. Live Twitter feeds are constant 24 hours a day and users can follow tweets at any time. Participant 2 mentioned, "it is more flexible and global. It is also very immediate." Participant 64 said, "it is flexible, individualized and essentially endless. It forces a shift away from big one day workshops towards ongoing, embedded, job-based PD." Tailoring an educator's professional development was seen as an advantage when using Twitter. As participant 9 stated, "Twitter shows a much more tailored view and needs of my PD interests." Similarly, participant 52 noted, "Twitter can

be tailored to fit your needs. It is not a one-stop-shop where one size fits all.” Participant 46 simply noted that Twitter was “useful on my own time.” Another participant noted that, “anything that allows me to learn in my own way and my own time is a bonus for me.” Being able to use Twitter for professional development at any time was clearly an advantage for these participants.

Twitter was mentioned as providing better options because of this tailoring effect. Teachers could pick what areas and people they would like to get involved with. Participant 51 stated, “Twitter provides better options for PD in the same way it provides better options for learning online. Time and personal comfort of wherever you are or want to be...” Twitter was viewed as offering many choices, not only in terms of options, but in where and when to look for professional development. As participant 94 specified, “There are so many choices, anyone and everyone can participate all at the same time, it’s at your own pace, and there’s so much opportunity for sharing and engaging in constructive conversation.”

At the same time that Twitter was viewed as being personal and tailored to individual needs, it coincidentally met the immediate needs of the global citizen. Participant 2 noted, “Twitter is more flexible and global. It is also very immediate.” Participant 6 stated, “it’s more immediate than waiting for the next conference.” Another said, “Twitter provides instant PD,” while another stated, “Twitter allows for an immediate connection to forward thinking ideas.” Participant 102 simply indicated, “Twitter is on my terms. I find the resources immediately. This is very motivating because Twitter gives purpose to my PD.”

It is often said that our world is smaller because of technology and the respondents felt this towards Twitter and professional development. The global aspect of this social media was a

particular inducement for educators. Participant 27 mentioned, “I also feel that there is instant feedback, answers, support, and ideas from professionals in all aspects of education from all over the world, that gives my development a more global perspective.” Participant 74 said, “people from around the world can connect, share, and discuss ideas about a topic of common interest.” Twitter allowed connections without regard for time and space. Participant 104 stated, “People share interests from all over the world and connect instead of picking from a narrow pool or pay thousands of dollars to travel to conferences.” The on-going international aspect also permitted Twitter users to stay connected with presenters after conferences were finished. This allowed for a more continuous flow of information among educators instead of ending the discussion once a conference session finished.

“Chats and hashtags.”

Two specific tools of Twitter, chats and hashtags, were seen as important advantages for professional development and the Twittersverse. Chats and hashtags are further discussed in more detail in the third and fourth open-ended questions. However, it is important to note that these tools were mentioned 10 times in this particular issue if Twitter provided a better way to deliver professional development. A participant noted that he found hashtags related to his research as a particular way to get immediate information. “Education hashtags are amazing,” said another, referring to the constant PD that Twitter offers. Chats were viewed as an excellent way to have intellectual discussions and real-time professional development. Chats were also seen as a way to keep updated about general teacher topics as well as specific topics.

Reservations about Twitter for Professional Development

“Limited, superficial, and lack of face-to-face contact.”

Nine percent (14) of the 153 participants felt that Twitter was not a better way to deliver professional development. The reasons for this were that it was felt that Twitter was only part of the professional development medium and that it had specific limitations. The lack of face-to-face connections, the limitation of the 140 character delivery and not enough professionals using it regularly limited its impact for PD. Although 9% is a small percentage as compared to the 37% that said Twitter is a better way to deliver PD, this 9% had strong language towards this issue. Some felt that Twitter was superficial or was not in sync with school policies. Participant 61 said that Twitter “did not align with school and district initiatives,” and participant 72 noted, “merely pointing people to new resources is not the same as the kinds of mental processing it takes to understand, absorb, integrate, and make planning decisions about how to integrate those options into one’s pedagogical practice. Also, it spreads ideas so quickly that many educators jump on the newest trend without seeing its effectiveness. We start replicating everyone’s inspiration without knowing enough about the why and how.” Another felt that Twitter was too self-promoting and was limited in what it could achieve in terms of higher order thinking. Participant 117 stated, “It is very egocentric, limited characters reduce higher order expression and discussion. It does not lend itself very well to enabling or recording collaboration for future collaboration and reference.” Another felt that Twitter did not carry enough analysis or depth in discussions.

Others missed the personal interaction and structure. Since Twitter is non-linear and filled with huge amounts of information, filtering information can be a challenge for some users. Twitter was mentioned by one participant as a “tease, it only provided a taste of PD.” As participant 141 noted, “I prefer PD with personal interaction, structured day/time, etc. Twitter presents challenges in terms of filtering the volume of tweets for those that may be useful. It can

feel like one more fire hose to have to drink from.” This clearly gives the impression that Twitter can overwhelm the user when searching for resources or people for professional development.

In addition, it is important to highlight that out of the 153 participants in the survey, fully one half (77) were either not sure or said it depended on the situation if Twitter offered a better way to deliver professional development. Therefore, for half the respondents, Twitter’s success for PD carried qualifications for it. In many cases, Twitter was viewed as an enhancement of PD and it complimented the existing traditional format. Participant 5 noted, “Yes and no, I think it enhances and compliments other professional PD formats.” Another mentioned, “That (Twitter’s success) would depend on the instructional goals and desired outcomes. It wouldn’t be worthwhile to deliver a hands-on, step-by-step workshop (on effective use of Google Apps in the Classroom, for example) through Twitter.”

As with the respondents who felt Twitter was not a better way to deliver PD, the ones that were not sure mentioned the problem of filtering the information. The feeling of too much information can be too much work to break down into meaningful parts. One mentioned that they did not have the patience to sit down and explore the Twittersverse. However, it was felt that once filtering did take place, the results were positive. Participant 54 stated, “Twitter is one method. For many teachers, it can be overbearing as there is SO much information but when one learns how to filter through the information it becomes a vast resource of material.”

Others felt that Twitter filled a niche for PD, as one commented, “Twitter has its place – not better or worse, just filling a different niche.” Twitter was not viewed as a replacement to the traditional PD model but something that could enhance the PD experience. The issue of the limitation of 140 characters was again noted by those who were undecided about the

effectiveness of Twitter for PD. Participant 90 said, “I feel it is a great way to discover new things but in-depth learning cannot be done in 140 characters. It takes different methods.” A face-to-face meeting was noted as better for deep discussion but Twitter was noted for being good at sharing links and moving a discussion at a quicker pace. Again, the effectiveness of Twitter for PD depended on the particular objective at the time. Twitter was perceived by participant 114 as an introduction for PD and research but not for extensive PD. Participant 133 said, “Twitter is good at sharing a ‘nugget.’ This often prompts me to follow up with my own investigation of the topics.” Twitter also helped to become more “aware of what people are talking about/interested in/what’s trending.” However, in the same sentence, this participant added, “however, I find what I learn is superficial...from small bits of information, anyone can post...which has pros and cons. Sometimes it is very superficial info...I think we all learn better in a social context and face-to-face. Twitter has the ability to add to this but not replace it.”

The feeling of Twitter being a better vehicle for delivering professional development is a complex one with many different and conditional answers. The general themes that connections, the global aspect, the immediacy, and personalization were viewed as significant advantages for Twitter and PD. However, the overwhelming amount of material, the filtering issue, and the limitation of the 140 characters played a role in diminishing the value of Twitter for others.

The next open-ended question in reference to the third research question was:

If you use hashtags, which ones are the most effective and why?

Twitter does not have a lack of information and resources. Participants have mentioned the plethora of resources that are available for educators. Filtering the information was seen as a necessary task to make sense of the material. Using hashtags is one way to filter this information

into more convenient and usable packages. A hashtag, represented by the symbol “#” lets users tweet to a specific interest group. Hashtags are usually used in live Twitter chats so that information can be grouped to a certain area in the Twittersverse. It also helps in retrieving information for later use as the user types in the hashtag symbol and the particular area, such as #edchat for example.

As illustrated in Figure 32, nearly three-quarters of the 153 respondents, or 73% (112) said they used hashtags and 8% (12) specifically mentioned they did not. Three percent (5) were not sure about using hashtags and 16% (24) left this question blank.

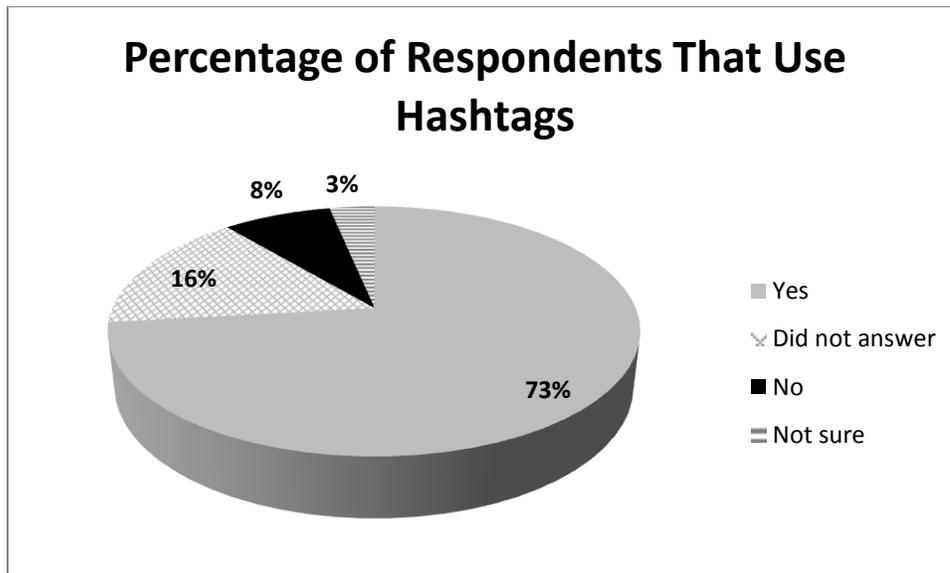


Figure 32. Percentage of Respondents That Use Hashtags. This figure displays the percentage of participants that answered the question, “If you use hashtags, which ones are the most effective and why?”

Figure 33 shows that the most popular hashtags included #edchat (50 times), #edtech (21), #mbedchat (15), #satchat (9), #education (4), #mbedu (3), and #edtechchat (3).

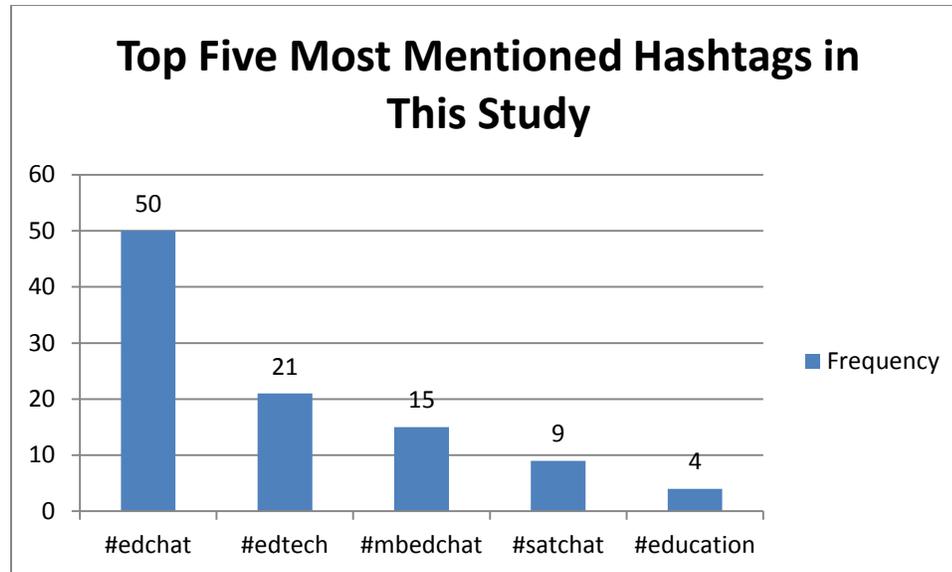


Figure 33. Top Five Most Mentioned Hashtags. This figure displays the frequency of hashtags that respondents mentioned in the question, “If you use hashtags, which ones are the most effective and why?”

These seven specific hashtags were the only ones mentioned more than two times by the respondents. Many hashtags were local to the participant’s subject and geographic area of work, such as, #personalFinance and #Calgary. Therefore, it was common to see many participants list a particular hashtag only one time.

By far, the most common hashtag was #edchat. #edchat is an all-encompassing hashtag that covers several areas of education. This hashtag is often used as a generic hashtag for chatting about anything related to education. It is frequently used across the world to share ideas and resources and is one of the most popular educational hashtags. #edtech is another popular hashtag for teachers across the world, especially those in the technology field. This was the second most frequently mentioned hashtag by the respondents. The most frequently mentioned local hashtag was #mbedchat, which is not surprising since this survey originated from

Manitoba. #mbedchat is a Manitoba teacher-based hashtag where live chats take place once a week.

“Filtering, chats, and conferences.”

There were common themes to the reasons why the participants used hashtags.

Respondents used hashtags for chatting, for conferences, and for filtering to get local information from schools and regions. Hashtags were used for funneling information from the educator’s particular field of work, and PLN. They were also often used for organizing subjects and ideas to specifically tweeted areas.

Using hashtags helps to make sense of the Twitter world. Participants mentioned that they help to clean and organize information into a usable and workable form. Hashtags based by subject area is a popular way to get information about a teacher’s particular course material. They help to filter information to a specific session at a conference or professional development day. Participant 6 noted, “...using hashtags that closely associate with the event that I am attending. I can see what others are thinking about the same event.” “Hashtags help organize tweets,” mentioned participant 12. Another stated, “I find searching with hashtags that include my areas of interest, usually provide information that I can use or links to others I can explore.” Participant 54 said, “I usually use hashtags that refer to the subject material I’m working with. In my case, I share a lot of materials on iPads, professional learning, and coding. I’ll use hashtags that refer to various chats as well as #ipadchat or #iosedapps. These chats are followed by loads of folks, so I tend to get a lot of reads and shares.” Hashtags can be more efficient if they are pre-planned ahead of time before the users start tweeting. Participant 117 noted, “The most effective

ones are when there is group agreement on a hashtag for a confined period of time or purpose, such as a regular weekly chat on a topic.”

In reference to using specific hashtags, the ones for chatting was the most common reason. Respondents mentioned using hashtags for chats 75 different times in the open-ended question. There are many specific chats that are live each week and several respondents noted that they use hashtags when chatting. As participant 87 said, “Hashtags for chats are the most effective.” More specific information about chats will be given when describing the answers for the next open-ended question about chats.

During conferences, educators often use hashtags to communicate about specific sessions or a conference in general. Fifteen respondents used the phrase “hashtags at conferences”. Hashtags at conferences help promote a session or let others know what specific session a person is attending. Sometimes referred to as “back-channeling,” using a hashtag, participants can have a live conversation while attending a conference session. This leads to current live discussion while a presenter is giving information. Participant 3 mentioned, “I don’t use hashtags very often, however, when I’m at a conference, for example, Manitoba EdCamp, I found it useful to use the hashtag #EDCampWpg for that specific conference so that all the tweets could be found easily.” Another participant expressed, “... mostly use hashtags related to chats, or during meetings/conferences.” Another noted that he only used hashtags at conferences. Participant 89 stated, “At a conference, it helped me stay in the conversation on Twitter. Helps connect with other people interested in the same things.” Similarly, another participant said, “I don’t use hashtags very often but find ones helpful when I’m at a conference and everyone is tweeting using the same hashtag.”

Hashtags were popular when a teacher wanted to localize the tweets to a specific region, school, or field of work. This was mentioned 22 times when hashtags and local endeavours were mentioned together. Since Twitter is so global and an “anywhere, anytime” proposition, hashtags help to control the environment to a local level. This was seen as a major advantage of using hashtags. Participant 19 mentioned, “...the ones local to my region/country and that have a specific audience...Ones used for parents and teachers to connect, or ones used for science to connect, or ones for all educators in Australia.” Other respondents noted the importance of using hashtags for sharing with the local community and city. Participant 101 stated, “#mbedchat is effective for me as it is local and focused on discussions that I’m interested in.” Participant 54 said, “I usually use hashtags that refer to the subject material I’m working with.”

It is important to note that five respondents specifically mentioned that they did not know how to use hashtags or were not sure about their usefulness. In addition, 24 respondents left the question blank. This total of 29 represents 18% of all participants. This could indicate that they did not use hashtags at all and/or did not find hashtags effective. As participant 44 put it, “Still learning, not sure about hashtags yet.”

The next open-ended question in reference to the third research question was:

Do you participate in live Twitter chats? If so, which ones? If you participate, why do you find live chats useful? If you don’t participate in live Twitter chats, why not?

This question followed a similar pattern from the previous question about hashtags. As mentioned earlier, hashtags were most popular when engaged in Twitter chats. The three most mentioned ones were #edchat, #mbedchat, and #satchat. Three of the four most popular hashtags mentioned by the respondents were chat related, as seen in Figure 32. Since chats can be very

specific to geographic areas and subjects, there were many respondents that listed chats that were only mentioned once. Examples included #pblchatlive, #saskedchat, and #LBGTeachChat.

Therefore, there was overlap with these two questions.

As figure 34 indicates, of the 153 participants, 57% (87) had participated in Twitter chats, 32% (49) never did, and 11% (17) did not answer this question.

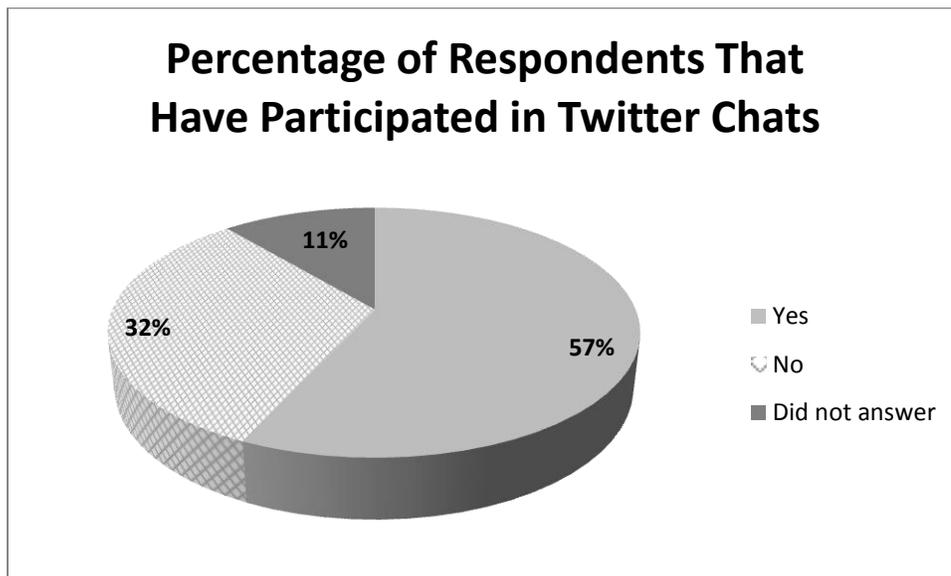


Figure 34. Percentage of Respondents That Have Participated in Twitter Chats. This figure displays the percentage of respondents that do or have participated in a live Twitter chat.

“Being connected.”

For those who participated in chats, being connected was again mentioned as a major reason for delving into this area. The word “connect” was mentioned 14 times in relation to Twitter chats. A typical answer was similar to participant 2 in saying, “Yes, #mbedchat keeps me connected with other teachers that I may not otherwise keep in touch with.” Similarly, participant 16 said, “I like meeting new people and connecting and collaborating with people that have

similar beliefs and views about education as I do.” On the other hand, some participants enjoyed the chat aspect of connecting but for reaching out to people who do not have the same beliefs as they do. For example, participant 45 said, “...the real time interaction with colleagues that I would not otherwise connect with, the variety of information and ideas from people from different position and systems...(the reason for using chats).” These connections allow educators to chat with other colleagues outside of normal school hours. Given the heavy demands of a typical school day and the lack of time to collaborate with teachers at work, chats were viewed as a flexible option for sharing ideas and resources. Participant 27 noted, “I enjoy ‘speaking’ with others about a given topic in the education field who have similar experience with curriculum as I. I also enjoy learning from others who see/do and use the curriculum differently as well. Some great ideas come about when we share how we implement an outcome.”

Reservations With Using Twitter Chats

Other than connecting, the reasons for using chats were very specific to the individual. This resulted in many conditional “yes” answers as to using chats. Many participants would only participate in a chat if it specifically fit their schedule and would not make an attempt to join one if it involved a certain amount of planning. Others had participated but stopped for various reasons such as: having no time, did not find it interesting, or found that it simply added an extra layer of work. Of the participants that did participate in chats, the use of a moderator was viewed as important to keep the flow going and being on task for the specific objective in mind. Participant 8 noted, “It is great to have the moderator present a topic, questions, and then see all of the different responses and perspectives on these questions.”

Over 40 respondents who said they did use chats mentioned that they used them sparingly or had reservations participating in them. Often, some participants had strong feelings about Twitter chats. Participant 9 said, “I tried to follow chats but usually find little information compared to the number of people explaining about housekeeping details and those who thank and welcome twerps far too often. I should really give it more thought this fall.” Participant 4 noted, “Occasionally, but not often. I find the time to devote to them the biggest problem. Sometimes the discussion lacks depth due to character constraints – but are still interesting and can be valuable.” One respondent said that she sometimes participates in chats but needed to find out more about them to make it useful. Participant 24 participated in chats but said, “I sometimes read the Twitter chats on Thursday and Sunday evenings. It is, however, yet another work-related event that is added to the ever-growing pile. Therefore, I don’t make participating in these regular chats a priority. Rather, if I’m on the computer and I remember, I read or become a silent participant in the chats.” Another respondent did use chats only occasionally and went on to say, “I do not like Twitter chats as much as many others do—it sometimes seems like a contest to be pithy in 140 characters, rather than sharing information.” Another chat participant found it sometimes frustrating given the speed at which the chats move. It was felt that the information moved faster than what could be consumed by the reader.

In conclusion, of the 87 respondents that answered yes to participating in chats, only 19 participants gave a definitive “yes” to using them. The other 68 respondents had some reservations with chats because of the specific time factor, the lack of pertinent subjects and direction, and the lack of depth in the material. Only 21% (19 of the 87 “yes” respondents) seemed completely convinced that chatting was a useful tool in the Twitter world.

Twitter Users Who do Not Use Chats

Forty-nine respondents, or one-third of the total respondents did not participate in Twitter chats. This group had very strong thoughts about their reasons to not chat. Some participants preferred face-to-face chatting over Twitter chats. Participant 31 stated, “I haven’t. Not really into sitting in front of a screen to do such. I’m much more of a people person and I prefer in person chats.” Another participant noted a “lack of interest.” Participant 61 stated, “Annoying Twitter feed – inefficient – Google Hangout would be better.” Participant 70 noted, “Not a huge fan of Twitter chats. Find it difficult to follow conversations. Also, Twitter doesn’t allow for in-depth conversations.” Other participants did not participate because of time constraints. Eleven of the “no” respondents noted that chats did not fit into their busy schedule. Participant 130 echoed the feeling of these 11 participants by saying, “I do not participate in live chats as they often occur at a time that is inconvenient to me.”

Overall, the “no” respondents were very clear in their statements as to why they did not participate in Twitter chats. The general theme for the reasons was that the chats were not held at convenient times, that face-to-face conversations were more satisfying, and that the chat conversations lacked depth.

The final open-ended question relating to the third research question was:

Who are some of the educational leaders (or organizations) that you follow on Twitter for professional development? Why do you find these leaders useful?

Today, educational leaders have more ways to deliver their information and ideas faster than ever before. At the click of a button, a tweet can be sent to thousands of followers instantly so that the message is given. Whether the message will be read is up to the follower. In addition,

since tweets are public, educational leaders can send a tweet to those who do not follow them. By using hashtags, messages can be sent to specific areas expanding the reach of these Twitter leaders. The participants named many Twitter users that they follow and discussed why they followed them. Organizations also have Twitter accounts to spread their ideas and information. Most educational institutions today have Twitter accounts, such as the University of Manitoba. These accounts are used to promote the institution and provide information for the staff, the students, and the community.

Of the 153 participants, 18% (28) did not respond to this question. Figure 35 displays that from this study, the top five most mentioned leaders were George Couros (28 times), Edutopia (26), Alec Couros (20), Eric Sheninger (19), and Dean Shereski (16).

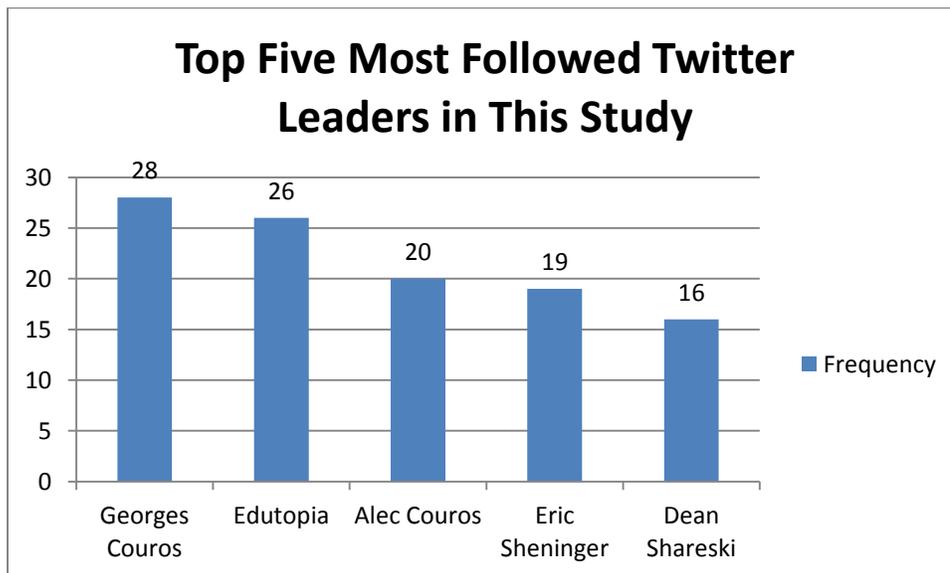


Figure 35. Top Five Most Followed Twitter Leaders in This Study. This figure displays which people or organizations were the most followed by the respondents in this survey.

The reasons for following these leaders were varied. Of the 125 participants who responded to this question, the most common reasons for following educational leaders or organizations included the following as seen in Table 3.

Table 3

Top Ten Reasons for Following Others.

Top Ten Reasons for Following Others	Frequency of Responses
Read what other leaders are saying	24
Get new ideas	16
Find new information	14
Find new resources	13
Get useful material	13
Connect with others	13
Get news from organizations	12
Keep current with information	9
Find website links	7
Find interesting information	5

“Leadership.”

The participants who noted that they liked to read what others leaders were saying followed many different leaders. These participants enjoyed the leadership experience and the practical information that was shared. They felt that these leaders had expertise in their fields and the respondents liked to know what the leaders were doing in their schools. For example, participant 66 mentioned Eric Sheninger and stated, “he shares many great ideas on how administrators can be instruction leaders through the use of technology.” Participant 85 noted, “George Couros provides many links and great current articles, videos, etc., ...also very

personable and balances humorous entertainment with professional issues. Alec Couros (has good links as well.”

Getting ideas from leaders was another common reason for following others. These new ideas allowed the followers to enhance “my profession and better myself,” as participant 62 mentioned. Participant 77 shared, “they bring the latest ideas, concepts, and resources into my orbit. Remember waiting for professional journals and magazines to come to your mailbox to get this kind of information? Now I just read my Twitter stream.” This provides an example of not only getting new ideas but getting these ideas much more quickly and allowing the follower to stay current more easily.

“Finding new information and resources.”

Finding new information, resources, or material was mentioned 40 times by the 125 people who responded to this question. It is very easy to find resources through links and have the material come to the follower and nearly one-third (40 of the 125) felt that getting new data was a main reason for following others. As participant 14 noted, “I find them useful (educational leaders) because they tweet relevant education resources and engage me in thinking about my practices.” Not only do people offer resources, but so do organizations. Participant 21 said, “Manitoba Reading Association, various Manitoba School Divisions, Manitoba Teacher Associations offer news and resources.”

In conclusion, there are many reasons why educators follow others on Twitter. One reason and major motivation is the ability to connect with others. The theme of networking by following others is also a reason why Twitter users use hashtags and chats. The personalized and

global benefits of Twitter encourage educators to use this medium for professional development.

However, there are still some reservations with the efficacy of Twitter for this purpose.

Chapter V – Discussion and Conclusion

This chapter recapitulates the research problem and questions, along with the methodology for this study. Research limitations and delimitations will be provided, along with recommendations for future studies.

Statement of the Problem

Technology today is moving at an extremely fast pace. Twenty-first century learning, which includes Web 2.0 tools and Twitter, offers a new technological and pedagogical paradigm for educators and for teachers in the school environment. Professional development plays a major role for teachers when updating in skills, knowledge, and ideas are needed. However, at the same time, the traditional professional development model of offering one day sessions a few times a year has not kept up with the demands of today's educational challenges. If a teacher's expertise and learning methodologies are to be effective and enhanced, strategies and skills need to be consistently upgraded. Can Twitter offer a new model for professional development to meet these needs of 21st century teacher education?

Review of Methodology

This study focused on researching why people were drawn to Twitter for professional development, who were the people using Twitter for PD, and what were they doing with it to enhance their professional development as educators. The study was appropriately conducted in the spirit of Twitter by having participants complete an online survey. This survey included both closed and open-ended questions. Participants could elaborate with their answers in the open-ended section. The survey link was sent out in the form of a tweet by the researcher and several other important leaders in the educational Twitterverse. The survey was open for a two-week

period just before the start of the 2014-2015 school year and during the first week of the school year.

Research Questions

To understand effective teacher professional development, it was important to understand the activities that teachers were engaged in. This study examined the motivation, demographics and characteristics of the teachers using Twitter for professional development (who), and the Twitter practices of these educators in relation to professional development (how).

The three research questions included:

1. What draws K-12 teachers and other educators to participate in professional development using 21st century learning Web 2.0 tools, and specifically Twitter?
2. Who are the teachers (demographics) and what are the characteristics of those educators that participate in Twitter for professional development?
3. How do K-12 teachers and other educators participate in professional development using Twitter?

Summary of the Results

Who are the teachers using Twitter for professional development?

1. Who are the teachers (demographics) and what are the characteristics of those educators that participate in Twitter for professional development?

The largest amount of demographic detail is found in the above question and will therefore begin this section. It is interesting to note that 57% of the respondents were female, while 42% were male. One percent preferred to not answer this question. In 2012, male Twitter

users comprised of 54% of the total while females consisted of 46% (Duggan & Brenner, 2013). This general reversal of percentages between genders could be attributed to the fact that there are more female teachers than male teachers in the K - 12 system (National Education System, 2008). In addition, females tend to use technology in more social ways than males do (Doyle, 2006). Given that Twitter is a highly social medium, it is not surprising that females represent a slight majority of the respondents.

The range between the highest (9,500) and lowest (1) number of followers is large. This explains in some part the difference between the median of 300 and the average of 417 followers per participant. The average number of followers and following tends to be inflated because of a few Twitter users with a very large number of followers and following.

It is often assumed that technology and youth go hand in hand. It is believed that students have more knowledge about technology than their parents and teachers. According to some scholars, it is also assumed that young teachers have more technological expertise over the older teachers. Marc Prensky (2001) suggested that older generations could not adapt as well as the younger generations in relation to technology. Following this thought process, it would be assumed that younger teachers would be more adept to use technology, including Twitter, than their older colleagues. Other researchers, such as Stephen Bax (2011), felt that Prensky's approach of dividing the older and newer generations based on technological expertise was too simplistic. Bax found that good pedagogy (over an artificial age factor), was more important to the proper use of technology and effective learning. This study of Twitter and PD would tend to support Bax's research over Prensky's. It was found that exactly half of the respondents to this survey were between the ages of 41 and 55 years. This was the largest representative age group. Thirty-nine percent were between the ages of 25 and 40. Responses from the older age group

were very enthusiastic and positive towards professional development and Twitter. The participants were at ease with the technology as much as the younger age group, if not more. A reason for this could be that with experience, older teachers would be more likely to experiment with different methodologies because their comfort level was higher than the younger teachers. Possibly, the younger teachers felt more pressure from the day-to-day classroom life and felt that using Twitter was another layer they did not want to deal with at this point of their career.

In addition, the largest represented group in terms of years taught was in the 16 to 30 years range of experience. At 42%, this was slightly higher than the 6 to 15 years of experience in the classroom which was at 38%. Again, a large portion of the respondents were well experienced in teaching and had positive experiences with Twitter. Also, the educational training of the respondents was very high. Nearly half of the respondents had a Master's degree and/or a PhD. This indicated a long period of teacher and other educational training and would suggest that those who use Twitter for professional development have many years of university experience, either as a student or professor. This also indicates that Twitter is a medium for intellectual stimulation given the knowledge base of the participants. Many Twitter users are leaders in their field and it is evident that this is a source of interest and material for other Twitter users when searching for ways to enhance professional development. This parallels the findings in which self-directed professional development through an online process can meet the needs and complexities of today's educators (King 2011).

Six out of 10 respondents were teachers, while nearly 3 out of 10 were administrators. This teacher to administrator ratio of 2:1 is very low. In this study, a disproportionately high number of administrators use Twitter for professional development. It is possible these administrators had more flexibility or time to complete the survey. Most schools with

approximately 70 teachers would have no more than three administrators (Manitoba Teachers' Society, 2010). This high number of administrator responses would bear well for Twitter and PD since school administration support was positively correlated with the use of Web 2.0, such as Twitter, among teachers (Pan & Franklin, 2011). As was found in this study, several teachers were encouraged by their administrators to sign up and use Twitter for PD. This is an encouraging sign for future growth since school administration can certainly take a lead role in implementing strategies, resources, and time allocation for teachers when developing professional development days. Administrators felt that Twitter did facilitate communication, along with the professional development domain, therefore, Twitter's use was not limited to just one particular objective.

Very few studies have researched the use of Twitter by K - 12 teachers (Forte, Humphries, & Park, 2012). From this survey, the 112 respondents (73% of all participants in the survey) with classroom experience taught from elementary schools to colleges and universities. The largest group of teachers came from high school (grades 9 to 12) and accounted for 40% of the total classroom teacher respondents. This is not surprising because this range covers four years. In addition, there are more teachers in high school than in middle years and they may have greater access to Twitter in the work place because of the older age group of students. For example, one teacher in the intermediate years (grades 5 and 6) said that Twitter was blocked in his school. Twitter also specifies on their website that users must be at least 13 years old. In addition, social media, including Twitter, has often been banned from schools (Watson, 2012). This apprehension by schools to allow Twitter and the legal ramifications due to the minimum age of Twitter accounts could mean limited access for many teachers at school, especially in the younger years. This can have negative effects in creating an encouraging professional

development environment for these teachers when using Twitter. This could result in slower growth for PD and Twitter use in the future.

Surprisingly, college and university degrees can span many years, but only accounted for nine percent of the respondents. This is unexpected given that only 15% of university faculty members were not acquainted with Twitter (Forte, Humphreys, & Park, 2012). Along with professors, higher education comprises mostly of adult students with greater access to mobile devices, therefore a need for greater participation from this group would be beneficial to developing a Twitter and PD leadership strategy.

The teacher's subject area may also have an impact on the effectiveness and direction of Twitter and PD for educators. Science teachers comprised nearly one-third of the subject areas mentioned by the respondents while eight percent were from the area of business and technology. These three areas covered 40% of all the respondents and are often associated with innovation and higher technological use. Perhaps this is "preaching to the converted" when planning professional development with Twitter. The hesitation levels may be greater with areas that tend to use less technology in the classroom. Apprehension was noted as having a delayed effective use for social media in K - 12 schools (Goldfarb, Pregibon, Shrem, & Zyko, 2011). Developing strategies for greater Twitter use for PD among those educators who do not use Twitter should be studied in greater detail.

Negative views from educational institutions about social media were stated in another study (Anderson, Quitney, & Rainie, 2012). It will be important to know the backgrounds of the teachers when developing Twitter and PD implementation, as the gap of the levels of comfort with technology for teachers is vast. For example, practical arts/arts represented only four

percent of the respondents. At the other spectrum, “Sciences” was chosen by nearly half the participants as one of the options when indicating what subject areas they taught. This could indicate that science teachers have a greater comfort level in using Twitter for PD. This demonstrates that, although Twitter material is rich in all subject areas, greater targeting of specific school subject areas could help in building a cohesive and inclusive professional development model with Twitter.

Apprehension towards Twitter and professional development may be mitigated by the number of *followers* and *following* that a user has. Positive comments about Twitter and PD are very common among users with a large number of connected users. Seventeen percent of the respondents have over 1,000 followers and 21% have over 1,000 users that follow them. Having a large pool of connections leads to a greater number of resources being linked to and to possibly higher levels of encouragement from others. The respondents with few followers and following (less than 50 in each case) have greater reservations about Twitter and PD. There is a common theme among the participants with few followers and following and the lack of the use of hashtags and chats. The uneasiness of using these two particular tools lead to a reduced practice of Twitter for PD. Since Twitter use is often self-motivating, it is important that those with a lack of knowledge of how to use particular Twitter tools be encouraged by others to become more versatile in the area. Pinpointing these specific areas of needing greater knowledge would help in developing PD with Twitter strategies. By focusing professional development on an educator’s particular needs and skill set, Twitter can become much more welcoming for those needing more encouragement using this new model.

What draws educators to Twitter for professional development?

2. What draws K-12 teachers and other educators to participate in professional development using 21st century learning Web 2.0 tools, and specifically Twitter?

Web 2.0 tools, along with Twitter, are being used by teachers in a wide range of applications, albeit, in varying degrees (Pan & Franklin, 2011). At the same time, these tools are disrupting the traditional learning and teaching patterns (Ala-Mutka, Punie, & Redecker, 2008). Although there is this disorder of the traditional system, collaboration, sharing, and enhanced creativity are taking place (Tu, Blocher, & Ntoruru, 2008).

Given the rapid changes in technology and education, the traditional model of professional development for educators is in a period of adjustment. Majorities of over 90% of the participants that strongly agree or agree with specific statements in the study are numerous. This includes the statements: “Twitter saves time in sharing information,” “Twitter keeps me current with educational material,” “Twitter helps me find new educational leaders,” “Twitter connects me with people that I would have never met otherwise,” and “Twitter enhances my professional development.” When asked what drew educators to Twitter for PD, common themes appeared in this study. These themes include:

- Being “connected.”
- Connecting with colleagues, educational leaders, and professionals. Getting encouragement.
- Community and professional learning networks. Sharing, collaboration, and communicating.
- Using current resources.

- Curiosity and fun.

Being “connected.”

Although there are common themes, these areas are not static or compartmentalized in a specific or rigid way and there is overlap among the reasons for the motivation of using Twitter for PD. The innovations in technology create new frontiers for thinking and delivering learning models and this is evident in the responses of this study. Researchers are also finding that teacher professional development needs are not standard (Bauer, 2010). Society identifies that the personalization of needs is greater than ever before. In turn, educators are indicating that similar objectives are being met through Twitter for professional development.

Being connected is the most common theme found throughout the survey. Whether it be simply the idea of being connected with others, or connecting with professionals, experts, and organizations, Twitter enhances this linking. The respondents may have been drawn to Twitter for PD because they saw this as a new way to make their upgrading more relevant and interesting. Other studies similarly found online professional development to be a viable option for improving teachers' practices (McNamara, 2010). The social aspect of Twitter is a huge incentive for respondents in this survey. Eighty-seven percent of the respondents either strongly agree or agree that they feel more connected as a teacher because of Twitter. They feel more connected because of the immense pool of friends, colleagues, and educational leaders that are available at any time and anywhere. Nearly all respondents (98%), either strongly agree or agree that they connect with people they would have never met otherwise if it had not been for Twitter. Building this social capital helps to reduce the alienation that some teachers may feel when upgrading their skills. Teachers, especially those in rural and isolated communities sense that

Twitter brings them closer to others even though they are physically far apart. This is supported by Casey (2013), in which he states that building social capital reduces the feeling of alienation among teachers in reference to professional development.

Connecting with colleagues, educational leaders, and professionals. Getting encouragement.

Ninety-five percent of the respondents either strongly agree or agree that Twitter helps them find new educational leaders. This overwhelming majority indicates that there is relevancy in using Twitter for professional development and leaders in the field. One of the goals of PD is to introduce teachers to new ideas and people in the education domain. A “one size fits all” model of the traditional PD model can possibly accomplish this, however, only a very limited number of new ideas or leaders can be introduced to a large group of teachers within a short specified time frame. It is also often prohibitively expensive to have a national or international educational leader come to a school or school division to give a talk. Today’s fiscal realities hamper this possibility of having educators meet a world-renowned speaker face-to-face. In addition, it is highly unlikely that all the teachers would be interested in the same person who is giving a talk at school or conference. The complexities of teaching and the vast area of subjects taught render the task of being relevant to all a very difficult one. While getting a tweet from an educational leader such as Daniel Pink may not be the same as seeing and hearing him in person, the constant feed from him through Twitter can certainly fill a large gap during the school year while trying to implement new concepts in learning.

Respondents enjoy following other leaders for various reasons. Mostly, they simply like to read what others are saying to get new ideas and resources. They also find the information

interesting and current. Many feel more engaged when getting material from an educational leader, such as Eric Sheninger or the Couros brothers. Although the tweets from the leaders are not directly sent to the respondent (unless as a direct message), it still may feel as if this leader is connecting on a one-to-one basis. This is because the Twitter feeds are sent directly to each user enhancing the feeling of the connectedness among educators.

Three-quarters of the respondents either strongly agree or agree that they get encouragement from others when using Twitter for PD. The sense of being connected with others plays a large role in encouraging teachers to seek Twitter as a new way to receive professional development. Being able to reach out to educators outside the confines of a classroom or office can provide a new conduit for developing current and new skills.

Community and professional learning networks. Sharing, and communicating.

Four out of five respondents feel that Twitter helps with collaboration with their colleagues. Only six percent do not agree that Twitter leads to collaboration. This is not surprising given the high level of connectivity that the participants feel when using Twitter for professional development. Being connected segues into feeling part of a community of like-minded individuals. Informal and formal networks develop over time. More formal communities create professional learning networks for sharing, collaboration and communicating. It is interesting to note that “global” and “intimate” are used as terms to describe Twitter. Although this social media is international and is found in every time zone of the world, communities are developed to share ideas. This is part of Twitter’s allure. Teachers share ideas and material, they carry on conversations, and participate in live chats at specified times of the week. This creates a humanizing experience for the individual even though he or she is participating through a digital

device such as a laptop, tablet, or smartphone (McCool, 2012). Educators, although living far apart from each other, can communicate very easily and share similar ideas. This in turn cultivates specific cultures among different parts of the Twitterverse. This technology brings people together that would normally not meet to discuss issues dealing with educational matters. Even a language develops with terms such as, “dm”, “mentions”, and “handles”, being bantered about without any thought of these words seeming nonsensical to those outside the culture. Even the term “Twitteracy,” meaning Twitter and literacy, is referred to by Greenhow and Gleason (2012). In addition, this specific culture development among participants spread across the world is referred to as a type of digital tribalization (Doyle, 2006). This self-identification with others within the local and global community in education is a major draw to Twitter. Teachers that may sense alienation because of physical or intellectual distance from others have found a new way to feel included among educators across a school division and across the world.

Teachers participate in many Web 2.0 activities, such as blogs and wikis. Often these tools need to be shared to be useful. Twitter is used as a vehicle to share these tools through connected links to PLNs and other informal communities. This way, the problem of how to share ideas and material is mitigated by this simple access. Twitter not only helps the communication process but improves the skills of the individual. Eighty-two percent of the respondents said that Twitter enhances their use of Web 2.0 tools. Therefore, there is an added advantage of using Twitter because it may indirectly motivate educators to use other tools that are seamlessly introduced when participating online.

Using current resources.

Given the billions of pages on the Internet, a lack of available information is usually not a general problem for teachers when they seek out new material for a course or methodologies. However, being able to find and disseminate the material to make it useful can be a challenge. Twitter can act as a conduit and filter to process this immense amount of information. This informal sharing of resources is a key factor in using Twitter (Risser, 2013). Eighty-nine percent of the respondents either strongly agree or agree that Twitter saves them time when sharing material. This large majority demonstrates that Twitter can help filter and distribute information that is needed for the teacher. Often, at a traditional PD session, material is passed along in the form of a hard copy or presented on a PowerPoint type lecture. Resources may or may not be shared, depending on the speaker. If they are shared, it is often for that specific session only. When educators use Twitter, the resources are in a constant stream 24 hours a day all year. Links to articles, studies, websites, audio, and video links are current and on-going. This material is shared with other educators and stored by the teacher. The information is accessed very easily from a computer, laptop, or mobile device such as a tablet or smartphone. It was estimated in 2012 that there were 6.8 billion mobile devices in the world which meant that there was one mobile device for each human being (Mobithinking.com, 2014). Therefore, access to the resources was not a limitation either.

Before the age of the Internet, most research material needed to be retrieved from libraries or other places that contained hard copy books and articles. Often, this material was out of date and not relevant to the teacher. With Twitter, the material is not only plentiful, but very current. Nearly all respondents (98%) either strongly agree or agree that Twitter keeps current with educational material. Given the rapid changes in technology and information, teachers must upgrade their skills and knowledge much more quickly than in the past. Information and

communication technologies (ICT) are an integral part of working and learning and it is now accepted as a continual and rapid element of society, as researched by Prestige (2009).

In addition, three-quarters of all the respondents either strongly agree or agree that Twitter increases their classroom subject knowledge. Only six percent believe that it does not increase their knowledge base. To have such a large percentage agree that their knowledge base increases through Twitter and PD is significant. I believe that any traditional professional development session would be considered very successful if 75% of the respondents felt that it increased their knowledge of the particular material.

Curiosity and fun.

It is important to note that not all motivations can be easily fit into a simple category. In addition, initial impetuses to join Twitter can change over time. Several respondents mention curiosity as an original stimulus to start using Twitter. Educators by nature are curious and there is a lot of hype with Twitter. This combination leads to many teachers signing up for an account and initially using Twitter for the social media aspect in general. Often it was just to keep current about celebrity antics. Over time, these teachers found followers that provide them with good resources and links. Other teachers start using Twitter because their administrators and students were using it. Others feel compelled to join because so many people have Twitter accounts. Ninety percent of adults between the ages of 18 to 29 participate in online social networking (Pew Research Center, 2013). These motivations of curiosity and fun suggest that when implementing a model for PD using Twitter, it will be important to add a factor of entertainment and socializing.

How are K - 12 teachers and educators participating in professional development using Twitter?

3. How do K-12 teachers and other educators participate in professional development using Twitter?

Tools and applications.

Teachers and educators across the world are interested in enhancing their professional development. This research looked at the tools and what educators use within Twitter to improve their PD. There was not one single overwhelming use of one particular tool or methodology for the participants involved in Twitter. The tools and activities were fairly evenly spread among several areas which included using website links, audio links, and video links. A large majority of the respondents (86%), send these types of links at least once a day. The participants find online documents, classroom information for students, send personal links to other sites and images, email Twitter links, and participate in live Twitter chats. Given the nature of the Internet and Web 2.0 tools, it is not surprising that teachers use a combination of sources and resources to help with their PD. The multiple use of resources is the most common method of accessing collective knowledge and the ability to link to websites, and audio/video makes the PD that much more powerful (Lalonde, 2012).

The respondents use a multitude of applications, most of which are particular to Twitter. The participants averaged using three applications, including Instagram (photo sharing), Vine (video sharing), and TweetDeck (Twitter organizing tool). The participants use these programs to provide a greater “human face” to Twitter because pictures and video of people, places, and activities are shared. Other applications are used in conjunction with Twitter making it easier to

organize and filter the large amount of information. Pocket, Scoop.it, Paper.li, and Twitter lists all help to engage Twitter users to read and seek information from other colleagues. These programs can create certain themes and organize subject material into manageable areas so that educators can then carry on online conversations about the information. This is also supported by Veletsianos (2012), where he found that information and discussions through Twitter crossed into other online areas such as YouTube and blogs.

Tweeting, retweeting, replying, reading, and mentions.

Educators today are using Twitter's features in specific ways. There are many tools available on Twitter but the core of Twitter is tweeting to the world. Eight-nine percent of the participants tweet at least once a day. Fifty-eight million tweets are sent every day across the world (StatisticsBrain.com, 2014). Teachers are tweeting and participating in online conversations. By tweeting, the participants are getting involved in the day-to-day life of Twitter and they are finding relevant resources and material. A 2009 study by Ovadia supported this by finding that people who use tweets, keywords, hashtags, and mentions, feel that their research material is current and relevant to their area.

Retweeting, the act of resending another person's tweet validates the original sender's message. By retweeting, a person is saying that the tweet is good and this can provide satisfaction to the original tweeter. Over half the respondents retweet at least once a week. Retweeting sends the original tweet to other people who do not necessarily follow the original tweeter. This expands the number of people who an educator is exposed to and can help enlarge the network of colleagues. This is supported by Lalonde (2012), where he found that the specific

use of retweets helped expand a teacher's professional learning network by exposing them to new people.

One of the major advantages of Twitter is that a person can simply lurk, or just read other tweets. Seven percent of the respondents only lurk and do not tweet. This is a common activity because it requires basically no planning or effort on the part of the participant. Reading tweets can be done at any time and anywhere, especially if the person has a mobile device. The act of reading other people's tweets can be a very satisfying and worthy experience. A large percentage of the participants (89%), read tweets at least once a day. By just reading tweets, an enveloping and fluid atmosphere is created for the participant involved and even for professional learning networks (Lalonde, 2012). In addition, it is relevant to note that 40% of all Twitter users just read tweets and do not participate in tweeting (StatisticsBrain.com, 2014). Given that a great deal of resources and information can be acquired without the act of tweeting, this may explain the large number of people who lurk in the Twitter world and do not find it necessary to participate.

Replying to tweets keeps a conversation going over a period of time. Replies help to validate a conversation and engage people to continue pursuing specific subjects. Again, a large majority of participants (88%), reply to tweets at least once a day. This indicates that conversations are happening among educators and that their tweets are being read and responded to. This provides an incentive to keep tweeting if a person knows that others are reading their tweets.

Mentions provide even greater validation for a Twitter user because his or her username is specifically cited in a tweet. Therefore, this mentioned person has their message substantiated by another user. Mentions help to attract new followers because a username becomes part of the

conversation across areas beyond the specific following/follower group. A surprising 83% of participants mention other people at least once a week. This demonstrates how people encourage others to participate and validate what others are saying. This is often not the case in a classroom where validation can only come from a student and even more rarely from a colleague because of the inherent isolation of teaching in a small room all day. It is possible this type of support can build greater confidence for teachers in terms of their teaching practices and material.

Twitter as a better delivery vehicle for professional development.

This study looks at the motivations, and who and how people use Twitter for PD. A little over half, or 58% prefer Twitter over traditional methods of professional development. Nearly one-third are neutral towards this statement and only 13% either disagree or strongly disagree with this statement. In addition, 92% of the participants either strongly agree or agree that Twitter enhances their professional development. Only three percent either disagree or strongly disagree that Twitter enhances their PD. Therefore, although educators agree overwhelmingly that Twitter helps their PD, a smaller percentage believe that Twitter is better at providing professional development. In addition, when the participants were asked to elaborate as to whether Twitter was a better way to provide PD, the numbers were more nebulous. Thirty-seven percent said that Twitter did provide a better system to deliver PD, 9% did not feel this way, and 51% were undecided. Therefore, a four-to-one margin of participants believed Twitter did provide a better model for PD. However, the large percentage of undecided is significant because although many prefer Twitter for PD, they are less convinced that it is a better vehicle for professional development. The reason for this is not entirely clear, but it is important to note that this survey was answered by people who already used Twitter for PD. It is possible that the participants feel that Twitter would be less effective for those who are not currently using

Twitter for PD. It is also possible that because of Twitter's short history, educators are not sure how this new social media fits within the traditional model of professional development. This would be an area for further study as there are still reservations about Twitter and PD for educators.

As in the earlier question relating to what drew people to Twitter, similar themes developed in the open-ended questions about educator participation in Twitter.

Sharing, networking, and developing a community, such as professional learning networks are major themes as to how Twitter is used for PD. Easy access, the personalization, the global nature, and immediate communication are all viewed as significant advantages.

Collaborating, networking, and developing a community.

Teachers and other educators use Twitter to enhance their PD because of the sharing, collaboration, networking, and the ability to "talk" among colleagues and friends. Twitter is breaking down the barriers by developing a close community of people with expertise in specific areas. Professional learning networks can be more easily attained because of the online environment where many people outside a school can form formal and informal groups. New ideas, resources, and methodologies can be explored at a much greater level given the networking of individuals across many divisions and districts. This is viewed as a major advantage because Twitter can provide PLNs for individual professional development that is current and relevant. Twitter is allowing educators to find colleagues across the country and no longer feel isolated, even in remote areas. The ubiquity of Wi-Fi, cellular service, in combination with mobile devices allow this to happen nearly seamlessly during any time of the day. This is supported by Forte, Humphreys, and Park (2012), where they found that Twitter creates and

maintains professional connections outside their schools. Risser (2013), also found that Twitter offers an informal system for the collection and sharing of information. Deyamport (2013), supported the view that Twitter is a useful tool for developing PLNs for individual professional development.

Easy access, personalized, global, continuous, and immediate.

The majority of teachers use Twitter to enhance their PD because it keeps them connected with others and offers a place to share ideas and resources. For this to be successful, a form of ubiquity is needed so that easy access is the custom. Teachers use computers and mobile devices to connect to Twitter. The growing Wi-Fi zones and cellular service areas are expanding at the same time. This is helping educators access more material from more people, at a quicker pace. Twitter was seen as a vehicle for getting information from a large audience (Lalonde, 2012). Educators are enjoying the ability to access data quickly because this matches what is going on in the classroom and for professional development purposes.

Teachers are embracing the self-service aspect of Twitter for enhancing PD. This mirrors society in general where people have more control over the timing of events. Whether it be the media, the news, or even filling up a car with gas, people are more comfortable doing things themselves. Society is now used to the idea that things come to them and not where people need to seek out information themselves. Twitter fits this mold quite well. Educators use Twitter during their own time and not one artificially defined by an organization or another person. They use Twitter for PD at school, at a conference, and at home. The limitations of a one day PD day are eliminated as educators migrate to the realm of continuous professional development. Twitter users follow who they want and people follow them. If a person does not want to be followed,

the user can be blocked. This personalization of professional development is making educators more engaged in their learning and upgrading of skills. People are also more comfortable with the online world to get information. When people sign up for Twitter, they agree to the terms of Twitter where tweets are made public. This is another area where people accept the fact that material is more public than before. Teachers are comfortable with sharing thoughts and ideas online. Educators are sharing resources relating to their professional development. They request help and offer suggestions to others. They participate in social discourse and pursue connections with others. This openness in sharing thoughts and resources through a digital identity is supported by the research done by Veletsianos (2012).

Educators are embracing this informal and non-linear aspect of enhancing professional development using Twitter. Siemens (2005) supports this idea about non-sequential learning and connectivism, where connecting with technology is an increasing part of our learning. Today's classroom is filled with differentiated learning for students. This model is now being applied to adults and professional development. Options and flexibility are traits that people now look for when tackling new challenges. A "one size fits all" model for PD is currently being tested by educators. In addition, the international aspect of Twitter and PD is becoming a normal way when communicating and collaborating. Teachers are conversing with people around the world in the same way they do with a neighbour across the street. Cox (2012), and Killion (2011) note this in their studies on how Twitter enhances global connections and gives opportunities to share educators' information. It is indeed ironic that educators are viewing Twitter as a global phenomenon while at the same time being very personalized and tailored to their needs.

Hashtags and Twitter chats.

Hashtags are a major filtering component of Twitter. Nearly three-quarters of all the respondents use hashtags. One third of the respondents use hashtags between once and seven times a day. Educational hashtags were the most popular (#edchat, #edtech, etc.), however, this is not surprising given that most of the participants were educators. Hashtags are often very specific to a teacher's geographic or subject area. This is often the case because hashtags are good for events that only happen once. A particular hashtag can be created to represent a specific session for a particular school. This helps to keep the Twitter "noise" down when people are tweeting about a certain subject.

Educational conferences often involve the meeting of many people. Several sessions can take place at the same time. Twitter users find it helpful to use hashtags to have a virtual meeting place to discuss a specific session. Hashtags let others know where a person is attending a session. Back-channeling using hashtags allows people to have online live conversations while a session is currently running. This helps to bounce ideas back and forth in the background as a speaker is talking. Hashtags start conversations when somebody wants to talk about something in particular. These hashtags help to connect people with others interested in the same topics. This encourages the formation of formal and informal PLNs. This back-channeling can often indicate the engagement level of participants in a session. When a specific hashtag is used in a constant stream over Twitter, this will show to other users that a particular session is worthwhile of a conversation. Interesting quotes from a presenter are often tweeted with a hashtag. This creates engagement among tweeters even though some users are not attending a specific conference session. This type of organic conversation and reflection of thoughts indicate a depth of sharing and learning that can be achieved in Twitter. This would be an example contrary to a Twitter

disadvantage, where some believe this medium is too superficial. These practices are supported by other studies. Ovadia (2009), found that hashtags help people research material that is relevant to their area. Lalonde (2012), noted that the specific use of hashtags expanded the teachers' PLNs by exposing them to other people they did not know.

Many Twitter users find hashtags very effective for Twitter chats. Live Twitter chats are a common activity for Twitter users. These chats connect people, either locally, or globally at a specific time. This is one instance of Twitter use where space does not matter but time does. As with hashtags, chats can be very specific to a subject or geographic area. Teachers in Manitoba will use #mbedchat on Wednesdays to discuss current topics in education. Although the majority of teachers will be from Manitoba, anybody can participate in the live chat. Hashtags and chats are often interrelated. For example, #edchat was the most frequently mentioned hashtag and chat that the respondents used.

Connecting with others is a major component of using chats. Teachers find chats to be an excellent method of keeping current with ideas and meeting other people, especially for those people teaching in remote or isolated areas. Chats provide a sense of community with many other colleagues even though a teacher may be in a very small school with only a few educators in the building. Chatting delivers flexibility in timing that may not be available during the work day. Having chats set up outside the school hours provides a chance for teachers to meet that would not happen otherwise. This keeps them connected to each other and they find encouragement and support this way.

Fifty-seven percent of the respondents participate in Twitter chats while surprisingly, nearly one-third do not. The ones that do not chat represent a fairly large percentage when

compared to other Twitter tools that are not used, such as hashtags or Twitter application programs. In addition, the ones who do use Twitter chats have some reservations about using them. Many teachers feel that chats do not fit their schedule in the evening or during the weekend. Some see chats for PD as simply another layer of work after school hours. Other people feel that too much housekeeping and introductions are taking place and many chats lack depth. The limitation of 140 characters is another factor mitigating the effectiveness of chats. However, teachers do feel that having a good moderator helps the flow and direction of Twitter chats.

Educational leadership.

Teachers enjoy seeking, reading, and following educational leaders using Twitter. Educators want to know what leaders are saying. This keeps them current with new educational theories and practices. Getting new ideas and resources are other reasons educators follow leaders. Teachers often teach subjects in isolation at a school. Getting new material or seeking expertise can be difficult. By following Twitter leaders in their specific field, this seclusion is reduced. Teachers want to better themselves and learn from others. Getting experts to give them information is one way to accomplish this. Even though the expert is not met face-to-face, teachers still embrace the idea of receiving valuable information by this method. The educational leaders are around the world and tweets can be found at any time of the day. This push technology, where the information is sent to the teacher, is a great advantage because teachers do not need to seek out the information. Teachers find it easy to get the resources they need from these leaders by simply following them. Twitter enhances these connections by giving the leaders the opportunity to share thoughts and expertise (Cox, 2012; Killion, 2011). Educators enjoy tweets from these leaders which are often humorous or motivational. This gives a human

approach to the virtual connection. Often, a person may follow somebody for years and then meet for the first time at a conference. This provides both parties with a feeling that they have known each other for years even though they had never before met in person.

Reservations about Twitter for Professional Development

Although a vast majority of educators believe that Twitter enhances professional development, slightly over one-third think that Twitter is *better* at delivering PD than the traditional methods. Many teachers feel that Twitter has limitations, specifically its 140 character maximum for tweets and the lack of face-to-face contact. Given that teachers in general, especially those who did not grow up with the Internet, see knowledge and in-depth information as keys to learning, Twitter's medium may be viewed as insufficient. This is noted by several participants who said that the 140 character limit could not allow deep learning. This can be one of the explanations why Twitter has still not developed into a mainstream educational tool in the classroom. Reducing this belief that Twitter only offers superficial learning is one way to help increase its use among educators for PD and in the classroom. In addition, educators feel that there are generally not enough professionals on Twitter which can limit its potential.

Some teachers feel that Twitter is too personal and sometimes self-promoting. This can reduce effective interaction and meaningful conversations. Educators have even more reservations with Twitter chats because they often move too quickly or they are set at times not convenient with the user. Other teachers are overwhelmed with the amount of information and even using hashtags can still cause a feeling of information overload. A constant stream of tweets, especially if they come from only a few specific people can simply become "white noise" to the reader. Personal conversations among two or three tweeters can also be viewed as being

excluded from the conversation by others, alienating the user from further interest or discussion. These are some of the reasons why Twitter was not viewed as a replacement model but simply as an enhancement for traditional professional development.

Although Twitter can provide many advantages to learning and collaboration, it is still only a tool. Twitter can only be as useful as people make it to be. There are many newsworthy stories about Twitter and a good number also reflect the negative aspects of Twitter and its misuse.

Twitter does provide a code of conduct on its website (The Twitter Rules, 2015). These rules include the areas of content boundaries, copyright, violence, impersonation, privacy, spam and abuse. However, there are abuses of Twitter use.

One of the misuses includes abusive behaviour. Some people misuse Twitter by exhibiting abusive behaviour toward other people. This abusive behaviour ranges from mild insults to the promotion of acts of violence towards others.

Another misuse is impersonation. Twitter does not allow a person to impersonate someone else, however, this does happen. For example, if a person does a search on Twitter for Barack Obama, several Twitter accounts appear, such as @BarackObama and @BarakObama_ (Twitter, 2015). If a user is not careful, he or she could be following the wrong person because the account names are very similar. In addition, the usernames, such as “Barack Obama” can be used many times. This impersonation can lead to confusion and false allegations towards a person in which false accounts have been made in their name. Trademark violations is another misuse where company logos, images, and usernames are used to represent an account that is not the actual business.

Another misuse is using Twitter for illegal activity. This includes tweets that direct people to illegal download websites and tweeting the selling of stolen or illegal goods and services. Several terrorist groups around world, including ISIL, have developed a very sophisticated social media network of luring troubled people to join them in their terrorism-related cause and activities.

People's user accounts can also be hacked and personal information can be stolen. False tweets can also be sent and cause embarrassment for the legitimate user.

Finally, Twitter can also act as a reinforcer of ideas and thoughts. If people only follow people that always agree with them, actions and ideas are often reinforced, regardless of the legitimacy of the idea. Self-serving promotion can also be an irritant for many users.

These issues with Twitter and PD can be a negative force when trying to implement a new model for professional development. Educators need to be convinced that this new system is worthwhile if Twitter's full potential is going to be met for teachers.

Limitations of the Study

Assumptions.

It was assumed the participants were all over 18 years of age and the online survey would be answered truthfully. It was anticipated that the participants understood the questions being asked and that the participants were educators in some capacity. It can be assumed that teachers using Twitter do not represent all teachers.

Limitations.

The researcher could not verify the truthfulness of the responses of the participant. It was not possible to ascertain without a doubt that a participant was at least 18 years of age. The participants in this study were drawn from a sample that was based on convenience, that is, only those willing and able to participate did so. Participants were limited to those with Internet access during the time the survey was available online for two weeks. In addition, certain groups of people in less affluent areas may not have had the ability to answer the survey due to access. In addition, the study is limited because the participants do not represent all teachers and educators. The link to the study came from a tweet, therefore, those who use Twitter in some capacity were the ones cognizant of the survey.

Restraint should be taken when generalizing the results. The participants were mostly from developed nations who have particular views compared to less affluent countries. The educators were generally comfortable with technology since the study was done online and referred to Twitter. This too would not be representative of educators as a whole.

Since the data collection was done online, there was no way to judge body language or other non-verbal communication cues. In addition, the sample size was 153 participants, however, studies have shown that a small sample size of educated professionals can represent the target population in general (Crouch & McKenzie, 2006).

Delimitations.

A tweet with a link to the online survey provided access to the study therefore the participants would be limited to those involved in some capacity in using Twitter.

Suggestions for Future Study

Current literature on the specific use of Twitter for professional development is sparse. Large scale studies are needed to examine what precise training is needed to increase the number of K - 12 teachers using this new PD model. This study involved educators that were already using Twitter for PD. Research into why teachers are not using Twitter for PD should be conducted. It is not enough to “preach to the converted,” non-users need to be involved in the process. Studies need to include teachers and educators with a wide range of technological abilities so that more accurate strategies can be developed when involving all teachers in Twitter.

In-depth research of Twitter and PD at a specific school with a few targeted teachers would be of benefit to deeply elaborate on why these teachers continue to use Twitter as their PD model. In-depth face-to-face interviews could reveal more of the complexities of why this social media works so well for certain people.

Other studies could delve into the deeper motivations of using Twitter for PD. Does Twitter increase morale among teachers? Can Twitter be used as a support group model for not only subject material but for other non-educational issues that teachers deal with?

Additional research could study how Twitter increases digital literacy for educators. What are the most effective Twitter tools available and why? Is Twitter actually improving the classroom experience for teachers? Are students more engaged if their teachers have a greater understanding of digital literacy?

These proposed studies will lead to a better understanding and direction for a more effective use of Twitter and professional development.

Recommendations and Conclusion

Although there are many advantages to implementing the concepts, pedagogy, and tools of 21st century learning and Twitter for professional development, it is important to stress that this new paradigm is not without its faults. There are many advantages to “20th” century learning and there is no definitive answer as to which approach is better, or if this needs to be even answered. The greatest inventions in the world were generally brought about without the 21st century model of learning (since this model was only in discussion during the late 1990s) and many students thrived in this type of environment. Linear and sequential learning has many merits as it tends to be more organized and follows a step-by-step process. Indeed, many students prefer this type of environment where structure plays a key role in the system.

Twenty-first century learning often refers to creativity, collaboration, communication, and critical thinking. These ideas are processed in a different manner when compared to the 20th century. It does not mean that these learning techniques and activities did not exist before the 21st century. Students before the 21st century also collaborated with students through group work and sharing ideas in class. Communication took place among students and teachers. The lecture approach advantage that is often diminished in the 21st century model is one that has flourished for centuries. Not all material can be simply “googled.” Content experts are needed in all areas of education and this material needs to be provided for others to digest, learn, and interpret. Face-to-face communication in class and among educators is a cornerstone of learning and this cannot be replicated using many of today’s Web 2.0 tools. Some would say this face-to-face communication is now lacking in the 21st century. Critical thinking and creativity were also encouraged through challenging assignments, experiments, and field studies.

What is important to stress is that it is not a “either-or” debate between which is better — 21st century learning or 20th century learning. The advantages of both systems should be cultured and amalgamated so that educators and students can be as prepared as possible for the future.

Today’s society is in a constant state of flux and educators need to adapt to the rapidly changing technology and needs of students, schools, subject material, and professional development. Educators are consequently faced with new learning environments (Rienties, Brouwer, & Simon, 2012). A greater fluidity to learning is resulting in new ways to approach professional development for educators.

21st century learning speaks of a new way to learn and collaborate because of this impetus coming from new technologies. Web 2.0 tools and Twitter already play a role for teachers and PD while the traditional static model of professional development is facing challenges in today’s self-service, mobile, and personalized world. Professional development with Twitter can be more prevalent and effective for educators in the future. For this to become a reality, new strategies need to be developed. To find these new approaches, more research is needed into the practice of existing Twitter users for PD. The purpose of this study was to find who are the current Twitter users for PD, what are their motivations to start using Twitter for PD, and how they are using Twitter for PD.

This study demonstrates that educators are willing to enhance their professional development and are using Twitter in various ways to achieve this goal. Teachers value the social media component of professional development. Twitter offers self-pacing, differentiated learning, and the ability to connect, communicate, and collaborate with colleagues across the globe. Educators appreciate the fluidity, the immediacy, and the immense amount of resources

available. Teachers are enjoying the online conversations and seeing a break-down of the physical barriers to meeting with other colleagues. Twitter is mitigating the isolation of many teachers in remote areas and those in small schools. The ability to stay current and share ideas is motivating educators to continue life-long learning and professional development. Teachers from all subject areas and grades are using Twitter for PD as they are connecting to experts in their fields and expanding their knowledge base. Educators are encouraged by others and feel a sense of community. Professional learning networks, both informal and formal are being created, with the help of hashtags and live Twitter chats.

Educators are tweeting, retweeting, replying, and mentioning other colleagues on a regular basis. This is complemented with the regular use of Twitter tools and applications. The easy access in which to connect to international educational leaders and colleagues across the globe is also enhancing professional development. This tailor made system of professional development is one that is sure to evolve and improve over time with the proper guidance and training.

Although there are many educators currently using Twitter with PD, there are many who are not. The range of the comfort level of Twitter use among educators is great. Knowledge about Twitter and its tools and potential, and the direction and training in this area are also at very different levels of development. There is also apprehension from some educational institutions to use this social media because of its newness. Nevertheless, professional development can be an organic and seamless system where educators learn on a constant basis, and not in a “stop-and-start” approach. It is beneficial to have professional development activities flow and connect from one time and place to another.

Schools and school divisions and districts can develop specific professional development on how to use Twitter for PD since the range of knowledge is pronounced. Teacher training in this area would be valuable. Current leaders in Twitter and PD can give these sessions and also be allocated time in their job description so that it becomes part of the culture of learning for educators. It is important that teachers see that this is as not another layer of work but a new model to keep learning on a constant but non-threatening basis. This way, teachers may feel less overwhelmed at one-day PD sessions where large amounts of material are often scheduled into one day.

It would be advantageous to have administrators and school divisions involved in the process since they have influence over the resources and time allocation for teachers and other educators. It is important to capitalize on the momentum generated by teachers who are excited and motivated to use this new Twitter medium for professional development. Educators see Twitter as helping them increase their knowledge base, augment their connections, facilitate sharing, personalize their learning, and in turn, enhance their professional development. This is happening because of the connections being made among educators without a specific hierarchical system, but one that is more dynamic and differentiated.

As my Honeycomb Digital Model suggested at the beginning of this thesis, learning is more synchronous, non-linear, and group-based. Building relationships, problem solving, and horizontal learning are becoming a new normal. The line of knowledge between the teacher and the learner is becoming more blurred. Being cognizant of this new paradigm shift in life-long learning for teachers will help foster a more organic atmosphere of upgrading skills and promoting new ideas. The unblocking of Twitter, especially in high schools, would also help

develop a new school culture of using this social medium for PD. Rather than being seen as a possible distraction, Twitter can be viewed as an enhancement to learning.

It is not enough to leave it at a grassroots level where technologically innovative teachers use Twitter and PD “on the side.” Greater flexibility should be given to teachers so that they can make their own decisions about tailoring their specific professional development. Job descriptions, evolving subject material, course changes, technological advances, and differentiated learning by students and educators are all part of the new equation in education. Professional development needs to mirror this new reality and paradigm shift in life-long learning for educators and teachers. As one participant using Twitter for PD succinctly exclaimed, “It is more personalized. It is more differentiated. It provides many more resources and connections. It provides better individual feedback. It is more flexible and can be done at different times. It is unlimited.”

Appendix A

Survey

Twitter and Professional Development for Educators

Below is an online survey about Twitter participation among educators. The results will be compiled by the researcher only. It should take between six and eight minutes to complete.

An asterisk (*) denotes a required question to answer. Radio buttons (○) allow for only one answer. Check boxes (☐) allow for multiple answers. Text boxes allow for numbers and letters with no minimum or maximum.

- Professional development may appear as the acronym PD.
- Professional learning networks (a formal or informal learning network where individuals want to communicate and share ideas for the specific reason of active learning) may appear as the acronym PLN.

By participating in this survey, you must be 18 years of age and it is assumed you have a Twitter account.

Please answer the following questions:

Are you 18 years of age or older?

- Yes (Survey will begin when this button is clicked.)
- No (You cannot complete the survey.)

Survey for participants that said YES to the previous question

(Note: RQ1, RQ2, and RQ3 refer to one of the three specific research questions that are being asked. This denotation will not be shown in the online version.)

*Age: (RQ1)

- 18 - 24
- 25 - 40
- 41 - 55
- 55+

*Gender: (RQ1)

- Male
- Female

Prefer not to answer

*Where do you live? Please enter the town or city, province or state, country. (RQ1)

*Are you or have you been a classroom teacher? (RQ1)

Yes

No

If you answered YES to the previous question, how many years have you taught? (RQ1)

0 - 5

5 - 10

11 - 20

21 - 30

30+

*What is your educational training? (RQ1)

Presently in school or university

Bachelor's degree(s)

Post-baccalaureate degree(s)

Master's degree(s)

PhD

Other, specify:

What is your position(s) in education? (RQ1)

Pre-service

Teacher

Support services

Administration

Other, specify:

If you teach in the classroom, please select the area you mostly teach in at the present time:
(RQ1)

Elementary (K - 4)

Intermediate (5 - 6)

- Intermediate (7 - 8)
- High School (9 - 12)
- University or college
- Other

How many Twitter followers do you have? (RQ1)

How many people do you follow on Twitter? (RQ1)

*What is (are) your main area(s) of teaching or work at the present time? (RQ1)

- Practical Arts
- Business/Technology
- English
- Math
- Sciences
- Social Sciences
- Physical Education
- Other, specify:

*What tools or activities do you use with Twitter? (RQ3)

- Website links, video, audio
- Online documents
- Live Twitter chats
- Email
- Your own links
- Classroom information for students
- Other, specify:

*Check below any Twitter Applications that you use or have used: (RQ3)

- TweetDeck
- Pocket

- Paper.li
- Scoop.it
- Vine
- Instagram
- Twitter Lists
- Other, specify:

*Please answer to the best of your ability the following about Twitter: (RQ2)

	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
Twitter helps in collaboration with my colleagues.	<input type="radio"/>				
Twitter saves time in sharing information.	<input type="radio"/>				
Twitter keeps me current on educational theories.	<input type="radio"/>				
Twitter enhances my professional development.	<input type="radio"/>				
Twitter helps me find new educational leaders.	<input type="radio"/>				
Twitter connects me with people that I would have never met otherwise.	<input type="radio"/>				
I get encouragement from others.	<input type="radio"/>				
I feel more connected as a teacher because of Twitter.	<input type="radio"/>				
I prefer Twitter for PD over traditional PD methods.	<input type="radio"/>				
Does Twitter enhance your use of new digital tools such as Web 2.0 tools, blogs, YouTube, wikis, etc.?	<input type="radio"/>				
It increases my classroom subject knowledge.	<input type="radio"/>				

Please check the option buttons that apply most accurately to you.
Per week, how many times do you? (RQ3)

	Never	1 to 7	8 to 50	50+
Tweet?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Retweet?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Read tweets?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Reply to a tweet?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Mention a user?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Insert a hashtag in your tweet?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Tweet a link to a website, article, or video/audio recording?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please take a few minutes to answer the following questions:

What drew you initially to Twitter? Preferably, list or explain at least three things. (RQ2)

Do you feel that Twitter provides a better way to deliver professional development? If so, why and how? If not, why not? Please provide specific examples. (RQ3)

If you use hashtags, which ones are the most effective and why? (RQ3)

Do you participate in live Twitter chats? If so, which ones? If you participate, why do you find live chats useful? If you don't participate in live Twitter chats, why not? (RQ3)

Who are some of the educational leaders that you follow on Twitter for professional development? Why do you find these particular leaders useful? (RQ3)

Appendix B

Letter of Invitation

Research Participation Request

STUDY: An investigation of how Twitter enhances professional development for educators.

As an educator and Twitter user with many followers, it would be greatly appreciated if you could participate in my Masters of Education thesis requirement by tweeting a request from myself to take part in an online survey.

I am researching how Twitter is used for professional development by educators. This involves participants to fill out a Google form online survey which would take approximately six to eight minutes to complete. The tweet itself will be the following:

If you are interested in Twitter and professional development for educators, please consider completing this survey. Thank you. *LINK HERE*.

If possible, I would like the tweet to be sent out three times (every second day) over a six day period, at different times of the day. This way, there is potential for a large number of respondents. Participants need to be at least 18 years of age and preferably be in the education field.

It is hoped that the results from the survey will help at developing better practices when using Twitter for professional development. The results of the information will be shared with educators. Your assistance in this research would be greatly appreciated!

If you would like more information, please email me or direct message me through Twitter.

This research has been approved by the Research Ethics and Compliance Office at the University of Manitoba (ENREB). If you have any questions about this project you may contact me or the Human Ethics Coordinator.

Thank you for your consideration.

Paul Doyle
Winnipeg, MB

Appendix C

Letter of Informed Consent

Twitter and Professional Development for Teachers

Researcher contact information:

Paul Doyle,
Student, Master of Education, Graduate Studies
University of Manitoba,
Winnipeg, MB
R3T 2N2

Research Supervisor:

Dr. Richard Hechter,
Faculty of Education,
University of Manitoba,
Winnipeg, MB
R3T 2N2

This consent form will give you the information of what this research entails and what your participation will be. If you would like more detail about the survey mentioned here, you should feel free to ask. Please take the time to read this carefully and to understand any accompanying information.

Purpose of the Study

Paul Doyle is conducting this study as part of his Masters of Education Thesis requirement, under the supervision of Dr. Richard Hechter from the University of Manitoba. Digital technologies and social media have changed the way educators and students learn and share material. There is a new paradigm for learning and professional development. The purpose of this study is to explore and see who and how Twitter use promotes and enhances professional development for teachers and educators. Through the exploration of Twitter demographics and practices, it is hoped to find more effective strategies for professional development for educators while using this new social media.

Description of the Research

An online survey design consisting of closed and open-ended questions will be applied. You will answer an online survey using Google Forms. This will include short answer questions about demographics, interests, use of Twitter, and experience in teaching. The second part is a short online interview where answers are open-ended and entered in paragraph boxes. You will be asked to describe your experiences and practices with Twitter and if, why, and how it helped you become a better teacher in the classroom and with your professional development. This study will focus on those already using Twitter for educational use and professional development. This will provide insight on how Twitter can be infused in professional learning networks and in day-

to-day experiences for the teacher. The purpose is not to get more teachers signed up for Twitter but to concentrate on the practices of current users. This is important research as there is currently great debate as to whether social media is helping or distracting teachers and students with their learning. Also, there is limited research done in the area of Twitter use and professional development for teachers.

The survey will be anonymous. You must be of 18 years of age or older and it is preferable that you are an educator in some capacity to participate. The survey should take between six and eight minutes to complete. The survey is intended to be completed only once by the participant.

Procedures

If you volunteer to participate in this study, you will be asked to do the following:

1. Answer an online survey using Google Forms. You do not need a Google account to complete the survey.
2. You will answer general demographic questions.
3. You will be asked about your attitude, feelings, and daily activities using Twitter and its use for professional development.
4. You will be asked before you start the survey that you are at least 18 years of age and by giving your consent to participate (by clicking on “Yes”) you are certifying that you are 18 years of age or older.

Potential Risks

There are no known risks or discomfort in taking part in this survey. If you are uncomfortable in answering any question, you may also stop your participation at any time.

Benefits

Results of the study will be shared to other educators. Benefits include new learning strategies and more effective professional development based on the findings. Benefits may also include increasing your professional learning network of Twitter followers and those following you. Self-reflection on your Twitter methods may improve your teaching in the classroom and professional development.

Confidentiality

Your responses to the survey will be anonymous, however, the research findings will be shared with other educators, either face-to-face or online. I will not know your IP address when you respond to the survey. At no time will your name, even if given, be used in any part of the research. You do not need to give your name or Twitter username in the survey. Your information will be kept in a password-protected Google Drive folder.

After one year, the survey form data will be destroyed. The information will be used solely for the educational purposes of this research study. If you would like the results of the survey, please email me at or contact me through Twitter.

Feedback

Feedback from you is encouraged. Any comments, questions, or suggestions will be kept in strict confidence with the researcher. The summary of the results will be available from the researcher. The researcher will tweet the results and will be available from the researcher's Twitter account. The results of the survey should be available by the summer of 2015.

The information from this study will be shared with other educators at teacher conferences, such as Manitoba's SAGE Conference. Summarized data will be available online, linked through my tweets. The intent is to provide insights into who and how Twitter is used for professional development for teachers. This will enhance on-going practices for professional development for educators. No names, even if given, will be used when sharing this information.

The results will also be publicly available through the publication of the researcher's Master's thesis on Twitter and professional development. This will be available in 2015.

Remuneration

There is no remuneration for this study. There are no costs involved in taking this study.

Voluntary Participation

Participation is voluntary. If at any time you want to withdraw from the survey, you need not contact the researcher. No reason is necessary.

Contact Information

If you have concerns or questions about this study, please contact Paul Doyle.

Clicking "Yes" on this form indicates that you have understood to your satisfaction the information regarding participation in the research project and agree to participate as a subject. In no way does this waive your legal rights nor release the researcher, sponsors, or involved institutions from their legal and professional responsibilities. You are free to withdraw from the study at any time without prejudice or consequence. Your continued participation should be as informed as your initial consent, so you should feel free to ask for clarification or new information throughout your participation. Your completion of this survey will imply your consent to participate.

This research has been approved by the Research Ethics and Compliance Office at the University of Manitoba (ENREB). If you have any concerns or complaints about this project you may contact any of the above-named persons or the Human Ethics Coordinator at the University of Manitoba. This consent form may be downloaded for your reference.

Appendix D

Consent Form

Participation is voluntary. Clicking “Yes” at the bottom of this form indicates that you have understood to your satisfaction the information regarding participation in the research project and agree to participate as a subject. In no way does this waive your legal rights nor release the researcher, sponsors, or involved institutions from their legal and professional responsibilities. You are free to withdraw from the study at any time, and/or refrain from answering any questions you prefer to omit, without prejudice or consequence. Your continued participation should be as informed as your initial consent, so you should feel free to ask for clarification or new information throughout your participation.

Appendix E

Additional Twitter Terms and Definitions

To better understand the terminology of Twitter and the analysis of the data, below is a more comprehensive list of Twitter concepts.

Activity: This is in the Connect tab and it gives a real-time view of what the people you are following are doing on Twitter.

Bio: A personal description of less than 160 characters.

Block: This means to block someone that tries to follow you on Twitter.

Connect: This tab lets you view interactions, mentions, recent follows and retweets. This is useful to see how active your account is with others on Twitter.

Deactivation: This is a way to remove your Twitter account, however, keep in mind that it won't delete any tweets you previously sent out!

Discover: This tab shows top tweets, who to follow, browse categories, and find friends. This helps in expanding and finding new people to follow.

Email Notifications: You can set up your account so that you are emailed when you get a new follower or a direct message.

Following and Followers: These give you the number for the quantity of people you are following and the number of followers you have.

Impersonation: This is when somebody pretends to be another person. Be very careful of this as many famous people don't have their real names as their username. A check in a blue circle to the right of the username will verify if the person is actually the person they claim to be.

Interactions: This is a timeline in the Connect tab which shows all the ways other users have interacted with your account. This includes retweets, adding to lists, mentions, and favourites.

Lists: A filtered and organized group of Twitter users. It is used to group people to specific areas, such as Manitoba-Educators.

Profile Picture: An image that can be uploaded to represent the person.

Appendix F

TCPS 2 Certificate of Completion



Appendix G



Human Ethics
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APPROVAL CERTIFICATE

August 13, 2014

TO: Paul Doyle (Advisor R. Hechter)
Principal Investigator

FROM: Lorna Guse, Chair
Education/Nursing Research Ethics Board (ENREB)

Re: Protocol #E2014:096
"Twitter and Professional Development for Teachers"

Please be advised that your above-referenced protocol has received human ethics approval by the **Education/Nursing Research Ethics Board**, which is organized and operates according to the Tri-Council Policy Statement (2). **This approval is valid for one year only.**

Any significant changes of the protocol and/or informed consent form should be reported to the Human Ethics Secretariat in advance of implementation of such changes.

Please note:

- If you have funds pending human ethics approval, please mail/e-mail/fax a copy of this Approval (identifying the related UM Project Number) to the Research Grants Officer in ORS in order to initiate fund setup. (How to find your UM Project Number: <http://umanitoba.ca/research/ors/mrt-faq.html#pr0>)
- if you have received multi-year funding for this research, responsibility lies with you to apply for and obtain Renewal Approval at the expiry of the initial one-year approval; otherwise the account will be locked.

The Research Quality Management Office may request to review research documentation from this project to demonstrate compliance with this approved protocol and the University of Manitoba *Ethics of Research Involving Humans*.

The Research Ethics Board requests a final report for your study (available at: http://umanitoba.ca/research/orec/ethics/human_ethics_REB_forms_guidelines.html) in order to be in compliance with Tri-Council Guidelines.

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