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Education All A'Twitter: Twitter's Role in Educational Technology

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EDUCATION ALL A'TWITTER:
TWITTER'S ROLE IN EDUCATIONAL TECHNOLOGY

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APPROVAL OF DISSERTATION

I hereby affirm that the following project meets the high academic standards for original scholarship and creative work established by my discipline, college, and the Graduate College of Marshall University. With my signature, I approve the manuscript for publication.

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DEDICATION

At 24 years old, I taught my first college class at West Virginia State Community and Technical College (WVSCTC). Over the next nine years, the name of the college changed from WVSCTC to Kanawha Valley Community and Technical College to BridgeValley Community and Technical College. Hundreds of students flowed in and out of my classes, and with every course taught, I learned from them as well. This dissertation is dedicated to my former students and to Antonia Hall Vaughn—without you all, I would never have opened Twitter to see if it could connect us to D/deaf culture. And without that experience, this dissertation would never have been written.

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"The light at the end of the tunnel is not a train!" I chuckle as I recall all the times I said, or posted, that very phrase as I have worked through this doctoral journey. Now, as I enter the final keystrokes to the dissertation, I am reminded of all those who have walked, hand in hand, with me along the way.

Choosing a doctoral chair was not an easy process for me. Without knowing what I wanted to do with my doctorate, other than getting it, I kept finding closed doors when attempting to establish my chair. Dr. Teresa Eagle, knowing me since birth, suggested I meet with Dr. Lisa Heaton during a fall seminar. I figured I would meet with her, but then, as had happened before, I would be told that she was full and would not be able to take on any more students at that time. What I had thought to be a short conversation turned into most of the afternoon, and by the end of our conversation, Dr. Heaton agreed to be my chair. Over the semesters, she believed in me, kept faith in me, pushed me, listened to me, guided me, and became the perfect fit to my doctoral journey. Words will never adequately express my gratitude and thankfulness I had for her guidance and listening ear. She saw me at my worst and at my best, and yet, never doubted by ability to finish. For that, I am forever thankful.

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Thank you to my parents for instilling in me the love of learning, a strong work ethic, and determination. Without those three attributes, I would have never reached this point. Gee—my partner, you being proud of me is the greatest gift. I love you. Sean, thank you for understanding how important this degree is to me. I could promise that we will eat less takeout now that this is done, but we both know that is not true. Allison, Morgan, and Michael—never give up on your dreams. Even if your dreams change, they are always worth fighting for. You three are the light of my world—I love you to the moon and back!

One of my friends sent me this thought: "When writing the story of your life, don't let anyone else hold the pen." That is the greatest lesson learned on this journey. As this part of my

journey reaches its end, another one is bound to begin. I am ready to hold the pen, forge my way, and see what happens.

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ABSTRACT

The purpose of this mixed methods study was to examine whether current uses of Twitter by educators correlate with the literature on the uses and advantages of using Twitter in education through an examination of United States educators and West Virginia educators. Data was obtained from responses to the online survey, Education All A'Twitter: Twitter's Role in Educational Technology, content analysis of public Twitter feeds, and semi-structured interviews that were sorted, coded, organized, and analyzed to identify emergent themes. The study had a population that included 97 survey responses, 78 Twitter feeds, and 8 semi-structured interviews. There were survey respondents from West Virginia and 26 other states in the United States, as well as international respondents. The study determined to what extent West Virginia and United States educators used Twitter for instructional strategies, professional development, and personal learning networks, as well as identified barriers and challenges educators face when attempting to employ the use of Twitter educationally. In addition, there were four ancillary findings that emerged through the study. As triangulation of the data supported the current literature, this study has several implications for current educators, policymakers, and researchers.

CHAPTER 1: INTRODUCTION

Teachers can no longer be concerned only with what occurs within the four walls of the classroom. From kindergarten on, there is an element of global consciousness that must be taught and learned in order to be successful in our technology-driven, global society (Partnership for 21st Century Skills, n.d.). The National Education Association (n.d.) in *Preparing 21st Century Students for a Global Society: An Educator's Guide to the "Four Cs"* established "The 4 C's: Critical Thinking and Problem Solving, Communication, Collaboration, and Creativity and Innovation," to clearly define the skills needed for 21st Century learning. In published educator guides by both the National Education Association and the Partnership for 21st Century Skills, technology has been embedded as an essential tool to accomplish the teaching and learning of each skill. Socioeconomic demands (Blankenship, 2011), social constraints (Hodges, 2010), and technophobia (Dixon, 2012), however, often hinder attempts to immerse our students in the technological world around them, even when there are free technological tools available for use.

Since its launch in 2006, Twitter continues to grow as one of the most used social-networking platforms; as of 2016, it is the world's largest microblogging platform. Limited to 140 characters per message (known as a Tweet), Twitter allows for concise interaction among users, no matter the geographical location or social status. Businesses and celebrities use Twitter to interact with consumers, promote products, and advertise with great success. But what does all of this mean, if anything, for education?

Background

Technology in Our Schools

We expect our educational system to be multi-faceted: "Schools are expected not only to conserve our values and standards but to be dynamic, reflecting the fact that the world around us is constantly changing" (Bowers, 1990, p. 1). As the world around us continues to change in the field of technology, "public schools must develop a built-in mechanism for incorporating such rapid and far-reaching changes into the curriculum and into the instructional technology which imparts that curriculum" (Bowers, 1990, p. 1). Educational change occurs to help schools, teachers, and students to accomplish their goals and objectives more readily (Fullan, 1982), and we see change often occur in the field of educational technology.

Technology is any element that makes a task easier for users. In his book, *The Shallows: What the Internet Is Doing to Our Brains*, Nicholas Carr (2011) looked at different technologies throughout history to see whether people's behavior changed in response to the technology. He found that it had. For example, Friedrich Nietzsche, a 19th century German philosopher, had physical ailments that forced him to give up his pen-and-paper writings. Falling into depression, he ordered a typewriter, a new technological advancement in his time. He resumed his writing, but, as his audience discovered, his writing began to change. His "prose became…tighter, more telegraphic" (p. 18). When questioned, Nietzsche replied, "Our writing equipment takes part in the forming of our thoughts" (p. 19). Even the ideas of the alphabet, reading, and writing, are technologies. Before the invention of written alphabets, we were oral societies. Carr (2011) explained that "knowledge is what you can recall, and what you recall is limited to what you can hold in your mind" (p. 56). With the invention of alphabets, and subsequently reading and writing, we no longer had to train our brains and commit all to memory; we could write down

what we wanted or needed to remember and we no longer had to tax our brains for all vital information. However, Carr continued, we must be cautious because "once technologized, the word cannot be de-technologized" (p. 77). As new technologies appear, our brains will continue to route and re-route new pathways to conform to new technologies (Carr, 2011). We adopt new technologies because they are new, and we strive to make our lives easier. What we do not realize, however, is that we cannot return to former ways of doing things as a society and we must remain vigilant as to whether or not our adoption of these new technologies helps us or hinders us.

It is now commonplace to go into any school and see various forms of technology. What we do not do, however, is question how those pieces of equipment got there. California State University at Long Beach (n.d.) summarized how technology began to be integrated into the American school system. Digital technologies in our schools began to be integrated in 1958 when the National Defense Education Act introduced new items of technology into vocational education schools during the Cold War. In 1965, the Elementary and Secondary Education Act (ESEA) brought technology into all schools, although most were used for administrative purposes. This trend continued until 1981 when the first educational drill software programs were developed for personal computer use. By 1986, schools were buying computers for use on all levels; by 1994, one computer per classroom became the norm. By 1997, computers, and eventually the Internet, were integrated within teacher lesson plans. Since that time, we have seen the continual abundance of technology within our school systems.

In the pedagogical move to make classrooms more learner-centered, rather than content-centered, technology was often touted as a key element in that process (Brown, D., 2003). The elements of a learner-centered classroom—such as using differentiated instruction (Brown, K.,

2003) and experience-based education, focusing on each learner's unique characteristics, involving the emotions, and creating an environment free from fear (Henson, 2003)—were not directly hinged on the use of technology within the classroom; however, using technology to achieve the ideal learner-centered environment was an accepted, encouraged, or even mandated practice. The question then remains, what technology do we use?

Twitter

Teachers and professors regularly look for free software that can help them connect their students to the world outside of the classroom. Twitter, for some, has been the platform through which this can occur. As Evans (2010) stated, "because of its highly fluid and distributed nature, the short posts that define Twitter are actually interlinked conversations" (p. 148). Twitter, a microblogging application, sends "tweets"—messages no more than 140 characters long—virtually around the globe (Twitter, 2014a). Twitter defines a tweet as "an expression of a moment or idea" (Twitter, 2014b, ¶1) of either professional or personal content with text, links, and pictures (see Figure 1). Tweets are automatically published to a timeline of all tweets called a "Twitter-feed." Tweets also appear on any feed that is "following" a particular user. In addition, a user can use the "@" symbol plus username, the name each Twitter user has selected for his account, for a tweet to appear on another person's feed, whether the recipient is a follower of the author or not. For example, to send a direct tweet to Scholastic, the tweet must contain @Scholastic within the 140 characters. In order to have conversations, or chats, a hashtag, (i.e. #education), is used so that someone can follow the thread. For example, a search for #education will bring up all the recent tweets that have mentioned #education. (For more specific instances of Twitter jargon, please see Appendix A.)

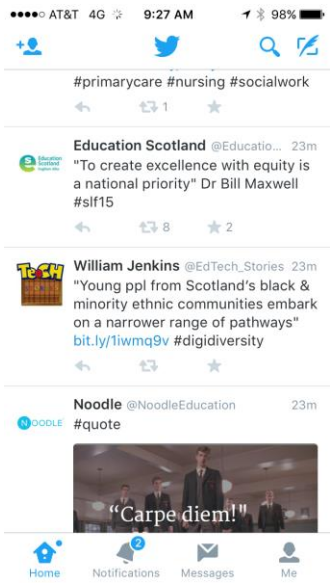


Figure 1: Twitter feed sample.

Users can also interact with tweets on Twitter. When a user finds a tweet of interest, there are four options available to interact with the tweet. First, the user can reply to the tweet. By clicking the arrow, the user will respond directly to the author of the tweet. Second, the user can retweet the tweet. By clicking the two arrows shaped like a square, the user automatically sends that tweet to everyone on her feed. Retweeting enables a tweet to reach more feeds than the original tweet alone. Any retweeted tweet can reach thousands of users that may not be followers of the original tweet (Kwak, Lee, Park, & Moon, 2010). Third, the user can quote the tweet. By holding the retweet button, an option appears to quote the tweet. Here, the user will see the exact tweet within her application and then can add to the original tweet. Finally, the user can designate the tweet as a favorite. When clicking the star, the tweet will show up in a user's favorites list (Twitter, 2014b).

Since Twitter's public launch on April 19, 2007, the program has grown tremendously (Saeed & Sinnappan, 2011; Twitter, 2014a). At the time of this writing (2015) there were over 271 million active monthly Twitter users with over 500 million tweets sent daily (Twitter,

2014a). Twitter has become the fastest-growing social networking platform (Mansfield, 2009) on a global scale, with 77% of Twitter accounts being outside of the United States (Twitter, 2014a). Twitter allows users to use other social networks, live searching, and link-sharing to immerse themselves in the interactive Web 2.0 interface (Johnson, S., 2009).

Twitter's Niche in Education. This dissertation's review of literature (see Chapter 2), identified three main areas in which educators have used Twitter for educational purposes: instructional strategies, professional development, and personal learning networks.

Twitter has a variety of options when using the platform for instructional strategies. Professional and scholarly articles regularly identify and explain specific instances of Twitter use in the classroom, but one emerging theme is clear: instructors who use Twitter find that the platform's benefits go beyond their expectations. The benefits include connecting online and on-campus students (Billiot, 2011), sharing ideas after the class is dismissed (Miners, 2009), simplifying course management (Cochrane, 2010; Silver, 2011), increasing teacher-student interaction (Ezarik, 2009), receiving donated equipment (Davis, M., 2010), and service-learning projects (Crews & Stitt-Gohdes, 2012). Overall, Cox (2010) wrote, "Twitter creates the opportunity to expand what we mean by educational conversation in our school libraries and classrooms" (p. 52). It allows the educator to truly engage in the active listening process by monitoring and detecting, routing and responding, and then reviewing and tracking the students', parents', and community's responses, questions, and sentiments about the school (Evans, 2010).

Demski (2010) listed worthwhile professional development as one of the strengths of Twitter's use educationally. Although teaching may conjure the idea of one adult in a room with children, teachers are urged to collaborate with other teaching professionals in order to refine skills, gather new ideas, and generate more knowledge (National Education Association, n.d.).

Carpenter and Krutka (February 2014) explained that one way Twitter has encouraged this type of collaboration is through chats. Chats occur on Twitter in real-time, although by using the hashtag to search, anyone can view the timelines of the chats at any point in time. Different states, levels, and subject areas have their own #edchats, a specific day and time in which educators across the globe meet and discuss ideas, issues, and solutions for what they are facing in education (Davis, M., 2010).

There are over 150 educationally-oriented chats in multiple categories; general education, content area, grade level, state, job type/role, topical, and organization-sponsored are just a few examples (Carpenter & Krutka, February 2014). Participation in the various EdChats is one way educators are creating their own professional development.

Educators have the option to take this collaboration further in the creation of personal learning networks. A review of literature reveals that there is no single, best way to create a personal learning network; all personal learning networks center on the idea of collaboration. Marin, Negre, and Perez (2014) has defined collaboration as a "learning strategy based on working in heterogeneous groups of people with similar knowledge levels to achieve communal goals and carry out tasks together, with there being a positive interdependence between them" (p. 36). To begin collaborating on Twitter, a user can respond to educational leaders, build partner networks, and begin conversations (Dixon, 2012).

Problem Statement

Currently, there is no research specific to the use of Twitter by West Virginia educators. The researcher has hypothesized that there is a possible disconnect between the research in using Twitter in education and the practice of West Virginia educators for two main reasons. First, some forms of social media are blocked on the West Virginia Department of Education's server,

including Facebook, YouTube, and Pinterest. Twitter has been blocked in the past, but is currently allowed on the state server. Second, although policies encourage the use of technology, and even social media, to promote 21st century learning, there is not support in the reviewed acceptable use policies to do so (see Chapter 2). Since the literature suggests that the use of Twitter has merit in education, to what extent are United States educators and West Virginia educators using Twitter for educational purposes in networking, professional development, and instructional strategies?

Purpose of the Study

The purpose of this study is to examine whether current uses of Twitter by educators correlate with the literature on the uses and advantages of using Twitter in education through an examination of United States educators and West Virginia educators.

Research Questions

To determine the extent United States and West Virginia educators are using Twitter for educational purposes, the following four research questions guided the study:

1. To what extent are US and WV educators using Twitter to employ instructional strategies?
2. To what extent are US and WV educators using Twitter to facilitate their own professional development?
3. To what extent are US and WV educators using Twitter to create their own personal learning networks?
4. What are the barriers and challenges facing US and WV educators when attempting to employ the use of Twitter professionally?

Nature of the Study

This study incorporated a mixed-methods approach that gave a deeper insight into the research questions. A pre-collection survey to obtain permission through informed consent had three questions for participants to answer regarding their perceptions of their Twitter use in education. Then, this study used content analysis facilitated by an organizational chart (see Appendix B) to categorize the nature of the tweets sent by the chosen educators. Finally, there were follow-up interviews (through FaceTime or telephone) to delve more deeply into the "how" and "why" derived from the quantitative data. Numbers and words worked together to provide a more complete picture of the research study and the results. In addition, use of multiple methods opened more paths of research that might not have been considered in using only a qualitative or quantitative approach.

Operational Definitions

For the purpose of this study, the following words and phrases are used in the following manner:

- To what extent: Based on a pre-collection survey, organizational chart (see Appendix B), and semi-structured interviews, an educator's tweets will be categorized to see the percentage of use that is dedicated to instructional strategies, professional development, and personal learning networks.
- US educators: Self-identified educators from across the United States, excluding West Virginia, who are established Twitter users and self-selected for this study.
- WV educators: Self-identified educators from West Virginia who are established Twitter users and self-selected for this study.

- Instructional strategies: Any tweet sent from an educator's account that can be directly identified as used with students for instructional purposes, based on triangulation of the self-reported survey, content analysis, and semi-structured interviews.
- Professional development: Any tweet sent from the educator's account that can be directly identified as participation in virtual professional development (i.e., specific #edchat hashtags, specific conference hashtags, question/answer designations), based on triangulation of the self-reported survey, content analysis, and semi-structured interviews.
- Personal learning networks: Any tweet sent from the educator's account that can be directly identified as communication with other professionals outside of a professional development session, based on triangulation of the self-reported survey, content analysis, and semi-structured interviews.
- Barriers and challenges: Perceptions as to why educators are not using Twitter, based on the responses received from the semi-structured interviews.

Study Assumptions

The main assumption of this study was that technology within the classroom is a valuable practice. While there is no definitive, existing evidence of the profitable nature of using technology in the classroom, it is an accepted practice, nonetheless. Since the practice of using technology is accepted or even mandated, technological tools that have purposeful application should be reviewed for their uses and applicability.

Significance of the Study

This study is useful for a variety of audiences. First, study results may be used by teachers as an example of best practice to foster relationships with students and other teachers; collaborate and communicate with students, parents, and other professionals; design their own

professional development; and network with other professionals and professional organizations. County and state boards of education could use the findings to create policies that support proper and effective implementation of Twitter, to offer professional development to use the tool within the classroom, and ensure that the firewalls and bandwidth allow use of the Twitter platform. Technology coordinators on the county, state, and Regional Education Service Agency (RESA) levels as well as the West Virginia Center for Professional Development could use the information presented to offer training and support (e.g., hardware, software, troubleshooting, best practices) to those using and wanting to use the Twitter platform.

Additionally, educational organizations may gain insight on how best to connect with potential teachers as well as network with current teachers. The state legislature could use this study to add to its knowledge base when creating laws and policies concerning education and the use of technology and social media in education. The U.S. Department of Education could potentially use this study as a reason to continue using Twitter to communicate and network directly with students and teachers. Professors of higher education and educational technology could use this study to learn current uses of Twitter in the field, expose current and future teachers to uses within the classroom, explain how use fits into current pedagogical frameworks, and explore benefits that classroom teachers may encounter. Finally, future doctoral students and researchers interested in the use of Twitter could use this study as an example of research in paving the way for Twitter as an accepted educational technology.

CHAPTER TWO: REVIEW OF LITERATURE

Focusing on Twitter's niche in education required the researcher to examine a broader view of technology in the schools, as well as Twitter's use among accountholders, so that a focus on education is understood within context. This review of literature considered technology in schools, social media's integration in education, social media in West Virginia public schools, as well as challenges and concerns of using social media in the classroom, Twitter as a technological platform, and personal and professional ways Twitter can be used. In reviewing the professional uses of Twitter, this chapter examined instructional strategies, professional development, and personal learning networks.

A review of dissertations in ProQuest discovered only three with a focus on Twitter in education: Kerry Davis's (2012) *Learning in 140 Characters: Teachers' Perceptions of Twitter for Professional Development*, W.H. Deyamport's (2013) *An Implementation of a Twitter-Supported Personal Learning Network to Individualize Professional Development*, and Orit Hirsh's (2012) *The Relationship of Twitter Use to Students' Engagement and Academic Performance in Online Classes at an Urban Community College*. These dissertation studies have been assimilated within the literature review based on the focus of each study.

Technology in Schools

Although use of educational technology is an accepted, encouraged, and mandated practice, the question must be asked: does technology improve student achievement? Larry Cuban (2015), a professor of education at Stanford University, declared that "the fact is that no substantial basis in research findings or existing data on the academic effectiveness of classroom technology warrant the boom-town spread of classroom devices" (¶1). Considering the contemporary state of classroom technology, this assertion is a strong statement against the

current trend. His proof for this assumption is that test scores have shown little to no improvement when using new hardware or software. Cuban speculated that this result could reflect how teachers use these devices and programs. The use ranges from creative to unimaginative and from daily use to almost-never use. In addition, many forms of technology found in classrooms are still used for teacher-dominated rather than learner-centered approaches to learning. Finally, within the argument that technology use in the classroom prepares the future workforce, software that students learned to use in 1985 was obsolete five years later; that trend continues to repeat itself.

A study by Ravitz, Mergendoller, and Rush in 2002 is used as evidence for Cuban's (2015) claims. This study explored whether there was a positive or negative relationship between student computer use and achievement, and whether results varied by the amount of school and/or home computer use. There were 31,000 students studied across 300 schools in which their levels of achievement were ascertained from the Iowa Test of Basic Skills and the Test of Academic Proficiency. Eighth and eleventh graders also completed a self-reporting instrument describing their competency with educational computer use. The researchers found a "negative relationship between use of computers by students at school and school wide achievement" (p. 3). Furthermore, "patterns of school achievement are positively related to home computer use and family income and inversely related to school computer use" (p. 3). The researchers found that students who performed better on the standardized achievement tests were those students who used computers more often at home, rather than at school. Finally, using the self-reporting instrument and correlated achievement data, Ravitz et al. concluded that "students who have higher software capability not only score higher on tests, but they also gained more, on average, from 1999 to 2000" (p. 7).

There is no evidence that suggests educational technology is beneficial as a curriculum; educational technology is a tool. For technology to be valuable to our schools, teachers, and students, technology must be "perfectly suited to the task" (Pinker, 2015, ¶11). When examining chosen technology tools, some educators have found merit in social media, specifically Twitter, to reach their millennial learners (Bahner et al., 2012).

Social Media

Social media within education finds itself following the history of technology-based education. Williams and Goldberg (2005) in "The Evolution of E-Learning" and Hiltz and Turoff (2005) in "Education Goes Digital: The Evolution of Online Learning and the Revolution in Higher Education" succinctly explained the transformation e-learning has undergone through the past several decades. The authors explained that when technology was first used to facilitate online learning, courses were self-taught by the use of a CD-ROM or a specific set of floppy disks. No Internet was needed for these courses; assignments were often mailed to an instructor. From there, distance learning and web-based training surfaced. In distance learning, the educator would be at one geographical location while the student(s) were in another. Although real-time instructing was scheduled, technical issues and limited interaction were downfalls of this method. Web-based training, which could be facilitated through the Internet, became more common than distance learning. It allowed the student to complete the course from anywhere, but self-motivation was required in order to successfully complete the course because there could be little to no interaction with the professor. Online courses have continued to be used, and in the last few years, social media has been introduced in conjunction with the web-based course. Students are no longer simply consumers within their online coursework; now they have also become publishers of their own input and information. Shim, Dekleva, Guo, and Mittleman

(2011) explained in their article "Twitter, Google, iPhone/iPad, and Facebook (TGIF) and Smart Technology Environments: How Well Do Educators Communicate with Students via TGIF?" that when social media is used within courses, students and educators can actively contribute throughout the course so that the information presented can meet the needs of individual students.

Social media can be defined as "an Internet-based tool for sharing and discussing information among users" (Schachter, 2011, p. 28). Different forms of social media include wikis (e.g. Wikipedia), blogs (e.g. Blogger), video (e.g. YouTube, Vine), pictures (e.g. Instagram, Flikr), ratings (e.g. Polls Everywhere), Internet forms (e.g. Topix), podcasts (e.g. iTunesU), social bookmarking (e.g. Delicious, Pinterest), microblogging (e.g. Twitter), and networking (e.g. Facebook, LinkedIn). Many forms of social media are free, or can operate on a free version, and have mobile applications in addition to desktop websites. Children, teens, and young adults flock to forms of social media and social networking because they provide new ways to present, learn, construct relationships, and manage privacy (Huffman, 2013).

Uses of social media in education, however, must be evaluated. Social media tools "can be both powerful allies and enemies in educating youth" (Huffman, 2013, p. 154). In his article "Asking the Right Questions: What Does Research Tell Us About Technology and Higher Learning?," Ehrmann (1995) found four areas of technology within the classroom, and in essence social media, that must be analyzed so that valuable instruction with technology can occur.

First, "if you are headed in the wrong direction, technology won't help you get to the right place" (Ehrmann, 1995, ¶10). If teachers are not teaching the right material for the objectives of the course and are not grading appropriately for the goals of the course, throwing

different forms of technology into teaching will not change the direction in which the teachers are heading. Neither should teachers expect that technology alone could change the direction of their courses. Technology is a tool that may be used to enhance the current teaching and learning occurring in the classroom. Technology will not change what is being taught or the concepts the students are learning.

Second, as Marshall McLuhan has often declared, "the medium isn't the message" (Ehrmann, 1995, ¶10). There are many different tools that can be used to teach content. Many factors contribute to why a teacher chooses one tool over another, including comfort with certain types of technology, accessibility, time, and students' familiarity with the tool. Ehrmann used the following analogy: "There are several tools that can be used to turn a screw, but most tools can't do it, and some that can are better for the job than others" (¶28). Choosing technology for technology's sake will not enhance teaching within a classroom. Often, Ehrmann continued, technology is used, but it is "single pieces of software for only a few hours" (¶44), meaning one or two days out of a semester the students will use a specific program, but when the program is shut off, so is the students' use and application of the tool.

Third, there is a misconception that "software that isn't designed for instruction can't be good for learning" (Ehrmann, 1995, ¶42). Technology does not have to be designed for education to have educational value. At the writing of Ehrmann's article, the term "wordware" was used to describe any type of software (such as word processing, email, and the Internet) that was not initially designed for education but had educational value. Although social media did not exist at the time, different forms of social media could also be added to the list of applicable software.

Finally, Ehrmann (1995) stated that the strategies used by teachers are what matter most. Ehrmann explained that technology must be used in conjunction with, and as a complement to, effective teaching in order to create a positive effect. The American Federation of Teachers (2012a) explained that when used effectively, social media allows relationships and communication to grow within the school by fostering greater connections between teachers, students, and communities. When this usage occurs, they argue, "schools with high levels of collaboration and strong professional communities have higher student achievement" (p. 4).

Overall, the educator has to determine why she wants to use social media and then choose a platform that best suits her needs and the needs of her students. In addition, teachers must be cognizant that "there is nothing innate about knowing how to apply those acquired skills to the processes of civil society, scientific or scholarly innovation, or economic production" (Rheingold, 2008, p. 2). Teachers must first teach students how to use the tools appropriately, as well as model the correct behavior (Abe & Jordan, 2013; Dunlap & Lowenthal, 2009b). Social media is not a single faceted program that should be used haphazardly because "social media continue[s] therefore to ask us to engage with a new research agenda, to continue to work creatively with new pedagogies appropriate to these novel digital spaces, and to engage with some far-reaching challenges relating to the literacies and assessment practices we bring to bear when we take education online" (Hemmi, Bayne, & Land, 2009, ¶73). Social media must be explicitly taught and explicitly used for a specific purpose.

Dr. Brian Dixon, author of *Social Media for School Leaders* (2012) explained that social media, when used appropriately, can engage families, increase student enrollment, create a collaborative school culture, and facilitate community support through awareness, feedback, collaboration, and advocacy. Schools achieve awareness through posting updates, sharing links,

displaying quotes, and retweeting other tweets. Feedback occurs when posting @replies, sending direct messages, asking questions, and providing links to surveys. Schools collaborate when they build networks, engage mentors, and converse with hashtags. Advocacy is displayed through retweeting, distributing content, and engaging followers (Dixon, 2012). When schools are seen on the Internet through self-publishing platforms, the credibility of the schools is increased (Dixon, 2012) by the transparency the platforms create.

Social Media in West Virginia Public Schools

Despite the literature that supports the use of social media in education, there is a disconnect between research and policy in the West Virginia public school system. In West Virginia public schools, policies and procedures concerning social media are first created by the West Virginia State Board of Education. Pinterest and Facebook are currently blocked by the West Virginia State Board of Education's server; YouTube is permitted only through a login given by the state board of education (called WebTop); and Twitter, although currently unblocked, has been blocked in the past (B. McCoy and J. Ratliff, personal communication, January 9, 2015). Each county in West Virginia must abide by the West Virginia State Board of Education's (2012) State Policy 2460, "Educational Purpose and Acceptable Use of Electronic Resources, Technologies, and the Internet," but the counties have the option of creating their own acceptable use policies (AUP). These county AUPs can impose greater restrictions on Internet use, but cannot lessen those expressed in Policy 2460.

Policy 2460 (West Virginia State Board of Education, 2012) has expressed support in the use of technology in education, not only in classroom use, but for professional development as well. The following quote from the policy provides an accurate representation of the West Virginia State Board of Education's position on educational technology:

3.2 Students of all ages and educators as lifelong learners require the necessary skills and access to technology tools to take responsibility for their own learning, to be actively involved in critical thinking and problem solving, to collaborate, cooperate, and to be productive citizens. West Virginia students must develop proficiency in 21st century content, technology tools, and learning skills to succeed and prosper in life, in school, and on the job.

3.3 Technology must be interwoven with educational improvement and personalized learning to accomplish educational goals, increase student achievement and educator efficacy, and provide increased opportunities for lifelong learning.

3.8 Teachers should integrate technology resources to personalize learning, enhance instruction, implement multiple technology-based learning strategies, implement high quality digital content and assessment, and utilize digital resources, technologies, and the Internet in the classroom.

3.9 Technology will enable educators to participate in online professional development, access digital resources and platforms, utilize educational data, and deliver instruction through blended learning and other virtual options. The acceptable use policy of digital resources and devices is necessary to support a personalized learning landscape and other district and state educational policies. (West Virginia State Board of Education, Policy 2460, 2012)

In addition to recognizing the value of the Internet within the classroom, Policy 2460 (West Virginia State Board of Education, Policy 2460, 2012) also recognized the need for professional development focused on educational technologies as stated in 5.3.e: “Administrators

and teachers will be provided professional development in the use and application of electronic sources, technologies, and the Internet."

Although it is noted within the policy (West Virginia State Board of Education, Policy 2460, 2012) that school personnel must maintain a professional relationship with students at all times, school personnel have been encouraged to use social media and other forms of electronic communication:

> 5.8.a Collaboration, resource sharing, and student/teacher, student/student, and teacher/parent dialogue can all be facilitated by the use of social media and other electronic communication. Such interactivity outside of the school walls can greatly enhance face-to-face classes. However, it is imperative that a clear line be drawn between personal social networking and professional/educational networking to protect the safety of the students and the integrity of educational professionals and service staff. (West Virginia State Board of Education, Policy 2460, 2012)

However, under "Unacceptable Use," section 6.3.e.17 declared that unacceptable use includes "downloading, installing, and/or executing non-educational gaming, audio files, video files or other applications (including shareware or freeware) without permission or approval" (West Virginia State Board of Education, Policy 2460, 2012). This could cause an educator to consider if wordware applications such as Twitter are appropriate for use.

In reviewing county AUPs, one from each of the eight Regional Education Service Agencies (RESA) in West Virginia, none explicitly said not to use forms of social media with students, but the language was strong in its discouragement. A policy from RESA III noted that "Regardless of the type of social media or electronic communication, inside or outside school, all employees shall maintain a professional relationship with students. Therefore, all employees are

discouraged from using any social media to establish non-professional interaction with students" (Kanawha County Schools, 2012, p. 7). In addition, the student's AUP that must be signed before Internet access can be permitted states, "I will only use school-sponsored blogs, wikis, web 2.0+ tools, social networking sites and online groups as part of any educational activity" (Kanawha County Schools, 2012, p. 11).

A county from RESA II has made specific instructions for the use of social media in regards to staff:

> An employee's personal or private use of social media, such as Facebook, Twitter, MySpace, blogs, etc., may have unintended consequences. While the Board respects its employees' First Amendments rights, those rights do not include permission to post inflammatory comments that could compromise the County's mission, undermine staff relationships, or cause a substantial disruption to the school environment. This warning includes staff members' online conduct that occurs off school property including from the employee's private computer. Postings to social media should be done in a manner sensitive to the staff member's professional responsibilities. (Logan County Schools, 2012a, p. 6)

The same county's (RESA II) AUP for students' notes:

> Students shall not access social media for personal use from the Board's network, but shall be permitted to access social media for educational use in accordance with their teacher's approved plan for such use. Based upon the acceptable use and safety guidelines outlined in WVDE Policy 2460, the State Superintendent, the WVDE and the WVNET system administrators will determine what is appropriate use, and their decision

is final. Also, the system administrator and/or local teachers may deny user access at any time. (Logan County Schools, 2012b, p. 5)

A county from RESA VI also has described responsibilities of employee use of social media within Chapter 6 of its policy handbook:

> 6.13.11 School personnel will maintain a professional relationship with all school students, both inside and outside the classroom and while using any form of social media and other electronic communication.
>
> School employees and students are not peers or friends, the former having a duty to model moral, ethical, and professional conduct for the latter at all times.
>
> Employees have certain rights under State and Federal law to express themselves in the media of their choosing, albeit with certain limitations as concerns their employment by a governmental employer such as the Board.
>
> School employees have a special responsibility to demonstrate responsible citizenship by maintaining a high standard of conduct, self-control, and moral/ethical behavior with respect to their interactions and communications with students, whether the same occur during or after school hours, on school grounds or off school grounds.
>
> One effect of interactions and communications between students and school employees on social networking websites is to obscure the boundary line between appropriate school employee-student relationships and inappropriate school employee-student relationships.
>
> It is the intent of this policy to create a bright boundary line not to be crossed by school employees. (Marshall County Schools, 2012, p. 7)

Overall, language regarding use of social media as an instructional strategy, or even as a networking or professional development tool if done on the school's network, has tones of warning and discouragement within the technology policies of West Virginia counties.

Challenges and Concerns

When educators are asked why they are hesitant to use social media or refuse to try a platform, they give several reasons including that the technology is unreliable and continually changing, that learning how to use the application (in addition to how to use it professionally) takes too much time, that they are fearful that they will make a mistake or break something (Dixon, 2012), and that the students, as well as faculty, may not want to interact on a social platform (Hodges, 2010).

Next, "blocking technology tools is a common practice" (Dixon, 2012, p. 5). In "The Social Media Dilemma" published in *District Administration* (Schachter, 2011), Michael Smith, superintendent of Mt. Vernon Township High School District in Oakland, Illinois, summed up the dilemma by indicating that just saying no is easier than learning to use a new tool. Smith observed that many adults do not know how to deal with social media platforms, so their solution is to block them. Smith also mentioned that his colleagues do not "want to give parents and community members any more access to school business than they already have" (Schachter, 2011, p. 32). Many states have also created laws that prohibit "friending", (the process of accepting users on personal sites on Facebook) students or that require documentation on every interaction between teachers and students on non-school-issued devices (Davis, M., 2010).

Even if the above challenges are resolved, there is the persistent concern that not every student has access to computers and smartphones (Blankenship, 2011). This concern, however, can be resolved in different ways. Some examples include using classroom computers, having a

student or assistant type in responses written on paper, and soliciting donations for a classroom set of computers or smartphones. Even companies such as Comcast, at times, provide Internet access at a discounted rate to families that may not be able to afford it otherwise (Stamatis, 2011).

In addition, there are concerns regarding privacy, cyber-bullying, appropriate content, and copyright issues (Huffman, 2013), as well as permanence of posted content, time used to facilitate social networking tools, and the acceptance of social media as a worthwhile educational tool (Abe & Jordan, 2013). For example, in regards to privacy, educators on Twitter can set up specific accounts for courses, and each user can set account settings to "Protect My Tweets," ensuring only approved followers can view the tweets (Forgie, Duff, & Ross, 2013).

There are also concerns about having students and teachers interact and use social media. Ignoring current societal trends does not make these trends disappear, and "while it would be easy to stick heads in the proverbial sand, it is not appropriate" (Huffman, 2013, p. 160) because social media has made itself a mainstay in today's society. Being proactive within using social media is first establishing guidelines and expectations for the use of social media as an instructional strategy. Arkansas's Professional Licensure Standards Board has outlined five guidelines that could guide any district in the implementation and use of social media within the classroom:

1. To the extent possible, use the social-networking tools provided through school accounts rather than tools available through your own personal accounts;
2. Provide parents/guardians and appropriate school officials a written explanation of your reasons/purposes for using each tool;
3. Use social-networking tools only during appropriate business/school hours;

4. Regularly check for inappropriate material on any tool site that you use to which your students and/or the public can post; and,
5. Report any inappropriate material to your school's administration. (Arkansas Professional Licensure Standards Board, 2010, p. 1)

Dr. Brian Dixon (2012), founder of the Mentorship Academy, offered six safety steps to help students stay safe. First, start small. Begin learning the features of one technology tool at a time and ask questions as the learning continues about the capabilities of the program. Second, get trained. By building a partner network with the local sheriff's department, Internet safety nonprofits, experts in the field, and locating training resources, each person utilizing the platform will feel competent in his/her use. Third, hire great faculty and staff. Hiring faculty and staff who "understand the value of student-centered learning, whereby students are using real-world technology in authentic ways" (p. 244) helps to ensure the faculty and staff will model and lead the appropriate use of all forms of technology. Fourth, teach parents about the use of the different technological platforms being used through seminars, article sharing, and answering questions as they arise. Fifth, use group policing. It is impossible for one person to police all posts originating from the school, directed towards the school, or made by students, so empower the faculty, form a student technology team, and use an AUP to help know what is going on through social media. Finally, build a culture of collaboration by embracing project-based learning (PBL), celebrate student work, and provide frequent teacher training and support.

Twitter

Grosseck and Holotescu (2008) and the creators of Profile Rehab (2010) explained how Twitter started as an in-house application and grew to become the world's largest microblogging platform. These sources explained that Twitter began in 2006 when Odeo, a podcasting company

began working on new ideas to keep up with the ever-changing technology scene. Employee Jack Dorsey came up with the idea of creating a short-message-service (SMS, similar to texting) that could be sent to groups of people. From this initial idea, Twitter began as an internal service for the Odeo Company. Twitter had its public launch in July 2006. From the public launch, Jack Dorsey, Biz Stone, and Evan Williams, along with other employees from Odeo, formed the Obvious Corporation. From the creation of Obvious Corporation, Twitter became its own company in April 2007.

According to Dixon (2012), "Wireless connectivity, now enabled through mobile devices, has profoundly shifted the way we are able to communicate" (p. 166). Twitter has become the first line of communication for most social media users (Evans, 2010). Although Twitter is only part of the social interaction for businesses, organizations, and public figures, it is a way to meet the needs of consumers that are not met through another format or platform (Evans, 2010). When the mainstream media news stations announced in May 2011 that the President of the United States was going to hold a press conference, many users went to Twitter to attempt to discover what was going to be said. Thirty minutes before the President took the platform, it was confirmed, through Twitter, that Osama Bin Laden had been killed (Dixon, 2012).

Twitter has become a reference point for breaking news, current events, and societal trends. All tweets have been recorded, and tweets do not disappear even when deleted; the Library of Congress digitally archives all public tweets (Forgie et al., 2013; McKenzie, 2014). The reason the Library of Congress started the archives was explained by Gayle Osterberg, the Library's Director of Communications, "As society turns to social media as a primary method of communication and creative expression, social media is supplementing, and in some cases

supplanting, letters, journals, serial publications and other sources routinely collected by research libraries" (McKenzie, 2014, p. 355-356).

Personal Uses

When asked, "How do you use Twitter?," answers have varied from "complaints against companies, sharing ideas, forwarding interesting material, documenting events, conversing and flirting" (Lenhart & Fox, 2009, p. 4). When examining large scale incidents, Twitter has been used to "organize and disseminate information…for the 2008 California wildfires, the recent American elections, the Mumbai massacre and even the January 2009 crash of US Airways Flight 1549 into the Hudson River" (Lenhart & Fox, 2009, p. 4). Twitter is one place where news sources broadcast information on current and breaking events (Moody, 2010).

As "Twitter was designed and used as a vehicle to have a conversation and share ideas," (Forgie et al., 2013, p. 8), personal uses of Twitter range from pictures of breakfast, quotes, or questions like asking what new flavor from Starbucks should be tried. When looking at the uses of Twitter, both Java, Song, Finin, and Tseng (2006) and Bollen, Pepe, and Mao (2009) found that there are four main categories of tweets: daily chatter, sharing information or URLs, reporting news, and conversation. Daily chatter allows users to keep up with those whom they do not encounter in day-to-day activities, or at all, for face-to-face contact (Zhao & Rosson, 2009). Within a specific sample (137,063 public tweets from 53,197 users), a quarter of the tweets were to share information or URLs (Hughes & Palen, 2009). Within the element of conversation, a study by Honeycutt and Herring (2009) found that direct tweets (using the @ plus username) received a response within one hour 31% of the time. This rate was determined by gathering public tweets through the use of an application, Twitter Scraper, at four separate intervals. The

tweets were then analyzed for content. In making connections and/or conversation, Twitter can supply the means to do so.

More and more public figures are turning to Twitter because it gives them a 24-hour platform to interact with fans (Janowitz, n.d.). Chad Ochocinco, NFL football player, responded that "Twitter gives us our leverage back. Before it, the only side of athletes people saw was the one the media presented. Now we can show fans who we truly are. People respond to that" (Janowitz, n.d., p. 78). Although many fans will never have the chance to meet stars, athletes, or other public figures face-to-face, interaction on Twitter allows them to feel as if they have (Janowitz, n.d.). For most public figures, emails are filtered, there are answering systems for phone calls, and all snail mail is screened and shredded. However, Twitter accounts are usually handled by the public figures themselves (Dixon, 2012).

While Twitter has been used as a platform for political debate (Tumasjan, Sprenger, Sandner, & Welpe 2010), politicians are also using Twitter to communicate with the public, introduce bills, and publicize visits. These are not just national politicians, but state and local politicians as well. A study by Kidwai and Imperatore (2011) examined the use of Twitter and social media on a local level at a Social Media Advocacy Day and found that Twitter was the most active social media network for that day. In this study, they identified specific criteria to determine the use of Twitter, Facebook, and blogs within the Social Media Advocacy Day. They found that there were 475 original tweets and retweets, 42 Facebook status updates, and 12 blog posts made in conjunction with the event.

There have been presumptions that using Twitter to consume information is not academic, professional, or even sufficient for any information other than daily chatter, and "research continues to show that people who read linear text comprehend more, remember more,

and learn more than those who read text peppered with links" (Carr, 2011, p. 127). Still, writer Whitney Mountain (2009) explained the consumption of Twitter this way:

> Is this new technology any different from a student leafing through a paper copy of *The New York Times*, reading the headlines, and occasionally clicking her eyes down to an article that sounds particularly interesting? She might look more sophisticated in the coffee shop, but the behavior is the same. (¶7)

Many have decided to take to Twitter for a professional slant, rather than only a personal one.

Professional Uses

Social media allows professionals to network and communicate in a quick and efficient way. As with the four main categories of personal use, Veletsianos (2011) explained that educators use Twitter in seven main ways: sharing information, resources, and media relating to their profession; sharing information about their classroom and/or students; requesting assistance or offering suggestions to others; engaging in social commentary; engaging in digital identity and impression management; seeking to network with others; and highlighting participation in other areas. Social media also enables professionals to organize efficiently. In Wisconsin and Ohio, for example, social media was instrumental in coordinating American Federation of Teacher members for meetings and other events (American Federation of Teachers, 2012b). Even healthcare professionals have been able to use Twitter in their profession. Forgie et al. (2013) wrote that healthcare professionals could use Twitter for "epidemiological surveys, disaster alerts, adverse event reporting, reporting of critical lab values, booking patient's appointments and appointment reminders, and large scale tracking of antibiotic resistant organisms" (p. 8).

When looking for a productive way to facilitate evaluations, a study by Stieger and Burger (2010) found that Twitter's data management and ease of use, along with a little administrative effort, is a very useful tool in a formative evaluation of a course. Through a small study of 26 participants, the researchers found that although the formative assessments (facilitated through Twitter) and summative assessments (traditional course evaluations facilitated both online and offline) differ in the results of the assessments, the formative assessments facilitated through Twitter offered insights that were not demonstrated in the summative assessments. Continual, i.e. weekly, formative assessments through Twitter can thus offer an instructor information that might not be known otherwise.

Simply the use of Twitter has been hypothesized to teach users "how to communicate with brevity and depth" (Forgie et al., 2013, p. 11). By limiting the interactions to only 140 characters at a time, the user must relay information clearly and succinctly. For some educators, using Twitter is more efficient than using other technological tools such as blogs or wikis. Unlike blogs and wikis, where each student page may be a different webpage that must be opened, students can view all tweets under a specific topic/hashtag on one page, a feature that makes the twitter "conversation" more conducive to ongoing discussions (Park, 2013).

Twitter can also be used to determine the culture and climate of a school. Members of a school community expect more than newsletters and once-a-year open houses; they want updates, communication, and collaboration (Dixon, 2012). Through this communication, the culture and climate of a school can be ascertained and changed. Studies by Bollen et al. (2010) and Pak and Paroubek (2010) found that changes in the public mood could be tracked by examining the content of tweets. If moods can be tracked on a large scale, a focused feed of tweets from the school and community could give an indication of the culture and climate of the

school. Bollen et al. (2010) analyzed 9,853,498 public tweets between February 28, 2008 and December 19, 2008, from 2.7 million users. These tweets were classified and analyzed in a three-step process using mood-assessment tools and causality analysis within a previously determined neural network. In their study, Pak and Paroubek (2010) examined over 300,000 tweets to classify them as positive, negative, or neutral emotions and then used a linguistic analysis to build a sentiment classifier. They concluded that Twitter would be a reliable source for opinion mining and sentiment analysis. Along the theme of these studies, there are web applications, like Tweetdeck, that provide a real-time Twitter analysis of tweets when users search for that topic (Evans, 2010).

Evans, in his 2010 book *Social Media Marketing,* found that by using Twitter to create a customer service program, Comcast was able to engage its customers in the platform where the customers were making complaints and concerns. Communicating with the customers through Twitter, CEO Brian Roberts asserts, "has changed the culture of our company" (Evans, 2010, p. 227). If the culture of a national business can be changed through Twitter, could a school's culture also be changed?

Some have declared that students do not want to communicate with colleges and universities through Twitter, as the study by Abe Gruber, director of marketing at Bloomfield College, found when he surveyed 200 prospective freshmen and 70 admission offices (Truong & Parry, 2010). Universities have, for several years, however, used Twitter to connect to future and current students. In his article, "Twitter Goes to Class: Tweeting for the Old U.," Doran (2009) described how Fairfield University first used social media platforms to engage potential students. The vice president of marketing and communication at Fairfield University, Rama Sudhakar, explained the concept this way: "Students want to participate and engage others in their learning

and developmental experiences, so we anticipate a lively exchange on the boards, in the blogs, and lots of video posts by both our online tour guides and participating members" (p. 18). In the United Kingdom, Leicester University (Ewbank, Foulger, & Carter, 2010) found such success using Twitter to connect with students on an advertising/marketing/informational level, that they then started using Twitter as a pedagogical tool within their courses.

In a 2013 study (Carpenter & Krutka, August 2014), a nonrandom sample of 755 K-16 educators took a survey about their use of Twitter in education. This study found that these educators used Twitter professionally in many different ways. Of these educators, 96% used Twitter to share and acquire resources, 86% collaborated with other educators, 79% networked professionally, 73% participated in Twitter chats, 30% used Twitter as a backchannel, 25% found emotional support for their profession, 23% communicated with students on Twitter, 18% communicated with parents on Twitter, 17% used Twitter for in-class activities with students, and 16% used Twitter for out-of-class activities for students.

There are challenges and limitations, however, in trying the application. A Faculty Focus (2009) study found that the faculty members gave four main reasons as to why they do not try or use Twitter: "[They] don't know how to use it, don't have time to use it, question its educational relevance, and [are] unsure as to whether students use it" (p. 4). These are all issues that must be confronted if they are to be overcome. With any new technology, the instructor must first be willing to try to learn and use the technology. If an educator does not attempt to first learn the platform before using it as an instructional strategy, the benefits of using Twitter are less likely to be obtained. In a case study, Lin, Hoffman, and Borengasser (2013) found that the benefits of using Twitter in the classroom were limited to information sharing between the students (44 students across 2 specific courses). The results prompted the researchers to make four

recommendations to faculty who want to use Twitter as an instructional strategy: provide scaffolding to the students in Twitter usage; address privacy concerns; establish the purpose of using Twitter within the course; and model use with structure from the educator.

At the 2012 World Conference on Educational Multimedia, Hypermedia, and Telecommunications, Kanjanapongpaisal discussed the limitations of using Twitter in academia in his full presentation, "Twitter Usage in Higher Education." Kanjanapongpaisal observed that the main limitations include the gap between the social use of Twitter versus the educational use of Twitter; that Twitter is only a communication tool; knowledge of the irrelevant and random tweets from users; and no confirmation of receipt of tweets read (Kanjanapongpaisal, Rogers, & Bryan, 2012). In addition, although someone is in the social network of Twitter, that does not necessarily mean that there is definite interaction between the individuals (Huberman, Romero, & Wu, 2008).

As seen in Table 1, *Emerging Themes of Educational Twitter Use*, nearly all categories of usage can be classified as instructional strategies, professional development, or personal learning networks.

Table 1: Emerging Themes of Educational Twitter Use

Instructional Strategies	Professional Development	Personal Learning Networks
Daily Chatter (Bollen et al., 2009; Java et al., 2006)	Daily Chatter (Bollen et al., 2009; Java et al., 2006)	Daily Chatter (Bollen et al., 2009; Java et al., 2006)
Sharing Information or URLs (Bollen et al., 2009; Java et al., 2006)	Reporting News (Bollen et al., 2009; Java et al., 2006)	Reporting News (Bollen et al., 2009; Java et al., 2006)
Communicate with Students on Twitter (Bollen et al., 2009, Carpenter & Krutka, August 2014; Java et al., 2006)	Engaging in Social Commentary (Bollen et al., 2009, Java et al., 2006; Veletsianos, 2011)	Engaging in Social Commentary (Bollen et al., 2009, Java et al., 2006; Veletsianos, 2011)
Communicate with Parents on Twitter (Bollen et al., 2009, Carpenter & Krutka, August 2014; Java et al., 2006)	Sharing of Knowledge and Resources (Bollen et al., 2009, Carpenter & Krutka, August 2014, Java et al., 2006; Veletsianos 2011)	Sharing of Knowledge and Resources (Bollen et al., 2009, Carpenter & Krutka, August 2014, Java et al., 2006; Veletsianos 2011)

Instructional Strategies	Professional Development	Personal Learning Networks
Use Twitter for In-Class Activities with Students (Carpenter & Krutka, August 2014)	Collaboration with other Educators (Carpenter & Krutka, August 2014)	Collaboration with other Educators (Carpenter & Krutka, August 2014)
Use Twitter for Out-of-Class Activities with Students (Carpenter & Krutka, August 2014)	Create Meaningful Professional Development (Davis, K., 2012)	Sense of Belonging (Davis, K., 2012)
Use Twitter as a backchannel (Carpenter & Krutka, August 2014)	Participated in Twitter Chats (Carpenter & Krutka, August 2014)	Networking Professionally (Carpenter & Krutka, August 2014; Veletsianos, 2011)
	Use Twitter as a backchannel (Carpenter & Krutka, August 2014)	Finding Emotional Support for the Profession (Carpenter & Krutka, August 2014)
	Engaging in Digital Identity and Impression Management (Veletsianos, 2011)	Engaging in Digital Identity and Impression Management (Veletsianos, 2011)
		Sharing Information about Classroom/Students (Veletsianos, 2011)
		Requesting Assistance; Offering Suggestions to Others (Veletsianos, 2011)

Instructional Strategies

Twitter's versatility has allowed the platform to be used in a variety of ways within the classroom. From elementary and secondary classrooms to those in higher education, Twitter has become a tool used for critical thinking, collaboration, communication, and creativity in classrooms across the globe. The use of Twitter in the classroom has not been shown to decrease a teacher's credibility, but instead has increased it within students' perceptions (Johnson, K., 2011).

Within a lecture hall, discussion can be difficult. With the use of Twitter, a feed of questions and comments can be displayed onscreen. Students can actively relate the topic to their own experiences, allowing them to connect to real-world applications of the topic, as well as

giving less outspoken students the opportunity to participate readily in the discussion. This practice can alter the classroom dynamic, offering students more control as to the direction of the lecture and requiring them to pay close attention throughout the class session (Elavsky, Mislan, & Elavsky, 2011; Forgie et al., 2013; Pollard, 2014; Tyma, 2011; Zax, 2009). In other instances, the speaker may have a specific presentation or set of notes, but then at the end of the speech, the Twitter feed is displayed to guide discussion, rather than asking for questions from the audience in a verbal manner (Forgie et al., 2013). Elizabeth Pollard of San Diego State University, using Twitter as a backchannel for a world history, lecture-based course, offers the following four tips as best practices when using Twitter in a lecture hall:

> tweet regularly and only with useful/relevant materials, but not so often that you become 'noise' on their feeds; select carefully who you follow, to set an example and to reduce "noise" on your own feed; encourage students to tweet at several points in the lecture—and stop to respond to tweets at set points in the lecture; and, know your content hands-down and avoid being derailed by incoming tweets. (2014, p. 347-348)

Even in studies that have shown no statistical difference overall in the level of engagement in the university classroom when using Twitter versus not using Twitter, students who are inclined to enjoy social media platforms report much higher experiences of engagement when using Twitter to engage with the content. One such study, done by Bridget Welch of Western Illinois University and Jess Bonnan-White of the Richard Stockton College of New Jersey (2012), surveyed over 200 students in four sections (two each) of undergraduate courses of Introduction to Sociology and Introduction to Cultural Anthropology. In these four sections, there was a control group that did not use Twitter within the pedagogy of the course and an experimental group that did use Twitter. Overall, there was no statistical difference in perceived

engagement of the control group versus the experimental group; however, in the experimental group, the students who enjoyed using Twitter reported that they were more engaged than those who did not enjoy using Twitter. The findings demonstrated that as with any technological tool used for academics, those who enjoy the tool in general report enjoying the tool for academic purposes.

Hirsh (2012) used an online survey to examine Twitter's effectiveness in student engagement for online courses at Kinsborough Community College in New York City during the Fall 2011 semester. Out of the 248 students who completed their respective online courses, 127 students attempted the survey, and 116 surveys were used for data analysis. There was no significant relationship between the quantity of students' tweets and academic performance, nor was there a significant relationship between the quality of students' tweets and academic performance; however, there were two findings directly related to the use of Twitter in the online course. First, Twitter use did increase the students' motivation to study, as well as enabling them to better communicate with the instructor. Second, the students who self-reported that the quality of tweets did increase their level of engagement had a higher grade than expected (on average) than those who self-reported that the quality of tweets did not increase their level of engagement. The researcher recommended that there is implication for social change within the findings. Although there was no significant relationship between the quantity and quality of students' tweets and academic performance, there was still importance in regards to student engagement and the use of social networking in an informal learning environment.

Educators must be cognizant of the fact that the Internet provides most of the information that students consume. A study by Forgie et al., (2013) found that "an online survey of healthcare students [through SurveyMonkey to 644 first year students and 413 graduating

students] revealed that most prefer to use online information sources" (p. 10). By connecting with students on Twitter, educators have the opportunity to share credible, new, and valuable resources with students; it only requires the students to "click" rather than search for said resource (Forgie et al., 2013). Both Blair (2013) and Thoms (2012) indicate that students can be engaged with Twitter educationally when the educator is engaged educationally. They suggest this can be done by creating a specific course profile, creating specific course hashtags, and providing instant feedback. Twitter can be used to set seminar tasks or daily learning objectives. Sharing additional resources and links, recapping classroom content, and extending classroom discussion will offer an extension of the learning process occurring within the classroom.

Chickering and Gamson wrote "The Seven Principles for Good Practice in Undergraduate Education" in 1987, but Chickering took a different perspective in 1996, when he published "Implementing the Seven Principles: Technology as Lever" with Ehrmann. In the later work, the authors viewed the seven principles through the lens of technology as a whole; however, each principle can also be viewed through the use of Twitter (Dunlap & Lowenthal, 2009a; Junco, Heibergert, & Loken, 2010). Using the seven principles as a guide, Junco, Elavsky, and Heiberger (2013) proposed the following activities for using Twitter in the classroom: continuing class discussions, asking questions in a low-stress manner, conducting book discussions, offering class reminders and campus event reminders, giving academic and personal support, connecting with other students and faculty, organizing service-learning projects, organizing study groups, and using Twitter as a platform for optional and required assignments. At Kanawha Valley Community and Technical College (now known as BridgeValley Community and Technical College), in South Charleston, West Virginia, Twitter has been used over the past several years in the American Sign Language Interpreting Program

as a form of best practice with Chickering and Ehrmann in mind (Lowe & Heaton, 2012) (see Appendix C).

K-12 Education. When searching for applications, games, and programs to fit the needs of students, classroom teachers may often focus on specific content; however, as Kroski (2008) pointed out, "Twitter doesn't require that users stick to a specific theme. So not to worry; content wise, you can shift gears from silly to significant without bewildering readers" (p. 35). This allows the teacher, whether he teaches multiple subjects or has multiple topics throughout a course, to have the freedom to explore Twitter to fit his needs. In a K-12 setting, a teacher can facilitate a tweet that allows the classroom to interact with a professional in the area. For example, most schools will not have the money to fly a famous author in for a meet-and-greet. However, through interaction on Twitter, a class may get to have a Twitter or video chat with the author (Schachter, 2011). Vela (2011) used the website *Collaboration Ideas* to blog about how to use Twitter for education. She mentioned that the teacher can create lists with "different interests, topics, or students and use a hashtag for every list so that the students can easily find the trends; use for discussions and updates; share links; encourage brainstorming; and help them connect to libraries, teachers, and interesting people to follow" (¶3).

Enrique Legaspi teaches history at Hollenbeck Middle School in East Los Angeles (Simon, 2011). He uses Twitter to promote classroom discussion. Legaspi connects the online Twitter discussion to a projector that allows everyone to see the tweets and respond to them. Legaspi has noted that "a lot of them, what it did is help find their voice. I have many students that do not participate in my classes or share what's on their mind, so Twitter became that vehicle" (¶13).

Kevin Jarrett, a computer teacher at Northfield Community School (PK-8) in Atlantic County, New Jersey used Twitter to teach his kindergarteners about farms (Lu, 2011). Jarrett sent out a tweet and was able to coordinate a video chat with two farmers for his class.

Susan Price, a foreign languages teacher at Burlington High School in Burlington, Massachusetts, uses Twitter within her French class (Demski, 2010). She has her students expand their reading, writing, and communication skills in French. She has found that using this single venue has been profitable in encouraging communication and collaboration with her students.

Twitter also has the ability to interact with Twitter polling applications for informal polls and quizzes. Similar to using "clickers" or "responders," students are able to send questions, give short answers, and reply to choices while working through a poll, quiz, or other classroom activity (Higdon, Reyerson, & McFadden, 2011). Using Twitter instead of clickers or responders allows the educator to start an activity right away, rather than taking the students to a "clicker-enabled classroom, handing out clickers, ensuring the correct code is entered" (Forgie et al., 2013, p. 12).

Higher Education. In 2009, Faculty Focus sponsored a study that surveyed 2,000 higher education professionals regarding their views and uses of Twitter as an educational tool. Only 30.7% of them used Twitter; some professors, like Scott McLeod of Iowa State University indicated that those who did not are missing out. McLeod stated, "academic discussions often take place on closed e-mail lists when they should be happening in public forums, like Twitter, so that a diverse group of outsiders can join in" (Young, 2009, ¶17). Like McLeod, there are many examples of instructors making great academic strides in their use of Twitter.

David Parry, assistant professor of Emerging Media and Communications at the University of Texas at Dallas, has used Twitter as part of a writing assignment (Young, 2008). However, the writing assignment was secondary to the other benefit Parry noticed. Between the sending and receiving of tweets, Parry and his students created a classroom community that extended beyond the classroom. Parry reflected that the Twitter usage "was the single thing that changed classroom dynamics more than anything I've ever done teaching" (¶6).

Sugato Chakravarty from Purdue University has students send questions through Twitter for discussion (Young, 2010). Students can send questions from laptops or cell phones, and if students do not have access to either, they can send a paper note to the teacher's assistant for tweeting. Chakravarty believes that, overall, this practice has been good for his class: "you have some meaningless stuff," he writes, "but it's followed by some very good questions that would never be asked" (p. 11).

Chen and Chen (2012) found that engaging students in Twitter provided immediate personal support, gratification and reinforcement of successes, and individualized feedback. This was, although, at the expense of a heavier workload and more time constraints for the instructors. Still, Chen and Chen also found that using Twitter throughout a course allowed the instructor to modify the course as needed, and made learning content available as needed to the students. Classroom management was enhanced through adaptive learning processes, engagement in meaningful constructs, collaborative learning, and critical thinking skills. Here Twitter was integrated within a research methodology course in Taipei for 12 weeks. Twitter was used to complete a formative evaluation of the course on a weekly basis, as well as to provide feedback and support. Semi-structured interviews then occurred after the completion of the course and evaluations.

Daniel Klinghard, assistant professor at the College of the Holy Cross, has used Twitter in his political science courses. Klinghard has developed a project that has his students summarize different reading selections without going past the 140-character limit (Lytle, 2011). Projects designed in this way requires the students to be concise and makes them get to the main point of the text through critical analysis (Dunlap & Lowenthal, 2009b).

Robert Williamson (2013) at Hendrix College has coined the phrase "tweading" to mean tweeting real-time reflection, response, and comment to the text being read aloud. Specifically, he has used this with the Gospel of Mark across several semesters. He has found that tweading has helped his students to grasp the meanings of the text through the lenses of their own experiences and commitments.

Brian McKenzie (2014) from the National University of Ireland in Maynooth used Twitter to reenact the Paris Commune and the Battle of Stalingrad with his students. He used the site Twhistory.org as a template because that particular site acts as a clearinghouse for historical event reenactments. The students created Twitter accounts for historical characters; posted to Twitter as any of the created historical characters; and tweeted in real-time using primary sources to create a digital timeline of the historical event. Not only was student feedback extremely positive for this class project, McKenzie accomplished all three objectives that he had for the project: "gain proficiency with Twitter and different tools for data mining; appreciate the challenges and opportunities that social media present as course materials for historians; and use the re-enactment to increase understanding of the Paris Commune/Battle of Stalingrad" (p. 357). McKenzie stated that without hesitation, this project will become commonplace within his course.

Within teacher preparation programs, a case study in New Zealand involving eight graduates facilitated by Wright (2010) found the use of Twitter to be insightful during practicum experiences that allowed the students to develop self-reflective practices by "focusing their thinking to reflect purposefully on their experiences" (p. 263) rather than writing responses where filling up a page may or may not have included clear and succinct reflections.

Denise Domizi (2013) authored a study, "Microblogging to Foster Connections and Community in a Weekly Graduate Seminar Course," in which the investigation focused on whether the use of microblogging in the Twitter platform enhanced content learning and fostered community with the graduate students (16) enrolled in a particular course. This case study design asked the students for an initial reaction to using Twitter as part of the course, content analysis of the Tweets posted while in the course, and a final questionnaire at the end of the course to gauge attitudes toward Twitter. Domizi found that the students' Twitter posts revealed that the tweets did connect to the content (47% of the time) and to each other (59% of the time), and were used to report their plans to use specific strategies learned within the course in their own classrooms, as well as to ask pedagogical questions that may or may not have directly correlated to the content. Although the students' initial reactions were mixed (five were positive, four were negative, and seven were neutral), the post-course questionnaire revealed that only one student continued to view the use of Twitter within the course as a negative component.

Facilitated discussion in real-time offers a dimension to online courses that is not readily available otherwise. Students can gather input and ideas from others across the world to expand the depth of their projects. When students are not physically, financially, or geographically available to travel, Twitter offers a platform to productively connect students with other students, professors, and professionals (Abe & Jordan, 2013). Instructors can learn from others in their

field and gather insight by following specific dialogues. Students and instructors can follow specific hashtags from conferences in order to learn about the subject matter of the conference, even though they did not attend (Reinhardt, Ebner, Beham, & Costa, 2009). Departments and colleges can tweet news updates and important information to students and prospective students or use Twitter as a customer-service line for concerns and suggestions (Joly, 2009). Remember that the traditional college classroom was once the "laboratory for students to evolve their communication habits into effective collaboration skills they can use in the workplace" (Shim et al., 2011, p. 665). With the rise of social media for personal and professional use, "teaching with social media creates the opportunity to model effective online engagement and effective virtual collaboration" (p. 665).

Professional Development

Twitter has become such a source for information; the American Federation of Teachers (2012a) suggests that Twitter can help an educator find new ideas, information, and share his/her own knowledge with fellow educators. To quick start professional development on the Twitter platform, one can search specific keywords or follow experts (Dixon, 2012).

Steven Anderson, instructional technologist at Clemmons Middle School in North Carolina, sees Twitter as a way to allow educators to personalize their professional development:

> In the past, professional development was formal and rigid. You go to these events scheduled by the district because this is what they think you need. With social networking, allowing teachers to connect one-to-one and one-to-many, they have the professional development they really desire. (Davis, M., 2010, p. 17)

A study by Reinhardt et al. (2009) found that Twitter was used during conferences to discuss the information presented, as well as to open a channel for additional information and

input. Reinhardt et al. examined the Twitter uses at five conferences with 41 different users and found that over 67% of the attendees used Twitter during the conference and that 74% of those users sent between 11 and 20 tweets a day about the conference during the conference. However, Desai et al. (2012) analyzed 917 English-worded tweets during Kidney Week 2011, and they found that a majority of the 993 tweets from 172 individual users who used #kidneywk11 were advertisements rather than tweets to share information or to initiate conversation.

K. Davis (2012) studied 17 U.S. public school teachers who participated in a specific set of #edchats (August 2011 to October 2011). Davis examined the participants' tweets in the #edchats and the archived documents from the #edchat discussions and completed semi-structured phone interviews with the participants. Davis found five emerging themes from the teachers' perceptions of Twitter use for professional development: Twitter allowed for the sharing of knowledge and resources, Twitter allowed for a sense of belonging, Twitter enabled them to create meaningful professional development, there were technical benefits that helped their ability to participate in the #edchat discussions, and, finally, technical drawbacks that hindered their ability to participate in the #edchat discussions.

Personal Learning Networks

One does not have to "follow" or "follow back" in order to communicate or read public Twitter accounts/feeds. By searching a specific topic on Twitter, numerous tweets and accounts related to that search will appear and give the user a starting point for information of interest, content specification, or research (Dixon, 2012). Sharing content can come from posting within the Twitter application or from other platforms that sync with Twitter. For example, Amazon's Kindle has a "share to Twitter" feature that enables quotes, commentary, and even links to the material to be sent out into the Twitterverse (Dixon, 2012).

Gerald Aungst of the Cheltenham school district in Pennsylvania explained that Twitter allows him to connect with educators across the globe, and he has been able to "extend the conversation about education and practice in the classroom beyond my immediate circle of people in my district" (Lu, 2011, p. 20). Traditionally, conferences were the only way to network and connect outside of the geographical location of the school district, and, most of the time, once the conference ended, so did the networking. With Twitter, it becomes a "continuous source of self-directed professional development" (p. 20).

In a study conducted by Marin, Negre, and Perez (2014), the examination of a personal learning network within a course facilitated through Twitter was analyzed. Three teachers with a total of 192 students within a technological media course at the University of Balearic Islands conducted a pre-questionnaire, observed students throughout the course, and analyzed documents once the course was completed to determine the use of Twitter in the personal learning networks of the students. They found that the majority of the interaction on Twitter, 73%, focused on assigned course activities. Another 10% of the tweets shared resources to the participants, and 8% focused on additional academic interaction between the participants. Overall, the researchers deemed the interaction of the participants as positive. The students' independence while learning was promoted, as was an overall increase in collaboration. The researchers, in addition, recommended that the use of Twitter in developing a personal learning network should be promoted through methodologies within the classroom.

Deyamport (2013) designed an action research project that included a workshop for potential subjects and support for the participants throughout the implementation of Twitter in email, phone, and weekly meetings. There were eight participants in the study and the length of the implementation was six weeks. Although there were individual themes from each participant,

a post-implementation survey found that 63% felt that Twitter helped them make progress toward their professional development goals, 50% felt that a personal learning network is valuable to professional development, 63% felt that their personal learning network contributed positively to their classrooms, 63% gained resources or strategies from their personal learning network, 100% agreed that Twitter is effective in building a personal learning network, and 88% predicted that they would continue using Twitter for their personal learning network.

Summary

As forms of technology continue to emerge in our schools, we must ensure that we are picking appropriate forms of technology for the task to be completed (Pinker, 2015). In reviewing what Twitter is as an application and its purpose for both personal and professional use, it can be ascertained that Twitter can have value in the field of education. From the review of literature, three themes emerged on how educators can use Twitter as a valuable educational resource—for instructional strategies, professional development, and personal learning networks. Table 1 (p. 34) summarizes all emergent themes from the reviewed studies[1]. This study then attempts to springboard from the current literature to see to what extent United States and West Virginia educators are using Twitter for professional purposes.

[1] K. Davis (2012) also found themes of technical benefits and drawbacks in the study. Those two themes, along with Veletsianos' (2011) theme of highlighting participation in other areas, does not have a place within the categories.

CHAPTER THREE: METHODS

Introduction

This mixed-methods study used both quantitative and qualitative measures to determine to what extent United States educators and West Virginia educators are using Twitter for educational purposes in networking, professional development, and instructional strategies. This chapter is divided into the following sections: research design, population and sample, instrumentation, instrument reliability and validation, data collection procedures, data analysis procedures, and limitations.

Research Design

This study featured a mixed-methods research design that used both quantitative (analytics, surveying, coding) and qualitative (document analysis and interviewing) methods of data collection through sequential procedures (Creswell, 2003). This study was intentionally placed on the continuum between quantitative research and qualitative research (Creswell, 2003) in order to get the clearest understanding of the research questions.

Twitter Analytics (http://analytics.twitter.com) was used to determine the reach of the tweets that were sent out regarding participation in the study. This approach was needed because without knowing the reach, the number in the population and sample could not be determined. Twitter Analytics is a program designed by Twitter (as a company) for use within the Twitter platform without an outside application.

An electronic survey, created in SurveyMonkey and disseminated through Twitter, was then used to collect informed consent, demographic information, and the users' perceived use of Twitter for educational purposes. An electronic survey was chosen because Twitter is a

technological tool, and an electronic survey allowed for a quicker response time with a wider magnitude of coverage (Barribeau et al., 1994-2012).

For analysis of the tweets, the research methods employed were document analysis and coding of the selected tweets. The tweets were analyzed by the words of the free-flowing text (Bernard & Ryan, 2010) to determine the appropriate category. Then, those tweets were coded, if applicable, to their educational purpose, (instructional strategies, professional development, or personal learning networks). Although some of the text was coded using a literal coding procedure, most text was coded using a focused coding procedure where the tweets were coded in a more analytical way to determine the overall purpose of the tweet (Hesse-Biber, 2010).

Finally, semi-structured interviewing was used to further delve into experiences by United States and West Virginia educators using Twitter educationally. The interview included a specific set of questions that did not lead the participant to produce a specific answer (Angrosino, 2005), but instead was structured to allow the participant to feel comfortable in sharing thoughts and experiences about Twitter in education. Again, a focused coding procedure was used in the analysis of the interviews to determine an overall understanding of the participants' Twitter usage, as well as any other themes that emerged.

Population and Sample

The population for this study began with the potential of the 151 educational Twitter accounts that were following @MrsLowe2001 (the researcher's professional Twitter account). This account, @MrsLowe2001, is public, however, so all tweets could be retweeted, quoted, and shared throughout the Twitter platform. This allowed for the number of potential respondents to increase exponentially. To determine the population, the 258 tweets (see Appendix D for examples of specific Tweets) sent to garner participation in the study were run through Twitter

Analytics, a program designed and run by the Twitter company. Twitter Analytics determined the reach of each tweet, with a total reach approximated at 20,000. This did not mean that 20,000 different people interacted with the tweet. This reach meant that the tweets were available on 20,000 feeds; note that reach does not entail duplicate feeds, reading the tweet, or interacting with the link. The sample came from Twitter users that self-selected themselves into the study. The exact number of potential respondents, as well as the actual number of participants, was known upon closing the survey and is reported in in Chapter 4.

Instrumentation

This mixed-methods study included both quantitative and qualitative data collection methods. Quantitative data was gathered in three different ways, and all three instruments were approved by Marshall University's Institutional Review Board (IRB) (see Appendix E for approval letter). First, permission through informed consent for the study, demographic information, and personal responses on the perceived use of Twitter (three questions determining their use of Twitter for educational purposes ranging from 1-Never to 5-Daily) came from a researcher-designed pre-collection survey created in SurveyMonkey (see Appendix F). Second, there was a content analysis of the participants' tweets sent, and the categories of the tweets were broken down into percentages, housed in a researcher-designed organizational chart (see Appendix B); the chart also held demographic data about the participants' Twitter accounts. Third, the qualitative data came from a seven-question, semi-structured interview (see Appendix G) with participants who indicated that they were willing to share their experiences in using Twitter for educational purposes through telephone and/or FaceTime interviews.

Instrument Reliability and Validation

For the pre-collection survey, powered by SurveyMonkey, the permission through informed consent, list of demographic questions, and the questions (scored on a Likert scale) of the participants' perceived use of Twitter were reviewed by a group of educational computing doctoral students on June 11, 2015. These experts reviewed the material and made comments and suggestions to improve the readability of the instrument; subsequently, the appropriate changes were made.

The researcher-designed organizational chart was first reviewed by the members of the researcher's dissertation committee. From that first review, the researcher then piloted the organizational chart by randomly selecting five Twitter users from the researcher's following list and analyzing and coding the tweets for a specific month. That pilot test was reviewed by the researcher and the dissertation committee chair. The gaps and problematic areas of the organizational chart were addressed, and a revised organizational chart was reviewed by a group of educational computing doctoral students on June 11, 2015. These experts reviewed the material, made comments and suggestions to improve the instrument; subsequently, the appropriate changes were made.

Finally, the semi-structured interview questions were reviewed by a group of educational computing doctoral students on June 11, 2015. These experts made suggestions to improve the clarity of the questions, and the appropriate changes were made. The researcher piloted the interview questions with a volunteer, non-related to the study, and the interview was then reviewed for improvements to the set of interview questions. From this process, the final set of interview questions was established.

Data Collection Procedures

After gaining approval from Marshall University's IRB (Appendix E), the data were collected in three separate sets of procedures: SurveyMonkey, Twitter feeds, and semi-structured interviews. First, a tweet asking for participation in the study was sent from the @MrsLowe2001 account. The tweet language was repeated daily for two weeks using specific #edchat hashtags and tagging specific users. The hashtags were created for specific educational Twitter chats that occur across the United States. The official list, hosted on Google Sites, was used, with only those chats from foreign countries and specific products being removed for the purpose of this study (@cybraryman1 et al., 2015). The specific usernames for United States educators were taken from self-identified educators who were spotlighted in three separate articles for being top educational tweeters (Caron, 2012; Educational Technology and Mobile Learning, 2013; Marino, 2013). The specific usernames for West Virginia educators were taken from the official #wvedchat database of active users (WVEdChat, 2015) (see Appendix H for the list of hashtags and usernames). There was a total of 258 tweets sent using the hashtags and usernames.

This procession of tweets is an example of snowball sampling. Snowball sampling is used when the population is considered small and specific, yet the information of the participants is key to the study (Jugenheimer, Kelley, Hudson, & Bradley, 2014). As explained in *Advertising and Public Relations Research, 2nd Edition* (Jugenheimer et al., 2014), after particular members of a population are identified, the sampling procedure relies on referrals to continue to garner participants; in this study, referrals are done through retweets and quoted tweets. Figure 2 below (concept taken from Jugenheimer et al., 2014, p. 143) demonstrates how snowball sampling can garner several additional participants from one initial participant.

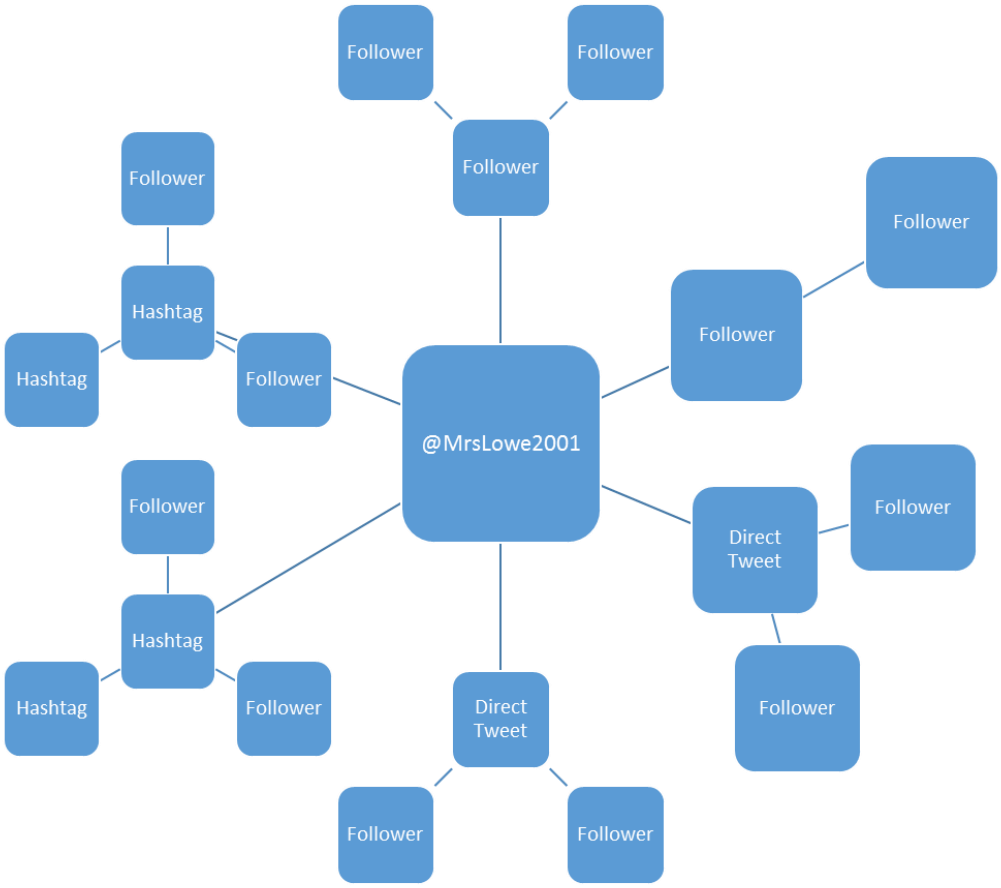


Figure 2: Snowball sampling.

Within the call for participation tweet, the link for the pre-collection survey was given. At the end of the survey period, Twitter Analytics was used to determine the reach of the tweet(s)—this determined the potential population. The researcher then entered the data collection area of SurveyMonkey to see the number of respondents, the permission given by the respondents through informed consent, the perceived extent of use of Twitter in education by the respondents, and the contact information of the respondents who agreed to the interview. The number of respondents determined the sample.

Based on the respondents who gave permission through informed consent for the study, each respondent's specific Twitter account was analyzed. The feed of that Twitter account was accessed through the @MrsLowe2001 account. The month of tweets that was analyzed was September 2015. September 2015 was the most recent month in which the entire month was scheduled for the classroom (barring possible school starts after Labor Day). All the tweets sent from the participants' accounts in September 2015 were analyzed and coded within the three main types of educational tweets—instructional strategies, professional development, and personal learning networks. This data was recorded within the organizational chart (see Appendix B); one chart for each participant. These charts were kept in a locked location and used for the purposes of this study only.

Finally, those respondents who gave permission through informed consent as well as contact information in the pre-collection survey were contacted through Twitter and/or email to set up a day and time for an interview. These interviews occurred either on the phone or through FaceTime, and the data from the interviews were logged in the form of notes. These notes were kept in a locked location and used for the purposes of this study only.

Data Analysis Procedures

To answer research questions one through three: *R1: To what extent are US and WV educators using Twitter to employ instructional strategies?; R2: To what extent are US and WV educators using Twitter to facilitate their own professional development?;* and *R3: To what extent are US and WV educators using Twitter to create their own personal learning networks?*, the researcher used descriptive statistics, content analysis, and responses to semi-structured interviews to triangulate the data and draw appropriate conclusions.

First, descriptive statistics were used to calculate perceptions of the participants' use of Twitter for educational purposes from the pre-collection survey. These perceptions came from three questions, scored using a 5-point Likert scale:

1. To what extent do you believe you use Twitter for instructional strategies?

1	2	3	4	5
Never	*Rarely*	*Occasionally*	*Often*	*Daily*

2. To what extent do you believe you use Twitter for professional development?

1	2	3	4	5
Never	*Rarely*	*Occasionally*	*Often*	*Daily*

3. To what extent do you believe you use Twitter for personal learning networks?

1	2	3	4	5
Never	*Rarely*	*Occasionally*	*Often*	*Daily*

Descriptive statistics were used to determine the actual use of Twitter by the participants in the areas of instructional strategies, professional development, and personal learning networks through content analysis; the content analysis was recorded on the organizational chart (Appendix B).

Next, based on the descriptive statistics of perceived and actual use by US and WV educators, the researcher reviewed the data to determine patterns and/or differences that existed between the two populations.

Then, the content analysis, coded on the organizational chart (see Appendix B), was used to identify any emergent themes that arose through the analysis. Examples were shared from the coding recorded on the organizational chart.

Finally, the seven-question semi-structured interview revealed additional evidence for *R1*, *R2*, and *R3* in addition to answering *R4: What are the barriers and challenges facing US and WV educators when attempting to employ the use of Twitter professionally?* Here, the interview notes allowed for a focused coding procedure so that the researcher created an understanding about what each participant was saying about professional Twitter use and experiences with the platform. The focused coding allowed the researcher to create abstract categories of the participants' responses and subsequently allowed the researcher to generate more theoretical frameworks as other emergent themes arose (Hesse-Biber, 2010).

Limitations

There were three main limitations of this study. First, the study was limited by the number of people who agreed to participate. There was no incentive to agree to this study; thus the participants had to volunteer to participate in the study. Second, there was a limitation to the analysis of the past tweets. Permission through informed consent to analyze the public Twitter feeds was given through an agreement within the survey disseminated through tweets. As a result, if permission to analyze the tweets was not given, then the analysis could not occur, hindering full triangulation of the study. Finally, the analysis was only a snapshot of the user's Twitter use in September 2015. The goal was for the semi-structured interviews to garner a more rounded perspective of the overall use.

CHAPTER FOUR: FINDINGS

The purpose of this mixed methods study was to examine whether current uses of Twitter by educators correlated with the literature on the uses and advantages of using Twitter in education through an examination of United States educators and WV educators. This study examined the use of current instructional strategies use on Twitter by US and WV educators, current professional development use on Twitter by US and WV educators, current personal learning networks use by US and WV educators, and current barriers and challenges educators face in using Twitter professionally. The findings in this chapter are organized into the following sections: demographics, major findings for each of the four research questions investigated, and ancillary findings.

The research questions were answered using both quantitative and qualitative data obtained through a self-reporting survey, content analysis of Twitter feeds, and semi-structured interviews. There were 97 responses to the self-reporting survey, 78 Twitter feeds analyzed for content, and 8 semi-structured interviews. The survey, titled *Education All A'Twitter: Twitter's Role in Educational Technology,* consisted of seven items (see Appendix F). The first four questions obtained demographic data. The fifth question provided a Likert scale (1-*Never*, 2-*Rarely*, 3-*Occassionally*, 4-*Often*, 5-*Daily*) to report Twitter use in the areas of instructional strategies, professional development, personal learning networks, and non-educational use. The sixth and seventh questions asked for permission for analysis of the Twitter feed and participation in the semi-structured interviews, respectively.

The content analysis was completed using the participants' Twitter feeds from September 2015, coded within the researcher-created organizational chart (see Appendix B). First, the organizational chart collected demographic data such as geographical location, number of

followers, number following, number of total tweets, and number of tweets. Then, the chart allowed for tallies for the number of non-educational tweets, instructional strategies tweets, professional development tweets, personal learning network tweets, and other educational tweets. Lastly, there were text boxes to record keywords, hashtags, and examples of each type of educational tweet. The coding analysis included review of 2,804 printed pages of tweets (see Appendix I for a summary table).

Finally, the semi-structured interviews were conducted over phone or FaceTime (see Appendix G). Eight semi-structured interviews were conducted between January 28, 2016 and February 12, 2016. In creating the list of selected interview participants, the population started with those who gave permission in the survey. These 44 were divided into a United States (36) and a West Virginia (8) population. (The researcher did not include two potential participants who were international in this total). Next, the researcher created percentages of use based on the content analysis, in the areas of instructional strategies, professional development, personal learning networks, and non-use. The top users in each category (US-Instructional Strategy [IS], WV-IS, US-Professional Development [PD], WV-PD, US-Personal Learning Networks [PLN], WV-PLN, US-Non-Use [N], WV-N) were contacted through email to determine whether or not they were still interested in participating in an interview and to set up an interview date and time. There were two categories, WV-PLN and US-N, in which the top user was not available for an interview. In these cases, the second highest user for personal learning networks in WV (WV-PLN), and the third highest US non-user for educational purposes (US-N) ended up interviewing for the study. There were seven questions in each interview, and the interviews averaged approximately 30 minutes each. Verbal consent was given at the start of each interview.

Demographics

Demographics were placed at the beginning of the survey. The data collected included self-perception as an educator, the level of education in the participant's workplace (early childhood, primary, secondary, higher education, other), public or private institution, and the participant's state of residence (see Table 2).

Of those responding, 99% (n=96) perceived themselves as educators. For the one participant not perceiving himself as an educator, the survey automatically ended. Participants were asked to choose the grade levels in which they worked, with 3% (n=3) choosing early childhood, 28% (n=32) choosing primary, 50% (n=58) choosing secondary, and 12% (n=14) choosing higher education. For those who chose other (7%, n=8), the following responses were given: department of education, administration, district (K-12), and retired. In regard to whether employment was in either public or private institutions, 88% (n=81) chose public. The final demographic question was in regard to geographical location. Participants had the ability to choose one of the 50 states within the United States or select "other." Out of 89 responses, 10% (n=9) were international, 71% (n=63) were from the United States minus West Virginia, and 19% (n=17) were from West Virginia. Out of the 80 respondents that gave their geographical location as within the United States, the largest number of respondents were from West Virginia (17). The 26 other states with participants included Arizona (2), California (5), Connecticut (3), Georgia (2), Illinois (3), Indiana (3), Iowa (3), Kentucky (2), Louisiana (2), Maryland (2), Massachusetts (3), Michigan (2), Minnesota (3), Missouri (4), New Jersey (1), New York (2), North Carolina (1), North Dakota (2), Ohio (2), Pennsylvania (5), South Carolina (1), Tennessee (5), Texas (2), Vermont (1), Virginia (1), and Wisconsin (1).

Table 2: Demographics of Survey Participants

Characteristics	Overall		US		WV	
	f	%	*f*	%	*f*	%
Self-Selected	*n*=97					
Educator	96	99%				
Non-Educator	1	1%				
Level*	*n*=115		*n*=80		*n*=20	
Early Childhood	3	3%	1	1%		
Primary (K-5)	32	28%	25	31%	3	15%
Secondary (6-12)	58	50%	42	53%	12	60%
Higher Education	14	12%	6	8%	4	20%
Other	8	7%	6	8%	1	5%
Type of Institution	*n*=92		*n*=63		*n*=17	
Public	81	88%	57	90%	16	94%
Private	10	11%	6	10%		
Other	1	1%			1	6%
State	*n*=89					
International	9	10%				
United States[2]	63	71%				
West Virginia	17	19%				

*Participants could select more than one level.

Related demographic data for survey participants who gave permission for their Twitter feeds to be analyzed is included in Table 3. All content analysis participants were educators distributed across all levels of employment (early childhood, 1%; primary, 31%; secondary, 51%; higher education, 9%; other, 8%). The majority served in the public sector (93%), and international (9%), US (74%), and WV (17%) residents were all represented. In reference to the participants' Twitter accounts, demographic information on the number of followers, the number following, the number of overall tweets, and the number of tweets in September were collected from the Twitter analysis. Overall, the majority of participants had 1,000+ followers (44%), yet in West Virginia, most (38%) had between 0-100 followers. In the number of overall tweets sent,

[2] This does not include WV participants.

most (37%) had sent over 5,000+ tweets in September, but for West Virginia participants, most (46%) had sent between 0-500 tweets.

Table 3: Demographics of Content Analysis Participants

Characteristics	Overall		US		WV	
	f	%	*f*	%	*f*	%
Self-Selected	*n*=78					
Educator	78	100%	58	100%	13	100%
Non-Educator						
Level*	*n*=87		*n*=72		*n*=15	
Early Childhood	1	1%	1	1%		
Primary (K-5)	27	31%	25	35%	2	13%
Secondary (6-12)	44	51%	35	49%	9	60%
Higher Education	8	9%	5	7%	3	20%
Other	7	8%	6	8%	1	7%
Type of Institution	*n*=71		*n*=58		*n*=13	
Public	66	93%	53	91%	12	92%
Private	5	7%	5	9%		
Other	1	1%			1	8%
State	*n*=78					
International	7	9%				
United States[3]	58	74%				
West Virginia	13	17%				
Followers	*n*=78		*n*=58		*n*=13	
0-100	15	19%	9	16%	5	38%
101-500	15	19%	13	22%	2	15%
501-1000	14	22%	10	17%	3	23%
1000+	34	44%	26	45%	3	23%
Following	*n*=78		*n*=58		*n*=13	
0-100	10	13%	8	14%	2	15%
101-500	17	22%	10	17%	4	31%
501-1000	21	27%	13	22%	4	31%
1000+	30	38%	27	47%	3	23%
Tweets	*n*=78		*n*=58		*n*=13	
0-500	20	26%	13	22%	6	46%
501-1000	5	6%	4	7%		
1000-5000	24	31%	20	34%	2	15%
5000+	29	37%	21	36%	5	38%

[3] This does not include WV participants.

Characteristics	Overall		US		WV	
	f	%	*f*	%	*f*	%
September Tweets	*n*=78		*n*=58		*n*=13	
0-50	26	33%	18	31%	6	46%
51-100	10	13%	5	9%	3	23%
100-500	33	42%	27	47%	4	31%
500+	9	12%	8	14%		

*Participants could select more than one level.

The demographic information for interview participants is found in Table 4. All participants were educators, with all levels of employment represented (early childhood, 9%; primary, 18%; secondary, 55%; higher education, 9%; other, 9%). The majority served in the public sector (95%), and only US (50%) and WV (50%) users were represented. In reference to the participants' Twitter accounts, demographic information on the number of followers, the number following, the number of overall tweets, and the number of tweets in September were collected from the Twitter accounts. Overall, most of these participants had between 501-1,000 followers (38%), yet in the United States population excluding West Virginia, most (50%) had between 101-500 followers. In the number of overall tweets sent, most (50%) had sent over 5,000 tweets from the account, but for United States participants, most (50%) had sent between 1,000-5,000 tweets.

Table 4: Demographics of Interview Participants

Characteristics	Overall		US		WV	
	f	%	*f*	%	*f*	%
Self-Selected	*n*=8					
Educator	8	100%	4	100%	4	100%
Non-Educator						
Level*	*n*=11		*n*=6		*n*=5	
Early Childhood	1	9%	1	17%		
Primary (K-5)	2	18%	1	17%	1	20%
Secondary (6-12)	6	55%	3	50%	3	60%
Higher Education	1	9%			1	20%
Other	1	9%	1	17%		

Characteristics	Overall		US		WV	
	f	%	*f*	%	*f*	%
Type of Institution	*n*=8		*n*=4		*n*=4	
Public	6	75%	3	75%	3	75%
Private	1	13%	1	25%		
Other	1	13%			1	25%
State	*n*=8					
International						
United States[4]	4	50%				
West Virginia	4	50%				
Followers	*n*=8		*n*=4		*n*=4	
0-100	1	13%			1	25%
101-500	2	25%	2	50%		
501-1000	3	38%	1	25%	2	50%
1000+	2	25%	1	25%	1	25%
Following	*n*=8		*n*=4		*n*=4	
0-100	1	13%	1	25%		
101-500	2	25%	1	25%	1	25%
501-1000	3	38%	1	25%	2	50%
1000+	2	25%	1	25%	1	25%
Tweets	*n*=8		*n*=4		*n*=4	
0-500	2	25%	1	25%	1	25%
501-1000						
1000-5000	2	25%	2	50%		
5000+	4	50%	1	25%	3	75%
September Tweets	*n*=8		*n*=4		*n*=4	
0-50	2	25%	2	50%		
51-100	3	38%	1	25%	2	50%
100-500	3	38%	1	25%	2	50%
500+						

*Participants could select more than one level.

[4] This does not include WV participants.

Major Findings

Research Question 1: Instructional Strategies

The first research question, *To what extent are US and WV educators using Twitter to employ instructional strategies,* was answered through a self-reporting survey, content analysis of Twitter feeds, and semi-structured interviews. Related to this question, there were 90 responses to the self-reporting survey, 78 Twitter feeds analyzed for content, and 8 semi-structured interviews.

Self-reported Twitter use. Through the survey on SurveyMonkey, participants self-reported their respective Twitter use in the area of instructional strategies (see Table 5). Overall, the majority of participants indicated using Twitter Often for instructional strategies (39%). The majority of US participants also indicated Often (42%), while most WV participants indicated using Twitter less (35% Occasionally). Only three participants responded that they Never use Twitter for instructional strategies, with all three coming from West Virginia.

Table 5: Self-Reported Twitter Use for Instructional Strategies

	n	Never		Rarely		Occasionally		Often		Daily	
		f	%	*f*	%	*f*	%	*f*	%	*f*	%
Overall[5]	90	3	3%	4	4%	29	32%	35	39%	19	21%
US	64			2	3%	20	31%	27	42%	15	23%
WV	17	3	18%	1	6%	6	35%	5	29%	2	12%

Observed use of instructional strategies through content analysis. From permission given through SurveyMonkey, 78 Twitter feeds were included in the content analysis. Only 1% (n=226) of all tweets observed fit within the operational definition of an instructional strategies tweet (see Table 6). The majority of participants, 77% (n=60), did not have any tweets categorized as instructional strategies. The percentage of participants demonstrating instructional

[5] Overall also incorporates international responses. Thus, the sum of US and WV responses will not equal the overall n.

strategies was comparable for US (22%) and WV (23%) Twitter users. The range of instructional strategies tweets was from as much as 73 tweets from an international user (Twitter User #73, Appendix I) to as little as 27 tweets from a US user (Twitter User #51); the highest WV user (Twitter User #10) had 39 instructional strategies tweets.

Table 6: Observed Use of Instructional Strategies through Content Analysis

		Sept Strategies by # of Users				Sept Strategies by # of Tweets			
		No Strategies		Some Strategies					
	n	*f*	%	*f*	%	*n*	*f*	%	Range
Overall[6]	78	60	77%	18	23%	18,621	226	1.000%	0-73
US	58	45	78%	13	22%	15,635	105	0.007%	0-27
WV	13	10	77%	3	23%	1,320	43	0.030%	0-39

Hashtags/Keywords. Of the 226 tweets that were classified as instructional strategies, some used identified hashtags that could be traced to a specific course (i.e. #CIEC700) or class account (i.e. @KirrClass). These tweets shared articles related to course information, lecture notes, videos shown in class, and reminders. In some of the tweets identified as instructional strategies, there were examples of classroom activities, i.e. #BudgetChallenge and #PreambleChallenge, which had participation in classrooms from across the United States. There were also examples of specific applications being used, such as @PowToon, @PearDeck, and Google Hangouts, within the classroom, where the application was often tagged in the showcase of the classroom activity. Within the 226 tweets, announcements were the most frequently observed instructional strategy, but as seen in Figure 3, there were many examples of use, although most uses were seen only once each within the single month analyzed.

[6] Overall also incorporates international responses. Thus, the sum of US and WV responses will not equal the overall n.

Figure 3: Instructional strategies Wordle.

Interviews. The interview with the US-IS participant (Twitter user #51, Appendix I) demonstrated how class Twitter accounts were used to connect to the class Instagram account, offered snow day activities, gave daily summaries of what happened in class, provided homework reminders, and included video links related to class content in a K-12 setting. This educator chose Twitter originally because it was easier than updating a website and started using Twitter before smart phones were widespread, when Twitter updates were sent to cellphones through SMS (texting). Twitter allowed this user to communicate even when access to the platform/website/app was limited.

For the WV-IS (Twitter user #10, Appendix I) participant, Twitter was used as a class assignment in higher education. Using Twitter as an assignment was also discussed in the interviews with US-N and WV-N when they were asked how they got started using Twitter. For this particular user, WV-IS, the Twitter assignment was multifaceted and designed to get

educators to see the benefit of using Twitter for educational purposes. Here, the assignment required creating the account; searching and following relevant educational companies, educational organizations, and professional educators; and then tweeting for three to four weeks about ideas, links, and resources relevant to course content. At the end of the three to four weeks, the students were asked to reflect on how they could use Twitter in their professional lives as educators. In addition, this WV-IS participant used Twitter within the classroom as a real, live backchannel about the topic of the meeting. This gave the WV-IS educator a different medium for classroom discussion other than speaking, such as substituting for classroom responders (e.g., clickers, Plickers, or PollEverywhere).

Research Question 2: Professional Development

The second research question, *To what extent are US and WV educators using Twitter to facilitate their own professional development,* was answered through a self-reporting survey, content analysis of Twitter feeds, and semi-structured interviews. For this question, there were 90 responses to the survey, 78 Twitter feeds analyzed for content, and 8 semi-structured interviews.

Self-reported Twitter use. Through the survey on SurveyMonkey, participants self-reported their Twitter use in the area of professional development (see Table 7). Overall, the majority of participants indicated using Twitter Daily for professional development (51%). The majority of US participants also indicated Daily (58%), while most WV participants indicated using Twitter less (29% Often and 29% Daily). Only one WV participant indicated Never using Twitter for professional development.

Table 7: Self-Reported Twitter Use for Professional Development

	n	Never		Rarely		Occasionally		Often		Daily	
		f	%	*f*	%	*f*	%	*f*	%	*f*	%
Overall[7]	90	1	1%	4	4%	7	8%	32	36%	46	51%
US	64			1	2%	2	3%	24	38%	37	58%
WV	17	1	6%	3	18%	3	18%	5	29%	5	29%

Observed use of professional development through content analysis. From permission given through SurveyMonkey, 78 Twitter feeds were included in the content analysis. A large portion of all tweets observed, 34% (n=6,358), fit within the operational definition of a professional development tweet (see Table 8). The majority of participants, 91% (n=71), did have tweets categorized as professional development. The percentage of participants demonstrating professional development was comparable for US (91%) and WV (85%) Twitter users. The range of professional development tweets hit a high of 559 tweets from one US user (Twitter User #60, Appendix I) and 164 tweets from a WV user (Twitter User #3); 9% of the users, including US (9%) and WV (15%) demonstrated no use of Twitter for professional development during the month analyzed.

Table 8: Observed Use of Professional Development through Content Analysis

		Sept Prof. Dev. by # of Users				Sept Prof. Dev. by # of Tweets			
		No Prof. Dev.		Some Prof. Dev.					
	n	*f*	%	*f*	%	*n*	*f*	%	Range
Overall[8]	78	7	9%	71	91%	18,621	6,358	34%	0-559
US	58	5	9%	53	91%	15,635	5,632	36%	0-559
WV	13	2	15%	11	85%	1,320	421	32%	0-164

[7] Overall also incorporates international responses. Thus, the sum of US and WV responses will not equal the overall n.

[8] Overall also incorporates international responses. Thus, the sum of US and WV responses will not equal the overall n.

Hashtags/Keywords. For the 6,358 tweets classified as professional development, some tweets used identified hashtags that could be traced to a specific #edchat (e.g., #satchat, #pblchat) or specific hashtags that are used during #edchats (e.g., #edtech, #STEM). These tweets shared articles, links, blogs, and videos related to #edchat themes, current educational trends, and topics related to the tweeter's content certification or area of interest. In some of the tweets identified as professional development, there were examples of classroom activities, but these activities were shared within a chat, such as #wvedchat or #sunchat, with the purpose of sharing a best practice that was in current use. There were also several avenues tweeted for users to continue designing their own professional development, including conferences, webinars, podcasts, and Periscope, an application used to share information such as parts of a presentation at a conference. Within the 6,358 tweets, article links were the most often represented professional development theme, but as seen in Figure 4, there were many examples of use; a large number of them occurred on established #edchats.

Figure 4: Professional development Wordle.

Interviews. Many of the interviewees (US-IS, WV-IS, US-PD, WV-PD, US-PLN, WV-PLN, WV-N) spoke about using #edchats as a best practice when considering Twitter for professional development. Two specific #edchats were mentioned: #sschat and #wvedchat. Within these chats, the participants discussed being able to learn new ideas and pedagogies from the #edchats, as well as having the opportunity to ask questions, to ask for advice and feedback, and to brainstorm about different situations that arise in education. Many of the #edchats are archived, so if a tweeter was not able to be involved in the synchronous conversation, the information would still be available to review later (US-PD, Twitter user #45). The WV-IS (Twitter user #10) participant also discussed conference hashtags as a way of active note-taking

during the conference. By 'taking notes' on Twitter, the participant was then able to share the feed with others who were interested in specific sessions or the conference as a whole.

Both US-PD (Twitter user #45) and WV-PD (Twitter user #5) participants spoke about pushing out information to other tweeters. Both of these participants work within organizations that have a focus on professional development, and as a result, both participants use Twitter as a medium to share information with other professional educators.

Research Question 3: Personal Learning Networks

The third research question, *To what extent are US and WV educators using Twitter to create their own personal learning networks,* was answered through a self-reporting survey, content analysis of Twitter feeds, and semi-structured interviews. For this question, there were 90 responses to the survey, 78 Twitter feeds analyzed for content, and 8 semi-structured interviews.

Self-reported Twitter use. Through the survey on SurveyMonkey, participants self-reported their respective Twitter use in the area of personal learning networks (see Table 9). Overall, the majority of participants indicated using Twitter Daily for personal learning networks (68%). The majority of US (77%) and WV (53%) participants also indicated Daily use. Two WV participants indicated that they Never use Twitter for personal learning networks.

Table 9: Self-Reported Twitter Use for Personal Learning Networks

	n	Never		Rarely		Occasionally		Often		Daily	
		f	%	*f*	%	*f*	%	*f*	%	*f*	%
Overall[9]	90	2	2%	2	2%	4	4%	21	23%	61	68%
US	64							15	23%	49	77%
WV	17	2	12%	1	6%	3	18%	2	12%	9	53%

[9] Overall also incorporates international responses. Thus, the sum of US and WV responses will not equal the overall n.

Observed use of personal learning networks through content analysis. From permission given through SurveyMonkey, 78 Twitter feeds were included in the content analysis. A large portion of all tweets observed, 47% (n=8,668), fit within the operational definition of a personal learning network tweet (see Table 10). The majority of participants, 87% (n=68), did have tweets categorized as use of personal learning networks. The percentage of participants demonstrating personal learning networks was comparable for US (88%) and WV (85%) Twitter users. The range of personal learning network tweets was as high as 1,366 tweets from a US user (Twitter User #60, Appendix I) and 210 tweets from a WV user (Twitter User #3); no use of personal learning networks was observed for 13% of participants, including both US (12%) and WV (15%) users.

Table 10: Observed Use of Personal Learning Networks through Content Analysis

		Sept PLN by # of Users				Sept PLN by # of Tweets			
		No PLN		Some PLN					
	n	*f*	%	*f*	%	*n*	*f*	%	Range
Overall[10]	78	10	13%	68	87%	18,621	8,668	47%	0-1,366
US	58	7	12%	51	88%	15,635	7,353	47%	0-1,366
WV	13	2	15%	11	85%	1,320	503	38%	0-210

Hashtags/Keywords. The 8,668 tweets classified as personal learning networks were very consistent in that nearly all of the tweets were tagged tweets, direct tweets, replies in a conversation thread, or retweets of tagged tweets. In some of the tweets identified as personal learning networks, there were questions posed to no one user in particular, but then several users would reply in response to the question. Within the 8,668 tweets, replies were the most often demonstrated use within personal learning networks, but as seen in Figure 5, there were few, but strong, examples of use.

[10] Overall also incorporates international responses. Thus, the sum of US and WV responses will not equal the overall n.

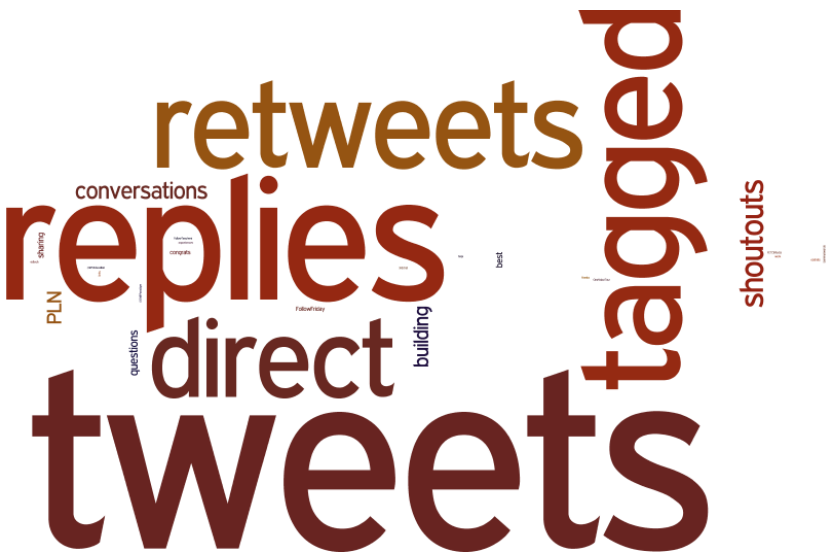


Figure 5: Personal learning networks Wordle

Interviews. At times, educators can feel isolated (US-IS, WV-PLN, US-N), but Twitter has offered a platform that enables the users to connect to other educators that are facing the same type of issues. Often, the issues facing educators are not limited to the personal geographical area, and Twitter has offered a way to connect educators so that they might be able to learn from each other (US-IS, WV-N). The WV-N (Twitter user #8) described members of one of his PLN being from Seattle, Washington, China, and the Middle East.

It is an accepted adage that success in the classroom begins with creating relationships—this was also described within the interviews—for Twitter to be a valuable resource, educators need to be connected to one to another. Many interviewees (WV-IS, US-PD, WV-PD, US-PLN, WV-PLN) relayed that building their PLN began within different #edchats. By participating in #edchats, they were able to connect with other educators, and they were able to learn and support one another. WV-PLN (Twitter user #3) explained it this way: "Professional development by itself might make an impact temporarily, but that ends. If you expose teachers to Twitter without connecting them to people to support them, you are doing them an injustice. Again, education is *all* about relationships."

Twitter allows the user to build his/her own community. As US-N (Twitter user #35) described, "It's all about finding your tribe." In finding a tribe, an educator has the ability to connect with others across the globe (WV-N, Twitter user #8), to receive encouragement to change the status quo (WV-PLN, Twitter user #3), to obtain support from other "life-wide learners" (WV-PD, Twitter user #5), and to create networks that can be profitable in many different professional aspects (WV-IS, Twitter user #10).

Research Question 4: Barriers and Challenges

The fourth research question, *What are the barriers and challenges facing US and WV educators when attempting to employ the use of Twitter professionally,* was answered through eight semi-structured interviews. Within the interviews, there were five themes that emerged from the interview question, *What reasons do you believe educators do not use Twitter professionally.* Participants believe that when it comes to using Twitter professionally, those educators who do not use Twitter feel like they are being told to implement a new tool without understanding its purpose (US-IS), believe Twitter is only for frivolous purposes (US-IS, WV-IS, US-PD, US-N), think the time commitment is too much (US-IS, WV-IS, US-PLN, WV-PLN), feel intimidated in beginning to use a new technological tool (US-IS, WV-PD, WS-N), and have an overall sense of fear (US-IS, WV-IS, WV-PD, US-PLN, WV-PLN, US-N, WV-N).

The face of education changes daily. With the new re-write of the "No Child Left Behind" Act (NCLB), now known as the "Every Student Succeeds" Act (ESSA), educators are given new items daily to incorporate into their profession (WV-PLN, Twitter user #3). In regard to Twitter, some educators could then decide that Twitter is just another tool that they are being told to use, but without understanding why Twitter could be useful to them (US-IS, Twitter user #51). Twitter is then perceived as being frivolous and without professional merit (US-IS, WV-IS,

US-PD, US-N). This reason does correspond with not understanding the potential of Twitter for a professional purpose. One piece of advice that US-IS (Twitter user #51) offered to combat both the lack of understanding of Twitter's purpose in education and the perception of it as trivial, is to explain to educators that Twitter is not like other forms of social media. The user chooses who she wants to follow and can tailor her newsfeed to her own interests, making it as unique to herself as fingerprints.

The third theme, the time commitment, resonated with half of the interviewees. Since many educators in the field did not grow up with technology, the time commitment to learn a new technological tool can feel overwhelming (US-IS, Twitter user #51). Without investing in the application to grow the personal learning network, search out others that will encourage growth, and experience success by using Twitter, the time spent in learning the application will not seem worthwhile (WV-PLN, Twitter user #3). This theme corresponds with the idea of intimidation related to a new technological tool (US-IS, WV-PD, WV-N). WV-IS (Twitter user #10) explained that to overcome intimidation, a new user should start small with meaningful follows and build from there. By starting small, a new user can see what using Twitter professionally is all about and then scaffold skills into following more users and engaging in chats before attempting Twitter use in the classroom.

All but one interview participant spoke about fear being a barrier to educators using Twitter professionally. There is the fear of lost privacy: once something is on the Internet, it is there forever; it becomes part of the user's digital footprint. This realization can cause fear in many educators because, as the WV-N (Twitter user #8) explained, educators get the "lawyer talk" every year about teachers whose lives were ruined by social media. For some, the belief is that they could also be in danger of violating state and/or local boards of education policies

(WV-IS, WV-PD, (US-PLN, US-N, WV-N). The interviewees expressed that fear is difficult to overcome, but that they do not worry about using Twitter professionally because they know that all their interactions are appropriate.

Ancillary Findings

Although the research was designed to answer the four above research questions, there are four findings that can be considered ancillary. These findings include an additional Other category of educational tweets, a strong connection between professional development and personal learning networks, the use of Twitter for non-educational tweets, and the strength of international users.

In the coding analysis, an Other category that had educational intent continued to appear, but could not be identified as one of the three aforementioned categories. As seen in Figure 6, several themes emerged within this Other category.

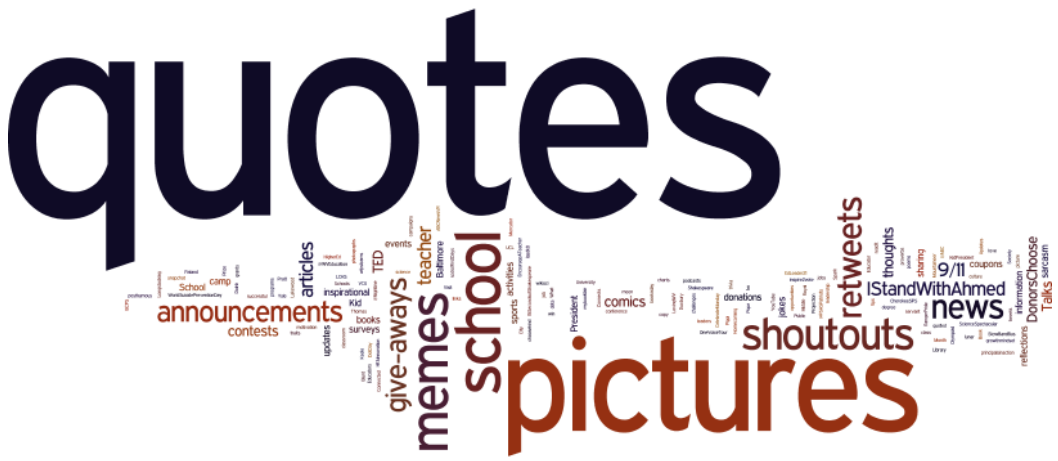
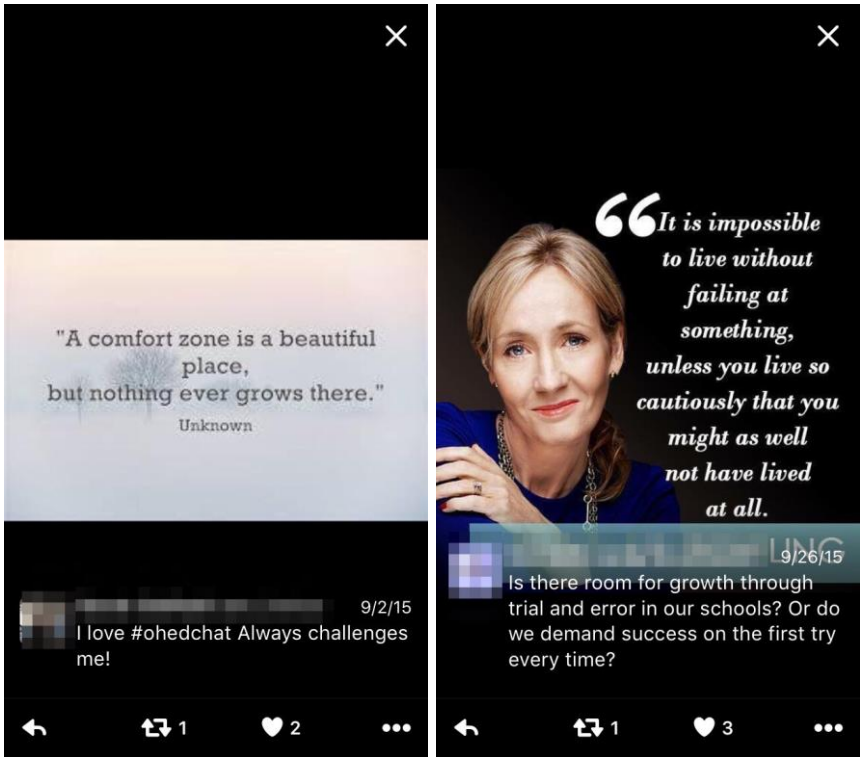


Figure 6: Other educational uses Wordle.

Many of these themes were seen only a few times within the 78 Twitter feeds that were coded (e.g.,@InspireWV, #WorldSuicidePreventionDay, and #DotDay); however there were two areas that continued to present themselves: quotes and inspirational pictures. These quotes and inspirational pictures were not tagged to send to a specific user, but instead were sent to all followers to share in the inspiration the user found in the specific quote and/or picture (see Figure 7).



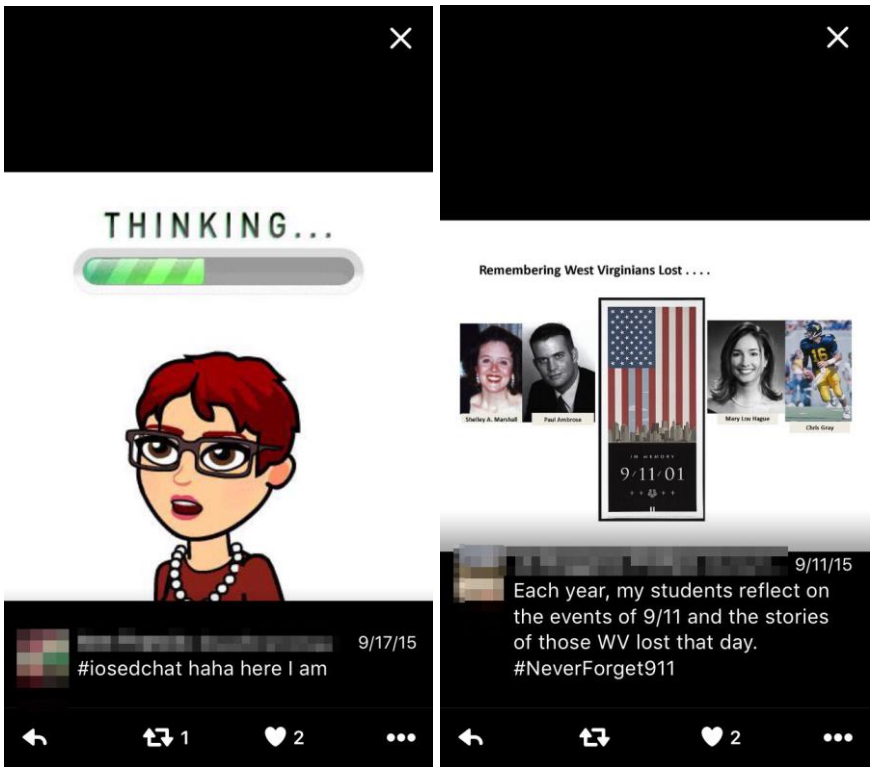


Figure 7: Examples of tweets classified as Other educational use.

Overall, this Other educational use was demonstrated within the Twitter feeds of 85% of users; 11% of all tweets analyzed could fall into this category. The frequency and percentages of use can be seen in Table 11.

Table 11: Observed Other Educational Use through Content Analysis

		Sept Other Ed. by # of Users				Sept Other Ed. by # of Tweets			
		No Other Ed.		Some Other Ed.					
	n	*f*	%	*f*	%	*n*	*f*	%	Range
Overall[11]	78	12	15%	66	85%	18,621	2,135	11%	0-500
US	58	8	14%	50	86%	15,635	1,915	12%	0-500
WV	13	3	23%	10	77%	1,320	99	8%	0-34

There also appeared to be a strong connection between users that had a focus on professional development and a strong personal learning network. Active users in various

[11] Overall also incorporates international responses. Thus, the sum of US and WV responses will not equal the overall n.

#edchats had a similar number of tweets that showed a strong personal learning network. One participant even tweeted, "Do we learn by sharing or by sharing with others?"

Through the survey on SurveyMonkey, participants self-reported their respective Twitter use in the area of non-educational use (see Table 12). Overall, few of the participants indicated using Twitter Daily for non-educational use (15%). This was consistent with the US (10%) and WV (10%) participants who indicated Daily use. US participants most often reported that they Rarely (44%) used Twitter for non-educational use, while most WV participants indicated they Often (44%) used Twitter for non-educational use.

Table 12: Self-Reported Twitter Use for Non-Educational Use

	n	Never		Rarely		Occasionally		Often		Daily	
		f	%	*f*	%	*f*	%	*f*	%	*f*	%
Overall[12]	86	4	5%	30	35%	24	28%	15	17%	13	15%
US	61	2	3%	27	44%	21	34%	5	8%	6	10%
WV	16	2	13%	2	13%	2	13%	7	44%	3	19%

Within the organizational chart, tweets that did not have an educational intent were classified as non-educational. This was done to account for all tweets sent in September. Table 13 shows the non-educational use of Twitter by those participants who had their Twitter feeds analyzed. Overall, 33% of the users analyzed made some non-educational tweets, but non-educational tweets represented only 6% of the overall number of tweets.

Table 13: Observed Non-Educational Use through Content Analysis

		Sept Non-Ed. by # of Users				Sept Non-Ed. by # of Tweets			
		No Non-Ed		Some Non-Ed					
	n	*f*	%	*f*	%	*n*	*f*	%	Range
Overall[13]	78	26	33%	52	67%	18,621	1,054	6%	0-125
US	58	22	38%	36	62%	15,635	630	4%	0-114
WV	13	4	31%	9	69%	1,320	254	19%	0-123

[12] Overall also incorporates international responses. Thus, the sum of US and WV responses will not equal the overall n.

[13] Overall also incorporates international responses. Thus, the sum of US and WV responses will not equal the overall n.

Although not intended in the original design of the study, there were nine international respondents who completed the tweeted survey. Of these international respondents, seven gave permission for the coding analysis. Five of these Twitter accounts had 1,000 or more followers. Like US and WV respondents, professional development and personal learning networks were the most common categories of use. Even though this data set is small (half the size of the WV set), the international participants demonstrated strong use of Twitter for educational purposes.

CHAPTER FIVE: SUMMARY AND DISCUSSION

Introduction

This chapter presents the summary and discussion of research regarding the use of Twitter educationally for both United States educators and West Virginia educators in the areas of instructional strategies, professional development, and personal learning networks. Implications and recommendations for further study derived from the findings of the *Education All A'Twitter: Twitter's Role in Educational Technology* survey, the content analysis of Twitter feeds, and semi-structured interviews are also presented.

Summary of Purpose

The purpose of this study was to examine whether current uses of Twitter by educators correlate with the literature on the uses and advantages of using Twitter in education through the examination of United States educators and West Virginia educators. An in-depth review of the literature supports educational uses of Twitter in the areas of instructional strategies, professional development, and personal learning networks. This study confirms that literature.

Summary of Population

To recruit study participants, 258 tweets were sent across 15 days. These tweets disseminated the survey link that resulted in 97 survey participants. From those 97 survey participants, 78 Twitter feeds were analyzed, and 8 semi-structured interviews were conducted. Demographic information collected in the survey identified participants' work in early childhood (3%), primary (K-5) (28%), secondary (6-12) (50%), and higher education (12%). Overwhelmingly, the participants came from the public sector of education (88%).

Through Twitter Analytics, the researcher was able to determine the overall reach of the tweets. The sum total of views of all the tweets sent equaled approximately 20,000. This does not

mean that 20,000 different tweeters saw the survey tweets, but that the tweets were viewed 20,000 times—one user could account for several of those views. Still, only 97 tweeters responded to the survey. This became especially interesting to the researcher because it strengthens the theory that Twitter users can be, and often are, consumers of information who "lurk" within the environment to read and learn, but rarely interact (Nielsen, 2006). Nielsen (2006) reported that only 1% of users are responsible for the majority of the interaction on online communities. Furthermore, the US-N interviewee explained that he regularly uses Twitter for professional development. Although he did not send out a large number of tweets, he consumed information from a variety of #edchats and felt his time on Twitter was valuable.

Summary and Discussion of Related Literature

As forms of technology continue to emerge in our schools, we must ensure that we are selecting appropriate technologies for the tasks at hand (Pinker, 2015). From reviewing what Twitter is and its purposes for both personal and professional use, it can be ascertained that Twitter has value in the field of education. From the review of literature, three themes emerged on how educators can use Twitter as a valuable educational resource for instructional strategies, professional development, and personal learning networks. This study determined to what extent United States and West Virginia educators use Twitter for these educational purposes. The survey, *Education All A'Twitter: Twitter's Role in Educational Technology,* allowed participants to self-report their Twitter use in the areas of instructional strategies, professional development, personal learning networks, and non-educational use. The content analysis then analyzed the Twitter feeds to count and record keywords and hashtags to identify non-educational, instructional strategies, professional development, personal learning networks, or other educational use. Finally, the semi-structured interviews delved deeper into the uses of Twitter

and barriers to use from the perspectives of both United States and West Virginia educators. Multiple methods were used to triangulate the findings between self-reported and observed use of Twitter and to learn more about the perspectives of participants.

Overall, the researcher looked to classify each educationally-based tweet into one of four categories. Some uses could be classified in multiple categories, if the use was to report news (Bollen et al, 2009 & Java et al., 2006), share knowledge and resources (Bollen et al., 2009, Carpenter & Krutka, 2014, Java et al., 2006, & Veletsianos, 2011), or collaborate with other educators (Carpenter & Krutka, 2014); in these cases, the researcher then needed to discern the intent of the tweet by its specific content.

Triangulation of the data revealed use that corresponded with the literature. The research also revealed four ancillary findings, discussed below, that were not clear within the literature. Conclusions related to each research question follow along with discussion of related literature.

Research Question 1: Instructional Strategies

Research question one asks, *To what extent are US and WV educators using Twitter to employ instructional strategies?* Analysis of self-reported data shows that the majority of US participants believe that they use Twitter Often (42%) for instructional strategies, while most WV participants indicate using Twitter only Occasionally (35%). However, the percentage of participants demonstrating instructional strategies during the September 2015 content analysis was comparable for US (22%) and WV (23%) Twitter users. In both self-reported use as well as the content analysis, using Twitter for instructional strategies is the educational purpose with the least use. Only 1% (n=226) of all tweets observed fit within the operational definition of an instructional strategies tweet. Within the 226 tweets, announcements were the most frequently observed instructional strategy. In addition to announcements, other observed instructional

strategies included sharing of course-related articles, lecture notes, videos, reminders, activities, and software applications. Interviews contributed more detailed examples of use, along with discussion of reasons why so many people do not use Twitter for instructional strategies.

Examples from both US and WV educators of instructional strategy use supported the literature and included sharing course information (Chen & Chen, 2012), lecture notes (Veletsianos, 2011), videos shown in class (Miners, 2009), reminders (Carpenter & Krutka, August 2014), class hashtags (Vela, 2011), and class accounts. Although donated equipment was referenced in the literature review as an instructional strategy (Davis, M., 2010), the only reference to donated equipment in the content analysis was a specific hashtag, #DonorsChoose, referencing the website. The literature had more examples of how to use Twitter for instructional strategies, but this category was, consistently, the least used within this study. The researcher concludes that this is most likely due to fear of using social media with students. The literature (Dixon, 2012), as well as the semi-structured interviews, declared that fear is a large contributing factor as to why educators do not use Twitter professionally. Fear can take many forms: fear of putting themselves on the web, fear of breaking rules and policies, fear of lawyers and lawsuits, or fear of incorrectly using the application. Nevertheless, fear, in whatever form, keeps many educators from using Twitter as an instructional strategy.

Although there is more literature about the different uses of Twitter in regard to instructional strategies, it is the area that is used least often, comparatively, with both US and WV educators. However, the uses found through both the content analysis, as well as the semi-structured interviews, supported the literature (Bollen et al., 2009, Carpenter & Krutka, August 2014 & Java et al., 2006). Research Question 4 focuses on barriers and challenges of using Twitter professionally, but the underlying response from the interview participants in regard to

instructional use of Twitter was that it is the most difficult to incorporate and remain consistent for it to be an effective tool within the classroom as an instructional strategy. Twitter can present opportunities that other technological tools cannot, but for those educators not using Twitter, the benefit must not outweigh the risk.

Research Question 2: Professional Development

Research question two asks, *To what extent are US and WV educators using Twitter to facilitate their own professional development?* Analysis of self-reported data shows that the majority of US participants believe that they use Twitter Daily (58%) for professional development, while most WV participants indicate using Twitter less (29% for both Daily and Often). However, the percentage of participants demonstrating professional development during the September 2015 content analysis was comparable for US (91%) and WV (85%) Twitter users. In both self-reported use and in the content analysis, there is consistent use of Twitter for facilitating professional development. A large portion 34% (n=6,358) of all tweets observed fit within the operational definition of a professional development tweet. Within the 6,358 tweets, participation in #edchats is the most frequently observed professional development use. Other observed professional development uses include sharing articles, links, blogs, videos, conferences, and examples of classroom activities. Interviewees pointed out that users can be consumers of information without putting themselves "out there" for critique and/or scrutiny. This ability makes professional development easier as a way to get started with Twitter and allows the user to still reap benefits of Twitter.

The literature is brief concerning the use of Twitter for professional development and focuses mainly on use during conferences (Davis, K., 2012; Reinhardt et al., 2009), but all uses found through both the content analysis, as well as the semi-structured interviews, correspond

with the literature (Bollen et al., 2009; Carpenter & Krutka, August 2014; Java et al., 2006; Veletsianos, 2011). Conference use is sporadic within the content analysis, as live-tweeting from a conference means the user is at the conference. #Edchats are used more frequently, as those are all virtual, and do not require the user to be at any specific location. Through following conference hashtags, participating in #edchats, as well as disseminating information, Twitter allows professionals to design their own professional development. Although the avenues seem few, with conferences and #edchats being the primary sources, the value is strong because there are hundreds of #edchats, and nearly every national and international conference has a hashtag to follow. The users are only limited by their own choices—there seem to be no limits to the professional learning opportunities on Twitter.

As mentioned in two of the interviews, some states and institutions of higher education are working on providing professional development/continuing education credit for those educators involved in using Twitter to grow as professionals (WV-PD, WV-PLN). Users of Twitter for professional development only foresee their use continuing and growing. An interviewee (WV-PD) explained that these users do not have another avenue of being "life-wide learners" that gives them the same opportunities and depth of knowledge as Twitter does. The users feel that they must keep growing as educators in order to benefit their students—school-based professional development is not giving them what they need. Instead, they have taken to Twitter to continue to polish their craft, and they feel that credit should be given for doing so.

Research Question 3: Personal Learning Networks

Research question three asks, *To what extent are US and WV educators using Twitter to create their own personal learning networks?* Analysis of self-reported data shows that the majority of US participants believe that they use Twitter Daily (77%) for personal learning

networks, while most WV participants indicate using Twitter slightly less (53% Daily). However, the percentage of participants demonstrating personal learning networks during the September 2015 content analysis is comparable for US (88%) and WV (85%) Twitter users. In self-reported use as well as through the content analysis, there is consistent, continual evidence that Twitter is used by educators to create their own personal learning networks. A large portion, 47% (n=8,668), of all tweets observed fit within the operational definition of a personal learning networks tweet. Within the 8,668 tweets, replies are the most frequently observed representation of personal learning network Twitter usage. Other uses of personal learning networks include direct (or tagged) tweets and retweets. Interviews contributed more detailed examples of use along with discussion of reasons why Twitter lends itself to individualizing a personal learning network.

The literature affirmed that a personal learning network tweet lies in the interaction with others, rather than in the content of the tweet (Carpenter & Krutka, August 2014; Veletsianos, 2011). Creating, maintaining, and sustaining relationships are all pillars of a successful personal learning network. Personal learning networks are not about the number of followers a user has, but about the quality of the interactions with other users.

Personal learning networks seem to influence other elements of Twitter use as well. The data seem to point to a conclusion that the stronger the personal learning network use, the richer the professional development use. As seen within the content analysis, a single tweet could contain an article link, a fact, or even a question. This single tweet could then grow into an in-depth discussion facilitating a spontaneous professional development session. Also, within the content analysis, there is not always a way to know with whom the user is networking, whether a

user is another educator or a student, but all networks grow from the strength of a personal learning network.

Research Question 4: Barriers and Challenges

Research question four asks, *What are the barriers and challenges facing US and WV educators when attempting to employ the use of Twitter professionally?* This question, answered through the semi-structured interviews, supports the literature (Dixon, 2012; Faculty Focus, 2009; Hodges, 2010) in the various barriers and challenges that were previously identified. Through the interviews, five themes emerged. Educators who do not use Twitter may think that they are being told to implement a new tool without understanding its purpose, that Twitter is only for frivolous purposes, and that the time commitment is too great. In addition, those educators who do not use Twitter may also feel intimidated in beginning a new technological tool or experience an overall sense of fear when it comes to Twitter use.

Dixon (2012) reported that educators are hesitant to delve into social media for several reasons: technology is unreliable, technology is constantly changing, it takes too much time to learn a new tool to implement it professionally, and they are afraid of making a mistake or breaking something. In addition, educators must also be concerned with state and county/local policies in regard to technology and social media; several WV counties have policies that discourage social media use by educators (Kanawha County Schools, 2012; Logan County Schools, 2012; & Marshall County Schools, 2012).

Although worded differently, many of the concerns cited in the literature were validated by this study. As with all new tools for classroom use and professional growth, there will be barriers and challenges. The goal of using technology within education is not to ignore the barriers and challenges, but instead, to find ways to alleviate the concerns and provide support

for those educators wishing to use technologies like Twitter in the classroom or for professional growth and development.

Ancillary Findings

Although the research was designed to answer the four above research questions, there are four other findings that can be considered ancillary. These findings include an additional category of educational tweets outside of instructional strategies, professional development, and personal learning networks; a strong connection between professional development and personal learning networks; non-educational tweets made by the users; and the high level of use of international users.

In the coding analysis, another category continued to appear as tweets were analyzed that had educational intent but could not be classified into one of the three aforementioned categories; this category was quotes and inspirational pictures. Unlike a direct tweet, these tweets were posted on the user's feed to give all users who read the tweet a source of inspiration and cheer. Similar to the use described as finding emotional support for the profession (Carpenter & Krutka, August 2014), these tweets seem to represent virtual encouragement to the user, PLN, and all others who see the specific tweet. As the researcher is a Twitter user, these inspirational quotes and memes will appear on the feed and, at times, these forms of media will touch the part of the researcher's heart that is called to education, ignites passion, and fuels the fire to work with students. These quotes and memes are then shared to give that intangible piece of educating that holds the passion, with the hope that they can inspire someone else as well.

There also appears to be a strong connection between users that have a focus on using Twitter for professional development and those that use it for personal learning networks. Active users, or users participating by tweeting, in various #edchats correspond with other users at the

same rate, if not more often, than they simply post tweets with a professional development intent. It does not seem that one (professional development or personal learning networks) can be strong without the other. Engaged students are students who are learning; the same could be applied to educators—engaged educators, engaged through active participation with other educators, are educators who are learning and growing.

This study does not focus on non-educational use of Twitter, but it did collect the number of non-educational tweets by each user in the content analysis. There is consistent evidence that some educators also use Twitter for non-educational purposes. The assumptions of this researcher are that not all educators have two separate Twitter accounts (one personal and one professional), and that some educators do not feel uncomfortable blending personal and professional tweets into one account due to fear of "friending" students or interacting with students on a more personal level (Davis, M., 2010).

Finally, the international users within the coding analysis showed great involvement and interaction on Twitter. The majority of the international respondents gave permission for Twitter feed analysis and for interviews. Although the international respondents were included in the content analysis, they were not considered for the interview portion because they were not originally intended for the study. These participants were not just consumers of information, they were active participants.

Implications for Action

The educational community assumes that technology within the classroom is a valuable practice. While there is no definitive, existing evidence of the profitable nature of using technology in the classroom, it is an accepted practice nonetheless. Since the practice of using

technology is accepted or even mandated, technological tools that have purposeful application should be reviewed for their uses and applicability.

This study examined Twitter's use for instructional strategies, professional development, and personal learning networks for both US and WV educators. It appears that US and WV educators have similar practices in the use of Twitter professionally. Thus, implications for actions are not limited to US and WV, but applied to the educational community as a whole. These implications are as follows:

1. Although only 1% of the tweets were classified as instructional strategies, educators can use the cases discovered through this study, along with current literature, as models of best practice in using Twitter to facilitate instruction.
2. This study supports the use of Twitter by educators and administrators as a valuable professional development tool that can facilitate professional growth in multiple content areas (#aplitchat), grade levels (#1stchat), technological applications (#dojochat), or specializations (#spedchat).
3. Educators, looking to expand their professional networks, can use ideas from this study as a means to begin creating a personal learning network. Twitter allows educators to find others with similar interests and pedagogies.
4. From the feedback provided in the interviews, to facilitate more participation from educators on Twitter, there needs to be basic instruction on the Twitter platform, guidance on starting small and building interactions, and have continual feedback in growing and developing a presence on Twitter that can allow educators to benefit.

5. In an effort to combat the barriers and challenges in using Twitter professionally, this study can be used to defend appropriate policy in regard to educators using Twitter professionally—in and out of the classroom.
6. Since the breadth of literature on social media, and specifically Twitter, is slim, this study offers researchers another layer of information to delve further into using social media, and Twitter, professionally within education.

Recommendations for Future Research

As declared in Chapter 2, there have only been three dissertations (Davis, K., 2012, Deyamport, 2013 & Hirsh, 2012) written on Twitter's use in education. Additionally, this study is unique in that the goal was to compare current use to uses found in the literature, as well as to compare the uses of US and WV educators. As the field of social media, including Twitter, within education continues to grow, the depth and breadth of the research will continue to grow as well. There is no limit to the future research for social media and/or Twitter in education; this researcher's recommendations for further research include the following items:

1. Replication of this study, with dissemination from other accounts (other than @MrsLowe2001), to aid in the generalization of the study.
2. Content analysis with specific groups (early childhood, primary, secondary, higher education, administration) to determine themes within use for instructional strategies, professional development, and personal learning networks.
3. Semi-structured interviews with specific groups (early childhood, primary, secondary, higher education, administration) to collect more in-depth information of uses, barriers, challenges, and successes specific to each group.

4. A study focused on each of the specific barriers and challenges identified in research question four could result in better courses of action when implementing new technological tools such as Twitter.
5. Contrasting users and non-users within schools/districts with surveys and interviews to determine additional barriers and challenges, as well as possible ways to offer support and guidance.
6. Focus groups with students regarding their perceptions of Twitter and how they feel it could be incorporated within their courses to show willingness of students to use social media for instructional purposes.
7. A study focused on the intent, use, and frequency of use of inspirational pictures and quotes within a professional nature (warranted by the ancillary data).
8. A study focused on the correlation between professional development and personal learning networks (warranted by the ancillary data).
9. A study focused on the use of international educators as compared to US educators (warranted by the ancillary data).
10. A study focused on issues of student safety and security, including cyberbullying, when using Twitter as an instructional strategy. (This topic was present in the literature, but did not emerge in this study; however, it warrants further attention.)

Summary

When this study began, the researcher had the idea of Twitter being important for educational purposes because of personal experience with the tool and the ability to model digital citizenship, promote relationships, foster communication, engage outside the bell, promote creativity, network, and learn from conferences. Through the literature review, the study shaped

into examining whether current uses of Twitter by educators correlated with the literature on the uses and advantages of using Twitter in education through an examination of United States educators and West Virginia educators. The researcher found that current educational uses of Twitter do align with the literature and that, although the use is less by WV educators, the areas of use are in alignment with US educators. Twitter, as long as it remains in use by the general public, will continue to be valuable for the educator who chooses to use this technological tool.

REFERENCES

@cybraryman1, @conniehamilton, @thomascmurray, @cevans5095, & @jrochelle. (2015). *Education Chats*. Retrieved from https://sites.google.com/site/twittereducationchats/education-chat-official-list

Abe, P., & Jordan, N. (2013). Integrating social media into the classroom curriculum. *About Campus,* 16-20. doi: 10.1002/abc.21107

American Federation of Teachers. (2012a, January/February). Tools for teachers: How social media can help you reach new heights. *American Teacher,* 4.

American Federation of Teachers. (2012b, May/June). Making connections: Social media is being used to organize, mobilize, and educate. *American Teacher,* 8.

Angrosino, M. (2005). *Projects in ethnographic research.* Long Grove, IL: Waveland Press.

Arkansas Professional Licensure Standards Board. (2010). *Recommendations regarding the educational applications of social-networking technology.* Arkansas Department of Education.

Bahner, D., Adkins, E., Patel, N., Donley, C., Nagel, R. & Kman, N. (2012). How we use social media to supplement a novel curriculum in medical education. *Medical Teacher, 34,* 439-444.

Barribeau, P., Butler, B., Corney, J., Doney, M., Gault, J., Gordon, J., . . . Palmquist, M. (1994-2012). *Survey Research, Writing@CSU.* Colorado State University. Retrieved from http://writing.colostate.edu/guides/guide.cfm?guideid=68

Bergman, G., & Lambert, J. (2011). *Geektionary: More than 1,000 words to understand goobs, gamers, orkdorks, and technofreaks.* Avon, MA: Adams Media.

Bernard, H. R., & Ryan, G. (2010). *Qualitative data analysis: Systemic approaches.* Thousand Oaks, CA: Sage.

Billiot, T. (2011). In one online class, Twitter brings students together. *Chronicle of Higher Education*, *58*(6), p. 33.

Blair, A. (2013). Democratising the learning process: The use of Twitter in the teaching of politics and international relations. *Politics*, *33*(2), 135-145.

Blankenship, M. (2011, March). How social media can and should impact higher education. *Education Digest*, 39-42.

Bollen, J., Mao, H., & Zeng, X-J. (2010). *Twitter mood predicts the stock market.* Retrieved from http://arxiv.org/pdf/1010.3003&

Bollen, J., Pepe, A., & Mao, H. (2009). *Modeling public mood and emotion: Twitter sentiment and socio-economic phenomena.* Retrieved from http://arxiv.org/pdf/0911.1583.pdf

Bowers, B. (1990). Initiating change in schools. *Research Roundup*, *6*(3), 1-5.

Brown, D. (2003). Learner-centered conditions that ensure students' success in learning. *Education*, *124*(1), 99-104.

Brown, K. (2003). From teacher-centered to learner-centered curriculum: Improving learning in diverse classrooms. *Education*, *124*(1), 49-54.

California State University Long Beach. (n.d.). *History, the history of computers, and the history of computers in education.* Retrieved from http://www.csulb.edu/~murdock/histofcs.html

Caron, S. (2012). Top 15 educators on Twitter. *Education World*. Retrieved from http://www.educationworld.com/a_curr/top-15-educators-on-twitter.shtml

Carpenter, J., & Krutka, D. (2014, February). Chat it up: Everything you ever wanted to know about Twitter chats but were afraid to ask. *Learning and Leading with Technology*, 10-15.

Carpenter, J., & Krutka, D. (2014, August). How and why educators use Twitter: A survey of the field. *Journal of Research on Technology in Education*, *46*(4), p. 414-434.

Carr, N. (2011). *The Shallows: What the Internet is doing to our brains.* New York: W. W. Norton.

Chen, L., & Chen, T-L. (2012). Use of Twitter for formative evaluation: Reflections on trainer and trainees' experiences. *British Journal of Educational Technology, 43*(2), E49-E52. doi: 10.1111/j.1467-8535.2011.01251.x

Chickering, A., & Ehrmann, S. (1996). Implementing the Seven Principles: Technology as lever. *AAHE Bulletin*, *49*(2), 3-6.

Chickering, A., & Gamson, Z. (1987, March). Seven principles for good practice in undergraduate education. *AAHE Bulletin*, 3-7.

Cohrane, T. (2010). Twitter tales: Facilitating international collaboration with mobile web 2.0. In C.H. Steel, M. J. Keppell, P. Gerbic & S. Housego (Eds), *Curriculum, technology & transformation for an unknown future. Proceedings of ascilite Sydney* (pp. 195-205).

Cox, E. (2010, March/April). Twitter for all: Expanding professional dialogue with social media. *Library Media Connection*, 52-53.

Creswell, J. (2003). *Research design: Qualitative, quantitative, and mixed methods approaches.* (2nd ed.) Thousand Oaks, CA: Sage.

Crews, T., & Stitt-Gohdes, W. (2012). Incorporating Facebook and Twitter in a service-learning project in a business communication course. *Business Communication Quarterly, 75*(1), 76-79.

Cuban, L. (2015, February 5). The lack of evidence-based practice: The case of classroom technology (Part 1). [Web log post]. Retrieved from https://larrycuban.wordpress.com/2015/02/05/the-lack-of-evidence-based-practice-the-case-of-classroom-technology-part-1/

Davis, K. (2012). *Learning in 140 characters: Teachers' perceptions of Twitter for professional development* (Doctoral dissertation). Retrieved from ProQuest Dissertations and Theses database. (Order no. 3531637)

Davis, M. (2010, November). Social networking goes to school. *Education Digest*, 14-19.

Demski, J. (2010). Tweets for teachers. *THE Journal*, *37*(2), 16-18.

Desai, T., Shariff, A., Shariff, A., Kats, M., Fang, X., Christiano, C., & Ferris, M. (2012). Tweeting the meeting: An in-depth analysis of Twitter activity at Kidney Week 2011. *PLoS ONE, 7*(7), 1-9.

Deyamport, W. H. (2013). *An implementation of a Twitter-supported personal learning network to individualize teacher professional development* (Doctoral dissertation). Retrieved from ProQuest Dissertations and Theses database. (Order no. 3559871)

Dixon, B. (2012). *Social media for school leaders: A comprehensive guide to getting the most out of Facebook, Twitter, and other essential web tools.* San Francisco, CA: Jossey-Bass.

Domizi, D. (2013). Microblogging to foster communications and community in a weekly graduate seminar course. *TechTrends, 57*(1), 43-51.

Doran, R. (2009, August 10). Twitter goes to class. *Fairfield County Business Journal*, 18.

Dunlap, J., & Lowenthal, P. (2009a). *Horton hears a tweet.* Retrieved from http://www.educause.edu/ero/article/horton-hears-tweet

Dunlap, J., & Lowenthal, P. (2009b). Tweeting the night away: Using Twitter to enhance social presence. *Journal of Information Systems Education, 20*(2), 129-135.

Educational Technology and Mobile Learning. (2013). *40 Educational tweeters every teacher should follow*. Retrieved from http://www.educatorstechnology.com/2013/12/40-educational-tweeters-every-teacher.html

Ehrmann, S. (1995). Asking the right questions: What does research tell us about technology and higher learning? *Change*, *27*(2), 20-27.

Elavsky, C. M., Mislan, C., & Elavsky, S. (2011, April 27). When talking less is more: Exploring outcomes of Twitter usage in the large-lecture hall. *Learning, Media, and Technology, 36*(3), 215-233.

Evans, D. (2010). *Social media marketing: The next generation of business engagement.* Indianapolis, IN: Wiley.

Ewbank, A., Foulger, T., & Carter, H. (2010). Red Bull, Starbucks, and the changing face of teacher education. *Kappan*, *92*(2), 25-28.

Ezarik, M. (2009, October). Higher ed: A-Twitter or not? *University Business*, 12(9), 14.

Faculty Focus. (2009). *Twitter in higher education: Usage habits and trends of today's college faculty*. Madison, WI: Magna.

Forgie, S., Duff, J., & Ross, S. (2013). Twelve tips for using Twitter as a learning tool in medical education. *Medical Teacher, 35,* 8-14.

Fullan, M. (1982, February). *Implementing educational change: Progress at last.* Paper presented at the meeting of the National Invitational Conference, Warrenton, VA.

Grosseck, G., & Holotescu, C. (2008). *Can we use Twitter for educational activities?* Paper presented at the meeting of the 4th International Scientific Conference eLearning and Software for Education. Bucharest.

Hemmi, A., Bayne, S., & Land, R. (2009). The appropriation and repurposing of social technologies in higher education. *Journal of Computer Assisted Learning*, 25, 19–30. doi: 10.1111/j.1365-2729.2008.00306.x

Henson, K. (2003). Foundations for learner-centered education: A knowledge base. *Education 124*(1), 5-16.

Hesse-Biber, S. (2010). *Mixed methods research: Merging theory with practice.* New York, NY: Guilford Press.

Higdon, J., Reyerson, K., & McFadden, C. (2011, March 29). *Twitter, Wordle, and ChimeIn as student response pedagogies.* Retrieved from http://www.educause.edu/ero/article/twitter-wordle-and-chimein-student-response-pedagogies

Hiltz, S., & Turoff, M. (2005). Education goes digital: The evolution of online learning and the revolution in higher education. *Communications of the ACM, 48*(10), 59-64.

Hirsh, O. (2012). *The relationship of Twitter use to students' engagement and academic performance in online classes at an urban community college* (Doctoral dissertation). Retrieved from ProQuest Dissertations and Theses database. (Order no. 3545578)

Hodges, C. (2010, June 24). *If you Twitter, will they come?* Retrieved from http://www.educause.edu/ero/article/if-you-twitter-will-they-come

Honeycutt, C., & Herring, S. (2009). *Beyond microblogging: Conversation and collaboration via Twitter.* Paper presented at the forty-second Hawai'i international conference on system sciences (HICSS-42). Los Alamitos, CA: IEEE Press.

Huberman, B., Romero, D., & Wu, F. (2008). Social networks that matter: Twitter under the microscope. *First Monday*, *14*(1).

Huffman, S. (2013). Benefits and pitfalls: Simple guidelines for the use of social networking tools in K-12 education. *Education, 134*(2), 154-160.

Hughes, A., & Palen, L. (2009). *Twitter adoption and use in mass convergence and emergency events.* Paper presented at the 6th international ISCRAM conference. Gothenburg, Sweden.

Janowitz, N. (n.d.). Fandom acts of kindness. *Sports Illustrated,* 74-78.

Java, A., Song, X., Finin, T., & Tseng, B. (2006, August). *Why we Twitter: Understanding microblogging usage and communities*. Paper presented at the Joint 9th WEBKDD and 1st SNA-KDD Workshop 2007, San Jose, CA.

Johnson, K. (2011). The effect of Twitter posts on students' perceptions of instructor credibility. *Learning, Media, and Technology, 36*(1), 21-38. doi: 10.1080/17439884.2010.534798

Johnson, S. (2009, June 5). How Twitter will change the way we live. *Time*. Retrieved from http://www.time.com/time/business/article/0,8599,1902604,00.html

Joly, K. (2009, January). Should you Twitter? Real and effective communication, 140 characters at a time. *University Business*. Retrieved from http://www.universitybusiness.com/article/should-you-twitter

Jugenheimer, D., Kelley, L., Hudson, J., & Bradley, S. (2014). *Advertising and Public Relations Research* (2nd ed. Armonk, New York: M. E. Sharpe.

Junco, R., Elavsky, C. M., & Heiberger, G. (2013). Putting Twitter to the test: Assessing student outcomes for student collaboration, engagement and success. *British Journal of Educational Technology, 44*(2), 273-287.

Junco, R., Heibergert, G., & Loken, E. (2010). The effect of Twitter on college student engagement and grades. *Journal of Computer Assisted Learning.* doi: 10.1111/j.1365-2729.2010.00387.x

Kanawha County Schools. (2012). *Telecommunications network access.* Charleston, WV. Retrieved from http://kcs.kana.k12.wv.us/Document/277

Kanjanapongpaisal, P., Rogers, S., & Bryan, W. (2012, June). *Twitter usage in higher education.* Paper presented at World Conference on Educational Multimedia, Hypermedia, and Telecommunications, Denver, CO.

Kidwai, S., & Imperatore, C. (2011, September). How to use social media as an advocacy tool. *Techniques: Connecting Education and Careers*, *86*(6), 36-39.

Kroski, E. (2008, July). All a Twitter: Want to try microblogging? *School Library Journal*. Retrieved from http://www.slj.com/2008/07/sljarchives/all-a-twitter-want-to-try-microblogging/

Kwak, H., Lee, C., Park, H., & Moon, S. (2010). *What is Twitter, a social network or a new media?* Paper presented at WWW 2010, Raleigh, NC.

Lenhart, A., & Fox, S. (2009). Twitter and status updating. *Pew Internet & American Life Project.* Retrieved from http://www.pewinternet.org/Reports/2009/Twitter-and-status-updating.aspx

Lin, M., Hoffman, E., & Borengasser, C. (2013). Is social media too social for class? A case study for Twitter use. *TechTrends, 57*(2), 39-44.

Logan County Schools. (2012a). Staff network and Internet acceptable use and safety policy. Logan, WV: Logan County Schools.

Logan County Schools. (2012b). Student network and Internet acceptable use and safety policy. Logan, WV: Logan County Schools.

Lowe, R., & Heaton, L. (2012). Are you Tweeting: A brief look at microblogging with Twitter in education. In T. Amiel & B. Wilson (Eds.), *Proceedings of World Conference on Educational Multimedia, Hypermedia, and Telecommunications 2012* (pp. 2729-2733). Chesapeake, VA: AACE.

Lu, A. (2011). Twitter seen evolving inter professional-development tool. *Education Week, 30*(36), 20.

Lytle, R. (2011). *Five unique uses of Twitter in the classroom.* Retrieved from http://www.usnews.com/education/best-colleges/articles/2011/05/24/5...

Mansfield, H. (2009, May). Ten Twitter tips for higher education: Making a home in the Twitterverse, one tweet at a time. *University Business*, 12(5), 27-28.

Marin, V., Negre, F., & Perez, A. (2014). Construction of the foundations of the PLE and PLN for collaborative learning. *Media Education Research Journal, 42*(21), 35-43.

Marino, K. (2013). 10 Educators on Twitter you should follow (but probably don't). *Te@chThought*. Retrieved from http://www.teachthought.com/social-media/10-educators-on-twitter-you-should-follow/

Marshall County Schools. (2012). Educational purpose and acceptable use of electronic resources, technologies and the Internet policy. Moundsville, WV: Marshall County Schools.

Mazer, J., Murphy, R., & Simonds, C. (2007). I'll see you on "Facebook": The effects of computer-mediated teacher self-disclosure on student motivation, affective learning, and classroom climate. *Communication Education, 56*(1), 1-17.

McKenzie, B. (2014). Teaching Twitter: Re-enacting the Paris Commune and the Battle of Stalingrad. *The History Teacher, 47*(3), 355-372.

Miners, Z. (2009). Twitter takes a trip to college. *U.S. News and World Report, 146*(8), 56-57.

Moody, M. (2010). Teaching Twitter and beyond: Tips for incorporating social media in traditional courses. *Journal of Magazine & New Media Research, 11*(2).

Mountain, W. (2009). 'No pessimism': The upbeat story of Twitter and new media. *Chronicle of Higher Education, 56*(2), pp. B18-B19.

National Education Association. (n.d.). Preparing 21st century students for a global society: An educator's guide to the "Four Cs." Retrieved from http://www.nea.org/assets/docs/A-Guide-to-Four-Cs.pdf

Nielsen, J. (2006). The 90-9-1 rule for participation inequality in social media and online communities. *Nielsen Norman Group.* Retrieved from http://www.nngroup.com/articles/participation-inequality/

Pak, A., & Paroubek, P. (2010, May). *Twitter as a corpus for sentiment analysis and opinion mining.* Paper presented at the International Conference on Language Resources and Evaluation. Malta.

Park, S. (2013). The potential of Web 2.0 tools to promote reading engagement in a general education course. *TechTrends, 57*(2), p. 46-53.

Partnership for 21st Century Skills. (n.d.). Teacher guide: K-12 global competence grade-level indicators.

Pinker, S. (2015, January 30). Can students have too much tech? *The New York Times.* Retrieved from http://www.nytimes.com/2015/01/30/opinion/can-students-have-too-much-tech.html?_r=1

Pollard, E. (2014). Tweeting on the backchannel of the jumbo-sized lecture hall: Maximizing collective learning in a world history survey. *The History Teacher*, *47*(3), 329-354.

Profile Rehab. (2010). *How did Twitter start?* Retrieved from http://profilerehab.com/twitter-help/history_of_twitter

Ravitz, J., Mergendoller, J., & Rush, W. (2002, April). *What's school got to do with it? Cautionary tales about correlations between student computer use and academic achievement.* Paper presented at the annual meeting of the American Educational Research Association, New Orleans, LA.

Reinhardt, W., Ebner, M., Beham, G., & Costa, C. (2009). How people are using Twitter during conferences. *Creativity and Innovation Competencies on the Web* (pp. 145-156). Salzburg: EduMedia Conference.

Rheingold, H. (2008). Using social media to teach social media. *New England Journal of Higher Education*, *23*(1), 25-26.

Saeed, N., & Sinnappan, S. (2011). Adoption of Twitter in higher education—a pilot study. In G. Williams, P. Statham, N. Brown & C. Cleland (Eds.), *Changing Demands, Changing Directions. Proceedings of ascilite Hobart* (pp. 1115-1120). Tasmania, Australia.

Schachter, R. (2011, July/August). The social media dilemma. *District Administration*, 47(7), 27-33.

Shim, J., Dekleva, S., Guo, G., & Mittleman, D. (2011). Twitter, Google, iPhone/iPad, and Facebook (TGIF) and smart technology environments: How well do educators

communicate with students via TGIF? *Communications of the Association of Information Systems, 29,* 657-672.

Silver, D. (2011). Twitter meets the Breakfast Club. *Chronicle of Higher Education, 57*(36), pp. B33-B34.

Simon, D. (2011, June 8). *Twitter finds a place in the classroom*. Retrieved from http://articles.cnn.com/2011-06-08/tech/twitter.schol_1_twitter-studen...

Stamatis, B. (2011, November/December). Bridging the digital divide. *American Teacher,* 20.

Stieger, S., & Burger, C. (2010). Let's go formative: Continuous student ratings with Web 2.0 application Twitter. *Cyberpsychology, behavior, and social networking, 13*(2), 163-167.

Thoms, B. (2012). Student perceptions of microblogging: Integrating Twitter with blogging to support learning and interaction. *Journal of Information Technology Education: Innovations in Practice, 11,* 179-197.

Truong, K., & Parry, M. (2010). Twitter flops as admissions tool; colleges are warned about inaccessible e-readers. *Chronicle of Higher Education, 56*(40), p. A13.

Tumasjan, A., Sprenger, T., Sandner, P., & Welpe, I. (2010). *Predicting elections with Twitter: What 140 characters reveal about political sentiment.* Paper presented at the 4th International Association for the Advancement of Artificial Intelligence Conference on Weblogs and Social Media. Munich,Germany.

Twitter. (2014a). *About*. Retrieved from https://about.twitter.com/company

Twitter. (2014b). *The Story of a Tweet.* Retrieved from https://about.twitter.com/what-is-twitter/story-of-a-tweet

Tyma, A. (2011). Connecting with what is out there!: Using Twitter in the large lecture. *Communication Teacher, 25*(3), 175-181.

Vela, L. (2011, June 30). *How to use Facebook and Twitter for education.* Retrieved from http://www.collaborationideas.com/2011/06/how-to-use-facebook-and...

Veletsianos, G. (2011). Higher education scholars' participation and practices on Twitter. *Journal of Computer Assisted Learning, 28*(4), 336-349. doi: 10.1111/j.1365-2729.2011.00449.x

Welch, B., & Bonnan-White, J. (2012). Twittering to increase student engagement in the university classroom. *Knowledge Management & E-Learning: An International Journal, 4*(3), 325-345.

West Virginia State Board of Education. (2012). Policy 2460: Educational purpose and acceptable use of electronic resources, technologies and the Internet policy. Charleston, WV: West Virginia State Board of Education.

Williams, J., & Goldberg, M. (2005). The evolution of e-learning. In *Balance, fidelity, mobility: Maintaining the momentum? Proceedings ascilite 2005* (p. 725-728). Retrieved from http://www.ascilite.org/conferences/brisbane05/blogs/proceedings/84_Williams.pdf

Williamson, R. (2013). Using Twitter to teach reader-oriented biblical interpretation: "Tweading" the Gospel of Mark. *Teaching Theology and Religion, 16*(3), 274-286.

Wright, N. (2010). Twittering in teacher education: Reflecting on practicum experiences. *Open Learning, 25*(3), 259-265.

WVEdChat. (2015). *WV Educators on Twitter*. Retrieved from http://www.wvedchat.org/p/wv-educators-on-twitter.html

Young, J. (2008). A professor's tips for using Twitter in the classroom. *The Chronicle of Higher Education*. Retrieved from http://chronicle.com/blogPost/A-Professor-s-Tips-for-Using/3643

Young, J. (2009). 10 High Fliers on Twitter. *Chronicle of Higher Education, 55*(31), pp. A10-A11.

Young, J. (2010). Teaching with Twitter: Not for the faint at heart. *Education Digest*, 75(7), 9-12.

Zax, D. (2009, October). Learning in 140-character bites: Twitter can improve teacher-student communication, in and out of class. *American Society for Engineering Education: PRISM.* Retrieved from http://www.prism-magazine.org/oct09/tt_01.cfm

Zhao, D., & Rosson, M. (2009). How and why people Twitter: The role that micro-blogging plays in informal communication at work. *GROUP '04.* Sannibel Island, Florida, USA. Retrieved from http://pensivepuffin.com/dwmcphd/syllabi/insc547_wi13/papers/microblog/zhao.rosson.Twitter.GROUP09.pdf

APPENDIX A: TWITTER JARGON

When venturing onto the Twitter application, a user may come across any of the following terms that have been made specific to Twitter:

- # (n): The # symbol is used to mark keywords or topics in a tweet (Dixon, 2012, p. 42).
- @username (n): When a username is preceded by the @ symbol on a Twitter post, it becomes a link that that Twitter user's profile (Dixon, 2012, p. 41).
- attwaction (n): When a person has a crush on someone they know only through Twitter (Bergman & Lambert, 2011, p. 101).
- avatar (n): An image or character that represents a user or player in a video game or online (Bergman & Lambert, 2011, p. 102).
- celebritweet (n): Twitters from celebrities or celebrities who Twitter (Bergman & Lambert, 2011, p. 104).
- cross post (v): To post messages or news in many different places on the Internet at the same time (Bergman & Lambert, 2011, p. 105).
- direct message (n): A private message sent through the Twitter platform. This can only be done if the receiver of the direct message is following the sender (Dixon, 2012).
- mashup (n): A combination of different media, such as mixing scenes from a movie with different music or sound (Bergman & Lambert, 2011, p. 11).
- microblogging (n): Blogging in short form, as seen in Twitter and Facebook updates (Bergman & Lambert, 2011, p. 109).
- microblogs (n): Mobile-device-friendly sites that allow users to post short updates from any location and to follow other user's posts. Twitter is the dominant tool in this category (Dixon, 2012, p. 2).

- netizen (n): A person who is hooked into the cyberspace community (Bergman & Lambert, 2011, p. 12).
- newspeak (proper n): From George Orwell's novel *1984*, the artificial reduction of language by the government to remove meaning and turn every concept into a dichotomy, such as good and ungood. The lexicon became diminished as "bad" became "ungood" and "wonderful" became "doubleplusgood" (Bergman & Lambert, 2011, p. 34).
- RT (v): To retweet. To copy and send out someone else's tweet (Bergman & Lambert, 2011, p. 111).
- social object (n): Something shared with others as part of the social media experience on the social web (Evans, 2010, p. 256).
- social media (n): The use of Web-based technologies to transform one-way communication into an interactive online dialogue (Dixon, 2012, p. 2).
- trending topics (n): These are the ten topics being mentioned the most on Twitter at any given time (Dixon, 2012, p. 44).
- troll (n): An annoying person on the Internet that is usually trying to be annoying (Bergman & Lambert, 2011, p. 114).
- twatted (v): Past tense for posting something on Twitter (Bergman & Lambert, 2011, p. 115).
- tweet up (n): To meet up with an acquaintance from Twitter in real life (Bergman & Lambert, 2011, p. 115).
- twitterati (n): Twitter power users who attract thousands of followers (Bergman & Lambert, 2011, p. 115).

APPENDIX B: ORGANIZATIONAL CHART

Name	
Twitter Handle	
Profile Bio	
Geographical Location	
# of Followers	
# Following	
# of Tweets	
# of Tweets September	

Tweets in September:	
Non-Educational	
Educational: Instructional Strategies	
Educational: Professional Development	
Educational: Personal Learning Networks	
Educational: Other	

Keywords, Hashtags, Examples:			
Instructional Strategies	**Professional Development**	**Personal Learning Networks**	**Other**

APPENDIX C: CASE STUDY

The Use of Twitter at Kanawha Valley Community and Technical College's American Sign Language Interpreting Program in Comparison to Chickering and Ehrmann's *Implementing the 7 Principles: Technology as Lever*

The *Seven Principles for Good Practice in Undergraduate Education* was created by Chickering and Gamson (1987), but Chickering and Ehrmann (1996) later took a different perspective in *Implementing the Seven Principles: Technology as Lever*. Here, the authors viewed the seven principles through the lens of technology as a whole; however, each principle can be viewed through the use of Twitter and how Twitter can be used to implement each principle (Dunlap & Lowenthal, 2009a; Junco et al., 2010). Using the Seven Principles as a guide, Junco et al. (2013) proposed the following activities for using Twitter in the classroom: continuous class discussions, asking questions in a low-stress manner, book discussion, class reminders, campus event reminders, academic and personal support, connecting with other students and faculty, organizing service-learning projects, organizing study groups, and using Twitter as a platform for optional and required assignments. At Kanawha Valley Community and Technical College (KVCTC) (now known as BridgeValley Community and Technical College), in South Charleston, West Virginia, Twitter has been used over the past several years in the American Sign Language Interpreting Program as a form of best practice (Lowe & Heaton, 2012). Using Chickering and Ehrmann's (1996) explanations of best practice using technology, the uses of Twitter from KVCTC can be explained through Chickering and Ehrmann's principles.

Kanawha Valley Community and Technical College is using Twitter in its American Sign Language Interpreting Program (KVCTC-ASLI). According to program instructors, the

population of Deaf is not large in the Kanawha Valley (Charleston-Huntington area), but being accepted into Deaf culture is an integral part of being an interpreter. Since there is not a large group in which to immerse the students, the students are instead immersed into Deaf culture through Twitter. First, students are required to create a Twitter account and follow the instructor and fellow classmates. Then they are required to follow accounts of those in Deaf culture such as Marlee Matlin (@MarleeMatlin), deaf actress and activist; Keith Wann (@KeithWann), ASL master interpreter and CODA (Child of Deaf Adults); and other members of Deaf culture (e.g., Deaf/Hard-of-Hearing, CODAs, interpreters, and specific accounts such as Deaf Politics Blog or Deaf News Today). Next, they are required, at least once a week, to tweet to the instructor something they have learned from the previous week's tweets. These responses are then discussed within the classroom setting so that all can discuss and learn from the previous week's interactions (Lowe & Heaton, 2012).

The instructors have observed interactions between their students and Keith Wann, Deaf Politics Blog, and ABC Family (sponsor of *Switched at Birth*, a show that revolves heavily around Deaf culture). Students also tweet and have chats throughout the week and on weekends with each other and members of Deaf culture across the United States, giving encouragement to the instructors that the students are becoming immersed within the Deaf world (Lowe & Heaton, 2012).

Twitter and the Seven Principles

1. *Good Practice Encourages Contacts Between Students and Faculty*

   Years ago, students communicated with faculty solely face-to-face. Then email became an accepted means of communication. Today, email is often seen as too slow. Twitter, especially with its mobile application, allows nearly instantaneous communication between

and among users. By tagging (using the @ symbol followed by a username), the message can be sent directly to the recipient's news feed, along with a notification by either email or SMS (text). Simply offering Twitter as an acceptable form of communication encourages more contact between students and faculty. Mazer, Murphy, and Simonds (2007) found that teachers/professors use of social networking sites (specifically Facebook in this study) may encourage greater communication by creating a more comfortable classroom climate. At KVCTC-ASLI, the instructors use Twitter to send out important announcements, changes in schedules, and notices to check the online classroom, and to answer questions students may have (Lowe & Heaton, 2012).

2. Good Practice Develops Reciprocity and Cooperation Among Students

"Study groups, collaborative learning, group problem solving, and discussion of assignments can all be dramatically strengthened through communication tools" (Chickering & Ehrmman, 1996, ¶10). Twitter is a useful communication tool because it allows for the sharing of ideas with multiple users without requiring usernames, email addresses, or an "acceptance'' on social networking sites. By defining a specific hashtag (the # symbol following by a specific set of letters and/or numbers [Twitter, 2014b]), classmates can communicate with each other without allowing access to their private or personal information. When KVCTC-ASLI students find an article of interest and tweet about it, they often times have conversations with each other about the article (Lowe & Heaton, 2012). In this way, Twitter encourages collaboration between classmates, even when it is not required.

3. Good Practice Uses Active Learning Techniques

Active learning can fall into one of three categories: "learning by doing, time-delayed exchange, and real-time conversation" (Chickering & Ehrmann, 1996, ¶15). Twitter can be

used in each category. There are Twitter accounts for multiple education organizations, journals, new blogs, and professionals. In addition, one can search through Twitter for specific subjects and users to discover information or to participate in a thread (a specific hashtag). Finally, real-time conversation occurs in the Twitter platform through user-to user communication. When the KVCTC-ASLI instructors first ask their students to join Twitter, the instructors offer suggestions of specific news blogs and professionals that are engrossed within Deaf culture for them to follow. The students usually start with these suggestions and then expand their connections within the Deaf world (Lowe & Heaton, 2012).

4. *Good Practice Gives Prompt Feedback*

Many times, feedback occurs in the form of a grade on a test or comments on a paper. Because these forms of assessment are typically used at the end of a unit, the feedback given does not always lead to change. Twitter gives students and teachers a platform to ask questions, clarify issues, and give appropriate feedback in a timely manner. The instructors at KVCTC-ASLI have specific settings set on the Twitter app on their smart phones and they get instant alerts when the students have tweeted them. Until the instructors answer the students, the notification stays on their phones. This helps the instructors respond to the students in a timely manner, as opposed to email, where it is easy for the mail to get lost in the large number of messages received per day (Lowe & Heaton, 2012).

5. *Good Practice Emphasizes Time on Task*

One way that Twitter can emphasize time on task is through time efficiency. Twitter allows research and interaction to occur without needing students and/or faculty to travel to a specific location, wait on class to begin and end, or conduct time-consuming research in a library setting. Twitter also improves time efficiency in the quick way it promotes

student/student and student/teacher communication. Deaf culture, interpreting education materials, and interpreting/signing workshops are scarce in the Kanawha Valley. By using Twitter as a venue for many different assignments, KVCTC-ASLI is able to break down the geographical barriers and still get quality information and applications that can be used in the interpreting classroom and profession (Lowe & Heaton, 2012).

6. Good Practice Communicates High Expectations

Each time a Tweet is posted, it is published on the Internet. This gives an inherent high expectation for self-authorship. In other words, tweets are public—public pressure leads to increased performance. In addition, seeing real-life problems and situations in real-time, reading and participating in conflicting points of view are all forces of motivation to improve comprehension, analysis, and synthesis of information. In addition, Twitter is an opportunity to model and teach about digital citizenship. "Once information is released into cyberspace, it becomes part of a global network" (Huffman, 2013, p. 155). Getting students to understand this principle about Twitter, as well as other forms of social media, communicates that high expectations are required inside and outside the classroom.

7. Good Practice Respects Diverse Talents and Ways of Learning

Twitter allows the sharing of information through concise text, pictures, websites, and video. Twitter encourages collaboration and learning across all demographics and geographical areas. Twitter usage can be diversified for different types of learners, and the ways it can be diversified are nearly endless. Many students connect their Instagram, YouTube, Vine, and/or Facebook accounts to Twitter so that they can use different mediums in addressing their audiences.

APPENDIX D: CALL FOR PARTICIPATION TWEETS

Call for participation! Please click on www.surveymonkey.com/r/MZYSY75 to join a study focusing on educators' use of Twitter!

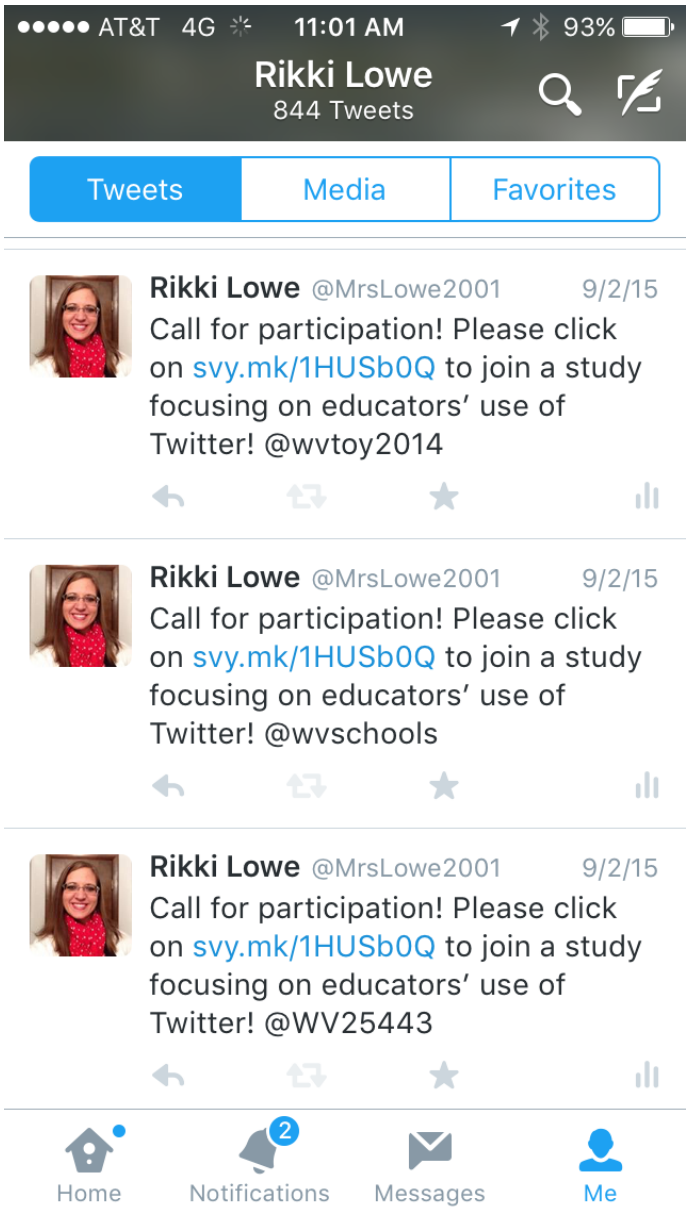


Figure 8: Call for participation tweets example.

APPENDIX E: IRB APPROVAL LETTER

MARSHALL UNIVERSITY
www.marshall.edu

Office of Research Integrity
Institutional Review Board
One John Marshall Drive
Huntington, WV 25755

FWA 00002704

IRB1 #00002205
IRB2 #00003206

August 18, 2015

Lisa Heaton, PhD
College of Education and Professional Development

RE: IRBNet ID# 765809-1
At: Marshall University Institutional Review Board #2 (Social/Behavioral)

Dear Dr. Heaton:

Protocol Title:	[765809-1] Education All A'Twitter: Twitter's Role in Educational Technology	
Expiration Date:	August 18, 2016	
Site Location:	MUGC	
Submission Type:	New Project	APPROVED
Review Type:	Exempt Review	

In accordance with 45CFR46.101(b)(2), the above study and informed consent were granted Exempted approval today by the Marshall University Institutional Review Board #2 (Social/Behavioral) Designee for the period of 12 months. The approval will expire August 18, 2016. A continuing review request for this study must be submitted no later than 30 days prior to the expiration date.

This study is for student Rikki Lowe.

If you have any questions, please contact the Marshall University Institutional Review Board #2 (Social/Behavioral) Coordinator Bruce Day, ThD, CIP at 304-696-4303 or day50@marshall.edu. Please include your study title and reference number in all correspondence with this office.

APPENDIX F: PRE-COLLECTION SURVEY

Confidential Survey Consent

You are invited to participate in a research project entitled "Education All A'Twitter: Twitter's Role in Educational Technology" designed to analyze educators' uses of Twitter in the domains of instructional strategies, professional development, and personal learning networks. This study is being conducted by Lisa Heaton, PhD and Rikki Lowe from Marshall University Graduate College. This study is being conducted as part of a dissertation study for Rikki Lowe, EdD candidate in Curriculum and Instruction.

This survey is comprised of seven questions on SurveyMonkey that should take no longer than 5-10 minutes to complete. Your replies will be confidential. The completion of this survey will also give consent for analysis of your public Twitter feed. There are no known risks involved with this study. Participation is completely voluntary and there will be no penalty or loss of benefits if you choose not to participate in this research study or to withdraw. If you choose not to participate, please exit out of your browser. You may choose to not answer any question by simply leaving it blank, and you may exit the survey at any time. Completing the survey through SurveyMonkey indicates your consent for participation in this study. If you have any questions about the study you may contact Lisa Heaton, PhD at (304) 746-2026 or Rikki Lowe at (304) 881-3292.

The survey can be accessed at https://www.surveymonkey.com/s/MZYSY75

If you have any questions concerning your rights as a research participant you may contact the Marshall University Office of Research Integrity at (304) 696-4303.

By completing this survey and returning it you are also confirming that you are 18 years of age or older.

Thank you for your time and consideration to this study.

Please print and keep this page for your records.

1. Do you consider yourself an educator?

- ◯ Yes
- ◯ No

The following questions collect information for demographic purposes.

2. On what level do you work? Please choose all that apply.

- ☐ Early Childhood (Birth-PreK)
- ☐ Primary (K-5)
- ☐ Secondary (6-12)
- ☐ Higher Education

Other (please specify)

Education All ATwitter: Twitter's Role in Educational Technology

3. Do you work at a private or public institution?

- ◯ Public
- ◯ Private

Other (please specify)

4. In what state/region do you work as an educator?

Listed Alphabetically

United States

Other (please specify)

The following question is to determine your perceived use of Twitter for professional purposes.

5. To what extent do you believe you use Twitter for...?

	Never	Rarely	Occasionally	Often	Daily
Instructional Strategies	◯	◯	◯	◯	◯
Professional Development	◯	◯	◯	◯	◯
Personal Learning Networks	◯	◯	◯	◯	◯
Non-educational Use	◯	◯	◯	◯	◯

6. Please provide your Twitter username.

By providing your username, you are giving the researcher permission to analyze your public Twitter feed for the purposes outlined in the study.

7. If you would like to be contacted for a phone/video interview about your experience with using Twitter educationally, please provide your email address. If you do not want to be contacted, please leave this blank.

Thank you so much for your participation in this study. Your time is very much appreciated. Please follow @MrsLowe2001 if you would like updates to the results of this study.

APPENDIX G: INTERVIEW QUESTIONS

1. Can you tell me about how you got started using Twitter?
2. Can you tell me about how you have used Twitter for instructional strategies?
3. Can you tell me about how you have used Twitter for professional development?
4. Can you tell me about how you have used Twitter for personal learning networks?
5. What reasons do you believe educators do not use Twitter professionally?
6. What reasons do you believe educators do use Twitter professionally?
7. What advice would you give other educators who are interested in using Twitter professionally?

APPENDIX H: HASHTAGS/USERS FOR CALL FOR PARTICIPATION TWEETS

The hashtags were created for specific educational Twitter chats that occur across the United States. The official list, hosted on Google Sites, has been used, with only those chats from foreign countries and specific products being removed for the purpose of this study (@cybraryman1 et al., Education Chats, 2015). The specific usernames for United States educators were taken from self-identified educators who were spotlighted in three separate articles for being top educational tweeters (Caron, 2012; Educational Technology and Mobile Learning, 2013; Marino, 2013). The specific usernames for West Virginia educators were taken from the official #wvedchat database of active users (WVEdChat, 2015).

#123princhat	#artsed	#collabed
#1stchat	#artsedchat	#connectEDtl
#1to1techat	#ASCDL2L	#coteachat
#21stedchat	#atchat	#csk8
#4thchat	#atplc	#ctedlead
#5thchat	#BOOSTchat	#ctedu
#7thchat	#busedu	#currichat
#ADEchat	#byotchat	#CVESDChat
#Admin2B	#caedchat	#DeafEd
#Aledchat	#catholicedchat	#DENchat
#apchat	#ccsschat	#dentonchat
#aphgchat	#CharacterEdChat	#DI4ALL
#aplangchat	#christianeducators	#dojochat
#aplitchat	#colchat	#DualLangChat

#ECEchat
#edchat
#edchatHI
#edchatma
#edchatri
#edmodochat
#edteach
#edtechbridge
#edtechchat
#edtechmath
#edtherapy
#EduAfterHours
#eduality
#educoach
#EdVoice
#EFHSchat
#ELAchat
#elemchat
#ElemMathChat
#ellchat
#elmused
#engchat
#engsschat
#enviroed
#espechat
#FLedchat
#flipclass
#fpslead
#gaed
#gafechat
#GCLchat
#geniushour
#glhsedchat
#globalclassroom
#globaledchat
#gtchat
#Gwinchat
#HigherEd
#hsgovchat
#hybrEdtech
#iaedchat
#IDedchat
#iechat
#ieedchat
#ILEdchat
#INelearn
#inquirychat
#iolchat
#iOSedChat
#ipadchat
#isedchat
#ISTELitChat
#iteachphysics
#jcedchat
#K12artchat
#K12talent
#kinderchat
#ksedchat
#kyadmin
#kyedchat
#LAedchat
#langchat
#LDCchat
#LDchat
#leadupchat
#learnbps
#lidchat
#livedchat
#lrnchat

#LTHEchat
#luthed
#masspchat
#mdedchat
#mdeschat
#MEMSPAchat
#miched
#mnlead
#MOedchat
#mschat
#msla
#msmathchat
#MSSAAchat
#MTedchat
#musedchat
#ncadmin
#nced
#nctechat
#nctlchat
#ndedchat
#nebedchat
#NGSSchat
#nhed
#NJed
#NOVAedchat
#Nt2t
#ntchat
#nyedchat
#ohedchat
#oklaed
#paedchat
#pblchat
#PiChat
#PISDedchat
#precalcchat
#probchat
#profchat
#PSCchat
#psychat
#ptchat
#PubPriBridge
#reflectiveteacher
#Reg5Chat
#RLchat
#RuralEdChat
#satchat
#satchatwc
#sblchat
#sced
#scitlap
#SDedchat
#siedchat
#specialedchat
#spedchat
#sschat
#ssdchat
#sstlap
#sunchat
#suptchat
#TCRWP
#teacheredchat
#TeacherFriends
#teacherpowered
#teacherwellness
#Teachwriting
#Thetitleonechat
#titletalk
#tlap
#TLchat

#TNedchat
#tntechchat
#txed
#txeduchat
#txlchat
#udlchat
#UTedchat
#vachat
#vaslchat
#vedchat
#vted
#WATeachLead
#WeAreWayne
#web20tools
#WeirdEd
#wischat
#wvedchat
#wyoedchat
@2ndgrade_guru
@8amber8
@Albertfralbert
@alemonteachwv
@amoles21
@andreaunionno1
@apmrw
@B_Wagoner
@ben_nesselroad
@bethferguson2
@blennydramaguy
@bmsautism
@brenda_bclark
@captkurt84
@childersbecca
@chrislehmann
@cjobell
@CLBayles
@coachjasonward
@coachnutter3
@coachtimmurray
@CoolCatTeacher
@cpomroy63
@cpriggs8
@cristama
@cswells6
@cybraryman1
@dave_foggin
@dfs45
@doccarpenter
@ejwise08
@Erob1600
@fboss
@friEdTechnology
@gailmhall
@gcouros
@gregcruey
@gregorymerritt1
@groganbee
@gwenjustice
@jacintaylor
@JaimeVanderG
@jazzsmith10
@jcs_super
@JeffEKirby
@jfrashier46
@jilljillshaffer
@jimmahan1961
@jkevin_campbell
@jkupfner
@joshuaratliff

@JustinTarte
@jwkessell2
@karenkarr
@karenlmitchell_
@kellyro69433611
@KenMcNattPro
@kevinmace
@KleinErin
@klphinzman
@Kristy_Vincent
@kristynsmith12
@ksearstis
@kyliekibble
@ladyvolhoops
@larryferiazzo
@letmagic
@lhoskins
@lisawhirtley
@LizBDavis
@losinglady
@luann_bell
@m_busiek
@mackenziemays
@mandybflora
@megan452
@meredith_stover
@mfspivy
@mikelikes2eat
@miss_hahnvandy
@misshahnsings
@mjmsuper
@mollywv
@momcooper3
@mozart26187
@Mr_B_TIS
@Mr_Oldfield
@mramoore99
@MrBMCTC
@MrJason_Jackson
@mrmacer
@mrs_agee_
@Mrs_JulOldfield
@mrs_kfarnsworth
@MrSchuReads
@msestep
@msfrenchteach
@msruddle
@mylak
@nbucka
@nmhs_principal
@PaulSolarz
@pernilleripp
@phsjonas
@pickens_teresa
@PrincipalJ
@profesora94
@profwheeler88
@RafranzDavis
@randyedge1
@retiredjez
@rgriffithjr
@Rogersheike
@ronclarkacademy
@rosejenkinswv
@rsstout
@sandra_a_2009
@sarahfarish
@scragg_osu
@shannonmmiller

@ShiftParadigm
@techwithintent
@TThaught17
@sjunkins
@techyturner
@vickiruble
@SNewco
@themfoxes
@vincentd_debbie
@sshoemaker1115
@TheOCBlog
@web20classroom
@stephanielitton
@tisinaction
@whosaflook
@stimmyjd
@tmcknight126
@WillRich45
@stumpteacher
@TomWhitby
@WMChamberlain
@tan_ashb
@tonyvincent
@WV25443
@teachingKkids
@totalteacher
@wvschools
@TechNinjaTodd
@tstrahin
@wvtoy2014

APPENDIX I: CODING ANALYSIS SUMMARY

	Location (1-WV, 2-US, 3-International)	Followers	Following	Tweets	Number of Instructional Tweets in September	Number of Instructional Strategy Tweets from September	Percentage of Instructional Strategy Tweets from September	Number of Professional Development Tweets from September	Percentage of Professional Development Tweets from September	Number of Personal Learning Networks Tweets from September	Percentage of Personal Learning Network Tweets from September	Number of Other Tweets from September	Percentage of Other Tweets from September
1	1	16	184	0	0	0	0.00%	0	0.00%	0	0.00%	0	0.00%
2	1	172	143	345	40	0	0.00%	11	27.50%	22	55.00%	6	15.00%
3	1	1714	1797	12500	403	0	0.00%	164	40.69%	210	52.11%	17	4.22%
4	1	470	988	1061	75	1	1.33%	23	30.67%	14	18.67%	34	45.33%
5	1	756	466	8082	221	0	0.00%	138	62.44%	8	3.62%	9	4.07%
6	1	67	174	397	16	3	18.75%	9	56.25%	2	12.50%	1	6.25%
7	1	3249	689	3895	223	0	0.00%	28	12.56%	170	76.23%	21	9.42%
8	1	900	773	10100	57	0	0.00%	7	12.28%	13	22.81%	7	12.28%
9	1	805	1299	8820	153	0	0.00%	1	0.65%	28	18.30%	1	0.65%
10	1	85	122	255	56	39	69.64%	3	5.36%	13	23.21%	1	1.79%
11	1	0	1	6	0	0	0.00%	0	0.00%	0	0.00%	0	0.00%
12	1	22	16	69	31	0	0.00%	23	74.19%	8	25.81%	0	0.00%
13	1	1760	2000	21900	45	0	0.00%	14	31.11%	15	33.33%	2	4.44%
14	2	319	523	579	224	0	0.00%	75	33.48%	145	64.73%	2	0.89%
15	2	1094	1206	7422	482	0	0.00%	219	45.44%	182	37.76%	74	15.35%
16	2	2504	2392	27000	992	0	0.00%	297	29.94%	619	62.40%	48	4.84%
17	2	14000	2168	37400	302	0	0.00%	128	42.38%	167	55.30%	2	0.66%
18	2	581	581	3039	124	0	0.00%	59	47.58%	56	45.16%	6	4.84%
19	2	935	779	2734	192	0	0.00%	76	39.58%	114	59.38%	2	1.04%
20	2	865	1286	2103	45	0	0.00%	16	35.56%	16	35.56%	2	4.44%
21	2	958	964	5218	217	8	3.69%	54	24.88%	108	49.77%	37	17.05%
22	2	1341	1693	1845	55	1	1.82%	28	50.91%	20	36.36%	6	10.91%
23	2	400	469	3080	138	3	2.17%	47	34.06%	9	6.52%	13	9.42%
24	2	48	20	87	1	0	0.00%	1	100.00%	0	0.00%	0	0.00%
25	2	41	109	63	3	0	0.00%	1	33.33%	0	0.00%	0	0.00%
26	2	320	265	1510	211	0	0.00%	78	36.97%	129	61.14%	3	1.42%
27	2	310	722	675	29	0	0.00%	18	62.07%	2	6.90%	6	20.69%
28	2	500	803	1224	119	0	0.00%	77	64.71%	28	23.53%	13	10.92%
29	2	360	544	933	69	0	0.00%	58	84.06%	9	13.04%	2	2.90%
30	2	9983	3855	59800	1453	11	0.76%	548	37.72%	800	55.06%	87	5.99%
31	2	1910	1947	3703	135	3	2.22%	58	42.96%	72	53.33%	2	1.48%
32	2	0	1	0	0	0	0.00%	0	0.00%	0	0.00%	0	0.00%
33	2	5531	2720	22300	853	0	0.00%	357	41.85%	445	52.17%	45	5.28%
34	2	546	637	3832	375	0	0.00%	91	24.27%	268	71.47%	15	4.00%
35	2	211	300	198	15	0	0.00%	10	66.67%	5	33.33%	0	0.00%
36	2	4475	1507	26800	917	9	0.98%	66	7.20%	561	61.18%	194	21.16%
37	2	833	1122	2772	26	0	0.00%	15	57.69%	1	3.85%	8	30.77%
38	2	99	151	213			0.00%		0.00%		0.00%		0.00%
39	2	1470	1990	8778	190	0	0.00%	73	38.42%	38	20.00%	70	36.84%
40	2	5643	1990	9506	67	0	0.00%	41	61.19%	26	38.81%	0	0.00%
41	2	1579	1984	3611	677	0	0.00%	184	27.18%	434	64.11%	42	6.20%
42	2	6007	6056	10200	212	0	0.00%	89	41.98%	42	19.81%	77	36.32%
43	2	888	820	6155	259	0	0.00%	220	84.94%	35	13.51%	4	1.54%
44	2	1290	1179	3724	547	0	0.00%	205	37.48%	328	59.96%	3	0.55%
45	2	2954	1905	6235	60	0	0.00%	54	90.00%	5	8.33%	0	0.00%
46	2	555	711	3312	262	0	0.00%	45	17.18%	34	12.98%	170	64.89%
47	2						0.00%		0.00%		0.00%		0.00%
48	2	1389	1814	3564	153	0	0.00%	84	54.90%	55	35.95%	7	4.58%
49	2	3711	3830	40700	460	9	1.96%	131	28.48%	283	61.52%	12	2.61%
50	2	1436	902	8662	104	0	0.00%	55	52.88%	44	42.31%	2	1.92%
51	2	228	69	2231	33	27	81.82%	1	3.03%	2	6.06%	3	9.09%
52	2	4	30	45	30	11	36.67%	0	0.00%	1	3.33%	18	60.00%
53	2	1258	1999	5950	141	0	0.00%	116	82.27%	8	5.67%	7	4.96%
54	2	231	186	6886	158	0	0.00%	68	43.04%	4	2.53%	21	13.29%
55	2	603	394	4159	414	0	0.00%	212	51.21%	146	35.27%	33	7.97%
56	2						0.00%		0.00%		0.00%		0.00%
57	2	4519	1763	20600	48	0	0.00%	34	70.83%	2	4.17%	4	8.33%
58	2	110	108	850	188	0	0.00%	144	76.60%	19	10.11%	25	13.30%
59	2	586	1070	1297	325	5	1.54%	79	24.31%	219	67.38%	22	6.77%
60	2	31000	6113	134000	2476	5	0.20%	559	22.58%	1366	55.17%	500	20.19%
61	2	1066	897	4326	58	0	0.00%	17	29.31%	21	36.21%	20	34.48%
62	2	103	227	448	45	0	0.00%	25	55.56%	0	0.00%	11	24.44%
63	2	3526	3004	22900	112	0	0.00%	23	20.54%	71	63.39%	12	10.71%
64	2	1194	1991	368	103	0	0.00%	89	86.41%	7	6.80%	7	6.80%
65	2	397	786	1911	37	0	0.00%	9	24.32%	12	32.43%	15	40.54%
66	2	53	47	317	38	12	31.58%	8	21.05%	17	44.74%	1	2.63%
67	2	1115	1657	3067	47	0	0.00%	45	95.74%	1	2.13%	1	2.13%
68	2	87	91	229	121	1	0.83%	98	80.99%	13	10.74%	9	7.44%
69	2	159	497	131	20	0	0.00%	4	20.00%	2	10.00%	14	70.00%
70	2	3974	1908	19000	117	0	0.00%	55	47.01%	31	26.50%	15	12.82%
71	2	5846	3985	35400	1156	0	0.00%	488	42.21%	331	28.63%	223	19.29%
72	3	1012	1894	1854	76	0	0.00%	51	67.11%	9	11.84%	12	15.79%
73	3	4699	4326	33100	816	73	8.95%	264	32.35%	417	51.10%	24	2.94%
74	3	6463	288	15900	454	5	1.10%	43	9.47%	315	69.38%	24	5.29%
75	3	4401	3536	11600	90	0	0.00%	3	3.33%	27	30.00%	13	14.44%
76	3	540	486	547	35	0	0.00%	24	68.57%	4	11.43%	5	14.29%
77	3	1246	2001	4328	187	0	0.00%	93	49.73%	40	21.39%	43	22.99%
78	3	26	105	80	8	0	0.00%	7	87.50%	0	0.00%	0	0.00%

CURRICULUM VITAE

Rikki Elaine McCormick Lowe

866 HUDSON STREET, ST. ALBANS, WV 25177
LOWE64@MARSHALL.EDU | 304.881.3292

EDUCATION

2009 – 2016 Marshall University South Charleston, WV
Ed.D., Curriculum and Instruction
Area of Emphasis: Educational Technology
Prospectus Defense July 28, 2015
Final GPA 4.0
Recipient of 2012 EdMedia International Technology Conference Scholarship

2009-2014 Marshall University South Charleston, WV
Ed.S. Curriculum and Instruction
Graduate Certificate: Program Evaluation
Graduate Certificate: Educational Leadership (Administration Certification)
Final GPA 4.0

2006 – 2009 Marshall University South Charleston, WV
Master of Special Education
Final GPA 4.0
Certifications in Specific Learning Disabilities, Mental Impairments, and Behavior Disorders
Highly Qualified: English, 5-AD; Biological Sciences, 9-AD

2001 – 2005 Concord University Athens, WV
Bachelor of Science, Athletic Training
Minors: Biology, Health Promotions, Psychology
Summa Cum Laude
2004-2005 Outstanding Athletic Training Major
Joseph Marsh Scholar of Distinction

PROFESSIONAL EXPERIENCE

2015 – Present Lincoln County Schools Hamlin, WV
Director of Special Education

- Provide leadership and guidance to assure the district establishes and maintains special education programs and related services needed to provide Free and Appropriate Public Education (FAPE) for eligible exceptional students as prescribed in IDEA and WV Policy 2419, The Regulations for the Education of Students with Exceptionalities, as well as to assure compliance with Section 504 and the Americans with Disabilities Act.
- WV CASE Secretary, 2015-Present

2009 – 2015 BridgeValley Community and Technical College South Charleston, WV
Adjunct Faculty

- Co-Founder of the Educational Interpreting Skill Set Programs at BVCTC
- Design curriculum, plans of study, course descriptions, syllabi
- Consult with full-time faculty to evaluate and revise current courses
- Teach traditional and online courses, utilizing WebCT and Edmodo
- Courses taught include *Deaf Culture and History, American Sign Language I, American Sign Language II, Voicing I, Voicing II, Cochlear Implants, Educational*

Interpreting as a Career, Educational Interpreting Principles, Fingerspelling I, Fingerspelling II

2008 – 2015 Putnam County Schools Winfield, WV
Teacher

- Teach students with a variety of disabilities, including Specific Learning Disabilities, Mental Impairments, Behavior Disorders, and Other Health Impairments in consultative, inclusion, and resource settings
- Taught at elementary (Winfield Elementary), middle (Winfield Middle), and high (Poca High) school levels
- Responsible for writing, monitoring, modifying, and implementing Individual Education Programs (IEPs)
- Advise students in developing community service projects to benefit the American Cancer Society and Big Brothers Big Sisters
- School representative for creating school-wide learning outcomes for Putnam County high schools
- President (2012-2013) of Faculty Senate
- Member of the Leadership Team (2012-2015)
- Student Assistance Program Coordinator/504 Coordinator (2014-2015)
- Served as On-Site Supervisor (Spring 2012) for a teacher completing special education certification through Marshall University
- Supervised 19 special education teacher candidates for special education teacher certification at the 2012 Marshall University Summer Academy by providing guidance and feedback through observations and final evaluations
- Site Manager at the 2014 and 2015 Marshall University Summer Academy

2007 – 2008 Putnam County Schools Winfield, WV
Sign Language Interpreter

- Educational interpreter in the elementary school setting (4_{th} grade) for one student
- Responsible for clearly interpreting all spoken language (teacher, student, principal) to the student
- Provided tutoring in subjects in which the student needed one-on-one instruction
- Taught sign language unit within classroom to all students to help further communication between students

2006 – 2007 Kanawha County Schools Charleston, WV
Sign Language Specialist

- Educational interpreter in the high school setting for five students within Algebra I, Geometry, Spanish I, Agriscience, and Learning Skills
- Provided tutoring in subjects in which students needed one-on-one instruction

April 2006-Aug. 2006 Kanawha County Schools Charleston, WV
Substitute Teacher

- Licensed under West Virginia Department of Education Policy 5202
- Short-term permit for General Education, Pre-K thru Adult
- Long-term permit for Biological Sciences, Grade 9 thru Adult

PROFESSIONAL PRESENTATIONS AND PUBLICATIONS

- Lowe, R., and Milliman, J. (2016). Breaking Down Geographical Barriers using Twitter to Bridge Understanding of Deaf Culture. In *Proceedings of American Council on Rural Special Education 2016.* (pp. 87-95). Morgantown, WV: ACRES.
- Accepted to present a paper at the Tenth International Congress of Qualitative Inquiry, May 21-24, 2014 in Urbana, Illinois.

- Lowe, R. (2014). Book Review: *The Shallows: What The Internet is Doing to Our Brains* by Nicholas Carr. *Journal of Technology Education, 25*(2), pgs. 85-87.
- Lowe, R. (2014). The Appalachian Culture and Female Doctoral Students: A Study of the Perception of Influence of Appalachian Culture on Female Doctoral Students at Marshall University Graduate College at Appalachian Studies Conference on March 30, 2014 at Huntington, WV.
- Lowe, R. (2013). "Twitter as a Tool to Promote Curricular Change." Presentation at West Virginia Statewide Technology Conference on July 30, 2013 at Morgantown, WV.
- Lowe, R. (2012). Tweet, tweet, tweet: Using Twitter in Higher Education. Presentation at WVCCA/WVADE on October 24, 2012 at Canaan Valley, WV.
- Lowe, R. (2012). Lara Croft, Call of Duty, and Rockband: A Qualitative Look at Gaming and Education. In *Proceedings of World Conference on Educational Multimedia, Hypermedia and Telecommunications 2012* (pp. 2286-2289). Chesapeake, VA: AACE.
- Lowe, R. and Heaton, L. (2012). Are You Tweeting: A Brief Look at Microblogging with Twitter in Education. In *Proceedings of World Conference on Educational Multimedia, Hypermedia, and Telecommunications 2012* (pp. 2729-2733). Chesapeake, VA: AACE.
- Heaton, L., Bolen, J., Carlson, A., Lawson, K., Lockwood, D., Lowe, R., Rhodes, M., & Shafer, S. (2012). Exploring the Application of Gaming and Gaming Principles in Education (Part Two). In *Proceedings of World Conference on Educational Multimedia, Hypermedia, and Telecommunications 2012* (pp. 2262-2265). Chesapeake, VA: AACE.

SPECIALIZED TRAINING AND CERTIFICATIONS

- Educational Interpreter Proficiency Assessment (EIPA) score of 3.1, Secondary, Pidgin Sign System (PSE)
- Sign Language Proficiency Interview (SLPI), Intermediate Plus
- Wilson Reading System, Level I Certification
- Blackboard 9
- Special Education iPad Facilitator Training from Apple
- PECS Level I Certification

PROFESSIONAL WORKSHOPS ATTENDED

2016

- WV Council for Administrators of Special Education Spring Conference
- American Council on Rural Special Education National Conference
- IT Showcase with the WV Center for Professional Development

2015

- Ruby Payne: A Framework for Understanding Poverty
- IT Showcase with the WV Center for Professional Development
- Mid-Atlantic Athletic Trainers' Association Annual Symposium
- Special Education Directors' Fall Leadership Conference
- WV Council for Administrators of Special Education Fall Conference
- WV Council for Exceptional Children Fall Conference

2014

- Appalachian Studies Conference
- Facilitated iPad Basic and Infusing Technology trainings with the West Virginia Center for Professional Development

2013

- Facilitated iPad Basic and Infusing Technology trainings with the West Virginia Center for Professional Development
- Foundations in Mentoring

- Evaluation Leadership Institute
- High Schools that Work Conference

2012

- WVCCA/WVADE Conference
- EdMedia International Technology Conference
- Special Topics in Autism
- Mimio Technology Overview

2011

- Daily Medications
- Emergency Medications
- Differentiated Instruction
- West Virginia Commission for the Deaf and Hard-of-Hearing Policy and Advocacy

2010

- Administering the DIBELS using PALM
- Co-teaching for Inclusion
- Online IEP Training
- Daily Medications
- Special Education Seminar
- Emergency Medications

2009

- Administering the DIBELS using PALM
- Monarch Grant Writing for Federal Grants
- Developing Behavioral Plans for Children with Aggressive Behaviors
- Wilson Reading System: Just Words
- Wilson Reading System: Wilson Fluency
- Wilson Reading System Overview
- Autism Spectrum Disorders Conference
- AIR: Alternative Identification and Reporting
- Response to Intervention for the Elementary Resource Teacher
- IEP Weaver Training
- Daily Medications
- Emergency Medications
- Technology/Data Systems
- West Virginia Department of Education Reading Research Symposium
- RtI: Response to Intervention
- Blueprints for Intervention
- Alternative Identification Reporting and Response to Intervention Reading: Vocabulary
  and Comprehension
- Alternative Identification Reporting and Response to Intervention: Mathematics
- Co-teaching for Inclusion

2008

- Evaluation of Diagnostic and Clinical Practices
- Administering the DIBELS using PALM
- AIR: Alternative Identification and Reporting: An Overview
- RtI: Response to Intervention
- University of Kansas Learning Strategies
- NIC: It's No Mystery
- American Sign Language for Elementary Settings
- ASL Tool Box
- Effective Instruction for Elementary Struggling Readers who are Deaf or Hard-of-Hearing

Conference

- Smaller Hands, Bigger Challenges: Voicing for Deaf Children II

2007

- Sign Language Interpreting
- EIPA Training
- Interpreting: Pragmatics, Prosody, Lexical
- Interpreter Coach Training
- EIPA Testing and Vocabulary
- Rhetorical Voicing
- International Signs
- English Idioms: PSST…How do you interpret that?
- ASL Role Shifting: He Said, She Said
- Visualize This: Drawing Space with ASL Classifiers
- That's a Wrap! Preparation for the EIPA
- Smaller Hands, Bigger Challenges: Voicing for Deaf Children I
- Creative ASL Cookbook: Recipes for ASL Performance

2006

- Developing Modifications for the Hearing Impaired
- Educational Interpreters: Policy and Practice
- Interpreter Training: Voicing
- Cochlear Implants for the Deaf and Hard-of-Hearing
- Auditory Oral Education