

PERSONAL LEARNING NETWORKS:
EXPLORING THE INFORMATION NEEDS OF EDUCATORS

by

Amanda K. Mossman

An Abstract

of a thesis submitted in partial fulfillment
of the requirements for the degree of
Education Specialist in Learning Resources
in the Department of Educational Leadership and Human Development
University of Central Missouri

August, 2012

ABSTRACT

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In this paper, personal learning networks are examined. It is proposed that educators benefit from examining their information needs and addressing them with the creation and use of personal learning networks. A review of the literature concerning personal learning networks is provided in addition to results from a study conducted with three elementary educators. The study found that while the educators were unfamiliar with the terms Web 2.0 tools and personal learning networks (PLNs), they were in fact already using a few tools and had strategies in place for finding information. By the end of the study, the educators had successfully added the use of more Web 2.0 tools and expanded their personal learning networks.

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CHAPTER 1 INTRODUCTION

Today's professionals, particularly educators, possess a myriad of information needs. Professionals must develop the skills required to understand their information needs and how to meet them. Personal learning networks utilizing Web 2.0 tools have the potential to transform professional development and give educators the opportunity to transform their information-seeking process. Educators benefit from examining their information needs and addressing them with the creation and use of personal learning networks. Personal learning networks (PLNs) are online resources a person turns to in order to learn relevant information about the world around them. The PLN is what the person consults when information is needed in their personal and/or professional lives. It provides ongoing guidance rather than only a simple answer to a query. David Warlick has identified three types of personal learning networks: personally maintained synchronous connections, personally and socially maintained semisynchronous connections, and dynamically maintained asynchronous connections. This thesis looks to examine the current information needs of educators and how they seek and use information. This thesis will examine how three educators use technology in their information search process. The researcher acted as a mentor to the educators by providing them with information concerning personal learning networks and opportunities to explore each other's networks. As the study progressed, the educators were asked to consider their information-seeking behavior, how they participated in professional development, and how they explored strategies for lifelong learning. This was achieved by learning about personal learning

networks. This chapter introduces the benefit of creating and maintaining personal learning networks, as well as the purpose of the study, research questions, limitations and delimitations of the study, definition of terms, and the research design.

Statement of the Problem

Educators have always sought learning opportunities for personal and professional growth. This is increasingly essential in the 21st century when educators are learning to build personal learning networks to organize and use their learning opportunities. Benefits from creating and using personal learning networks include professional growth and overcoming information overload caused by the Internet. This overload is caused by the volume of resources available online and the difficulty that may be experienced while sorting through them to find quality information. Other benefits include being connected to needed information and people through Web 2.0 applications and customized learning tailored to an individual's needs.

Purpose of the Study

This paper presents a review of the literature concerning personal learning networks. The purpose of the study is to illustrate how educators benefit from examining their information needs and addressing them with the creation and use of personal learning networks. Included in this review is a discussion of what personal learning networks are; types of personal learning networks (personally maintained synchronous, personally and socially maintained semisynchronous, and dynamically maintained asynchronous connections); and examples of online tools for creating personal learning networks (iGoogle, Netvibes, Twitter,

Facebook, Google+, Google Reader, Diigo, and Pinterest). Information-seeking behavior, forms of professional development, information literacy standards, and mentoring are also discussed. The last section presents aspects related to reasons for K-12 educators to learn about personal learning networks. Research for this study is being conducted by interviewing three educators and mentoring them, individually and in groups, as they create their own personal learning networks.

Research Questions

This paper is limited to questions about the basic premise of what personal learning networks are and their use in education. The questions are as follows:

1. What are personal learning networks?
2. What are some Web 2.0 tools available for the creation of personal learning networks?
3. How are personal learning networks currently being used in education?
4. What mentoring strategies may help educators as they develop personal learning networks?

Limitations and Delimitations of the Study

Common limitations of this study on personal learning networks include working in a limited time frame and the quality of research previously conducted on personal learning networks which the researcher relied on. The researcher reviewed research in peer-reviewed journals and relied on more rigorous studies found. Other limitations include the chosen research strategy and number of participants. Three individuals volunteered to be included in

this study. The participants were interviewed three times during the course of the study (Appendices A, B, and C). They also participated in two group-learning sessions. Their experiences are not representative of all users of personal learning networks. Rather than relying on large samples and quantitative measures to increase the generalizability of the study, the researcher provided thick, detailed descriptions, drawing on the data gathered from these three subjects and related those experiences to the research reviewed in the literature review.

This paper is meant to address the use of personal learning networks among PreK-12 educators, although the discussion could have extended into higher education. Many of the sources presented here were found by searching databases for peer-reviewed articles. Other online resources have been used, but were limited to those created and published by reputable sources. In some cases, these sources were the blogs of individuals who have written articles for peer-reviewed journals. Most sources were published after 2008. Sources used were limited to those dated 2011 and 2012 as frequently as possible as information on this topic quickly becomes out of date. Every topic in this paper deserves to be further explored. Specific topics explored in this paper include personal learning networks, information-seeking behavior, and professional development. Personal learning environments (PLEs) are similar to personal learning networks and the two terms may at times be used interchangeably. Personal learning environments are only briefly mentioned in this paper. These tools were selected for inclusion in this review because of the number of individuals who use them and the likelihood that they will remain relevant for the foreseeable future.

Definition of Terms

This section provides definitions for the terms used in this paper. More meanings for the terms may be found outside of the ones offered here, but the meanings given convey the sense of how these terms are used in this paper.

Aggregator: a piece of software designed to allow users to subscribe to sites through syndication and automatically download updates from websites and blogs (Crane 24)

Asynchronous: refers to things that do not occur at the same time; digital communication between computers in which there is no timing requirement for transmission (Merriam-Webster, "Asynchronous")

Hashtag: a term to describe the use of the # symbol to mark keywords or topics in a Tweet; these categorize Tweets and occur anywhere in the Tweet (Twitter "What Are Hashtags")

Information-seeking behavior: the "ability to find, gather, organize, and use information" (Spink xi); this is supported today through the use of Web technology (Spink 9)

Mentor: an individual who guides, advises, and offers support to another person ("Mentor, n")

Personal learning environment: system designed around an individual's goals that enable self-directed learning; similar to and has the potential to be used interchangeably with personal learning network (Johnson, Adams, and Haywood 30)

Personal learning network: resources a person turns to in order to learn relevant information about the world around them; ongoing guidance is provided in regard to a person's personal and/or professional life rather than just an answer to a query; there are three

types of personal learning networks: personally maintained synchronous connections, personally and socially maintained semisynchronous connections, and dynamically maintained asynchronous connections

RSS (Really Simple Syndication or Rich Site Summary): a family of Web feed formats used to publish frequently updated content such as blogs, news headlines, and podcasts in a standardized format (Crane 16)

Synchronous: happening at precisely the same time; digital communication between computers in which a common timing signal is established that dictates when individual bits can be transmitted; allows for very high rates of data transfer (Merriam-Webster, “Synchronous”)

Tweet: posts made on Twitter, which are limited to 140 characters

Web 2.0: a growing collection of Web-based tools; most are social in nature (open to interaction among users) such as blogs, wikis, and photo and video sharing sites

Widget: any mini application that pulls information from a server in order to continuously update data displayed to the user, or to have data pre-loaded to browser memory, so as to be available for quick display as needed; also known as a gadget

Research Design

I began my search for information with the database *Library Literature and Information Science Full Text*. From there I moved on to *Academic Search Complete* and *Education Research Complete*. I also referred to articles I had examined while writing the research paper “Personal

Information Portals” for the completion of the Master of Science in Library Science and Information Services from the University of Central Missouri.

I used the following search terms with the different databases: personal learning networks, information-seeking, professional development, iGoogle, and Netvibes. I also searched by author name, looking up researchers who have written articles about my topic and who started appearing in other search results. These people included David Warlick, David Loertscher, Tom Whitby, Will Richardson, and Esther Rosenfeld.

In addition to using databases, I used books from James C. Kirkpatrick Library at the University of Central Missouri, Kent Library at Southeast Missouri State University, and other libraries across the state of Missouri through MOBIUS. My search also included websites such as *Merriam-Webster Online*, Google, Netvibes, Facebook, Twitter, Pinterest, and Diigo. I was also directed to sources by various blog posts read in my Google Reader account.

Summary

This study focuses on the information needs of educators and how they meet those needs. The study also explores educators’ experience with personal learning networks (PLNs). Educators benefit from examining their information needs and addressing them with the creation and use of personal learning networks. Chapter 1 presented the following sections in relation to personal learning networks: statement of the problem, purpose of the study, research questions, limitations and delimitations of the study, definition of terms, and the research design.

Chapter 2 is a review of the literature concerning topics related to personal learning networks. These topics include what personal learning networks are; types of personal learning networks (personally maintained synchronous, personally and socially maintained semisynchronous, and dynamically maintained asynchronous connections); and examples of online tools for creating personal learning networks (iGoogle, Netvibes, Twitter, Facebook, Google+, Google Reader, Diigo, and Pinterest). Information-seeking behavior, forms of professional development, information literacy standards, and mentoring are also discussed. The last section presents aspects related to reasons for PreK-12 educators to learn about personal learning networks.

Chapter 3 discusses the methodology used in this study. Chapter 4 presents the results of the study. Chapter 5 discusses the study's conclusions and answers the research questions presented in Chapter 1.

CHAPTER 2 REVIEW OF THE LITERATURE

Educators seek learning opportunities for personal and professional growth. This is increasingly essential in the 21st century. Mary Ann Harlan noted, “As teachers and as citizens, we are lifelong learners, modeling the same for our students. And so the ability to develop a network and to implement strategies to keep learning throughout our careers is an essential part of our profession” (6).

The Internet has become an indispensable aspect of the lives of millions of individuals around the world. However, the Internet is also a cause of concern for individuals because of its potential to be overwhelming with the amount of information it provides. Marcoux and Loertscher have listed building information spaces as a way for students and adults to turn information and technology into a foundational tool to boost learning. Widgets, RSS feeds linked to blogs, and alerts (email updates of search queries using a service such as Google Alerts), as part of an individual’s personal learning network, provide automatic connections to needed information and people. This personalization allows individuals to take control of their learning (15).

Educators benefit from examining their information needs and addressing them with the creation and use of personal learning networks. Creating and using personal learning networks provide many benefits. A few benefits include professional development growth; gaining power over information overload caused by the Internet; being connected to needed information and people through widgets, RSS feeds, and alerts; and customized learning

tailored to an individual's needs. This paper examines the following topics related to personal learning networks: information-seeking behavior, forms of professional development, and information literacy standards. The discussion then focuses on what personal learning networks are; types of personal learning networks (personally maintained synchronous, personally and socially maintained semisynchronous, and dynamically maintained asynchronous connections); and examples of online tools for creating personal learning networks (iGoogle, Netvibes, Twitter, Facebook, Google+, Google Reader, Diigo, and Pinterest). A section on mentoring precludes the last section, which presents aspects related to reasons for K-12 educators to learn about personal learning networks.

Information-Seeking Behavior

Amanda Spink, in the book *Information Behavior: An Evolutionary Instinct*, explored the information behaviors of humans and asserted that information behavior is not a modern phenomenon occurring from interacting with computing technologies or the Internet (2). Information behavior is defined as the "ability to find, gather, organize and use information" (xi). At present it's increasingly difficult to separate information behaviors from the technologies (such as the Internet) that were designed to support them. Most people today are expected to support their information behavior through the use of Web technology (9). As Aspray and Hayes noted, the Internet isn't the only source of information for Americans (2). Sources include family, friends, community members, professional and social organizations, and media sources (2). Although information-seeking behaviors were present before the Internet, it is possible those behaviors have been reshaped (2).

Most people don't consciously think about their information seeking behavior though they engage in multiple information-seeking processes (Spink 48; 79). Aspray and Hayes provided an example of a typical day of seeking and using information for many individuals. In the example, individuals used a laptop to check stock portfolios, browsed vacation packages online, read a newspaper, read and sent emails, called people, listened to local weather and traffic reports, checked sports scores on a cellphone, and texted friends (1). These activities are aspects of normal, everyday life for many.

People often seek information in some form or another, whether consciously or unconsciously. Information seeking behavior isn't a modern notion. However, it is becoming increasingly difficult to separate these behaviors from the technologies that were designed to support them (Spink 9). The next section demonstrates that educators benefit from examining their own information needs and addressing them with the creation and use of personal learning networks.

Professional Development

When one considers traditional professional development, thoughts may come to mind of attending a conference, a teacher in-service session, or taking a class for credit. As Tom Whitby noted, many states require educators to be provided with or obtain professional development (N.p.). Today, professional development is moving beyond conferences and in-services to learning that is continuous and comes from sources all over the world.

Education Week compiled information regarding professional development in the article titled "Professional Development" (first published in 2004 and updated in 2011). Educators

face complex challenges including student diversity, new technology integration, and the need to meet standards and goals (“Professional Development” N.p.). This has changed the way some individuals consider professional development. *Education Week* referenced a three-part study by the Stanford Center for Opportunity Policy in Education (SCOPE), in partnership with the National Staff Development Council (NSDC), as containing information on professional development trends in the United States (N.p.). Funding for the SCOPE study came from the Bill and Melinda Gates Foundation (Learning Forward). Four states were identified as having high levels of teacher participation in professional development; Missouri, Colorado, Vermont, and New Jersey (Learning Forward). The study found that effective professional development was critically affected by having state policies and systems for ensuring accountability and monitoring professional development (Jaquith et al. 3). Another key factor includes how intermediary organizations extend the reach of state agencies while supporting professional learning and providing a chance for local stakeholders to make their voices heard (4).

Catherine Huber presented assumptions associated with professional learning for K-12 educators. The assumptions involve passing on information, looking for insight from outside the school, and the idea that good planning equates to learning (Huber 42). Huber noted that the administrator has long been seen as the disseminator of information in school districts (42). Information would be passed on from the administrator to the staff members rather than the staff members sharing information. Huber warned of focusing on long-range plans that don’t leave room for emerging issues (42). She recommended incorporating Web 2.0 tools such as wikis, Twitter, Nings, and Moodle into professional learning (Huber 41). These tools enable

ongoing professional learning (46). Whitby also discussed how professional development is becoming increasingly attributed to Web 2.0 tools such as Twitter and LinkedIn. He described how educators are stating that their social media involvement provides the best professional development (N.p.). These Web 2.0 tools offer access to professional development that more closely aligns with what teachers teach and are interested in.

Mary Ann Harlan divided professional development into two categories: professional development 1.0 and professional development 2.0. Professional development 1.0 includes face-to-face conferences, organization membership, online courses, and listservs (10). Professional development 2.0 incorporates RSS feeds and aggregators, blogs, wikis, and tools like Twitter (10).

David Loertscher and Carol Koechlin mentioned a growing trend at professional meetings and conferences, BYOD (Bring Your Own Device) (25-26). Internet connected devices, such as smartphones and tablet computers, allow individuals to update the members of their personal learning networks on topics of interest while at the conference or meeting rather than waiting until they return. This trend could have multiple benefits as long as the devices aren't a distraction.

Richardson and Mancabelli add another acronym in regard to personal learning networks: DIYPD (Do-it-yourself professional development) (33). This trend could be seen as especially popular and worthy of attention in the current time of decreased funding. Personal learning networks have the ability to include subject area experts from around the world at little or no cost to the individual.

This section briefly discussed thoughts concerning professional development. While opinions differ, all agree on the need for continued professional learning. Educators benefit from examining their information needs and addressing them with the creation and use of personal learning networks. Benefits extend to both personal and professional learning.

Information Literacy Standards

Teachers and staff members are charged with helping students master 21st-century information literacy skills. They are called to become masters themselves and effective models of information behavior. State and national standards are in place to guide the information literacy instruction of students. Pertinent to this study are the American Association of School Librarians' *Standards for the 21st-Century Learner* and the Missouri Department of Elementary and Secondary Education's *Information and Communications Technology Literacy Grade Level Expectations*. The International Society for Technology in Education also has standards that address the needs of students, teachers, and administrators.

The American Association of School Librarians presented standards by which learners develop information skills that allow them to use technology as an important tool for learning. The following are just a few of the standards that represent how individuals use personal learning networks to organize, analyze, gather, and share information.

- 1.1.6 Read, view, and listen for information presented in any format (e.g. textual, visual, media, digital) in order to make inferences and gather meaning.
- 1.1.8 Demonstrate mastery of technology tools for accessing information and pursuing inquiry.

1.2.3 Demonstrate creativity by using multiple resources and formats.

1.2.7 Display persistence by continuing to pursue information to gain a broad perspective.

2.1.2 Organize knowledge so that it is useful.

2.1.4 Use technology and other information tools to analyze and organize information.

4.1.4 Seek information for personal learning in a variety of formats and genres.

4.1.7 Use social networks and information tools to gather and share information
(American Association of School Librarians N.p.).

The Missouri Department of Elementary and Secondary Education released Grade Level and End of Course Expectations concerning information literacy for grades K-12. These expectations, known as *Information and Communications Technology Literacy*, outline standards under the following six strands:

1. Follow an inquiry process to construct new understandings, draw conclusions, and create new knowledge.
2. Determine nature and intent of information needed.
3. Access information efficiently and effectively.
4. Evaluate information critically and competently.
5. Use information effectively and creatively.
6. Practice ethical, legal, and safe use of information and technology (Missouri Department of Elementary and Secondary Education).

The use of personal learning networks is one of many ways that these standards are addressed. In order to maintain an effective personal learning network, individuals are required to seek and use information, in multiple formats and from various perspectives, competently; master technology tools for the information seeking process; be able to organize information; and practice the ethical use of information. This is all part of being a master of 21st-century information literacy skills.

In order for students to master 21st-century information literacy skills, through the guidance of these standards, teachers and staff members are called to become masters themselves and effective models of information behavior. The International Society for Technology in Education (ISTE) has standards for teaching known as the National Educational Technology Standards (NETS) (International Society for Technology in Education [ISTE], "ISTE NETS"). These include standards for students, teachers, administrators, coaches, and computer science teachers (ISTE, "ISTE NETS"). Teachers are called to use these standards to improve their professional practice and "provide positive models for students, colleagues, and the community" (ISTE, "ISTE NETS-T"). The NETS-T standards are organized under the following headings:

1. Facilitate and Inspire Student Learning and Creativity
2. Design and Develop Digital Age Learning Experiences and Assessments
3. Model Digital Age Work and Learning
4. Promote and Model Digital Citizenship and Responsibility

5. Engage in Professional Growth and Leadership (International Society for Technology in Education)

Educators benefit from examining their information needs and addressing them with the creation and use of personal learning networks. The standards highlighted here, from the American Association of School Librarians and the Missouri Department of Elementary and Secondary Education, are two examples of how personal learning networks are used to meet information literacy skills standards. The International Society for Technology in Education also provides standards for teaching in the digital age. These standards further the call for teachers to be effective models of information behavior.

Personal Learning Networks

In the past, personal learning networks consisted of only the face-to-face connections in an individual's life. These connections included family, friends, and colleagues, in addition to information gleaned from books, periodicals, television, and radio. Presently, it is becoming increasingly difficult to separate personal learning networks from the Web 2.0 tools that have enhanced their creation and use. Web 2.0 is a term that represents a collection of Web-based software applications. These applications, or tools, are often free, predominantly social in nature, and include blogs, wikis, and photo and video sharing sites.

David Warlick is regarded as an expert and leading contributor of ideas concerning personal learning networks (PLNs). Warlick described his feelings concerning personal learning networks:

This *network of ideas* is one of my favorite aspects of personal learning networks. The people I am connected to are not part of my network because we look the same, speak the same native language, follow the same religious doctrine, or share identical cultural traits. We connect through our ideas, because what we do provokes us to share those ideas, and we all benefit (“Community” N.p.).

Definitions of personal learning networks vary slightly because of their ability to be tailored to fit the needs of individuals. It may also be possible to refer to personal learning networks by other names such as personal learning environments. Richardson and Mancabelli described personal learning networks as a set of offline and online connections that enrich learning (2). The networks are unique, created and developed in accordance with personalized learning goals that evolve over time (3).

Personal learning networks are known for their ability to take on a variety of characteristics. As Ernie Cox noted, “The persistent ambiguity surrounding this concept is actually one of its greatest strengths. PLNs are not a one-size-fits-all t-shirt” (34). In addition to face-to-face connections, personal learning networks use a combination of online tools such as blogs and RSS aggregators like Blogger and Google Reader; social networking sites such as Facebook, Twitter, Google+; and bookmarking sites including Diigo and Delicious. They also include news outlets such as CNN and MSNBC; videos from YouTube and TEDTalks; wikis using a platform such as Wikispaces; and podcasts as part of iTunes U.

Traditional resources such as print journals, face-to-face discussions with colleagues, and conferences are still part of an individual’s personal learning network. However, today’s

technology gives individuals the opportunity to expand their personal learning network in new ways. Kathy Fredrick suggested building a personal learning network in terms of communities, sites about using technology in schools, gurus, professional journals, and professional associations (38-39). She gave examples of specific resources for each of these categories. In terms of communities, Fredrick suggested Nings and Twitter; Eduscapes and WebTools4U2Use for techie stuff; and following gurus such as Doug Johnson, Joyce Valenza, and Will Richardson (38-39). In terms of professional journals and associations, she suggested *Edutopia*, the American Association of School Librarians (AASL), and the International Society for Technology in Education (ISTE) (39).

Terrence Young and Carl Harvey also present thoughts that align with Fredrick's. In their article, "Professional Development on a Shoestring," they discussed traditional and nontraditional options for professional learning. Young and Harvey mentioned their belief that professional journals are still relevant and they noted that many have made conversations and materials available on their websites (19). Information is also found on the Web pages of professional associations such as American Library Association (ALA) and the National Council of Teachers of English (NCTE) (20).

Lisa Nielsen suggested thinking about personal learning network development in terms of five Cs: consider, consume, converse, create, and celebrate (N.p.). These suggestions involved using Web 2.0 tools for personal learning network development. Individuals should consider what a PLN is and how it changes teaching and learning. Consume, converse, and create involve starting to read blogs, joining a social network (such as Facebook, Twitter, and

Google+), commenting on posts, and creating your own posts. The last “C,” celebrate, is for learning how to be a globally connected educator and empowering students to become globally connected as well.

Educators benefit from examining their information needs and addressing them with the creation and use of personal learning networks. Richardson and Mancabelli described personal learning networks as a set of offline and online connections that enrich learning (2). No matter the definition, it is becoming increasingly difficult to separate personal learning networks from the Web 2.0 tools that have enhanced their creation and use. These personal learning networks take on a variety of characteristics because of their ability to be tailored to fit the needs of individuals.

Types of Personal Learning Networks

Individuals use personal learning networks in order to gain guidance about their personal and/or professional lives. Personal learning networks no longer include just the face-to-face connections in an individual’s life. Personal learning networks, using Web 2.0 tools, have extended to connections between individuals all across the world. As David Warlick noted, personal learning networks now allow access to sources of information not previously available in addition to the continually evolving technologies that help individuals fight information overload (13). Information overload refers to the state of having quantities of information to the extent that it is no longer used effectively (Pijers 22). This overload may also be referred to as information glut, cognitive overload, and information fatigue syndrome

among other terms (Pijers 21). Three aspects concerning information overload are the amount of information, diverse information formats, and low quality of information (Pijers 23).

Three main types of personal learning networks are in common use: personally maintained synchronous connections, personally and socially maintained semisynchronous connections, and dynamically maintained asynchronous connections (Warlick "Grow" 13-14). Personally maintained synchronous connections encompass an individual's traditional personal learning network, the people and places an individual would consult when faced with an information need. This personal learning network is enhanced through the use of tools such as instant messaging, Skype, Twitter, and Second Life (13). This connection focuses more on breaking the barriers of geography, background, language, and culture. Most of these connections may be experienced one-on-one. However, information overload may be experienced depending on the number of people individuals try to follow on a service like Twitter.

Personally and socially maintained semisynchronous connections use tools such as Facebook, Twitter, wikis, blogs, and other discussion tools (Warlick 14). Questions may be sent out to a community of people, based on their interests, expertise, or perspectives in order to start conversations (13). This collaboration does not have to happen in real time. An individual may send out a question to a community of people who are able to help because of their interests or expertise (13). This type of personal learning network allows for connections when it works best for an individual's schedule. The number of tools an individual uses and the responding community members could add to information overload if they are many in

number. Alternatively, the community could positively affect information overload by providing pertinent and quality responses compared to using a search engine.

Dynamically maintained asynchronous connections provide individuals with identified valuable content sources (Warlick 14). Asynchronous refers to something that doesn't occur at the same time ("Asynchronous"). An individual isn't present when a piece of information is created; it comes to the individual's attention later on. This connection focuses on the use of an RSS aggregator to bring information feeds to an individual. These feeds may be blog posts or subscriptions to search feeds using tools such as Delicious. This helps overcome information overload because the information is being organized and delivered to the individual (Warlick 14). Searching a service such as Delicious could prove valuable as the list of websites would be more manageable and possibly better in quality compared to a Google search result list of 25 million pages (14-15).

Educators benefit from examining their information needs and addressing them with the creation and use of personal learning networks. David Warlick identified three types of personal learning networks, each with a different kind of connection. These connections, using Web 2.0 tools, help individuals overcome information overload by connecting individuals to helpful information resources. This is compared to using a search engine and sorting through thousands of pages in a results list.

Personal Learning Network Creation Tools

Personal learning networks are created using numerous tools in a variety of ways. Richardson and Mancabelli placed focus on Google Reader, Blogger, Diigo, Twitter, and

Facebook. They believe these five tools act as a good foundation (37). Two well-known tools for creating and maintaining personal learning networks are iGoogle and Netvibes. Other tools available include Twitter, Facebook, Google+, Google Reader, Diigo, and Pinterest. These tools were selected for inclusion in this review because of the number of individuals who use them and the likelihood that they will remain relevant for the foreseeable future. These tools can also be used alone or together nested inside an iGoogle or Netvibes page (i.e. using Google Reader in iGoogle). The following section describes each service and its features for individuals.

iGoogle

One choice for creating and maintaining a personal learning network is iGoogle. A customized iGoogle homepage provides the ability to access standard features such as RSS feeds and blogs, Web searches, calendar, bookmarks, and email (Rosenfeld 72). It is customized through the addition of gadgets (known as widgets on other sites). Gadgets are applications for displaying Web content that is embedded in other Web pages (72). Content for many gadgets is supplied through RSS feeds such as those connected to a Google Reader account or social bookmarking tool like Delicious. Gadgets are just one option for displaying and accessing RSS feeds.

The first step to creating an iGoogle portal is to set up a free Google account. Individuals who already use Gmail, Google Docs, or other services provided by Google already have a Google account. Thirty seconds is all it takes to set up a page with a variety of Google product gadgets (Google "Set up"). Other gadgets to add include Flickr, Delicious, and YouTube, in addition to dictionaries, encyclopedias, weather, and maps (Rosenfeld 72).

Gadgets are movable, able to be dragged to different spots, and a variety of decorative “themes” are available to be chosen for the background (72). The selected theme remains the same for each tab.

A useful feature of iGoogle is the ability to create “tabs,” specialized pages behind the opening page (Rosenfeld 72). Tabs are listed on the left side of an iGoogle page (Google “What is iGoogle”). Tabs may be used in a variety of ways. All iGoogle pages start with a “home” tab (Google “Set up”). Examples of other tabs include having one tab for personal productivity tools such as email, calendar, and to-do lists, and another for news sources including CNN and *The New York Times* (Rosenfeld 72).

Netvibes

Netvibes was founded in 2005, appealing to individuals for personalizing and publishing aspects of their daily digital lives (Netvibes “About Netvibes”). This personalization is achieved through access to standard widgets like iGoogle provides. These continue to include email, news, blogs, photos, videos, podcasts, and more (WebAdvantage.net). Netvibes also strives to appeal to agencies, publishers, and companies. According to the Netvibes site, this dashboard “powers personalization for more than 1000+ of the world's leading brands, interactive agencies, government organizations, non-profits and enterprises—serving half a billion widgets every month” (Netvibes “About Netvibes”). Netvibes uses the term dashboards like startpage or homepage. The dashboard is the first page the individual sees when they log on. Netvibes continues to expand its relationship with businesses. According to Freddy Mini, Netvibes CEO, Netvibes believes in continuing to promote dashboard intelligence among businesses in order

to react to consumer needs and provide personalized work dashboards for employees (Mini N.p.). Netvibes has offices in Paris, London, and San Francisco (Netvibes "About Netvibes").

Twitter

Twitter is a frequently used resource for building and maintaining a personal learning network. Twitter is unique in how it limits posts, known as tweets, to 140 characters (Huber 43). Twitter was founded in San Francisco and is currently available in over twenty languages (Twitter "About").

Twitter uses hashtags to connect conversations. Hashtags use the # symbol to mark keywords or topics in a Tweet (Twitter "What Are Hashtags"). Hashtags categorize Tweets and occur anywhere in the Tweet. Tweets in a category are found by clicking on a hashtagged word (Twitter "What Are Hashtags"). One example of using a hashtag is for an individual or corporate entity to post a query and ask other members of Twitter to use a specific hashtag in their answer. The hashtag allows the individual or corporate entity to track responses, whether from a few individuals or a hundred.

As Ernie Cox noted, forming a personal learning network could be as simple as using a hashtag to start a shared conversation among individual posts (35). A popular education hashtag is #edchat. This hashtag was created in collaboration between Shelly Terrell, Tom Whitby, and Steven Anderson (Terrell N.p.). By using this hashtag, educators post their thoughts and questions, among other things (N.p.). Searching for or clicking on the hashtag will compile a results list of all the other times the hashtag was used. Educators could use Twitter

to gather information, collaborate with others, exchange lesson plan ideas, receive constructive criticism, share tips and advice, and poll educators (Terrell N.p.).

Facebook

Facebook is a social networking tool with millions of users around the world. Launched in February 2004, Facebook is a place to stay connected with people, upload photos, and share links and videos (Facebook). Facebook strives to connect the world while promoting openness and transparency (Facebook).

Through Facebook, users create a profile containing their names and biographical information. This information includes contact details, education and work experience, and interests (such as likes in music and television shows). It is possible to limit the amount of information users share with certain individuals through the use of privacy controls. Profiles, photos, wall posts, and so forth are designated as available to be viewed by individuals organized into friends, custom, lists, or public collections. Group pages can also be created. One example of this feature is the group page for the Southeast Region of the Missouri Association of School Librarians.

Google+

In an effort to keep up with social media tools such as Facebook and Twitter, Google created Google+. Users create a public profile that features their full names (Google “Getting Started with Your Profile in Google+”). Other information such as contact details and links is also added (Google “Getting Started with Your Profile in Google+”). Users organize their social connections into circles with labels such as family, friends, classmates, and more. Content is

also shared with certain circles rather than with everyone (Google “About Circles”). The same is true with profile information (Google “About Circles”).

Melissa Venable has provided tips for using Google+ in the post “50 Great Google+ Tips for School Librarians.” The suggestions are organized as follows: communication, circles, hangouts, integration, information sharing, efficiency, and privacy (Venable N.p.). Communication includes creating polls and sharing and updating content. Circles could be used to connect with authors, make announcements, and create study groups. Reference desk hours, Q&A sessions, and guest panels could be hosted using hangouts. The hangouts feature allows individuals to spontaneously connect with up to nine others through video chat (Google “Google+ Overview”). Integration involves adding a Google+ Badge to a library Web page, and the use of Google Translate, Google Docs, and Google Calendar (Venable N.p.). The Google+ Badge is an icon that may be added to link a profile and website together (Google “Linking to Your Website”). Another suggestion involves sharing information. It is possible to increase sharing efficiency by temporarily muting certain threads, using keyboard shortcuts, and updating notification settings (Venable N.p.). This advice could positively affect information overload. If a user receives too many updates, it may be difficult to sort through multiple comment threads. In terms of privacy, Venable recommends that users control what they share, disable instant upload, and remember that it is possible to block users if necessary (N.p.).

Google Reader

Google Reader is one example of an RSS feed aggregator. It is used alone or embedded into an individual’s iGoogle page, wiki, blog, or other tool. Users are able to subscribe to and

share feeds (Google “Getting Started with Google Reader”). By subscribing to a feed, users don’t have to keep checking various websites for updates. Google Reader also offers a selection of pre-compiled bundles of feeds available to be subscribed to (Google “Getting Started Google Reader”). Feeds can be organized into folders. Users are able to go through all new posts or just certain folders. Items are saved for later use by marking the star found on each post. Tags may also be added to articles. Any word can be a tag (Google “Using Tags”).

Diigo

Diigo (Digest of Internet Information, Groups and Other stuff, pronounced Dee’go) is a social bookmarking tool for online resources (Diigo). Diigo provides a way for users to collect and organize bookmarks, highlights, and sticky notes as they browse Web pages. Collections are accessed from any Internet connection and are easily shared (WebAdvantage.net). Collections are created by using a browser add-on that allows portions of Web pages to be highlighted. Sticky notes may also be added to Web pages (Diigo). The use of highlighting and adding sticky notes allows individuals to organize digital information. These functions allow an individual to focus on what they determine to be relevant parts of a site. The use of Diigo in schools for developing personal learning environments (synonymous with personal learning networks) is rising (Johnson, Adams, and Haywood 30).

Diigo describes itself as “a research and collaborative research tool on the one hand, and a knowledge-sharing community and social content site on the other” (N.p.). Diigo could be used by groups to gather information together, and by individuals to follow people with similar interests and to subscribe to recent, popular bookmarks using tags (Diigo).

Pinterest

Pinterest is another popular Web 2.0 tool. Pinterest is described as a virtual pinboard, allowing users to save, organize, and share items they find online (Pinterest “What is Pinterest?”). Items for pinboards could include favorite books and movies, recipes, craft ideas, and travel destinations. Items are found by searching other pinboards or by adding the “Pin It” button to a web browser. The “Pin It” button allows images to be pulled from a website and added to a pinboard (Pinterest “Goodies”). It is possible to browse other people’s pinboards, seeking and gaining inspiration, while also sharing interests with others. Individuals are connected through shared tastes and interests with the addition of millions of new pins every week (Pinterest “What”).

Pinterest holds possibilities for personal and professional use. BestCollegesOnline.com staff compiled “37 Ways Teachers Should Use Pinterest.” Ideas presented include gathering inspiration for classroom organization, bulletin boards, and projects; swapping lesson plans and locating resources to improve lessons; collaborating with other educators, and sharing classroom experiences (“37 Ways”). The post also reminded individuals to have fun.

Educators benefit from examining their information needs and addressing them with the creation and use of personal learning networks. Web 2.0 tools are used to create and maintain personal learning networks. This section presented only a few of the available tools. There are many other tools that available to be used alone or in combination with a variety of tools.

Mentoring

Mentoring is another topic for consideration when discussing personal learning networks (PLNs). In regard to this study, there are two layers of mentoring. The first is the act of mentoring a group of colleagues as they create a PLN. The second is the colleagues building a PLN that provides customized, ongoing mentoring of their choice.

The act of mentoring is not a new concept. Education is based on the idea of someone (a mentor) helping someone else learn. The *Oxford English Dictionary* defines a mentor as “a person who acts as guide and adviser to another person, especially one who is younger and less experienced...a person who offers support and guidance to another; an experienced and trusted counselor or friend; a patron, a sponsor” (“Mentor, n”).

As noted by Mary Ann Blank and Nancy Sindelar, “No ideal mentor-type exists” (N.p.). Their article, “Mentoring as Professional Development: From Theory to Practice,” discussed the mentorship of new teachers. Blank and Sindelar listed some of the qualities of mentors. These qualities include having intuitive sensitivity and technical expertise, and being proficient instructors (Blank and Sindelar N.p.). Other qualities include being observant, confident, flexible, introspective, accessible, problem-solving, and approachable listeners (Blank and Sindelar N.p.). These are only a few of the qualities mentors could possess.

In teacher education literature, the meaning of mentoring and its practice has varied over time and across disciplines (Tang and Choi 384). Jian Wang and Sandra J. Odell reviewed and analyzed three models of mentor preparation: the knowledge transmission model, the theory-and-practice connection model, and the collaborative inquiry model (525). In the

knowledge transmission model, mentor preparation involves the attendance of workshops that develop skills and knowledge about mentoring (Wang and Odell 525). The theory-and-practice connection model focuses on the active construction of mentoring knowledge (Wang and Odell 527). Mentoring novices are called to continually learn and reconstruct their knowledge through application and “constant dialogue with teacher educators and staff developers” (Wang and Odell 528). The mentoring done by the novices is not directly observed by the teacher educators and staff developers (Wang and Odell 528). The collaborative inquiry model shares aspects with the theory-and-practice connection model. It differs, though, in that it calls for teacher educators and staff developers to work side by side with mentors and their novices (Wang and Odell 529).

The way adults learn could also be considered when discussing mentorship. Victor Wang and Beth Kania-Gosche noted that adults are internally motivated (62). They also noted that Malcolm Knowles, a leader in adult education, advocated for the “student-centered andragogical approach to adult learning” (Wang and Kania-Gosche 64). Sang Chan stated that “andragogy is based upon six assumptions: (a) self-directedness, (b) need to know, (c) use of experience in learning, (d) readiness to learn, (e) orientation to learning, and (f) internal motivation” (25). Chan noted that adult learners benefit from active involvement in the learning process (33).

Wang and Kania-Gosche stated that effective teachers take prior knowledge and experience into consideration when making choices about their teaching strategy (65). This includes all aspects, from content to assessment (Wang and Kania-Gosche 65). While

conducting surveys for their study, Wang and Kania-Gosche found that “the instructors surveyed were facilitators, helpers, and partners in the learning process; they trusted students to assume responsibilities for their learning and respected and utilized the experiences and potentialities of students” (72). These are aspects to be considered in terms of mentoring adult learners.

Educators benefit from examining their information needs and addressing them with the creation and use of personal learning networks. One way that educators learn about personal learning networks is by being mentored. Qualities of a good mentor include being confident, flexible, introspective, accessible, and a problem-solver (Blank and Sindelar N.p.). When mentoring another educator, it is worth noting some of the characteristics of adult education. Adult learners tend to be internally motivated and respond to learning that takes their experience into consideration.

Personal Learning Networks in K-12 Education

The NMC Horizon Report: 2011 K-12 Edition described emerging technologies that are likely to have a large impact on education around the world. The report divided topics into the following time-to-adoption horizons: near-term (one year or less), mid-term (two to three years), and far-term (four to five years) (Johnson, Adams, and Haywood 6). The report noted that despite the availability of tools to construct personal learning environments, they haven't been widely adopted yet and have been placed on the far-term horizon (31). In this instance, the term personal learning environment is being used interchangeably with personal learning network.

Many standards address the need for students to master 21st-century information literacy skills. This review mentioned those presented by the American Association of School Librarians, Missouri's Department of Elementary and Secondary Education, and the International Society for Technology in Education. In order for students to master 21st-century information literacy skills, teachers and staff members are called to become masters of information literacy themselves and effective models of information behavior. This isn't limited to just one segment of the curriculum, but is applied to all curriculum areas.

Teachers and staff members are also required to participate in some form of professional development. Each state has different laws and standards that affect professional development. Although certain types and amounts are required, teachers and staff members have a responsibility to seek out the kind of professional development that leads to lifelong learning. This is another aspect to be modeled for students. The future is uncertain in regard to specific technological developments and trends. However, it is certain that technology will continue to be a significant factor in education and the lives of individuals.

Educators benefit from examining their information needs and addressing them with the creation and use of personal learning networks. The literature reviewed in this section represents a few of the aspects educators consider in the current educational climate. Educators are asked to reflect on how they address 21st-century information literacy skills, professional development, current technology offerings, and lifelong learning in relation to improving themselves on a professional (and possibly personal) level.

Summary

Chapter 2 presented a review of the literature concerning personal learning networks. Researchers report that educators benefit from examining their information needs and addressing them with the creation and use of personal learning networks. Topics involved in the review of the literature included information-seeking behavior; forms of professional development; and information literacy standards. The discussion then focused on what personal learning networks are, types of personal learning networks, and online tools for creating personal learning networks. A section on mentoring preceded the last section, which presented aspects related to reasons for K-12 educators to learn about personal learning networks.

Chapter 3 discusses the methodology used in this study. Chapter 4 presents the results of the study. Chapter 5 discusses the study's conclusions and answers the research questions that were presented in Chapter 1.

CHAPTER 3 METHODOLOGY

This chapter will explain the methodology used in this study. The researcher sought to examine how educators keep up with their information needs. Educators benefit from examining their information needs and addressing them with the creation and use of personal learning networks.

Overview of the Research Plan

This study focuses on the information needs of educators and how they meet those needs. The study also explores educators' experience with personal learning networks (PLNs). Volunteers were recruited to learn about personal learning networks and construct their own for personal and professional development use. The participants were interviewed throughout the course of their PLN development. During learning sessions, they were introduced to the tools highlighted in Chapter 2 (iGoogle, Netvibes, Twitter, Facebook, Google+, Google Reader, Diigo, and Pinterest). These tools were selected for inclusion in this review because of the number of individuals who use them and the likelihood that they will remain relevant for the foreseeable future. The participants were also given David Warlick's article "Grow Your Personal Learning Network: New Technologies Can Keep You Connected and Help You Manage Information Overload," and viewed a PowerPoint presentation created by the researcher. The presentation highlighted the researcher's personal learning network and other key topics.

Setting

This study takes place in an elementary school located in a rural community in Southeast Missouri. Permission was obtained from the district superintendent and elementary principal to collect data outside of normal school hours. The interviews and learning sessions took place in the elementary library. Desktop computers were used for the learning sessions. The computers had filtered Internet access provided by the district which blocked Facebook and Twitter. To accommodate this, the PowerPoint created by the researcher contained screenshots of the researcher's Twitter and Facebook main profile pages.

Population

Invitation emails were sent to the school district's faculty and staff to join this study. Three volunteers accepted the invitation. Throughout the course of this paper they are referred to by their positions in the school. The participants were a counselor, Pre-K teacher, and an aide. All of the individuals are female, between the ages of thirty and forty, and work full-time in the elementary school. This group combination works well because of their familiarity with each other, the researcher, and technology in general. The individuals are closely matched in their knowledge of technology tools and their use.

The counselor has worked in the district since 2007. She has two children under five years old. She has a Master of Science in School Counseling. The Pre-K teacher has worked in the district for over five years. She has four children living in her home, ranging in age from one to twelve years old. The Pre-K teacher holds a Bachelor of Science in Elementary Education. The aide has worked in the district since 2007. She has worked with specific grade levels (first

through fourth) and pullout groups. This year she is the second grade aide and continues to work with various groups across multiple grades (mainly third through sixth). The purpose for the pullout groups is to address learning related to Response to Intervention (RTI) and Missouri Assessment Program (MAP) preparation. Both pullout groups are divided between mathematics and communication arts. The aide has no dependents and holds a Bachelor's degree. The number of children each participant has was mentioned in regard to added time constraints and other issues they experienced while participating in this study. The children are also a source of inspiration for items that may be added to the personal learning network.

Data

Data were collected by conducting one-on-one interviews with the participants. They were asked to provide details concerning their information needs and how they currently meet those needs. The participants were also asked to create a personal learning network (PLN) to address information needs. Interviews were conducted before, during, and after the creation of their personal learning networks. The specific interview questions are provided in Appendices A, B, and C. The initial interview (Appendix A) asks background questions and sets the groundwork for learning about personal learning networks. The second interview (Appendix B) asks how the PLN creation is progressing. The final interview (Appendix C) examines the characteristics of the PLN and overall experience of each participant.

Data Analysis

The data collected from the interviews and other discussions were analyzed to determine the information needs of particular educators and how they met those needs.

Discussions occurred during group learning sessions and during individual conversations. The interviews with each of the participants were video recorded and transcribed by the researcher. The researcher conducted each interview using questionnaires designed specifically for each of the three interviews (see Appendices A, B, and C).

Once the initial interviews were conducted and transcribed, the researcher evaluated the participants' answers to determine information gaps and specific possibilities for development. The researcher looked at the participants' knowledge of personal learning networks and examples of the tools used to create them. The researcher evaluated the participants' answers in relation to the researcher's personal learning network and knowledge gained from the literature review. The second interview provided insight into how the learning progressed. The final interview focused on the key points of a successful personal learning network.

After the three interviews were completed, the researcher transcribed each interview word for word. The text was copied into a table with columns as follows: "interview text," "key terms," and "themes that emerge." The interviews were read multiple times to observe the key terms the participants were using. The key terms were then read to see what themes emerged. Chapter 4 is organized around those themes.

Summary

This study examined the information needs of professionals, particularly educators, and presents ways to meet those information needs through the creation and use of a personal learning network. Educators benefit from examining their information needs and addressing

them with the creation and use of personal learning networks. Three individuals working in an elementary school volunteered to participate in this study. Each signed a consent form and understood that they could leave the study at anytime. Throughout the study they will be referred to by the positions they hold in the school: counselor, Pre-K teacher, and aide. Data were collected from the participants during interviews conducted before, during, and after the successful creation of personal learning networks. The data collected from the interviews were analyzed to determine the information needs of particular educators and how they met those needs. The participants also viewed a PowerPoint presentation highlighting the researcher's personal learning network in addition to other key topics, and were given David Warlick's article "Grow Your Personal Learning Network: New Technologies Can Keep You Connected and Help You Manage Information Overload."

CHAPTER 4 RESULTS

This chapter presents the results of the study. The three participants, counselor, Pre-K teacher, and aide, all remained in the study. They participated in three one-on-one interviews with the researcher, viewed a PowerPoint presentation, and explored parts of the researcher's and each other's personal learning networks. Based on the data gathered during the interviews, the researcher developed the following themes: mentoring, expectations, social media and professional development, relationship with Web 2.0 tools, what to add, time, and recommendations. These themes will be explored further in the sections that follow.

Mentoring

The participants viewed a PowerPoint presentation created by the researcher. The presentation described what personal learning networks are, suggested current personal learning network components (family, friends, reference books, face-to-face conferences, and library resources); described qualities of PLNs (expanded from current components to include Web 2.0 tools); defined basic terminology (Web 2.0 tools, RSS, widgets/gadgets); highlighted the researcher's personal learning network (family and friends, multiple school and university libraries, the researcher's personal library, local radio and television stations, Missouri Association of School Librarians membership, and use of the LM_NET listserv, iGoogle, Google Reader, Gmail, Facebook, and Pinterest); and explored the Web 2.0 tools reviewed in Chapter 2 of this thesis (iGoogle, Netvibes, Twitter, Facebook, Google+, Google Reader, Diigo, and Pinterest).

The researcher follows numerous organizations, places, people, and entertainment interest items on Facebook. This was discussed with the participants. Organizations include the Missouri Department of Conservation, City of Cape Girardeau, the Public School and Education Employee Retirement Systems of Missouri (PSRS/PEERS), and the Southeast Region of the Missouri Association of School Librarians. Places include Lake Wappapello and Kent Library at Southeast Missouri State University. The researcher follows popular authors Rick Riordan, Brandon Mull, and Diana Gabaldon. Entertainment items include television shows such as HBO's *True Blood* and movies such as *The Hunger Games*.

Also at the time of the presentation, participants were given a copy of David Warlick's article "Grow Your Personal Learning Network: New Technologies Can Keep You Connected and Help You Manage Information Overload." This article was chosen because it presented what seemed to be a simple introduction to personal learning networks. It also provided tips for creating and maintaining the PLN. The participants also had the opportunity to view and explore the researcher's Pinterest, iGoogle, and Google Reader accounts.

In terms of ongoing mentoring, the participants saved most of their questions for the times the group met together. The participants did ask questions of the researcher one-on-one a few times. This included in-person conversations, email, and messages on Facebook. The participants were more independent than other individuals may be based on their previous knowledge and experience.

Expectations

The participants reported that developing a personal learning network was easier than expected. They were a bit nervous about starting this process. They were unsure of what to expect in the beginning and weren't used to being interviewed and video recorded. Their syntax was affected by this nervousness and familiarity with the researcher. In the end, all agreed that the process was easier than expected. During the second interview the counselor noted, "I think Pinterest is super easy. I'm using that as an example...But overall I feel like, yeah, definitely easier than expected. It seems like it'd be kind of intimidating, but it's pretty easy." The aide agreed when asked about her current thoughts on the process: "Fascinating. Helpful. Easier than expected." When asked what her most memorable experience was, the aide responded: "Honestly just the fact that I thought, 'Oh gosh, this is going to be so daunting. This is going to be so challenging' and then getting on it, and getting it up, and seeing how easy it is and how everything is just click here or click there, and the exploration of it all."

Social Media and Professional Development

The use of social media and technology to further professional development was a new concept for the participants. The aide expressed her skepticism in the initial interview when stating "Social media's considered professional development?" The participants were familiar with traditional professional development. The counselor is a member of the Missouri School Counselor Association and American School Counselor Association, and attends conferences related to such organizations and Positive Behavior Support. The Pre-K teacher is a member of the Missouri State Teachers Association and attends local workshops offered through Southeast

Missouri State University. The aide attends school in-services only. She stated, “Well I don’t really have to participate in a lot of that because I am technically an aide, but next year I hope to attend more of that. As far as our in-services go, I do try to attend every single one of them for myself.”

The initial interview (conducted using the questionnaire in Appendix A) also made clear the emphasis the participants place on finding and using curriculum and parenting resources. When asked about professional development, the participants discussed conferences, emails, listservs, and Facebook. When probed further by the researcher, the participants also reported that they used both print and online resources. This is also part of their professional development, although they didn’t initially think of it in those terms. The researcher believes this occurred due to the examples given along with the question, “What forms of professional development do you currently take advantage of?” (Appendix A). The examples were “conferences, email, listservs, social media, like Facebook or Twitter, etc.”

Relationship with Web 2.0 Tools

All of the participants had Facebook accounts prior to the start of the study and were frequent users. The counselor and Pre-K teacher were also frequent users of Pinterest. Despite this use, the participants were not able to successfully define Web 2.0. When asked if they had any questions for the researcher at the end of the initial interview, the aide and Pre-K teacher both asked, “What is Web 2.0?”

The researcher answered that, “Web 2.0 is a growing collection of Web-based tools. Most of the tools are social in nature and include blogs, wikis, and photo and video sharing

sites. Facebook and Pinterest are included among these tools due in part to their social aspects and ability to share items with other individuals online.”

In terms of other tools, all agreed on their use of Google when seeking information. As noted by the Pre-K teacher, “I Google everything.” The Pre-K teacher also mentioned using YouTube while the aide mentioned Wikipedia.

Web 2.0 tool use expanded by the second interview (guided by the questionnaire found in Appendix B). The participants had expanded their use of Facebook and Pinterest, and had developed their own iGoogle sites. In terms of Facebook use, the counselor noted, “I hadn’t before, but I’ve been reading a lot more on there. My friends have been posting more I feel like, and now it has trending articles.... I haven’t really clicked on anything there, but it’s catching my interest more.”

The counselor also discussed how this study has changed her thinking. She stated: “Yeah because of our discussions and learning about it, I think I’ve been thinking more. I used to read a blog—‘Oh that’s interesting’—but now I’m like ‘Oh, I can link to that if I had an iGoogle page or whatever and it would come to me.’...I think more systematic than hit and miss which is what I was before.”

What to Add

The question of what to add to the personal learning network could be seen as both fun and stressful. The personal learning network isn’t limited to only professional items or only entertainment items. The personal learning network has room for resources related to professional development, parenting, lesson plan ideas, entertainment, and other personal

interests. The personal learning networks of the participants illustrate this. Tables 1 and 2 list what the participants stated as having added and wanted to add during the second and final interviews (Appendices B and C).

Table 1

Second Interview Responses

	Added	Want to Add	Expanded use of
Counselor	No new tools	iGoogle; Gmail	Facebook and Pinterest (pinboards: Useful Tips, Kid Tips and Ideas, School Stuff, Holiday Snacks and Food, Crafty Gifts, Food and Snacks, Things I Love, and Craft Ideas)
Pre-K teacher	iGoogle (home tab only: Driving Directions, <i>Lord of the Rings</i> Quote of the Day, <i>Harry Potter</i> Quote of the Day, <i>Twilight</i> Quotes, <i>Hunger Games</i> Random Quotes, Hamster, YouTube, Weather, Date & Time, Celebs by Access Hollywood, TVGuide.com widget, Flixster Movies, News, NYTimes.com-Top Stories, Facebook, Gmail, and CNN.com)	None stated	Facebook and Pinterest (pinboards: Teacher Stuff, Cute Snacks, Quotes, Books Worth Reading, Eye Candy!!, Guilty Pleasure, Not Sure Where to Put This ;o), Makes Me Smile :o), Yummy, Parenting, Crafty Stuff that I'll never Have Time to Make, Where I want to Go, Too Cute, Awesome Bulletin Boards, Holiday Art, Blast from the Past, and The Nerd in Me)
Aide	Good Reads; iGoogle (tabs: education, news, HGTV); Pinterest (no pins; standard pinboards: Favorite Places & Spaces, For the Home, Products I Love, My Style, and Books Worth Reading)	None stated	Facebook; Google Calendar

Table 2

Final Interview Responses

	Added	Want to Add	Expanded use of
Counselor	Google Reader; iGoogle (home tab only: Google Reader, Pinterest Search, Google Calendar, Morning Edition, All Things Considered, Date & Time, YouTube, Weather, CNN.com, Facebook, and Gmail)	My Fitness Pal gadget (calorie/exercise counter); more to Google Reader	Same as Second Interview
Pre-K teacher	New gadgets; authors on Facebook	Google Reader; add more authors and blogs	Same as Second Interview
Aide	Google Reader	"Probably more things to do with education"	Same as Second Interview

Time

Time was a factor for the researcher and participants. The researcher hoped to decrease the participants' time spent looking for information by having them create personal learning networks. The counselor noted, "I think if I did an iGoogle, I'd be much more likely to go to it everyday. I would like to have a system that I could check daily and have it all in one place and not have to waste time going from one to another."

The participants also noted the need for more time to improve their personal learning networks when responding to various interview questions. The Pre-K teacher repeatedly mentioned this. When asked during the second interview what her current thoughts were about this process, the Pre-K teacher stated, "More time to think about this stuff." During the final interview, she responded, "I just need more time to do more with it." The aide remarked during the second interview, "I mean it's time consuming kind of, but it's a good time consuming. It's productive time consuming which is ok."

In terms of conducting the study in the spring, during the last couple months of school, the participants agreed that despite being busy and having end-of-the-year stress, it is nice to have the summer to continue working on the personal learning networks. The counselor and Pre-K teacher both noted that they should have time in the summer to add more and want the researcher to check back with them in the fall to see what they added.

Recommendations

The participants were given the opportunity to make recommendations to the researcher. The counselor was the most vocal. Her thoughts aligned with the researcher's in

translating this study into an in-service for the other teachers and staff in the school district. When asked in the second interview about her current thoughts on the process, the counselor responded, "I think it's been really good...I think this would actually—going through it—be something to share with the whole staff, especially because of...I think a fair amount are tech savvy and we're going to have some new teachers, so I could see how it would be beneficial to have as a new classroom teacher, or just as a teacher, to have a way to organize all the resources you're already using. I think it's been great." The counselor expressed similar thoughts throughout the final interview (guided by the questionnaire in Appendix C). She appreciated having support and being able to see what the other two participants had accomplished. The group meetings were her most memorable experience during the study.

The counselor also agreed with the researcher's thoughts to use the participants as helpers in the future when presenting this to the district staff: "I think this would be really interesting if the whole staff, especially if you had [the Pre-K teacher] and [aide] and I start using [our personal learning networks] more and then you had us as helpers at a staff meeting or in-service or whatever.... Even those teachers who aren't as technologically savvy could have interest in [creating a PLN using iGoogle and other tools] because it would bring [information] to them and it would be less work in the long term."

Summary

This chapter presented the findings of the study. All three of the participants completed the study by being interviewed three times, viewing a PowerPoint presentation, and cultivating their personal learning networks. The data from the study were discussed according to the

following themes: mentoring, expectations, social media and professional development, relationship with Web 2.0 tools, what to add, time, and recommendations. The participants learned about Web 2.0 tools and how social media is used in professional development. The participants expressed their need for more time, discussed how easy the process turned out to be, and suggested presenting this to the district's teachers and staff.

CHAPTER 5 DISCUSSION

This chapter discusses the study's conclusions and answers the research questions that were presented in Chapter 1. This thesis has presented information regarding personal learning networks and how three educators at a rural elementary school in Southeast Missouri created their own. The findings of this study are not representative of all studies involving personal learning networks. Each study will contain unique aspects due to the nature of personal learning networks; they are customizable to an individual's specific needs. Despite having little knowledge in regard to personal learning networks, the educators (a counselor, Pre-K teacher, and aide) were able to use Web 2.0 tools to successfully cultivate their personal learning networks.

Personal Learning Networks

Chapter 1 presented four questions that guided the research highlighted in this paper. The first question was "What are personal learning networks?" As stated in Chapter 2, personal learning networks (PLNs) are used by individuals in order to learn relevant information about the world around them. The PLN provides ongoing guidance in a person's personal and/or professional life rather than the simple answer to a query. Personal learning networks have previously consisted of face-to-face connections in an individual's life. Connections included family, friends, and colleagues, in addition to information taken from books, periodicals, television, and radio. Web 2.0 tools have enhanced the creation and use of personal learning networks. These tools, which include blogs, wikis, and photo and video sharing sites, have

allowed individuals to connect with others all across the world. Personal learning networks now allow access to sources of information not previously available (Warlick 13). There are three main types of personal learning networks: personally maintained synchronous connections, personally and socially maintained semisynchronous connections, and dynamically maintained asynchronous connections (Warlick 13-14).

Personal Learning Network Creation

The next question asked, “What are some Web 2.0 tools available for the creation of personal learning networks?” There are many Web 2.0 tools available to be used alone or in combination with others to create personal learning networks. This study focused on the use of iGoogle, Netvibes, Twitter, Facebook, Google+, Google Reader, Diigo, and Pinterest. These tools were selected based on the number of individuals who use them and the likelihood that they will remain relevant for the foreseeable future.

The research participants were introduced to each of the aforementioned tools. However, they gravitated to the use of iGoogle, Facebook, Google Reader, and Pinterest—the tools most frequently used by the researcher. All of the participants were already on Facebook, and the counselor and Pre-K teacher also had Pinterest accounts. Google Reader plays a significant role in the researcher’s personal learning network. The participants began using iGoogle and Google Reader for the first time during the study. All were happy with their chosen tools and agreed that the process was easier than expected.

Personal Learning Networks and Education

Chapter 2 presented information concerning the role of personal learning networks in education and how they are used in regards to professional development. One of the research questions from Chapter 1 asked how personal learning networks are currently being used in education. This paper presented only a few ways that they are being used.

Chapter 2 reviewed literature that included recommendations about how educators could incorporate Web 2.0 tools into professional learning. Among the suggested tools were wikis, Twitter, Nings, and Moodle (Huber 41). Whitby described how educators are stating that their social media involvement provides the best professional development (N.p.). Richardson and Mancabelli discussed DIYPD: Do-it-yourself professional development involving Web 2.0 tools (33).

The research participants weren't familiar with the concept of personal learning networks or Web 2.0 tools. In truth, they all had a PLN that incorporated both face-to-face connections and Web 2.0 tools, but were unaware of the fact. The research participants were all frequent users of the school library and using the Internet to find information. The counselor and Pre-K teacher also use a local public library for resources and programs for their children. All were quite familiar with Facebook. The counselor specifically mentioned using blogs in the past, but wasn't aware of subscribing to them using a service like Google Reader. Since participating in the study, the counselor, Pre-K teacher, and aide have all vowed to continue using and improving their personal learning networks. All requested that the researcher continue to check their progress and send them pertinent information.

Mentorship

It has been proposed that “no ideal mentor-type exists” (Blank and Sindelar N.p.). Chapter 2 listed being observant, confident, flexible, introspective, accessible, and a problem-solver as some of the qualities good mentors possess (Blank and Sindelar N.p.). The final research question asked, “What mentoring strategies may help educators as they develop personal learning networks?” The researcher took prior knowledge and experience into consideration when working with the participants, as noted by Wang and Kania-Gosche (65). The mentoring relationship between the researcher and the participants was affected by the familiarity each shared with the others. All four work in the same small rural elementary school in Southeast Missouri. During the study the participants viewed a PowerPoint presentation created by the researcher and were given a copy of David Warlick’s article “Grow Your Personal Learning Network: New Technologies Can Keep You Connected and Help You Manage Information Overload.” They also had the opportunity to view and explore the researcher’s Pinterest, iGoogle, and Google Reader accounts, as well as each other’s.

The participants asked questions of the researcher a few times one-on-one, but mainly saved their questions for the times the group met together. The questions were asked in-person, and by sending emails and messages on Facebook. These particular participants might be more independent than other individuals based on their previous knowledge and experience with technology.

The researcher recommends mentoring using a combination of one-on-one and group time with participants. The one-on-one time allows for conversations unique to each

participant and adds to their comfort level. The participants are less likely to experience feelings such as embarrassment if one-on-one interviews and conversations are conducted before group meetings. The group meetings are useful in order to assure that all participants have the same level of understanding about the information being presented. This also keeps the researcher from repeating herself or leaving out information.

The participants of this study enjoyed having both one-on-one time with the researcher and group time with the other participants. The counselor listed the group meetings as her most memorable experience during the study. She described it as “impactful,” seeing what the others had started and gaining inspiration for what she could do [with her own PLN]. The counselor found it “very helpful” to have the researcher there “as kind of the expert” and being with other people who were at the same level learning. The idea that the researcher could provide information about something, but also that the others were able to say “Look what I found...This is how I did it.”

Conclusion

Personal learning networks are the connections that guide an individual to learn relevant information about the world around them. According to this particular study, individuals use and cultivate these networks with little thought at times. This is evidenced by the research participants having personal learning networks, but not labeling and recognizing them as such.

Specific definitions of personal learning networks are not available as they vary from individual to individual. This is one of the many benefits of personal learning networks—that they are tailored to the specific needs of individuals. During this study, individuals learned about iGoogle, Netvibes, Twitter, Facebook, Google+, Google Reader, Diigo, and Pinterest. Participants focused on iGoogle, Facebook, Google Reader, and Pinterest and ignored the other tools. This was partly influenced by the tools most frequently used by the researcher and tools that the participants were already using.

Further study is needed in regard to personal learning networks. The literature review presented in Chapter 2 highlighted only a few of the topics for consideration when discussing personal learning networks. Every topic deserves further research. Of particular note is the continued use of Web 2.0 tools and their role in professional development.

Educators benefit from examining their information needs and addressing them with the creation and use of personal learning networks. This was found to be true for a counselor, Pre-K teacher, and aide at a rural elementary school in Southeast Missouri. The way they view gathering and organizing information has been forever changed. All agreed that the study was a positive experience and that they will continue to use what they learned to improve their personal learning networks. They also agreed to help teach others in the school district in the future.

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APPENDIX A INITIAL INTERVIEW

Respondent Characteristics

- Position in school:

Information Seeking

- What is your current information need? What types of information do you seek?
- What sources do you use or consult to find information?
- How do you organize information?
- Do you use the local public library or school library for information? How do you use these institutions?
- Where else do you seek information?
- Is there anywhere else you had thought to explore, but hadn't yet or were curious about?
- What are your current strategies for lifelong learning?
- How much time do you spend seeking information?

Resources

- Do you have Internet access at home?
- What types of devices do you own? (e.g. laptop, desktop, tablet, smartphone)
- Do you have Internet access at work?
- Do you use other forms of Internet access?

Professional Development

- What forms of professional development do you currently take advantage of? (e.g. conferences, email, listservs, social media, like Facebook or Twitter, etc.)
- What professional organizations are you a member of? (e.g. MSTA)

- What other community organizations are you a member of?
- How much time do you spend on professional development?

Other

- Are you familiar with the term Web 2.0? If so, what Web 2.0 tools do you currently use?
- Are you familiar with personal learning networks (PLNs)? Please describe in detail.
- Would you categorize yourself as having a particular learning style?
- Do you have any questions for me?

APPENDIX B
SECOND INTERVIEW

Respondent Characteristics

- Position in school:

PLN Development and Use

- How would you categorize your PLN development at this point? How have things gone?
- What external sources are you using or have used to track down useful information?
- What is currently a part of your PLN? What have you added to the personal information portal (PIP)?
- Discuss placement of widgets/gadgets and the use of tabs/pages.
- How are you using the PIP/PLN? Are you accessing it at a particular time of day? For how long?
- How would you categorize PIP/PLN ease of use at this point?
- What do you plan to add to the PIP/PLN?

Other

- What are your current thoughts about this process?
- What are your specific positive and/or negative thoughts?
- Do you have any questions for me?

APPENDIX C
FINAL INTERVIEW

Respondent Characteristics

- Position in school:

PLN Development and Use

- What is currently a part of your personal learning network (PLN)? What have you added to the personal information portal (PIP)?
- Did you consult any new external sources for information?
- Discuss placement of widgets/gadgets and the use of tabs/pages.
- How are you using the PIP/PLN? Are you accessing at a particular time of day? For how long?
- How would you categorize PIP/PLN ease of use at this point?
- How satisfied are you with your PIP/PLN?
- What are your thoughts on the whole PIP/PLN development process?

Future Considerations

- Will continue to use the PIP/PLN?
- What do you plan to add to the PIP/PLN?
- Is there anything else you plan to change in the future?
- Have you been inspired to explore other technologies? What about making more library visits or joining organizations?

Other

- What has been your most memorable experience?
- What recommendations would you give to the researchers and others?
- Do you have any other comments?
- Do you have any questions for me?

APPENDIX D
HUMAN SUBJECTS APPROVAL



Human Subjects Protection Program
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Warrensburg, MO 64093
Office 660-543-4621
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www.ucmo.edu

2/28/2012

Amanda Mossman
2830 Independence St. Apt 8
akm30920
Cape Girardeau, MO, 63703

Dear Ms. Amanda Mossman,

Your research project, "Personal Learning Networks: Exploring the Information Needs of Educators", was approved by the Human Subjects Review Committee on 2/28/2012. This approval is valid through 2/28/2013. Your informed consent is also approved until 2/28/2013.

Please note that you are required to notify the committee in writing of any changes in your research project and that you may not implement changes without prior approval of the committee. You must also notify the committee in writing of any change in the nature or the status of the risks of participating in this research project.

Should any adverse events occur in the course of your research (such as harm to a research participant), you must notify the committee in writing immediately. In the case of any adverse event, you are required to stop the research immediately unless stopping the research would cause more harm to the participants than continuing with it.

At the conclusion of your project, you will need to submit a completed Project Status Form to this office. You must also submit the Project Status Form if you wish to continue your research project beyond its initial expiration date.

If you have any questions, please feel free to contact me at the number above.

Sincerely,

A handwritten signature in black ink that reads "Janice Putnam Ph.D., RN".

Janice Putnam Ph.D., RN
Associate Dean of The Graduate School
putnam@ucmo.edu

cc: Dr. Patricia Antrim