SOCIAL MEDIA USE IN HIGHER EDUCATION: AN EXPLORATORY MULTIPLE-CASE STUDY

by

Ghania Zgheib
A Dissertation
Submitted to the
Graduate Faculty
of
George Mason University
in Partial Fulfillment of
The Requirements for the Degree
of
Doctor of Philosophy
Education

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Date: _____ Spring Semester 2014
George Mason University
Fairfax, VA

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DEDICATION

This work is dedicated to my husband Wissam and to my daughter, Liv. This proved to me once again that our strong bond is the driving force of our greatest achievements as a family. I also dedicate this work to my nieces Ayla and Zoey and to my nephew Antoine to prove to them that any goal is achievable in life when there is a will and hard work. I would also like to dedicate this dissertation to the loving memory of my Mom who has watched over me all these years and whose loss has given me strength and perseverance.

ACKNOWLEDGEMENTS

I would like to begin first by thanking my Ph.D. and dissertation committee members whose guidance and knowledge have influenced my ideas as a developing scholar. More specifically, I thank Dr. Nada Dabbagh, my dissertation chair, for her invaluable support and mentorship throughout my Ph.D. program and my dissertation. Dr. Dabbagh has encouraged me and challenged me to dig deeper throughout my academic program, especially when completing my dissertation; her feedback was very helpful and constructive. I would also like to express my deepest gratitude to Dr. Anya Evmenova who supported me and encouraged me in the dissertation process from planning to execution. Her constructive feedback was very inspiring in my dissertation process. I would also like to thank Dr. Brenda Bannan, who was also supportive of my ideas and pushed me to think outside the box. I want to thank Dr. Bannan and Dr. Karyn Mallett for the opportunities they gave me to engage in research projects with them. I would also like to thank my husband for believing in me and for his support and patience throughout the long process of completing this dissertation. Without his presence, the completion of this program would not have been possible. Finally, I would like to thank my family and friends for the support and for their patience for the last four years. It is because of everyone‘s support and encouragement that I have completed this journey.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

Figure Page

ABSTRACT

SOCIAL MEDIA USE IN HIGHER EDUCATION: AN EXPLORATORY MULTIPLE-CASE STUDY

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Social media technologies have become integral in today's societies and they have been highly adopted by college age students. The emergence of social media technologies has impacted the way people learn and interact with each other resulting in communities of learning supported by collective intelligence. Social media technologies have also caused a paradigm shift in education resulting in emphasis on collaboration, personalization, and user-generated content. Research suggests that social media promotes student engagement and content learning, and 41% of faculty members in higher education are using social media for teaching purposes. However, more research is needed in this area to understand how experienced faculty are using social media in higher education in order to develop best practices for implementing social media in teaching and learning contexts.

This dissertation explored how experienced faculty are using social media to support student learning. More specifically it analyzed the types of social media learning activities (SMLAs), their design, the cognitive processes that they support, and the types of knowledge that students engage in when completing SMLAs. The focus was on the analysis of the interaction between cognition and social media affordances, experienced faculty strategies for designing SMLAs, and faculty perceptions of social media as educational tools.

A multiple case-study design was implemented in Fall 2013, and data was gathered from five different cases of six faculty using social media in their courses. Data sources included syllabi and course documents stating the descriptions of the SMLAs, students' posts in SMLAs, and faculty initial and follow-up interviews. Content analysis was conducted on SMLAs and students' posts while deductive coding was applied on faculty interviews. Data collected from faculty initial and follow-up interviews, analysis of the SMLAs and analysis of students' posts in SMLAs revealed that social media has the potential to support student learning and promote different levels of cognitive processes and types of knowledge. Results also revealed that experienced faculty select social media tools based on their technology features or their popularity in the field of study, and they recommend integrating several media sources in the design of a single SMLA. Furthermore, this study suggested that experienced faculty who use social media, specifically wikis and blogs, use them as Learning Management Systems. Finally, the social factor of social media was not evident in the design of the learning activities, and

faculty reported promoting more dialogue in their revised SMLA. The findings of this dissertation yielded significant considerations for faculty when designing SMLAs

CHAPTER 1. INTRODUCTION

Learning in a Digital Age

In recent years, the world has experienced a degree of networked digital connectedness that exceeds the limits of traditional communication tools such as phone or email. The rise of social media over the last ten years has led to a wired universe that has impacted the way people interact with each other, as well as the way they process the wealth of information surrounding them. Social media have merged the physical world with the virtual world, leading to digital identities that interact 24/7 beyond brick-and-mortar settings. Not only have social media influenced individuals on the personal level, they have also impacted the way people process information, which has become ubiquitous. Information can now be accessed anywhere and anytime due to the features of cloud-based technologies (Johnson, Adams, & Cummins, 2012; Siemens, 2005).

Since the introduction of social media, mobile applications have facilitated its adoption (Bannon, 2012). Research suggests that college students whose ages range from 18 and 34 are the population most likely to use social media sites for long periods of time (Bannon, 2012). Consequently, students have conveyed a preference for courses that have an online component (Dahlstrom, 2012). The availability of extensive online

information has led to a paradigm shift in considering the role of the educator and classroom structure (Dabbagh & Reo, 2011a).

The ecological change in social interaction and learning in the digital age has evolved as a result of the *Web 2.0* movement (Alexander, 2006; Dabbagh & Reo, 2011a; Lee & McLoughlin, 2011; O'Reilly, 2005) representing a consequential development in Computer-mediated Communication (CMC) tools that existed since the Internet originated in 1969 (Dabbagh and Reo, 2011a). O'Reilly and his colleagues first used web 2.0 in 2004 to refer to emerging technologies distinguished from previous World Wide Web tools in the following areas:

- Services, not packaged software, with cost-effective scalability
- Control over unique, hard-to-recreate data sources that get richer as more people use them
- Trusting users as co-developers
- Harnessing collective intelligence
- Leveraging the long tail through customer self-service
- Software above the level of a single device
- Lightweight user interfaces, development models, and business models
- Social software as a subset of Web 2.0 (O'Reilly, 2005, p. 5).

These characteristics of Web 2.0 technologies have allowed users more technological control to create, publish, and co-create, giving users the opportunity to write on the web and produce, rather than just read, as was the case with Web 1.0 technologies. Moreover,

Web 2.0 features have afforded users with new ways of networking and connecting with people and establishing identity and social presence that was not possible with older CMC tools and Web 1.0 technologies (Dabbagh & Reo, 2011a). Andrade et al. (2012) described Web 2.0 as "a space for interaction, dialogue and collaboration, where users assume the role of not only consumers, but also producers (prosumers) of content" (p.294).

Not only has the Web 2.0 wave led to a paradigm shift in how users interact with web content and connect with other people, it has also impacted how people learn, particularly in higher education contexts. As a result, a new suffix was added to education: 2.0. Indeed, the 2.0 features have introduced *affordances* and means of communication that were not available previously in higher education. Dabbagh and Reo (2011a) discussed the impact of Web 2.0 on all aspects of higher education, including faculty, students, classrooms, and pedagogy. They used the terms *Faculty 2.0*, *Student 2.0*, *Classroom 2.0*, and *Pedagogy 2.0* to emphasize the impact of Web 2.0 on higher education. For example, faculty in the 2.0 era no longer represent the only source of information (Siemens, 2005) for students, but are more of co-learners and co-designers surrounded by a 2.0 generation that has access to information 24/7. Similarly, Students 2.0 use social media as part of their daily activities, carry mobile devices including laptops, smart phones and tablets, and attend 2.0 classrooms that are equipped with interactive. Hence, Web 2.0 technologies have become part of the student's everyday life, bringing a significant and fast-paced change to higher education that faculty, curricula,

and even the classroom setting must adapt to (Dahlstrom, 2012; McLoughlin & Lee, 2011).

A paradigm shift in pedagogy has also occurred as a result of Web 2.0 technologies. This is described as Pedagogy 2.0, which emphasizes participation, personalization, and productivity (McLoughlin & Lee, 2011) (see Figure 1). McLoughlin and Lee (2011) explained that Pedagogy 2.0 is not a prescribed framework, but highlights the affordances of Web 2.0 and proposes a learner-centered and self-directed learning model that focuses on higher levels of engagement, user-generated content, and personalized learning.

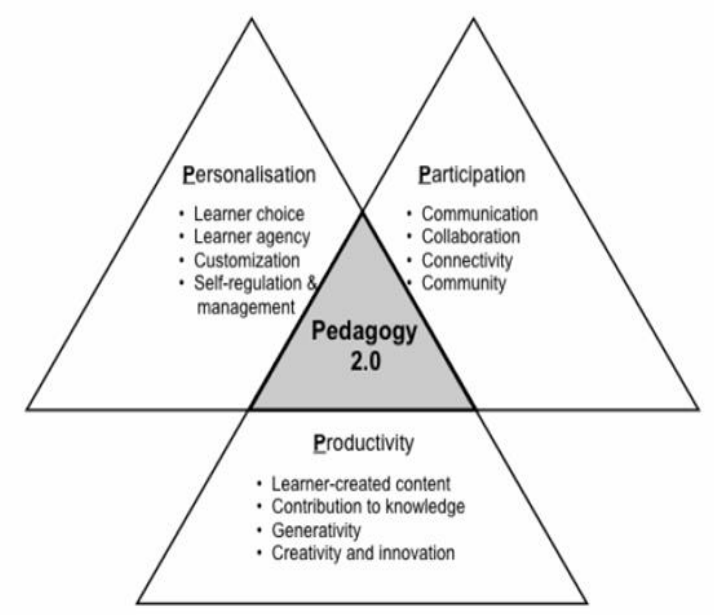


Figure 1. Key elements of pedagogy 2.0, McLoughlin and Lee (2011).

A major component of the Web 2.0 movement is social media. Alexander (2006) argued that social media encompass technologies that have a social, interactive, user-friendly layer added to them, and are organized through micro-content. Researchers have used the terms *social media* and *social software* to refer to Web 2.0 technologies (Dabbagh & Kitsantas, 2010; DeNoyelles, 2013; Kelm, 2011; Sistek-Chandler, 2011; Tindall, 2013), while others used the term social media interchangeably with social networking sites such as Facebook or LinkedIn (Johnson & Maddox, 2012). The next section provides a more comprehensive definition and description of social media technologies and their social and educational uses.

Social Media

Social media, also referred to as Web 2.0 applications or technologies, (Ravenscroft, Warburton, Hatzipanagos & Conole, 2012; Valjataga, Pata, Tammets, 2011) are defined as "a group of Internet-based applications that build on the ideological and technological foundations of Web 2.0, and that allow the creation and exchange of user-generated content" (Kaplan & Heinlein, 2010, p.61). Social media technologies are low-cost and low-barrier tools for both teachers and students. Hratinski and Aghaee (2012) explained that social media allow for the creation and sharing of content, and it is up to the users to decide whether the tool is social depending on how it is used.

Social media services such as Facebook and YouTube have become integrated as part of the design into smartphones and mobile devices. Other social media services can

be downloaded on portable devices as apps that can be used anywhere and anytime with an Internet connection. In a recent ECAR (EDUCAUSE Center for Applied Research) study, Dahlstrom (2012) reported that 62% of undergraduate students own a smartphone and 67% of these students use their smartphones for academic purposes. The ECAR report suggested that there is an increase among college-level students' adoption of mobile devices that can connect wirelessly to the Internet, such as smartphones, tablets, and laptops. Adoption of mobile web and mobile apps has increased by 82% and 85% respectively between July 2011 and July 2012, while the time spent on mobile apps has increased by 120% between July 2011 and July 2012 (Bannon, 2012). The use of mobile devices and mobile apps are driving forces in the increase in adopting social media (Bannon, 2012). The GPS feature of mobile devices has even allowed users to share locations and preferences while interacting digitally. Merchant (2012) argued that 3G (4G now) "mobiles, phones can be both the symbol and the hub of an individual's portable and dispersed connections" (p. 773). This suggests that mobile devices can support ubiquitous learning.

Social Media Technologies

There are hundreds of social media technologies at the user's disposal and many of them have different and common affordances. An affordance is "an attribute of an interaction design feature that is what that feature offers the user, what it provides or furnishes" (Hartson, 2003, p. 316). Greeno (1994) clarified the term affordances by

referring to Gibson (1977), who coined this term and explained that affordances are features that allow the agent to interact with a system or an object. Hence, social media technologies possess different affordances that allow for interaction and usage. Kitsantas and Dabbagh (2010) and Dabbagh and Reo (2011b) classified social media technologies as follows:

- *Experience- and resource-sharing tools* that enable online/social bookmarking, blogging, Wiki-ing, and microblogging such as Delicious, WordPress, PbWorks, and Twitter;
- *Media sharing tools* that enable social tagging such as Flickr and YouTube;
- *Social networking applications* that enable *socio-semantic* networking such as Facebook and LinkedIn;
- *Communication tools* such as e-mail and web-conferencing tools like Skype.

Hart (2013) provided rankings of technology tools for learning in 2013 based on the 7th Annual Learning Tools Survey of over 500 learning professionals worldwide. The top 10 tools by ranking order were Twitter, Google Docs/Drive, YouTube, Google Search, PowerPoint, and Evernote. Most of these tools allow for user-generated content, sharing of information, and even collaboration. The few that do not classify as social media tools (e.g. PowerPoint) can be integrated with social media tools.

The following section describes the different types of social media tools including blogs, wikis, microblogs, social networking sites, podcasts, media sharing tools, and social bookmarking tools with an emphasis on their affordances.

Blogs

A *blog* or a *weblog* is a website and authoring tool that allows the user to publish content without prior knowledge of HyperText Markup Language (HTML). Blogs are user friendly, and several open source platforms such as WordPress (www.wordpress.com) and Blogger (www.blogger.com) support novices' skills (Dabbagh & Kitsantas, 2010; Yang & Chang, 2010). A blog could be used as a diary, where users create content in reverse with the newer information ahead of the older information (Yang & Chang, 2011; Rudestam & Schoenholtz-Read, 2010), or it can be created such that the *blogger* (the person who is writing the blog) writes about a topic of interest. Bloggers submit their text via posts that are published on the blog's main page or on different pages if the blog has more than one page. Blogs can also include links to referenced websites or other blogs using a trackback feature that notifies the blogger when his or her blog has been linked to (Dabbagh & Kitsantas, 2010). In addition to the publishing feature, blogs offer commenting features that serve as a communication tool between the reader and the blogger (Kitsantas & Dabbagh, 2010).

Although blogs did not originate in education, they have been used in several ways to support students' learning in face-to-face and online courses. As a social media

tool, blogs allow the user to generate content, publish, and share this content, to communicate and collaborate (Minocha & Kerawalla, 2011). "Blogs can be used as an instructional tool for communication, articulation, reflection, evaluation, and analysis" (Kitsantas & Dabbagh, 2010, p. 167) and have the ability to extend learning beyond the classroom, by connecting students with experts and inviting public commentary as described by Rudestam and Schoenholtz-Read (2010).

Wikis

Wikis are websites that allow users to create and edit content collaboratively in a user-friendly environment that does not require expertise in web design (Kitsantas & Dabbagh, 2010; Lazda-Cazers, 2010; Rudestam & Schoenholtz-Read, 2010). When a wiki is created, the creator can send invitations to users to give them access to the wiki. A single page in a wiki is called a *wiki page*, while the sum of pages connected by hyperlinks makes up the wiki (Donne & Lin, 2013). The open editing feature of wikis allows users to add media, text, or links, in addition to adding pages and creating files or folders. Wikipedia is a popular wiki site whose open editing feature suggests that information is fluid and flexible rather than fixed, and it is user-generated rather than authoritative (Rudestam & Schoenholtz-Read, 2010). Users are able to track updates by date and by author through the "page history" feature (Lazda-Cazers, 2010). Other wiki sites that allow for private and public sharing are Wikispaces (www.wikispaces.com), and PbWorks (www.Pbworks.com). Wikis as instructional tools allow creation of

content, editing, sharing resources, commenting, linking, versioning, communicating, and reflecting, which all are defining characteristics of social media.

Social Networking Sites

Social networking sites (SNS) are very popular among college students, with an average of 90% of students using social networking (Smith & Caruso, 2010). SNS support individuals' engagement and interaction through a user-created profile that connects to friends and others on the site. Examples of these tools are Facebook (www.facebook.com), MySpace (www.myspace.com), Ning (www.ning.com), and Friendster (www.friendster.com). Kitsantas and Dabbagh (2010) refer to these tools as "community networking tools" that help students create a network of friends with which users can share multimedia resources, collaborate and share common interests, and "enable a connection between knowledge, community, and learning" (p. 169). Users can comment on each other's posts and use private messaging to communicate with each other. They can also search for other users by age, gender, interests, affiliations, or names (Rudestam & Schoenholtz-Read, 2010) and connect with them. Similar to blogs, SNS enable students to connect with people in their field and extend the discussion beyond the classroom and become members of a community of practice (Kitsantas & Dabbagh, 2010).

Podcasts

The term *podcast* was created as a combination of the product name iPod by the Apple company and broadcasting. Podcasting is simply audio blogging, and it can be an audio-only file or include images and video (Buffington, 2010). Podcasts can be downloaded and listened to on mobile devices such as iPods or MP3 players, a computer, smartphones, and iPads. Video podcasts or *vodcasts* are another type of podcast that accompany PowerPoint slides and are often associated with digital storytelling (Rudestam & Schoenholtz-Read, 2010). Mobile technologies have simplified the process of user-generated podcasts as well as their formatting and distribution, and give teachers as well as students the ability to create and share content to meet several learning course goals (Ng'ambi & Lombe, 2012). Specialized applications such as Garageband (www.apple.com/ios/garageband/) and Audacity (http://audacity.sourceforge.net) are often used for recording and editing the content of the podcasts.

Users receive updates about new podcasts, news items, videos, or blogs using a Really Simple Syndication (RSS) reader or aggregator (Lee, McLoughlin, & Tynan, 2011). Aggregators can be web-based or software-based, and deliver new content to the user's email. The 2.0 version of RSS includes a feature called *enclosure* that sends a URL link to the media file which is downloaded by the aggregator, or in this case, *podcatcher*. Lee et al. (2011) emphasized the potential that podcasting plays in education as a solution for students missing classes, as well as providing them with opportunities to publish their own podcasts.

Microblogs

As reported in most of the literature (Sinnappan & Zutshi, 2013), microblogging is associated with Twitter (www.twitter.com) and became popular with the launch of Twitter in 2006 (Gao, Luo, Zhang, 2012). Microblogging combines the features of blogging and social networking, where users post brief public messages of 140 characters called *tweets* and can choose to *follow* and be followed by other users. Following other users means that the follower can access other users' tweets, as well as *retweet* their messages and *tag* them. For instance, Twitter users can "create content, tag it, and share it" (Greenhow & Gleason, 2012, p. 465). Twitter affordances are unique, since it allows for a limited number of characters per posts, and as a result hypertext links are abbreviated (e.g. http://t.co), and *hashtags,* indicated by #, facilitate discussion and searching for topics. Users can also comment on each other's posts by including the username of the user, which begins with @. Timeliness and immediacy are advantages of microblogging, resulting from its availability on mobile devices. This allows users to respond to each other's posts instantly, creating a collaborative learning environment that holds promise in the use of Twitter as an educational tool (Gao, Luo, Zhang, 2012).

Media Sharing Tools

In addition to sharing video and photos, media sharing tools provide a means of *social tagging*. YouTube (www.youtube.com), Pinterest (www.pinterest.com), and Flickr (www.flickr.com) are examples of media sharing tools. YouTube is a video-sharing

website that allows users to create a video, upload it to the website, and share it publicly or with specific users. The average age of users who upload to YouTube is 26. About 80% of YouTube videos are uploaded by amateurs, 15% by professionals, and 5% are commercially produced (Sherrer & Shea, 2011). Users create an account in order to be able to upload a video to YouTube.

TeacherTube (www.teachertube.com) is another video sharing site geared towards educators to post educational videos and lesson plans. Video sharing sites are highly used in teaching as reported by Moran, Seaman, and Tinti-Kane (2012). Photo-sharing websites such as Flickr and Wikimedia (www.wikimedia.org) allow for the creation of an account, uploading images, tagging and sharing them with the public, as well as commenting on others' pictures. Although generally used for individual accounts, the media-sharing site Flickr can be used to encourage collaboration among group members by providing group access to a shared account (Price, Tsui, Hart & Saucedo, 2011). Other photo-sharing sites that allow for collaboration include Dweeber (www.dweeber.com) and Scriblink (www.scriblink.com), which afford synchronous online whiteboards and text-chat, image-upload, and voice sharing features. Pinterest is another media sharing tool that allows creating a board of topics, pinning videos and images, and following other members' shared content.

Social Bookmarking

Social bookmarking allows users to save favorite websites on the web, rather than on the desktop, and exchange them with other users of the social bookmarking tool (Kitsantas & Dabbagh, 2010). Delicious and Diigo (www.delicious.com; www.diigo.com) are examples of tools that allow users to keep a repository of information, tag, and share it with a group. Websites are saved online as links through an account created by the user. The links are only text-based (Bower et al., 2010), and can be accessed from an online browser anywhere and anytime. Users can classify the saved websites using tags or keywords that makes it easier for other users to find them. These tools also allow users to find and network with people who have the same interests.

Table 1 summarizes the affordances of each of the social media technologies described in this section.

Table 1

Summary of Social Media Affordances by Tool

Social Media Tools	Technology Affordances
Microblogging Andrade, Castro & Ferreira, 2012; Domizi, 2013; Fox & Varadarajan, 2011; Gao, Luo, & Zhang, 2012; Junco, Heibergert & Loken, 2011; Lin, Hoffman, & Borengasser, 2013	• Posting tweets • Following users • hashtagging • Commenting on tweets. • Linking • Favoriting • Re-tweeting
Blogging Churchill, 2009; Farwell & Kruger-Ross,	• Posting

2013; Gedera, 2011; Yang & Chang, 2012	• Commenting • Following other blogs • Tagging • Linking
Social Networking Cain & Policastri, 2011; Hung &Yuen, 2010; Irwin, Ball, Desbrow & Leveritt, 2012; Junco, 2012; Omar, Embi, &Yunus, 2012; Rambe, 2012	• Commenting • Posting • Networking • Following other users • Linking • Liking • Tagging
Wikis Bonne & Lin, 2013; Franklin & Thankachan, 2013; Hu & Johnston, 2012; Oskoz & Elola, 2011; Park et al., 2010	• Editing • Commenting • Creating pages • Posting • Linking
Media Sharing Bussert, Brown, & Armstrong, 2008; Lehmen, Dufren & Lehman, 2010; Lichter, 2012; Price, Tsui, Hart & Saucedo, 2011	• Creating • Sharing • Uploading • Tagging • Commenting • Liking
Podcasting Dale & Hassanien, 2007; Holbrook & Dupont, 2011; Tam, 2012	• Recording • Editing • Downloading • Uploading
Social Bookmarking Bower et al., 2010; Kitsantas & Dabbagh, 2010	• Saving • Tagging • Sharing • Classifying

Social media can be used as a part of a teacher-centered or learner-centered model. To date, most social media in education is used in a teacher-centered model where the teacher posts resources from different social media sites (Bates, 2011). On the other hand, Dabbagh and Reo (2011a) explained that social media can be used on three different levels: "private information management," "basic interaction or sharing," or "social networking" (p. 15). As described in this section, social media includes a variety of technology and learning affordances that hold a potential for educational use. Hence, there is no question as to whether social media should be used in education; rather the focus should be on how to use it effectively. Understanding how experienced faculty are already using social media in higher education is essential to developing strategies for further implementing social media in teaching and learning contexts.

Statement of the Problem

Seaman and Tinti-Kane (2013) conducted a survey (N=8,016) on faculty's personal, professional, and teaching use of social media. They reported that 44.1% of faculty members in higher education use social media in their teaching, with a higher percentage in the humanities and arts. They also reported that faculty mostly use wikis and blogs among other social media tools, in addition to their preference for online videos through YouTube and similar tools. The survey results also showed that the use of social media by faculty is on the rise, and social media has become a basic teaching tool adopted by faculty as well as by students to support and facilitate learning.

On the other hand, Bannon (2012) reported the findings of a national survey (N=1,998) that suggested the use of social media is on the rise, especially at the college-age level (18-34). Similarly, Duggan and Brenner (2013) reported that 67% of Internet users whose age ranges between 18-29 use social networking sites, with a higher percentage of Facebook users, followed decreasingly (N=1,802) by Twitter, Pinterest, Instagram, and Tumblr users. The ECAR Study for Undergraduate Student and Information Technology revealed that students (N=10,000) wished their professors used more technology tools, such as open educational resources (e.g. the OpenCourseWare Consortium and the Khan Academy), social studying sites (e.g. Cramster, CourseHero), simulations or game-based learning, e-portfolios, learning management systems, online chatting tools, web-citation libraries, and ebooks, because students believe they all contribute positively to their learning and academic success (Dahlstrom, 2012).

Research on social media generally demonstrated the positive impact that different social media tools have on student learning, such as increasing engagement with peers and course content, and as effective tools to supplement classroom teaching (Churchill, 2009; Domizi, 2013; Hung & Yuen, 2010; Fox & Varadarajan, 2011; Lichter, 2012; Menkhoff & Bengtsson, 2012; Rambe, 2012; Yang & Chang, 2012). For example, several studies suggested that wikis could increase student engagement and collaboration to produce better work (Franklin & Thankachan, 2013; Hu & Johnston, 2012), podcasts provide students with opportunities to catch up with course lectures (Holbrook & Dupont, 2011), and Flickr promotes interest in learning the content (Lichter, 2012). The focus of

these research studies is on non-cognitive aspects of student learning, and they addressed single learning activities in individual courses.

While college-level students' use of social media and faculty's integration of social media is on the rise, few studies have examined how faculty are designing learning activities using social media, and whether faculty are learning to support such learning activities and leveraging the intrinsic or integral affordances of social media for teaching. Understanding how experienced faculty are using social media in higher education is essential to developing best practices for implementing social media in teaching and learning contexts.

Hypothesis/Research questions

The aim of this study was to explore how experienced college faculty used social media to support student learning in higher education contexts. More specifically, it aimed to analyze the design of social media learning activities (SMLAs), the cognitive processes that students engage in when completing SMLAs, and the types of knowledge they promote. Additionally, this study explores faculty perceptions regarding the effectiveness of social media as educational tools. The overall question that this study addressed is:

How are experienced faculty using social media to support student learning?

More specifically, the following questions were addressed:

1. What types of learning activities are designed through social media?

a. What cognitive processes do SMLAs promote?

b. What types of knowledge do SMLAs promote?

2. What strategies do experienced faculty use to design SMLAs?
3. What are experienced faculty perceptions regarding the effectiveness of social media as educational tools?

Significance of the Study

Several studies emphasized the positive impact that social media brings to the classroom and to learning in particular (Churchill, 2009; Domizi, 2013; Fox & Varadarajan, 2011; Hung & Yuen, 2010; Lichter, 2012; Menkhoff & Bengtsson, 2012; Rambe, 2012; Yang & Chang, 2012), but none of these studies focused on the design of the social media learning activities and the level of learning they promote. Rambe (2012) suggested a gap in the literature in understanding the relationship between social media, student learning, and effective pedagogy. Similarly, Hung and Yuen (2010) expressed a need for more qualitative research to advance our understanding of social media's impact on student learning.

This study addressed a gap in the literature and analyzed the learning activities that are implemented through social media in higher education courses, as well as the cognitive processes and types of knowledge that are supported by these activities. Unlike other studies that described the use of one social media tool in an individual course, this study looked at multiple cases to analyze the use of social media in every case, and across

cases, in order to achieve generalizability. Furthermore, this study explored faculty perceptions of the use of social media as educational tools and the design of the learning activities in their respective courses. Analyzing SMLAs and the cognitive processes they promote in students will help in understanding best practices of social media in education.

Working Definitions

- An *affordance* is traced back to Gibson (1977) who proposed an interactionist view of perception of an object's features and action and it was defined by Hartson (2003) as "an attribute of an interaction design feature that is what that feature offers the user, what it provides or furnishes" (p. 316).
- *Cognitive processes* are the thinking skills such as remembering, understanding, applying, analyzing, evaluating, and creating that learners engage in while completing a task (Krathwohl, 2002).
- *Knowledge dimensions* or types of knowledge refer to facts, processes, concepts and metacognition that learners acquire through engagement in a learning activity (Anderson & Krathwohl, 2001) It refers to the noun part in the learning objective that illustrates what the students actually learn or the subject matter.
- *Social media* is defined as "a group of Internet-based applications that build on the ideological and technological foundations of Web 2.0, and that allow the

creation and exchange of user-generated content" (Kaplan and Heinlein, 2010, p.61).

- *Social media learning activities (SMLAs)* are the learning activities that the learner has to complete using a social media technology.
- *Web 2.0 technologies* provide user control to create, publish, and co-create web content unlike Web 1.0 technologies that allowed for only passive viewing of the content (O'Reilly, 2005).

CHAPTER 2. LITERATURE REVIEW

This study aimed at exploring how experienced faculty are using social media to support student learning in higher education contexts. More specifically it aimed at analyzing social media learning activities, the types of knowledge they promote, and the cognitive processes that students engage in when completing these activities. Additionally, this study aimed at exploring faculty perceptions regarding the effectiveness of social media as educational tools. This chapter provides (a) an overview of the learning theories that support the use of social media as educational tools, (b) provides an overview of social media research, and (c) presents the learning taxonomies that support the educational use of social media.

Learning Theories That Support Social Media as Educational Tools

The most current justification of social media's pedagogical use is through theories that describe learning "as a social process." *Distributed cognition* (Dabbagh & Reo, 2011a) and *connectivism* (Siemens, 2005) are two such theories. They both situate learning in a social context, and argue that knowledge and cognition are socially constructed and mediated by tools and artifacts.

Distributed Cognition

Distributed cognition is deeply rooted in Vygotsky's social learning theory, in which he argued that humans develop cognitively and learn through social interaction using language, cultural history, and social context (Vygotsky, 1978; Hutchins, 2000). Vygotsky started the concept of student-teacher relationship as more of a reciprocal benefit rather than a one-way benefit. He advocated the role of the teacher as a facilitator, rather than the only provider of knowledge that is evident in today's e-learning pedagogy. Vygotsky did not study this theory in the light of technologies and social media technologies that exist today, but he discussed the natural, non-linear phenomenon of human learning that could be translated into what we are witnessing today in the dynamic, collaborative world of social media. Hutchins (2000) also attributed distributed cognition theory to Minsky's *Society of Mind,* in which Minksy described cognition of an individual as collective, since intelligence and cognition involve physical and mental connections that are intertwined.

Distributed cognition gained its current name in the mid-1980s (Hollan, Hutchins, & Kirsh; 2000) and it was "specifically tailored to understanding interactions among people and technology" (Hollan et al., 2000, p. 192). Built on Vygotsky's and Minsky's work, Hollan et al. (2000) and Hutchins (2000) present three tenets for the theory of distributed cognition. First, they argue that distributed cognition is more than cognitive processes distributed across the members of a group. Rather, it is the result of the social interaction of the people and the interaction of people with their environment. Hence in

this tenet, the focus is on the outcome and the process of interaction. In the second tenet, Hollan et al. explain that cognition is "embodied," and it involves more than stimulus-response interaction, encompassing coordination between internal factors such as memory and external factors such as objects. Finally, Hollan et al. situate cognition within cultural boundaries, since people live in cultural environments that are impacted by human cognition that in turn is impacted by cultural systems.

Consequently, Duffy and Cunningham (1996) proposed the metaphor "mind as a rhizome" to refer to situated or distributed cognition learning theory. This metaphor suggests that learning is "distributed across multiple minds and the interactions or activities that connect these minds through the use of tools and symbols forming sociocultural and other contexts," and it also proposes that knowledge is "dynamic – constantly evolving and changing – and subject to infinite juxtapositions, just as a rhizome is" (Dabbagh & Bannan-Ritland, 2005, p. 166).

Mansour (2009) grounded the use of social media in distributed cognition. He explained that Web 2.0 technologies connect large number of people, allowing them to link their individual cognitive processes with each other producing group knowledge that is related to a common interest. He justified that Web 2.0 technologies support "the propagation and distribution of shared knowledge within social interactions" (p. 249). Mansour presented Wikipedia as an example of distributed or collective knowledge creation through the public sharing, publishing, editing, and deleting features that it affords users in order to create a reliable article. Simoes and Gouveia (2008) explained

that students produce quality work through social media because their work is publishable to a general audience and they receive feedback through the commenting feature.

Hence, distributed cognition, which focuses on learning beyond the individual and emphasizes perception as a factor in building knowledge, can be used to explain the process and the nature of learning that takes place in social media contexts where information is shared, distributed, reciprocal, and co-created; the learner has to be selective in choosing the information that works best for him or her; and builds upon previously acquired knowledge, a skill that is highlighted in connectivism, a learning theory proposed by Siemens (2005).

Connectivism

Siemens (2005) proposed connectivism, a more recent learning theory that supports the use of social media. This theory concurs with the theory of distributed cognition and the mind as a rhizome metaphor in the fact that it presents learning as a result of interaction with external factors that are chaotic and require self-organization skills. This interaction leads to an ongoing process of knowledge expansion that depends on making connections between any new or old acquired knowledge. Connectivism is based on the following principles:

- Learning and knowledge rests in diversity of opinions.
- Learning is a process of connecting specialized nodes or information sources.

- Learning may reside in non-human appliances.
- Capacity to know more is more critical than what is currently known.
- Nurturing and maintaining connections is needed to facilitate continual learning.
- Ability to see connections between fields, ideas, and concepts is a core skill.
- Currency (accurate, up-to-date knowledge) is the intent of all connectivist learning activities.
- Decision-making is itself a learning process. Choosing what to learn and the meaning of incoming information is seen through the lens of a shifting reality. While there is a right answer now, it may be wrong tomorrow due to alterations in the information climate affecting the decision. (Siemens, 2005, para. 25)

Connectivism implies that learning happens informally when individuals make sense of information circulating among them, unlike the formal learning strategies that take place inside the classroom. It also suggests that learning is cyclical, starting from within the individual who influences the organization that influences the individual in return with new knowledge. Siemens offers a more current learning theory that embraces the information age and offers accessible data for all individuals.

The principles of connectivism can be perceived through a study that Cain and Policastri (2011) presented on the use of Facebook as a learning activity. The researchers created a Facebook group and invited students to optionally join the group. The purpose

of the Facebook group page was to invite guest speakers to submit posts on contemporary management, pharmacy, and leadership issues not covered in the course. Data collected from this study revealed that students appreciated the informality of the activity, and the opportunity to connect with professionals in the field and be exposed to "real world" experience. In this sense, Facebook supported drawing connections between the classroom and the real world creating learning communities.

The theory of connectivism emphasizes the skills that are needed in order to use the wealth of information that is offered by social media, and more importantly to make connections between the information (Bates, 2011). This implies that the use of social media in an educational setting requires a new set of skills that are not justified by traditional learning theories such as behaviorism, cognitivism, and constructivism. Learning through social media requires data management and connections which facilitate collective learning supported by social collaboration and interaction.

Literature on the Use of Social Media in Higher Education

The search for existing research on social media was conducted by subject, "Education" through the databases Academic Search Complete, Education Full Text (H.W. Wilson), Education Research Complete and ERIC. Keywords that were used to conduct the search were "social media in higher education," "social media and learning activities," "Facebook and learning activities," "Twitter and learning activities," "blogging and learning activities," "YouTube and learning activities," "wikis and

learning activities," "Flickr and learning activities," "bookmarking and learning activities," and "podcasts and learning activities." The search returned 1,320 articles related to the social media tools described earlier. However, only articles that focused on how social media tools are being used in courses in higher education were reviewed. Thirty studies were included, and they are classified under microblogging, blogging, wikis, social networking sites, podcasts, social bookmarking, and media sharing tools. Due to the broadness of this study in examining different social media tools use in higher education, only three to five research articles related to each of the tools is presented below.

Microblogs

Gao, Luo, and Zhang (2012) analyzed articles on the use of Twitter in education published between 2008 and 2011. After careful selection of 21 empirical studies that focused on microblogging in educational settings, Gao et al. (2012) provided a critical analysis of the types of research that were conducted, ways in which microblogging was used in teaching, the efficiency of microblogging as a pedagogical tool, and implications for further research. The results of this analysis revealed that data analyzed in these studies were mainly collected through the number of Twitter posts or tweets, the content of the tweets, and surveys or interviews. The analysis of educational activities that were mentioned in these studies suggested that microblogging gave learners an opportunity to participate in learning instantaneously, extended learning beyond the classroom to

include virtual participation and sustained learning, expanded the learning content through real-world experiences, fostered collaborative activities, and supported informal learning. Specific examples of the educational activities include:

- Holding discussions on proposed themes;
- Posting at least two tweets of a personal nature and replying to a follower's tweet every week;
- Annotating class material and interacting with the class during the lectures;
- Having micro-gaming language activities;
- Back channel for communication;
- Documenting and sharing learning processes during 6 weeks' learning;
- Having writing activities;
- Reflecting on practicum experiences;
- Posting weekly summarizations on selected readings;
- Sharing resources;
- Instructor posting announcements and event updates (pp. 797-799).

Gao et al. (2012) also analyzed the disciplines in which microblogging was used in the literature review, and it included language courses, social sciences, new media, and marketing. Finally, they synthesized information on the effectiveness of microblogging as an educational tool, describing that it fosters learning communities, participation and engagement, reflective thinking, and collaborative learning.

In a study that investigated the use of Twitter in a pre-health professional seminar, Junco, Heibergert, and Loken (2011) presented the results of a semester long study on students' use of Twitter for academic and co-curricular discussions. Students were divided into control (N=50) and experimental (N=70) groups. The experimental group participated in the following educational activities that promote connectivity: continuing class discussions, asking questions in a low-stress environment, engaging in a book discussion, receiving class and campus event reminders, receiving academic and personal support, connecting with peers and with the instructors, organizing service learning projects and study groups, and completing optional and required assignments that require the students to reflect on readings, videos, or sayings, post their tweets and then comment on two of their friends' tweets. While both experimental and control groups had the same GPAs in high school, the researchers suggested that Twitter had a positive effect on the GPAs of experimental group who were using Twitter to communicate with the professor or other students). This study also showed the experimental group showed more engagement with the content than the control group.

Domizi (2013) conducted a study on pedagogy and course design using a case study approach on the use of Twitter in a graduate seminar (N=16). The study aimed at exploring whether Twitter enhances the students' learning of the content and fosters a sense of community, and also aimed to investigate the students' reaction to the academic use of Twitter. Below is a description of the assignment as it appeared in the syllabus:

> Each week, each student will post at least one "connection" to Twitter. This assignment is designed to promote immediate reflection and to encourage you to look for connections between what we are learning and discussing in our class, how this relates to your practice as an instructor, your ideas about teaching and learning, and your experiences in life in general. Did you do something new with your students today as a result of something discussed in our class? Did you overhear students on the bus talking about study strategies that we know are less than effective? The connections assignment, however, is not restricted to school alone – sometimes it is the outside world that gives us those "ah ha!" moments. Did you hear a story on NPR that related to a class topic? Did you have a discussion with friends over dinner about what good teaching looks like? We will spend some time each class looking over the Twitter feed and discussing our connections.

Data collected from the analysis of tweets (577 in total), students' reaction papers on the Twitter activities, and a pre- and post-questionnaire that explored the students' attitudes towards Twitter before and after the assignment, revealed that students felt more connected to each other and to the course content through the Twitter assignment. Student attitudes towards Twitter positively increased throughout the semester, and the assignment allowed them to participate in reflective and metacognitive activities outside the classroom. Hence, this assignment encouraged the students to build connections cognitively through the technology affordances of Twitter.

Andrade, Castro, and Ferreira, (2012) described a quantitative study to explore how Twitter, a Web 2.0 tool, is used in combination with a Web 1.0 tool, PowerPoint, to foster cognitive communication in lectures and large groups in higher education. The participants were 122 students across ten master's classes (N=122). The activity that students engaged in consisted of a hashtag included in a PowerPoint presentation which gave the students a space on Twitter to ask and answer questions, vote on answers, and answer multiple choice questions. This activity provided the students an opportunity to interact with the content, with each other, and with their instructors. A questionnaire that measured pedagogical aspects, technological aspects, cognitive learning, interactions in the classroom, positive behavior in the classroom, and negative behavior in the classroom suggested that the activity was very interactive through the participatory features that Twitter affords, which moved communication in Web 1.0 technology (PowerPoint) to 2.0 technology. Besides, all the students were given the opportunity to participate in the activity due to the Web 2.0 technology, Twitter.

Fox and Varadarajan (2011) explored the effectiveness of the use of Twitter in promoting interaction between students, faculty, and guests in a pharmacy management course taught using live synchronous video conferencing for two groups across different campuses. Both groups (N=143) participated in the Twitter activity. Students were required to post 10 tweets about information technology over the course of four weeks when IT will be the major lectures' topic. Content of the tweets were not detailed in this study. Students were interacting with each other, their instructors, and guests and

researchers were able to track their tweets through a hashtag that was created specifically for this course. The researchers specified five kinds of interaction that could take place in the Twitter environment: *learner-content*, *learner-learner*, *learner-interface*, *learner-instructor*, and *vicarious interaction*. An analysis of the types of interactions through the tweets and an optional evaluation survey revealed that students mainly interacted with each and valued the experience of reading each other's posts. Students also thought that Twitter in the classroom was distracting and prevented them from taking notes, while many of them thought that Twitter gave them the opportunity to participate and share their opinions. The researchers recommended taking into consideration the interactive nature of Twitter, but also considering the distracting nature of the technology and the large number of tweets to be monitored when implementing Twitter in a pharmacy course.

Lin, Hoffman, and Borengasser, (2013) studied the uses of Twitter and students' perceptions (N=44) about Twitter as an effective communication tool in three education courses, two of which were undergraduate courses offered online, and one graduate face-to-face course. The undergraduate course was "Computer in Education" and the graduate course was "Mobile Learning." Students were asked to create a Twitter account, follow each other, follow the course hashtag, and post 75 tweets throughout the semester. The researchers in this study did not mention the content of the tweets. The instructor also tweeted class announcements, and course-related information. Tweets were analyzed and students had to turn in three reports answering questions about Twitter usage. As a result,

the researchers suggested that given the unstructured nature of the activity, students did not interact enough through Twitter. Students who were already using Twitter before the course activity shared information through Twitter. However, when questions required an answer, none of the students responded. When implementing Twitter in the classroom, the researchers proposed having more structured activities and more scaffolding and modeling on the part of the instructor.

The research reviewed shows that Twitter is being used in graduate as well as undergraduate courses in education majors, pre-health professional major, and pharmacy majors. Some studies showed that faculty are making use of most of Twitter's affordances, while others revealed that only some affordances were used. In some studies, the researchers explained that students had to use hashtags, following, and tweeting features, while in others, students were only asked to tweet. In some studies, Twitter was used as an interactive tool that promoted discussions, communication, support, organizing groups and projects, voting on answers, and answering multiple-choice questions, while in others Twitter was only used as a reminder tool. None of the studies showed an alignment between learning activities and social media affordances, and none of the studies focused on the cognitive processes that the students were supposed to engage in while completing the social media learning activity. Furthermore, most of these studies did not provide a thorough explanation of the Twitter activity except in Junco, Heibergert, and Loken (2011). The focus of these studies was more on the outcomes of the activities in terms of fostering engagement, content learning, and the

effectiveness of Twitter as a tool to supplement face-to-face class meetings. However, the minimal description that was provided gave a sense of how faculty are using Twitter through structured or unstructured activities, formal or informal, static or interactive, and how the tool is being used across disciplines.

Blogs

Kelm (2011) described his experience using blogs and media sharing tools with a group of students (N=30) who were part of China Global Connections program that provided students with international business communication experience abroad through an MBA program. The program's purpose was to enrich students' experience in international business communication. As part of this experience, students were required to post comments (75-100 words) about the daily activities that were scheduled. The students' comments had to be focused on their takeaways about Chinese culture and their awareness of aspects related to the American culture. In this same course, the instructor asked students to post seven photographs and videos on LESCANTE's photo-sharing tool and YouTube channel, a University of Texas at Austin database that allowed students to post media and comment on it in a blog format. These social media-based activities encouraged students to engage in discussions, reflections, and collaboration to decide on videos to share. Kelm suggested the social media-based exposure to the language and the culture, and communicating about them online, enriched the students' experiences of international business communication.

Yang and Chang (2012) conducted a study in which they described a learning activity using blogs that required the experimental group (N=154) to post a blog contribution in which they wrote about course content-related material (information technology) after each lecture. Students in this group were also asked to read and comment on three of their peers' blog contributions. Students in the experimental group who were using blogs in an interactive way were compared to another group of students using blogs for personal reflections in an isolated way. As a result, Yang and Chang showed that blogs, when used in an interactive manner, could enhance peer interaction, improve critical reflection, and increase students' positive attitude towards academic achievement.

Churchill (2009) described a study on the effectiveness of the use of blogs in a postgraduate course "in which students were accessing course material, posting reflections, featuring artifacts created through the learning tasks, commenting on each other's contributions and otherwise participating on a regular basis throughout the semester" (p. 179). Data was collected through observations of the blog, faculty reflections, student interviews, and surveys. The results of the study suggested a positive learning impact of blogs on student learning. Interesting findings from the study reveal that students (N=24) believed they learned more in that course compared to other courses, and that blogging facilitated and contributed to their learning. Hence, social media played an important role in this course through the interaction among students enrolled in one course and the reflection tasks that they had to conduct.

Gedera (2011) presented an overview of how blogs can be implemented in an English as a Second Language learning environment to enhance process writing, emphasizing the fact that students write to a real audience through blogs which impacts their writing skills positively. In addition, blogs boost students' self-esteem through the publishing feature that allows students to share their work. The activity engaged an unspecified number of pre-university level students in the process of writing the first draft of an essay and publishing it on self-created blogs. They then gave each other peer feedback through the comments feature of the blogs, followed by a revision and editing of the essay to produce a final version. The researcher's experience suggested that blog features played an important role in facilitating this process.

Farwell and Kruger-Ross (2013) illustrated their experience using blogs in three different higher education courses in order to evaluate students' engagement and learning in this environment. In the first course, Social Media and Advertising, an unspecified number of students had to post two blog contributions per week. One blog contribution was about how a specific company is using social media to advertise a product, and the other one was about a topic of the student's choice. In the second course, Advertising Campaigns, students were asked to use blogs as reflection journals in which they wrote about their learning experiences and working with their team. In this course, students had the option to share their blogs with their team members or only with their professor. The third course was an online graduate course in web design in educational technology. Students in this course were required to use WordPress as the main course platform, and

Ning. The authors did not mention the type of blog contributions, but students were asked to share their blogs with their team members and comment on each other's posts. In this course, blogs were public and students could interact with people outside the course. Based on the authors' experiences using blogs and evaluations of the students reflections and contributions, the authors suggested that blogging was successful when an individual blogging platform was required to be used by all students, the number of words were limited, students were given the freedom to use RSS feeds, and they had the freedom to select the content of their posts. The researchers recommended the use of RSS when using blogs in the classroom, so that students are notified when their classmates post new content and become aware of all their classmates' feedback beyond their group. In addition, limiting the word count of the post produced a better quality of posts and comments. Furthermore, the researchers suggested that the analysis of recurring themes assisted them in identifying possible student slackers in order to provide them with support.

A review of existing studies on the use of blogs in higher education indicated that blogs have been used across the disciplines, specifically in language learning, information technology, marketing, and education. These studies were based on observations of the researchers through case-study analysis, quasi-experimental research design, as well as a mixed-methods study. They showed that blogs are being used privately as e-portfolios or shared publicly with people outside the classroom. Students in these courses were mainly asked to create their blogs, post reflections or assignments,

and comment on each other's posts. In some courses, faculty used RSS feeds so that students received post updates by other students. Not all the studies reviewed show that faculty took advantage of all the affordances of blogs, but common usage was related to posting, commenting, and following other students' blogs. The focus of the studies reviewed was on evaluating the use of blogs for interaction purposes and their effects on students' learning of the content. None of the studies explained the way the researchers aligned learning activities with blogging affordances, and none of these studies analyzed the cognitive processes or the types of knowledge that the students were supposed to achieve when conducting the social media learning activity.

Social Networking Sites

Cain and Policastri (2011) presented a mixed-methods study on the use of Facebook as a learning activity in a pharmacy management and leadership course. The researchers created a Facebook group and invited students to optionally join the group. Of 128 students enrolled in this course, 80% of the students joined the group. The purpose of the Facebook group page was to invite guest speakers to submit posts on contemporary management, pharmacy, and leadership issues not covered in the course. The students' participation in the posts was optional with no requirements, so that the researchers ensured the informality of the nature of the Facebook activity. Data from the student survey, exam responses, and student focus groups revealed that students

appreciated the informality of the activity and the opportunity to connect with professionals in the field and be exposed to "real world" experience.

Rambe (2012) examined the use of Facebook informally to supplement face-to-face interactions in two first-year clusters in an information systems module at a South African university that covered three courses. A departmental Facebook group was created to support students (N=165) with content inquiries or learning difficulties. Lecturer and peer-based interactions ranged between academic, logistical, academic-related, course administration, and social queries. Data was collected using community of inquiry and virtual ethnography approaches. Results showed that communication on Facebook encouraged collective intelligence, and it provided the students with a third space to communicate their ideas outside the classroom and to ask questions whenever the need arose.

Hung and Yuen (2010) explored how the social networking site Ning is perceived by students as a tool to supplement formal instruction and its impact on students' sense of community. Ning was used to engage 67 students enrolled in four face-to-face courses at two public universities in Taiwan. The students were asked to reflect on class learning by participating in discussion forums on the course sites. In addition, all the enrolled students (N=67) were asked to create their own profiles and encouraged to share their interests by uploading photos, audios, and videos to the class networks. Data collected from a survey suggested that Ning was perceived as a positive tool to supplement classroom teaching, its information-sharing feature and the interactional function of the

technology fostered a positive learning environment, and learners developed feelings of social connectedness.

Irwin, Ball, Desbrow & Leveritt, (2012) presented a study that examined students' interactions on Facebook course pages and their perceptions of Facebook's utility as a learning tool. He described the learning activities that 253 students across four courses (2 undergraduate and 1 postgraduate) in the School of Public Health at Griffith University's Gold Coast campus. Facebook pages were created for the four different courses, and they were used to provide the students with course-related information and an opportunity to network with each other. Instructors posted notifications about content or lecture notes added to Blackboard, reminders about assessments, useful external resources, and discussion questions on the Facebook course pages to engage students in content-related discussions. Students were also encouraged to use the comment feature to ask any question or answer discussion questions. Some students were frustrated by the added communication channel since it was another page that they had to track, duplicated material on the learning management system and the Facebook page, and lacked notifications. Other students found the Facebook page to be an efficient and familiar tool that enhanced communication and interaction with their instructors and their peers, and provided instantaneous updates and feedback. As a result, students recommended creating a Facebook group rather than a page, and engaging students in more discussion to provide them with more opportunities to master the content.

To explore students' perceptions about the use of Facebook in an English and second language learning environment, Omar, Embi, Yunus, (2012) described the learning activity and students' feedback. They detailed the learning activity as follows:

> The goal of the task was to engage learners in sharing and exchanging views in groups of four or five members on general or academic topics and themes selected by the learners and the course instructor. The information-sharing task required each group to select one of three shortlisted topics for discussion: natural disasters (ND), strange festivals (SF), and weird diseases (WD). The 31 students were divided into four groups of four and three groups of five members. Three groups chose ND, while the other two topics were covered by two groups each (p. 69).

Students were required to post six entries including a summary of each of the entries and related questions. Students were also required to answer questions posed by their peers. The assistant instructor played a peripheral role by giving instructions and facilitating student engagement. The analysis of Facebook discussion threads and responses to an open-ended survey suggested that Facebook could be an engaging second language learning environment. Students gave positive feedback about their experience using Facebook in an information-sharing task that suggests using pedagogically sound learning strategies could help students practice the language beyond the classroom. Furthermore, the researchers explained that this activity emphasized the student-centered approach to learning and marginalized the instructor's role.

Based on the studies that were examined, social networking sites are being used by faculty to promote student-student, faculty-student, and expert-student interactions. These studies mainly followed a case-study design and measured the effectiveness of social networking sites such as Facebook and Ning as educational tools that could have the potential of enhancing student interactivity and learning. Learning activities were either described thoroughly or briefly. While some of the activities described were optional, others were mandatory, and they engaged students in discussions, asking questions, sharing resources and summarizing them, or simply receiving updates about course-related news or sources. The studies showed that social networking sites are being used in in different public health courses, pharmacy courses, information systems courses, and ESL courses. However, none of the studies explained the rationale behind aligning learning activities with social networking technology affordances, and none of these studies analyzed the cognitive processes and types of knowledge that the students achieved as a result of completing SMLAs.

Wikis

Oskoz and Elola (2011) presented the findings of a study in which they explored the use of a wiki and chat tools to complete a writing assignment in a Spanish foreign language face-to-face course consisting of 10 students. The researchers looked at students' essays, wiki drafts, chat discussions, and a questionnaire that was administered to the students. Findings suggested that students learned more about foreign language

writing through the collaborative nature of the wiki and the chatting that took place among the group members. Students also reported that the combination of a collaborative site with a chatting tool was very helpful. However, the study also suggested that some students did not take full advantage of the affordances that wikis provide and they preferred to meet on campus.

Franklin and Thankachan (2013) proposed the findings of a study in which 36 graduate students participated through the use of wikis to complete a problem-based learning activity. Students engaged in groups in a two week activity to evaluate and propose software implementation for a school district. Students engaged in role-playing, identifying critical questions that could assist them in the selection of the open source software, and identifying school demographics in order to solve the case. Students collaborated via wiki and had a final face-to-face meeting to compile a list of software and an implementation plan that they would recommend for the school. Students' recommendations were based on course readings. A single case study approach was used to analyze student wikis, peer-reviews, discussions, and final presentations of the team's solutions. Findings suggested that students enjoyed the collaborative nature of the wiki where they could role-play in order to solve the problem. Students also reported that they engaged with their peers over the course of these two weeks more than they talked to them for the whole semester.

Park et al. (2010) explored the use of wikis and the students' different learning styles in a graduate-level health professionals course of 45 students. The mixed methods

study consisted of the analysis of quantitative scores on a *learning style inventory* compared to students' perceptions of the value of using a wiki in their online course. The wiki was used as an interaction tool where students completed several assignments such as peer reviewing, editing, and commenting. The study resulted in information about the variations of students' learning preferences, but it did not yield significant results concerning the students' perceptions towards the use of wikis. Many students had a negative experience with the wiki as a technology, which made it hard for the researchers to analyze the students' perceptions. However, the researchers mentioned that the study brought forth some considerations for future design of wiki activities.

On a program level, Donne and Lin (2013) explained how a Wiki was developed to support graduates and current students in a master of special education program at a private institute. The wiki engaged teachers and current students in several activities by creating several wiki pages that serve different purposes: "Working Towards Certification," "Working as a Special Educator," "Teacher Community," "Stay Connected with the University," and "Wiki Help." Through these pages, students and colleagues connected with each other, shared knowledge, experiences, and resources, asked questions, and shared teaching experiences. Finally, the researchers present the benefits of an online induction program by stating that,

> (1) it was possible to have multiple contributors, (2) it required no particular person to be in charge, (3) graduates could make use of the wiki at their leisure

both in time and location, and (4) all resources were free to the participants (p. 46).

Wikis were also used in a public administration online program in order to engage students in a learning community. Hu and Johnston (2012) provided an in-depth analysis of the use of wikis in a public administration course in which students (N=17) were enrolled in Fall 2010. The wiki encouraged student-generated content through collaborative activities which students participated in to create a paper, book chapter reviews, and commenting on each other's' work. Students were also asked to add any relevant examples to the course content and they were required to write reflections about readings and videos, and their peers were supposed to review and comment on them. Data collected from wiki contributions, number of wiki edits and posts, students' reflections, and course evaluations revealed that the affordances of the wiki helped students master the course content, recognize the value of collaboration, develop a sense of responsibility, develop personalized learning experiences due to the multiple pathways for interaction and learning that the wiki provided them with, and create high quality work.

Researchers of existing studies have perceived wikis as efficient educational tools across language learning, educational technology courses, health professional courses, education courses, and public administration programs. In these studies which were mainly case-studies using mixed methods approaches, students engaged in collaborative tasks to create an artifact by using the commenting feature, peer reviewing, and asking

and answering learning strategies. Some studies reported students' frustrations with using wikis, while other reported a positive feedback on the students' learning and engagement through wikis. However, little analysis of the learning activities and the cognitive processes was presented.

Media Sharing Tools

In an undergraduate introductory chemistry course, Lichter (2012) described the implementation of an optional YouTube learning activity as follows:

> Students were challenged to produce a YouTube video that could be used to help themselves and others learn them. The guidelines for the video project were as follows: (a) the solubility rules had to be completely covered (as seen in Table 1) and must be audible, visible, and easy to understand, and (b) the video must be posted to YouTube so that the rest of the class (and world) could view the project. The group size was limited to 5−6 people and stipulations were given that upon submission of their video link, all group members must provide proof of how they were involved in the video. (p. 1134)

The activity resulted in 17 videos uploaded to YouTube by 17 groups (N=48) who completed the activity. All the students who were enrolled in this course were asked to watch these videos on solubility in preparation for their second exam. Results from an exam question on solubility, a survey, and comments suggested that students who

participated in this activity mastered the content better than students who did not participate, and the YouTube video creation made students more interested in chemistry.

Lehman, Dufren, and Lehman, (2010) offered an overview of a YouTube video creation project in a business communication course that emphasized communication ethics. In teams, an unspecified number of students were required to create a video depicting communication ethics as part of a formal training at a company. Students then had to upload their videos to YouTube, and present them in front of their classmates followed by a questions-answer session. The content of the video was based on a role-playing activity of the violation of a company's professional code of conduct. Prior to filming their videos, students were given guidelines and a decision-making matrix for use in ethical problem solving.

Bussert, Brown, and Armstrong, (2008) explained how Flickr can be used to promote students' learning of the databases that exist in a library. In a LALT 101 course that emphasized information literacy, an unspecified number of students were required to create a Flickr photo stream. To complete this activity, students "took photos of their groups; uploaded the photos to Flickr; selected tags and wrote a description" (p. 5). Students were also encouraged to search for their LALT 101 tags and find other students' pictures. The researchers believed that this activity promoted experiential learning, creativity, intellectual curiosity, and meaningful personal learning environments. They also suggested that adding the social software to learning about library databases helped students master the content and retain it.

Flickr was also used to archive any concept or exercise written on whiteboard in Physics 205 and 206 at California State University, San Marcos. Price, Tsui, Hart, and Saucedo, (2011) presented the benefits of taking pictures of whiteboard activities and uploading them to a course account on Flicker used by the instructors, the students, and the learning assistants. Students could comment on the pictures and ask questions through the comment feature of Flickr while the instructors or the learning assistants answered them promptly. Furthermore, learning assistants provided comments on any incorrect information that appeared in the photos. Photos were organized hierarchically by the learning assistants to match the course structure "course section → unit → block → activity" (p. 427). A student survey at the end of the semester revealed that students benefited from this activity by reviewing whiteboard content and the professor's notes on the chalkboard, especially when they had a test or a homework assignment. Moreover, students cleaned up their notes on whiteboard and organized them prior to taking the picture, which increased the quality of the posted notes. Hence, the authors recommend the use of Flickr in courses that require a lot of whiteboard use, so that students' work does not get erased.

Studies that explored the use of media sharing tools such as YouTube and Flickr showed how these tools could create a more fun learning environment that could engage students with different learning styles. The reviewed studies on video and photo sharing tools revealed different learning activities that students engaged in to create videos and share them, or to post photos and tag each other with them. Commenting features were

enabled in some of the learning activities in which the students ask and answer questions or simply give feedback to their peers on submitted projects. The reviewed literature did not present enough analysis of the learning activities that are carried out through these technologies, nor did they elaborate on the types of knowledge or cognitive processes that was intended to be achieved by these activities.

Podcasts

Podcasting is being frequently used in higher education for the benefits that it offers students when reviewing lectures or catching up with material from a missed class. Holbrook and Dupont (2011) report a study that examined the efficiency of podcasting in completing course activities and the impact of podcasting on students' absence from class. Lectures were recorded in real time using ProfCast software and synchronized with PowerPoint presentations so that students could review lectures after class. Students could download the podcasts to their personal computers and transfer the file to an mp3 player or iPod from the learning management systems of the course, but these podcasts were not made available through an RSS feed. A questionnaire that was completed by students enrolled in 100 and 400 level biology courses revealed that enhanced podcasts helped an unspecified number of students with the learning activities, although 39% of the undergraduate students and 20% of the graduate students reported that podcasts gave them the opportunity to miss class and still catch up with missed lectures. The researchers

argue that the benefits of podcasts for enhancing students' learning, especially first year students, outweigh their impact on absence.

Tam (2012) reported on a study that examined the effectiveness of using podcasts to learn music and visual arts. Podcasts were created for eight courses ranging from first to fourth year at a teacher education institute, distributed through iTunes, and RSS feeds were made available to the students (N=128). Podcasts were categorized into informational, demonstration, and assignment or activity related, and they included references, handouts or PowerPoint presentations, demonstrations of procedures. Some required answering questions asked in the podcast, or asked listeners to complete activities and produce their own podcasts. Results based on a survey and focus group interviews showed that students perceived podcasts as beneficial to their learning in general, and they also stated that demonstration podcasts were more useful than information podcasts that reiterate lectures. Students also reported that they prefer shorter podcasts with an average length of 15 minutes. Students also recommended audio and visual effects as effective components of podcasts. Finally, students' reported difficulty with podcasts technical issues, suggesting that faculty should always provide technical guidance when using podcasts, especially because RSS feed is a relatively new technology.

Similarly, Dale and Hassanien (2007) confirmed the effectiveness of podcasts in supporting students' learning through a study that explored the use of podcasts in an undergraduate level-one tourism module (N=40). Weekly podcasts were created with

Apple's Garageband software application to supplement course lectures by summarizing important points that would be discussed in the upcoming lecture. Podcasts were a mix of audio and video recordings, 4-6 minutes each, and they were published through a website and iTunes, which also served as an aggregator. A survey and focus groups revealed that podcasts support students' learning, meet the needs of a varied body of student population, and promote students' motivation to learn. The researchers emphasize the importance of technical support for both faculty and students when implementing podcasts.

Hence, while podcasts are being used in different disciplines, their use is mostly static, in which the learner only listens to them for lecture reviews. Tam (2012) provides a more interactive approach to using podcasts by engaging students in learning activities based on the podcasts, and requiring them in some instances to create their own. Furthermore, some of the professors used RSS feeds while others did not. Finally, researchers emphasize the importance of providing technical support for faculty when developing their podcasts and implementing them. The reviewed literature did not present enough analysis of the learning activities that are carried out through these technologies, nor did they elaborate on the types of knowledge or cognitive processes that were intended to be achieved by these activities.

Summary of Literature Review

Existing studies on social media use in higher education were generally limited to one course in which social media is used, and described the implementation of one or more learning activity through social media per course. Furthermore, these studies revealed that faculty from different disciplines including education, pharmacy, language learning, public administration, information technology, science, business, music, and visual arts are using social media to support their face-to-face or online courses. The studies revealed that the activities mainly engaged the students in connecting with peers and with learning outside the classroom, commenting on each other's work, collaborating, and creating projects through microblogging platforms, social networking sites, media sharing tools, blogging, wikis, and podcasting.

Consequently, most of the studies have reported the effectiveness of social media in the classroom and the sense of community that is developed through the use of these technologies. Although empirical research on the effectiveness of social media in education is limited, the research to date suggests that social media does have a positive impact on students' learning and the classroom environment, which makes the need to explore how SMLAs are designed important. Existing studies did not specifically examine whether learning activities were aligned with the affordances of the specific social media tool (Bower, 2008; Kirsh, 2006), nor did they provide a thorough analysis of the social media learning activities. Examining SMLAs and experienced faculty perceptions is critical to understanding best practices in using social media as educational

tools. Table 2 summarizes the findings of the social media research described in this section and describes social media tools that were used, learning activities, and related courses/disciplines.

Table 2

Summary of Data Collected on the Use of Social Media as Identified in the Literature

Social Media Tools	Course/ context	Learning Activities
Microblogging Andrade, Castro & Ferreira, 2012; Domizi, 2013; Fox & Varadarajan, 2011; Gao, Luo, & Zhang, 2012; Junco, Heibergert & Loken, 2011; Lin, Hoffman, & Borengasser, 2013	• Education • Pharmacy • Health professionals	• Posting connections with the classroom content • Posting tweets about a course topic • Tweeting class announcements and reminders • Discussing a topic • Asking and answering questions • Voting on answers
Blogging Churchill, 2009; Farwell & Kruger-Ross, 2013; Gedera, 2011; Yang & Chang, 2012	• Information technology • Educational technology • Marketing	• Writing essays • Comment on each other's blogs • Accessing course material • Posting reflections • Posting course artifacts • Reflection journal • Follow group members' contributions
Social Networking Cain & Policastri, 2011; Hung &Yuen, 2010; Irwin, Ball,	• Information systems • Pharmacy management • Public health	• Asking and answering questions • Participating in discussion forums • Creating profiles

Desbrow & Leveritt, 2012; Junco, 2012; Omar, Embi, &Yunus, 2012; Rambe, 2012	• Communication	• Sharing resources • Inviting guest experts • Peer networking • Posting notifications • Exchanging views
Wikis Donne & Lin, 2013; Franklin & Thankachan, 2013; Hu & Johnston, 2012; Oskoz & Elola, 2011; Park et al., 2010	• Business • Language learning • Education • Health professions • Public administration	• Collaborating to complete a task • Peer reviewing and editing • Connecting • Sharing resources • Asking questions • Creating course content • Commenting on peer work • Reflecting on readings • Writing critiques
Media Sharing Bussert, Brown, & Armstrong, 2008; Lehman, Dufren & Lehman, 2010; Lichter, 2012; Price, Tsui, Hart & Saucedo, 2011	• Chemistry • Communication • Information literacy • Physics	• Creating a video • Sharing a video • Uploading photos • Tagging photos • Commenting on photos
Podcasting Dale & Hassanien, 2007; Holbrook & Dupont, 2011; Tam, 2012	• Music and Visual arts • Tourism	• Recording lectures • Downloading • Summarizing important lecture points • Recording demonstrations

Pilot Study

A pilot study was conducted in Fall 2012 to investigate how faculty are using social media in their courses, and to solicit their perceptions as well as their students'

perceptions about social media as educational tools (Zgheib & Dabbagh, 2012). This study added a new layer to the research presented earlier by showing how social media is being used across the curriculum, and faculty perceptions about social media as opposed to their students' perceptions. Although other studies have suggested a positive influence on students' learning as a result of social media, this study shed light on *how* social media can influence students' learning based on faculty perceptions. The overall research question was:

How are faculty members using social media across the disciplines in higher education, and how do faculty and students perceive the role of social media in the learning?

The research question was further divided into several questions:

- In what ways are faculty members using social media in higher education?
- What are the most common learning activities that faculty assign for students to complete through social media?
- What perceptions do faculty have about their students' learning using social media?
- What perceptions do students have about their learning through social media?
- How do faculty and students' perceptions about the use of social media in an educational context compare?

Five faculty members who were using social media in their courses at a Northern Virginia higher education institution were purposefully selected and interviewed. Furthermore, a survey was sent to their respective students who were spread across seven different courses (N=152). However, only 21 responses were received. Results revealed

that faculty and students perceived social media as playing an important role in (a) extending learning beyond the classroom, (b) activating students' technology skills, and most importantly, (c) facilitating and enhancing students' learning. Figure 2 shows student-only findings, faculty-only findings, and common themes that emerged from both students and faculty.

This pilot study also revealed additional findings. For instance, some faculty used social media technologies differently from what the technology affords. One of the faculty members used Twitter as a reflection tool, while different social media tools supported similar cognitive processes. The study also suggested that there is a variety of learning activities across the disciplines that are implemented through the same social media. This gave rise to a need to analyze the different educational uses of social media tools and to study the learning activities in more depth. It is worth understanding the cognitive processes and the types of knowledge that learners engage in through the SMLAs. Also, it is worth understanding how experienced faculty design SMLAs. These areas have not been addressed by previous studies, and understanding the cognitive processes that SMLAs promote is important for informing best practices of social media use in higher education.

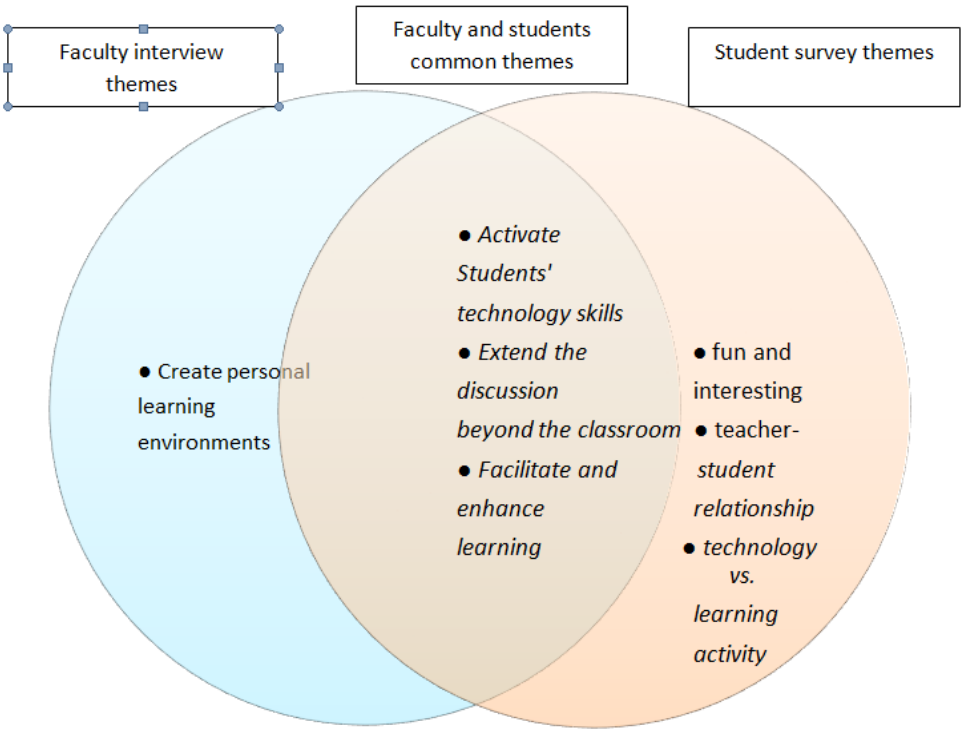


Figure 2: Faculty and Students' perceptions of the use of social media as educational tools.

Learning Taxonomies That Support the Educational Use of Social Media

In the early 1990s, Richard Clark and Robert Kozma engaged in a debate about the role of media in learning (Clark, 1983; Kozma, 1994). Clark (1983; 1994) argued that media or technologies do not play a role in students learning; rather, they are mere tools for delivery of instruction. Clark argued that "technology not only does not influence learning, but it will never influence learning, and that media is neither sufficient for nor necessary to learning" (Clark, 1994, p.23). He claimed that learning effectiveness resides

in the design of the instructional strategy or learning activity irrespective of the technology used. In response to Clark's argument, Kozma (1994) argued that technology plays an important role in enhancing student learning. He defined *technology* "as the physical, mechanical, electronic capabilities of a medium that determine its function, and to some extent, its shape and other features" (p. 11). Kozma claimed that media has different attributes or affordances, so activities that engage students' cognition in a certain medium (technology) must be identified, as well as the specific instructional uses of these attributes (affordances), which resonates with Jaffee's (2003) description of *pedagogical ecology*. Jaffee (2003) used the term pedagogical ecology to explain the interconnectedness between technology and learning which creates interdependent systems that feed from each other.

In order to understand how social media can be used to support student learning, it is necessary to understand the affordances of the particular social media technology and align these affordances with the appropriate learning activities (Bower, 2008). The term affordances can be traced back to Gibson who proposed an interactionist view of perception of an object's affordances, and action that could be translated to human computer interaction. Hartson (2003) paraphrased the definition of affordances that was proposed by Gibson (1977) as "an attribute of an interaction design feature that is what that feature offers the user, what it provides or furnishes" (p. 316). Greeno (1994) suggests "the affordance is a property of whatever the person interacts with… it has to be a property that interacts with a property of an agent in such a way that an activity can be

supported" (p. 340). For example a doorknob affords the action of turning it to open the door. Similarly, a chair affords the action of sitting on it or maybe standing on it. Greeno explained that Gibson's theory emphasizes the impact of the physical environment on the cognitive activity, a theory that contradicts with Clark (1983). Greeno added that other factors such as perception and motivation are necessary in driving action. For instance, a chair might be perceived as a seat for one observer and a stool to stand on for another.

Similarly, Kirsh (2006) argued that affordances feed into the development and the enhancement of the technologies that facilitate mental activities. He explained how artifacts (tools) and tasks co-evolve and are interdependent. He proposed that "artifacts transmit cognition" (p. 1), that is, they stimulate the user to engage in cognitive processes. Kirsh also described an artifact ecology that supports the co-evolution of users, artifacts, practices, and tasks. All the elements of the artifact evolution feed into each other in a cyclical manner. Kirsh's theory highlights the interdependency of learning activities and technology affordances. It shows that the selection of the technology depends on the learning activities, but on the other hand, the learning activity influences the way the technology is used. Hence, the technology affordances of social media should be identified when using these tools in an educational context (see Table 1 in Chapter 1). Likewise, Bower (2008) proposed a framework for matching learning activities with the appropriate technology to create an e-learning environment, and he argued that the affordances of the learning task should be matched with the most convenient technology affordances. He also explained that sometimes e-learning activity needs to be adapted and

adjusted in the final design stages of the activity, after the technology affordances have been identified.

Bower, Hedberg, and Kuswara, (2010) proposed a Web 2.0 learning design process that guided the selection of appropriate social media for a certain learning activity by focusing on the interaction of technology and cognition. They suggested following the process of (1) identifying learning goals, (2) identifying the type of knowledge that students should gain from the activity, (3) identifying the cognitive processes that the students should engage in, (4) selecting the type of pedagogy, and finally, (5) selecting the "preferred modalities of representation" such as audio, video, and text.

Two main components of Bower et al.'s (2010) Web 2.0 learning design process are *cognitive processes* established by *Bloom's Taxonomy of Cognitive Domains* and *knowledge dimensions* or types of knowledge proposed by Anderson and Krathwohl (2001). Bower et al. presented a conceptual framework which cross-tabulated Bloom's revised cognitive processes with the types of knowledge proposed by Anderson and Krathwohl's and another component, types of online pedagogies (Figure 3). This conceptual framework was used to show examples of how different SMLAs can be created to support different cognitive processes and types of knowledge. For instance, they illustrated how blogs could be used to understand, apply, and evaluate, while promoting different types of knowledge. They also demonstrated how blogs could be

used for dialogic activities, constructive and co-constructive, when implemented in different learning contexts (Figure 3).

	Cognitive Process dimension			
Knowledge dimension	Remember	Understand	Apply	Analyse
Factual knowledge	*Microblogging* – document and share new items of factual knowledge with a group as they come to hand (D)	*Social bookmarking* – bookmark with facts relevant to a certain topic (D)	*Image creation* – construct an image that represents or describes an item of knowledge (C)	*Wikis* – analyse the definitions provided by peers and provide them with constructive comments on how to improve (D)
		Podcasting – provide definitions of terms on an audio discussion board (D)		
Conceptual knowledge	*Wikis* – identify the main concepts relevant to the topic on the wiki (C)	*Blogs* – explain the concepts and issues of a topic as they arise (C)	*Digital storytelling* – create a story that exemplifies/applies a concept (C)	*Wikis* – construct/adjust a knowledge network so that it appropriately interrelates concepts (C)
	Image creation – draw an image to represent a concept or set of concepts (C)	*Presentation tools* – represent and present the knowledge and relationships of a conceptual domain (C)	*Video* – create a video that applies the concepts you have learnt to a concrete situation (C)	*Podcasts* – collaboratively analyse an image or artefact using Voicethread (D)
	Podcasting – listen to a podcast of a lecture and attempt to recall the main concepts (T)	*Wikis* – explain a set of concepts on a wiki (C)		

Figure 3. A framework for implementing Web 2.0 in a learning environment, Bower et al. (2010)

Similarly, Bosman and Zagenzysk (2011) and Lightle (2011) argued that Bloom's taxonomy of cognitive processes can be highlighted using social media. They paired

social media tools with existing cognitive processes to show how technology interacts with pedagogy. For instance, they suggested that social bookmarking promotes remembering, social blogging promotes understanding, social file sharing supports applying, social collaboration supports analyzing, social decision making tools stimulate evaluating, and social creativity sharing tools promote creating. However, Bower et al.'s (2010) framework is merely conceptual and is not based on empirical research. Furthermore Bosman and Zagenzysk's (2011) and Lightle's (2011) analysis of social media in the light of Bloom's taxonomy is only perceptual. Hence there is a need to understand the actual use of social media and the levels of cognitive skills and types of knowledge that it promotes through SMLAs.

While the main focus should be on the design of learning activities which incorporates cognitive processes and types of knowledge that are leveraged by the social media affordances, understanding how experienced faculty are using the technology affordances of social media is essential. Hence, it is important to analyze the cognitive processes that the students engage in while taking advantage of social media technology affordances to complete activities. Influenced by Bower et al.'s conceptual framework for Web 2.0 learning design, two taxonomies guided the analysis of the learning activities in this study: original and digital versions of Bloom's *Taxonomy of Cognitive Domain* (Churches, 2009), and *Knowledge Dimensions or Types of Knowledge* (Anderson & Krathwohl, 2001).

Bloom's Taxonomy of Cognitive Domains

Bloom's (1956) taxonomy of the cognitive domain was originally designed to refer to learning goals, or what action the student is supposed to do to achieve learning. Bloom's taxonomy ranges from lower order to higher order thinking skills or cognitive processes that the student engages in to achieve learning goals. Bloom's original taxonomy consisted of six categories: knowledge, comprehension, application, analysis, synthesis, and evaluation. They ranged from lower order cognitive processes, which included knowledge at the bottom of the hierarchy, and higher order cognitive processes, which was represented by evaluation as the highest level of thinking.

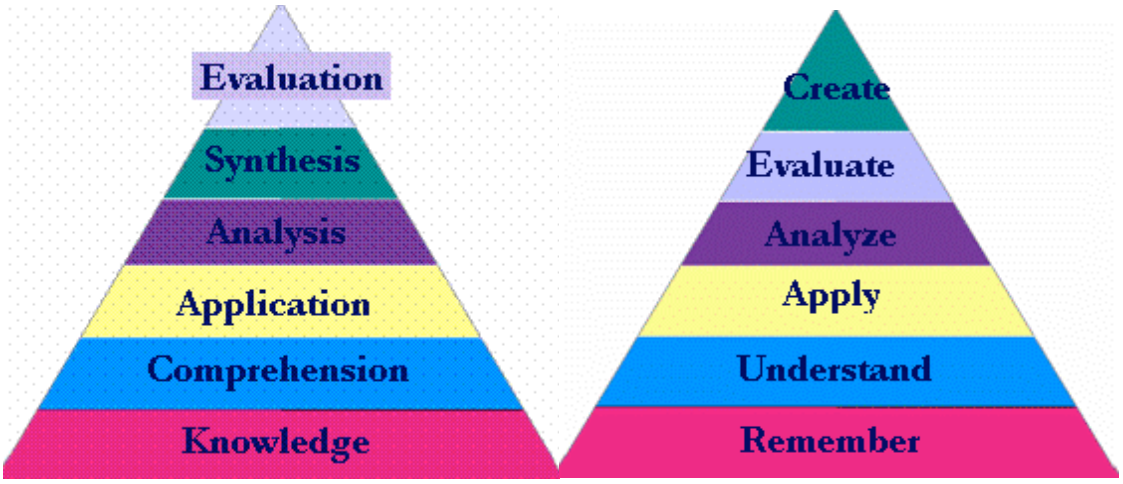


Figure 4. A comparison between Bloom's original taxonomy of cognitive domains and Anderson's and Krathwohl's revised taxonomy of the cognitive domains.

As presented in Figure 4, Anderson and Krathwohl (2001) came up with a revised taxonomy of Bloom's cognitive domains that involved verb forms of the previous cognitive processes and added the "create" level of thinking skills to replace "evaluation" in Bloom's taxonomy, and "remember" to replace "knowledge." Each of the main cognitive processes of Bloom's taxonomy, also referred to as categories, had subcategories as presented in Figure 5.

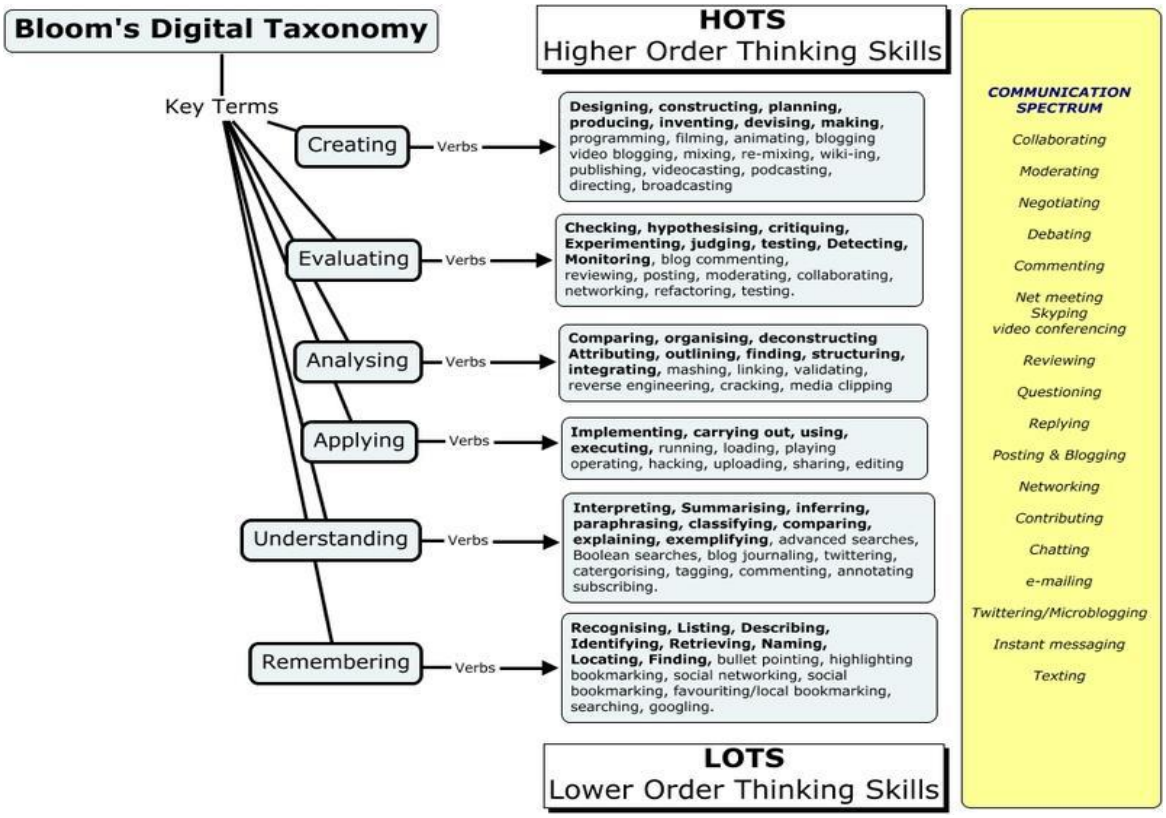


Figure 5. Bloom's digital taxonomy, adapted from Churches (2009).

An interpretation of each of the main categories (cognitive processes) in the taxonomy that will be used in the study is presented below:

1. *Remember*: Retrieving knowledge from long-term memory.
2. *Understand*: Determining the meaning of instructional messages, including oral, written, and graphic.
3. *Apply*: Carrying out or using a procedure in a given situation.
4. *Analyze*: Breaking material into its constituent parts and detecting how the parts relate to one another and to an overall structure or purpose.
5. *Evaluate*: Making judgments based on criteria and standards.
6. *Create*: Putting elements together to form a novel, coherent whole or make an original product. (Krathwohl, 2002, p. 215)

Churches (2009) took the revised Bloom's taxonomy a step further to embrace Web 2.0 specific cognitive processes that learners engage in when using Web 2.0 technologies. He added technology cognitive processes to Anderson and Krathwohl's version of Bloom's taxonomy that are crucial in the use of emerging Web 2.0 technologies. Another major contribution to Bloom's digital taxonomy was the addition of a communication or collaboration spectrum, which Churches argued is central to learning with emerging Web 2.0 technologies, disregarding the level of cognitive processes that students engage in (lower order cognitive processes or higher order cognitive processes). Hence, Bloom's Taxonomy (original and digital) is a starting point for the design of each learning objective and matching it with corresponding learning

activities. Analyzing SMLAs based on this taxonomy is important to investigate the level of cognitive processes that social media supports.

The Knowledge Dimension or Types of Knowledge

The knowledge dimension was extracted from Bloom's original taxonomy and became a separate taxonomy as Krathwohl (2002) described. It refers to the noun part in the learning objective that illustrates what the students actually learn, or the subject matter that they acquire when they achieve the learning outcomes. Its categories represent the different types of knowledge: factual knowledge, conceptual knowledge, procedural knowledge, and metacognitive knowledge (Krathwohl, 2002). Each of the types of knowledge has subcategories, and they are defined as follows:

A. Factual knowledge - The basic elements that students must know to be acquainted with a discipline or solve problems in it.

Aa. Knowledge of terminology

Ab. Knowledge of specific details and elements

B. Conceptual knowledge - The interrelationships among the basic elements within a larger structure that enable them to function together.

Ba. Knowledge of classifications and categories

Bb. Knowledge of principles and generalizations

Bc. Knowledge of theories, models, and structures

C. Procedural knowledge - How to do something; methods of inquiry, and criteria for using skills, algorithms, techniques, and methods.

Ca. Knowledge of subject-specific skills and algorithms

Cb. Knowledge of subject-specific techniques and methods

Cc. Knowledge of criteria for determining when to use appropriate procedures

D. Metacognitive knowledge - Knowledge of cognition in general as well as awareness and knowledge of one's own cognition.

Da. Strategic knowledge

Db. Knowledge about cognitive tasks, including appropriate contextual and conditional knowledge

Dc. Self-knowledge (Krathwohl, 2002, p. 214)

Both Churches (2009) and Bower et al. (2010) presented a taxonomy and a framework to designing SMLAs. Table 3 shows the level of cognitive processes that learners could engage in when using specific social media tools based on Churches' analysis. It also represents Bower et al.'s analysis of the types of knowledge that students gain when using each of the social media technologies. Bower et al. emphasized the gap in matching social media technologies with the levels of cognitive processes, and they explained that the design of the learning activity should be taken into consideration to explain cognition.

Table 3

A Breakdown of Social Media Tools and Activities by Cognitive Processes and Types of Knowledge

Social Media	Cognitive Processes Churches (2009)	Types of Knowledge Bower et al. (2010)
Wikis	*Evaluating*: posting, collaborating *Analyzing*: linking *Applying*: uploading, sharing, editing *Understanding*: categorizing, commenting *Remembering*: Bullet pointing, highlighting.	Conceptual
Blogs	*Creating*: publishing, blogging *Evaluating*: blog commenting, posting *Analyzing*: mashing, linking *Understanding*: tagging, annotating, subscribing	Metacognitive
Microblogs	*Analyzing*: linking *Understanding*: tagging, categorizing, commenting *Remembering*: social networking	Factual
Podcasts	*Creating*: podcasting *Applying*: editing, uploading, playing	N/A
Media sharing	*Creating:* filming, video casting, video blogging, animating *Analyzing:* media clipping *Applying*: playing, uploading, editing	Conceptual Procedural

Therefore, although Clark (1983) argued that technology does not impact learning, others such as Kozma (1994), Bower (2008), Bower et al. (2010), Gibson

(1977), and Kirsh (2006) suggested that there is a relationship between technology and cognition. Social media technologies and learning activities are interrelated, and in order to inform best practices for the design of SMLAs there is a need to explore how experienced faculty design their SMLAs and the levels of cognitive processes and types of knowledge that these activities promote.

CHAPTER 3. METHODS

This study aimed to explore how experienced faculty are using social media to support learning activities in their courses. More specifically, it aimed to analyze social media learning activities (SMLA) and the cognitive processes and types of knowledge that students engage in when completing these activities. The study also explored the perceptions of experienced faculty about the use of social media as educational tools, as well as social media strategies that worked for them as they designed their SMLA. The overall question that this study addressed was:

How are experienced faculty using social media to support student learning?

Research questions addressed in this study were:

1. What types of learning activities are designed through social media?
    a. What cognitive processes do SMLAs promote?
    b. What types of knowledge do SMLAs promote?
2. What strategies do experienced faculty use to design SMLAs?
3. What are experienced faculty perceptions regarding the effectiveness of social media as educational tools?

Research Design

Yin (2003) explained that case-study design should be used when (a) the study seeks to answer "how" and "why" things happen; (b) the study is focused on the natural behavior of participants; (c) the context is important for the study; or (d) there are no clear descriptions of what is happening between the "phenomenon and context." This study adopted a case-study design to explore and describe the nature of social media use in higher education. More specifically, a multiple case-study design was used because it provides the opportunity to "analyze within each setting and across settings" (Baxter & Jack, 2008, p. 550). The studies about social media use in higher education were single cases of single courses, and as a result, replication of results was lacking. Yin (2003) explained that multiple case-study designs are more robust in nature because they provide richer evidence from multiple sources. He explained that replication is necessary in multiple-case study design in order to achieve either "literal replication," similar results across cases, or "theoretical replication," contradictory results across cases. In this study, a holistic approach was used to analyze the different cases. This entails approaching the multiple cases as one entity in which comparisons and contrasts are conducted across cases (Yin, 2003). Baxter and Jack (2008) explained that multiple case studies yield more reliability, although they are time-consuming.

The purpose of the multiple case-study design was to identify common and different patterns in how social media tools are being used to promote student learning, particularly as this relates to the cognitive processes evoked and the types of study

students engage in. In other words, this research design was useful in comparing the use of social media for learning in different contexts. In addition, faculty perceptions about social media as educational tools were compared to provide recommendations for designing and implementing social media in educational contexts. Faculty defined my cases in this study. Five cases participated in this study involving six faculty members teaching six different courses and using different SMLAs. Two of the faculty were considered one case because they co-taught a course.

The study was highly qualitative, and faculty interviews, document analysis, and students' posts in SMLAs were the main data sources. Data sources were analyzed based on pre-established categories. Faculty interviews were coded based on the pre-established categories and open coding. Syllabi, course documents and students' posts in SMLAs were analyzed based on pre-existing categories as well, which allowed for quantification of the content analysis of the data that will be discussed later in the data analysis section.

Researcher Identity

This research study was influenced by the researcher's own teaching practices involving the use of social media. The researcher is a language instructor at the higher education institution where the study was conducted. The researcher has been using social media in her language courses for over two years, and has observed engagement among her students. Despite the innovation that social media promotes and the level of adoption among students, the researcher has been questioning the impact, if any, social

media has on student learning. To learn more, she is studying the design of SMLA and the impact of social media on student learning.

Participants

This study involved primary and secondary participants. Primary participants were faculty members who were using social media in their courses. Secondary participants were students enrolled in the faculty participants' courses. Faculty were interviewed and directly involved with the study, while students participated indirectly by consenting to be observed and having their social media posts analyzed.

Inclusion/Exclusion Criteria

Participants in this study were purposefully selected based on their involvement and experience with the study topic (Maxwell, 2013). The primary participants were selected to meet the following inclusion criteria: faculty that are currently teaching at a higher education institution in Northern Virginia and have been using one or more social media tools in their teaching for two or more semesters. Such faculty were considered "experienced" faculty in this study. Faculty participants were also teaching courses in which they were using an SMLA at the time of data collection in Fall 2013. Snowballing sampling technique was used with purposefully selected faculty, who were asked to suggest names of faculty that met the inclusion criteria. Six faculty were included in this study, totaling five cases. The number of the participants was adequate for a qualitative study, allowing for deeper analysis of the cases.

Recruitment and Description of Faculty Participants

Recruiting participants began in Spring 2013 by contacting the Center for Teaching Excellence at the institution and through the wiki administrator to identify faculty at the institution who had been using social media in their courses. After getting Institutional Review Board approval in Summer 2013 to conduct the study, the faculty who were on the list were contacted via email, asking if they were going to use social media in their courses in Fall 2013, and if they were willing to participate in the study. Following a snowballing method, they were also asked to provide the names of colleagues who might be using social media in their courses. The snowballing method resulted in eight names of faculty members who could be using social media in their courses. Out of the twenty-six faculty whose names were generated by the Center for Teaching Excellence, the wiki administrator, and the snowballing method, six faculty met the inclusion criteria and agreed to participate in the study. One of the six faculty (Faculty C) was teaching two courses in which she integrated social media, resulting in a total of six courses included in the study. The Food, Culture and Technology (FTC) course was co-taught by two faculty, referred to as Faculty B1 and B2, representing one case. The six faculty participants belonged to different disciplines and were using different social media tools. This established heterogeneity as Maxwell (2013) proposed. Table 4 provides a description of the participants' demographics. In order to retain anonymity, faculty were referred to as Faculty A, B1-B2, C, D, and E.

Table 4

Description of the Faculty Participants

Faculty Particip-ants	Course Title in Which SM is Used	Number of Semesters Teaching this Course	Course Delivery Format	Years in Higher Ed	Year Started Using SM	Number of Students per Course	Number of Student Consent
Faculty A	Digital Future: Digital Activism (DFDA)	2	Hybrid 6 credits	17	1997	18	N/A
Faculty B1	Food, Culture, and	3	Face-to-Face	15	2007	6	5
Faculty B2	Technology (FTC)	3	Non-credit	18	2010		
Faculty C	Leading Change (LC)	3	Face-to-Face 4 credits	19	2009	25	22
	Leadership Theory and Practice (LTP)	3	Face-to-Face 3 credits			20	16
Faculty D	Introduction to Digital Studies (IDS)	1	Face-to-Face 3 credits	9	2005	25	22
Faculty E	Introduction to Business Information Systems (IBIS)	5	Face-to-Face 3 credits	3	2011	185	50

Faculty A holds a Ph.D. in Modern History and an MFA in Creative Writing. She teaches courses related to the digital activism in which her research interests lie. She has been teaching in higher education since 1997, and has received several grants to enhance teaching and learning in higher education from the Technology Across the Curriculum program. She is currently teaching 200 and 300 level courses in which she integrates social media. Digital Futures: Digital Activism (DFDA) was taught by Faculty A in Fall 2013 for the second time, and it was included in this study because of SMLA integration. This six credit course prepares students to use digital devices to articulate the stories of marginalized and silenced people.

Faculty B1 and Faculty B2 co-teach Food, Culture and Technology, a language course. Faculty B1 focuses on technology instruction, while Faculty B2 addresses content related to food and culture. Faculty B1 and Faculty B2 have co-taught this non-credit course for three semesters in a row. Faculty B1 has been teaching English as a Second Language (ESL) courses for 15 years, and has been using social media in her courses since 2007. Faculty B2 has been teaching ESL for 18 years and has been using social media in his courses since 2010. FCT is a four-hour elective that meets weekly for 12 weeks. The course helps students develop their English language skills through food and culture related topics presented through technology. Students also develop technology skills by developing their individual blogs and presenting content in several social media and technology activities.

Faculty C holds a Ph.D. in Counseling and Personnel Services and has been teaching in the humanities for 19 years. She has authored and co-authored textbooks and manuals on leadership and is currently teaching 200 and 400 level courses. She has been using social media in her courses since 2009, and has taught Leading Change (LC) for three semesters and Leadership Theory and Practice (LTP) for three semesters. LC, a four credit course, introduces students to topics such as social change and globalization, creative conflict resolution, the nature of power, oppression and influence, and systemic leadership. By the end of the course, each student develops a plan for solving a societal problem. LTP, a three-credit course, introduces students to historical and contemporary leadership theories, as well as the application of leadership theories, concepts, and skills.

Faculty D began the study as a faculty member teaching at the institution where the study was conducted. In Fall 2013, he was a visiting professor at another institution in Northern Virginia where he was teaching Introduction to Digital Studies (IDS) for the first time. He holds a Ph.D. in Comparative Literature and Literary Theory. Faculty D has been teaching in higher education for nine years and began using social media in his courses in 2005. Faculty D's teaching and research focus on contemporary literature, new media, and videogames. In recognition of his commitment to innovation in teaching, Faculty D was the recipient of a teaching excellence award. IDS focuses on the history of digital media, the rise of network society, and the influence of digital technology upon narrative, arts, and science.

Faculty E has a Ph.D. in Business Administration and has been teaching in higher

education for three years. He has been using social media in his courses since 2011. His teaching focuses around management of Information Systems (IS) and business strategy, IS audit and control, database modeling, database management, and software analysis and design. He has taught a three-credit course Introduction to Business Information Systems (IBIS) for five semesters. IBIS focuses on understanding the business implications of emerging technologies in streamlining business processes, and what these implications mean for business students and their future careers.

Recruitment of Student Participants

Students enrolled in the six courses taught by the faculty participants were considered secondary participants, and consented to observation of their course-related posts in the SMLAs examined. Recruitment of students took place through the faculty, who distributed student consent forms in the classroom accompanied by a recruitment letter that listed the purpose of the study. Students were asked for permission to have their social media course-related posts observed and analyzed by the researcher. The faculty also explained to their students that the observations would not impact their course grades and that their work would be analyzed anonymously. Out of 279 students who were enrolled in the six courses, 115 students gave consent to the researcher to observe their course-related social media posts and participated in this study. Students who did not give the researcher consent were not included in the study. The largest number of students who did not wish to participate was in the IBIS course, in which

students were studying internet security. Pseudonyms such as Student A, B, C, etc. were used for student participants to refer to their course-related social media posts.

Setting

This study was conducted in a public higher education institution in Northern Virginia. The university is known for its innovation and promotes excellence in teaching and student success. Almost 33,000 undergraduate and graduate students are enrolled in this university, and it employs approximately 2,900 academic staff. The university consists of one main branch and two smaller campuses, all of which are located in Northern Virginia. There are thirteen schools and colleges in this university, and it is mostly known for its strong programs in economics, law, creative writing, computer science, and business. The university was selected for its innovative instructional initiatives and for the convenience of the researcher, who is an employee of the university.

The university offers face-to-face (more than 50% face-to-face), hybrid (51%-99% of scheduled class time is online), and fully online (100% of scheduled class time is online) courses that are supported by the Office of Distance Education. Currently, there are 24 fully online graduate certificates, undergraduate certificates and master's programs and five hybrid online programs. Some courses are delivered synchronously via Teleconferencing and Blackboard Collaborate, where faculty and students interact in real-time. Other courses are delivered asynchronously, where the faculty shared resources

with the students through Blackboard, and students have to complete assignments and adhere to a deadline. The Office of Distance Education and the instructional design team provide support for faculty members in a series of workshops and one-on-one consulting sessions, guiding the faculty in their endeavors to move their courses from face-to-face to online or hybrid formats, or even to design web-enhanced courses.

Instructional technology supported by the university includes Blackboard, a learning management system (LMS) that has a blog and a wiki among other features. Videoconferencing is available in Blackboard through Blackboard Collaborate, which allows faculty and students to meet synchronously. The university also provides a separate Wiki tool, PbWorks, which includes tutorials for faculty, and is supported by the Instructional Technology Office. A platform powered by Wordpress is also available for faculty and students to create blogs or websites, and is supported by the Office of Student Media. Podcasting is also available through iTunesU provided by Apple's iTunes, and gives faculty the ability to upload podcasts that are made available to students for streaming and download. Other instructional technology tools provided by the university include Respondus, for the creation of online quizzes and exams; SafeAssign, a tool that detects plagiarism; and Streaming Media, to develop content for streaming and broadcast.

Data Sources

Data sources in this study included syllabi and course documents, initial and follow-up faculty interviews, and student posts in SMLAs.

Syllabi and Course Documents

Prior to interviewing, faculty participants were asked to provide a course syllabus or a document that described the SMLAs their students had to complete in their respective courses. Four out of five faculty participants emailed the researcher a link to their course platforms that included a link to syllabi or documents describing the SMLA. One faculty emailed his syllabus to the researcher. As a result, documents included six syllabi of six different courses, and two documents that described two different SMLAs in two different courses in detail. The syllabi and the descriptions of the SMLA provided baseline data about the requirements and deadlines that guided the analyses of the SMLAs, prior to the faculty interviews and the observations of the students' posts in social media.

Faculty Interviews

Participants were interviewed at the beginning and end of the semester in initial and follow-up interviews. Both interviews were semi-structured and included open-ended questions that gave participants the freedom to express their range of perceptions about the use of social media in their courses (Maxwell, 2013).

Initial interview. In the initial interview, faculty were asked about their perceptions about using social media to support student learning, the criteria they use to choose their social media, strategies used to develop the learning activities involving social media, and their past experience in using the same learning activity and social

media tool. The initial interview protocol consisted of eleven leading questions and five follow-up questions. Full interview protocol is available in Appendix A. Some questions included in the initial interview protocol were:

a. Could you please describe the value that social media will add to your course? To your students' learning?
b. Did your selection of the social media come first? Or the learning activity?
c. What were the criteria that you based your social media tool selection on?
d. Have you used the activity and the tool in any course before now? If yes,
    a. What impact do you think this activity had on your students' learning in the past?
    b. What changes have you made to the existing learning activity?
    c. What levels of learning (cognitive processes) do you think this (these) activity(ies) promote?

Follow-up interview. In the follow-up interview, faculty were asked to describe their experiences with the outcomes of the social media activity, whether it has achieved what it was intended to achieve, and the types of knowledge that students gained. Moreover, the follow-up interview served as a member checking tool, where faculty were asked to review analyzed data from the initial interview and modify or add any ideas. The follow-up interview protocol consisted of nine leading questions including:

- How well do you think the learning activity goals were achieved by the selected social media tool?

- Do you think another social media tool would be a better fit for the learning activity? Why or why not?
- Would you modify the learning activity to match the social media features?
- Looking at Krathwohl's description of knowledge dimensions, what types of knowledge do you think the learning activity promoted?
- Do you think the same type knowledge would have been achieved if the activity was not implemented in social media?

Construction and validation. Faculty interview questions were constructed based on the research questions. Some of the questions in the initial interview (1, 2, 3, and 7) were adapted from the pilot study described earlier.

- What courses are you teaching this semester?
- Is the use of social media optional for students or is it a course requirement?
- What type of activities are students required to complete through the social media tools?
    a) Explain a task or two that they are supposed to do
    b) Describe a learning activity that you think (or students have reported) has enhanced students' learning.

The first few questions are warm-up questions, and they are straightforward and foundational, used to establish rapport with the participants and to introduce them to the topic (Glesne, 2011). The remaining questions explore faculty experiences with social media. The initial interview consisted of eleven questions, two of which had follow-up

questions. The follow-up interview consisted of nine prepared questions. Since these were semi-structured interviews, additional follow-up questions came up during the actual interviews.

Validation of interview questions adapted from the pilot study was already conducted, since in that study they succeeded in extracting information to answer the research questions. Experts in the field validated the current interview protocol to check whether the interview questions match the research questions. To further validate the interview questions, the interview protocol was piloted with a faculty member who uses technology in her courses. Her answers to the interview questions revealed some redundancy in the way the questions were constructed. To avoid repetition, two questions were eliminated from the original interview protocol. Based on the information obtained from the initial interview, one question was eliminated from the follow-up interview to avoid redundancy, while other questions followed-up on faculty experiences implementing the social media activities.

Students' Posts in SMLAs

Patton (2002) presented four advantages of field observations, (a) creating a better understanding of the context, (b) providing firsthand experience, (c) establishing a different perspective of the setting than participants' perceptions, and (d) learning about things that the interviewees do not mention in the interview. Social media platforms used by the faculty and the students to complete the SMLAs were observed online and then

analyzed. The focus of the observations was on identifying cognitive processes and knowledge domains observed in students' SMLA posts. A framework was developed (Table 9) to conduct the observations of SMLAs, and it included a column for the learning activity as described by the documents (syllabi, description of activities), technology affordances of the social media as they were used in the activity, perceived students' cognitive processes and types of knowledge through their posts and their interaction with peers and faculty, and additional activities that are not described by the faculty in the activity description or in the interviews.

Faculty gave the researcher access to their social media platforms. Students' posts in social media were saved in a Word document, resulting in 878 total student posts, divided unevenly across different SMLAs and the six courses. 30% of the students' posts were analyzed, resulting in analysis of 343 posts. The systematic way of obtaining 30% of students' posts is described in detail in the Data Collection section below. The sampling of 30% of the students' posts in SMLAs resulted in 86 tweets in the Personal Transformation Twitter Experiment, 163 tweets in the Twitter Online Participation activity, 15 posts in the Language Blog activity, 43 posts in the Digital Studies Course Blog, and 36 posts in the Collaborative Note-Taking activity (see Table 6). Students' posts in the Digital Futures Digital Activism Course were not analyzed because students' consent was not obtained.

Data Collection

Data was collected during Fall 2013 semester using the data sources described previously. After obtaining Institutional Review Board approval to conduct the study, the nominated faculty were sent an email as described earlier in the participants sections. All six participants who agreed to participate in the study were recruited from the original email. A follow-up email was sent to schedule the initial interview, and participating faculty were asked to provide the researcher with the syllabus or the document that described the SMLA. Prior to the interview, the syllabi and the documents were analyzed to understand the nature of SMLAs.

The initial interviews were to be conducted during the first two weeks of classes, between 8/26/2013 and 9/6/2013. However, delayed faculty responses and difficulties with scheduling the interviews resulted in some delay. As a result, initial interviews were conducted with the five faculty members between 9/9/2013 and 10/18/2013. The initial interviews ranged between 17 and 45 minutes, depending on the faculty's concision in answering the interview questions. Faculty B1 and B2 were interviewed together because they were co-teaching their course and considered as one case. Some faculty had already added the researcher to their workspaces, or shared their course hashtag or blog site with the researcher. At the end of the initial interview, the remaining faculty were asked for access to the social media platforms to conduct the observations of the students' posts in the SMLAs.

Follow-up interviews were conducted during the last two weeks of classes, between 12/5/2013 and 12/12/2013, exactly as planned by the researcher. Follow-up interviews lasted between 20-35 minutes (see Table 5 for initial and follow-up interview dates and duration).

Table 5

Initial and Follow-up Interviews Dates and Duration

Participant	Date of Initial Interview	Duration of Initial Interview	Date of Follow-up Interview	Duration of Follow-up Interview	Date Student consent was obtained
Faculty A	10/18/13	44 mins	12/12/13	40 mins	Not obtained
Faculty B1-B2	9/12/13	25 mins	12/10/13	37 mins	9/19/13
Faculty C	9/9/13	33 mins	12/5/13	34 mins	9/30/13
Faculty D	10/14/13	26 mins	12/11/13	17 mins	11/10/2013
Faculty E	10/2/13	21 mins	12/6/13	20 mins	10/2/2013

Faculty were asked to distribute the consent forms in their courses and return them to the researcher after the initial interview. Once students' consent was obtained, observations and analyses of students' posts in SMLAs were conducted. Student consent forms were received between 9/30/2013 and 11/10/2013. Some SMLAs were semester

long and others were limited to a few weeks in the semester. Due to the archival nature of social media, observations of students' posts from any time of the semester remained possible.

At the end of the semester, there was a total of 878 student posts in the SMLAs across the 6 courses different courses. Posts ranged between student tweets, blog contributions, and wiki posts. The length of the posts was uneven across tools, due to different affordances including character limits. For instance, in Twitter, students' posts were constrained to140 characters long, while blog contributions and wiki posts were as often as long as 500 words. Furthermore, the number of posts per activity was distinct, depending on individual activity requirements.

In order to organize the data, analytic files were created to represent different data sources. Since this is a multiple-case study, three data sources folders were created for interviews, observations, and syllabi. The interview transcripts were included in the interview folders labeled "Faculty A-initial interview" and "Faculty A- Follow-up Interview." The observations folder included Word documents of all the students' posts, and they were labeled by activity name, such as "Personal Transformation Experiment Tweets." The syllabi folder constituted all the documents describing the learning activities and was labeled by course title. As the data collection and the analysis progressed, new folders were created to include data analysis and data summary sheets (Glesne, 2011). The data analysis folder incorporated all the data analysis and

classification tables obtained from the interview analysis and from the analysis of the students' posts and SMLAs.

Data Analysis

Data analysis was ongoing and started upon receiving the syllabi and descriptions of learning activities from faculty (Glesne, 2011; Maxwell, 2013). The transcription and analysis of the initial interviews was next, followed by the analysis of 30% of the students' SMLA posts, and ending with the transcription and analysis of the follow-up interviews. The exact process for the data analysis of each of those steps is described in detail below. Table 6 shows the alignment of research questions with data sources and data analysis.

Table 6

Data Sources and Analysis

Research Question	Data Sources	Data Analysis
1. What types of learning activities are designed through social media?	• Students' posts in SMLA • Syllabi and Course Documents • Faculty initial interviews	• Transcription • Content analysis • Cross-case synthesis • Memoing • Thematic analysis
a) What cognitive processes do SMLAs promote?	• Faculty initial interviews	• Transcription • Content

	• Students' posts in SMLAs • Syllabi and Course Documents	analysis • Cross-case synthesis • Memoing • Thematic analysis
b) What types of knowledge do SMLAs promote?	• Faculty follow-up interviews • Students' posts in SMLAs • Syllabi and Course Documents	• Transcription • Content analysis • Cross-case synthesis • Memoing • Thematic analysis
2. What strategies do experienced faculty use to design SMLAs?	• Faculty initial interviews	• Thematic analysis • Transcription • Cross-case synthesis
3. What are experienced faculty perceptions regarding the effectiveness of social media as educational tools?	• Faculty initial and follow-up interviews	• Transcription • Thematic analysis • Member check • Cross-case synthesis

These procedures were followed sequentially to conduct the data analysis:

1. Obtaining the syllabi and the description of the learning activities and analyzing them based on a framework.
2. Conducting initial interviews.
3. Transcribing and analyzing initial interviews using deductive coding.

4. Establishing sub-categories of established themes by identifying common patterns in the initial interview.
5. Observing and analyzing students' posts in social media using the same framework used to analyze the social media learning activities.
6. Conducting follow-up interviews.
7. Transcribing and analyzing follow-up interviews using deductive coding.
8. Establishing sub-categories of established themes by identifying common patterns in the initial interview.

Analysis of SMLAs as Described in Syllabi and Course Documents

Content analysis was conducted for the SMLAs listed in course documents and syllabi. To begin with, codes for the content analysis of the SMLA were established using a deductive approach based on research questions 1b and 1c, and the taxonomies that frame this study and focus on Bloom's Taxonomy and types of knowledge (Miles & Huberman, 1994). The goal of the analysis of the SMLAs was to identify the levels of cognitive processes and the types of knowledge that were included in the design of the learning activities in this study. SMLAs were analyzed in terms of the following cognitive processes: Remember (Rem), Understand (Un), Apply (App), Analyze (An), and Create (Cr) (see Table 9). Remember stands for retrieving knowledge from long-term memory. Understand is interpreting text, visual, or oral information. Apply is

demonstrated by carrying out or using a procedure in a given situation. Analyze stands for breaking material into its constituent parts, and detecting how the parts relate to one another and to an overall structure or purpose. Evaluate is illustrated by judgments based on criteria and standards. Create involves putting elements together to form a novel, coherent whole, or to make an original product (Krathwohl, 2002). Bloom's Digital Taxonomy (Churches, 2009) provided a breakdown to the main categories of the original taxonomy, by also providing digital verbs that match Web 2.0 software features.

Furthermore, SMLAs were analyzed in terms of the following knowledge types: Factual Knowledge (F), Conceptual (C), Procedural (P), and Metacognitive (M). Krathwohl (2002) provided a detailed explanation of the different types of knowledge:

> *Factual Knowledge* - The basic elements that students must know to be acquainted with a discipline or solve problems in it.
>
> *Conceptual Knowledge* - The interrelationships among the basic elements within a larger structure that enable them to function together.
>
> *Procedural Knowledge* - How to do something; methods of inquiry, and criteria for using skills, algorithms, techniques, and methods.
>
> *Metacognitive Knowledge* - Knowledge of cognition in general as well as awareness and knowledge of one's own cognition. (p. 215)

Both taxonomies of Cognitive Processes and Knowledge Dimensions or types of knowledge were used to create a framework for SMLA analysis. The framework included the types of social media tools that were gathered in this study, a description of the course

in which they were used, and the SMLA related to the specific social media technologies. The framework was an expansion of a table that Bower et al. (2010) proposed to analyze learning activities (Table 7). While Bower et al. analyzed the learning activities in terms of cognitive and knowledge processes, types of pedagogy, modalities of representation, and synchronicity, this study was only concerned with cognitive processes and knowledge domains.

Table 7

An Analysis of Learning Outcomes/Activities as Proposed by Bower et al. (2010) (p. 194)

Learning outcome	Pre-service teachers apply their technology skills to construct clear instructions about how to manage and administer a blog.
Type of content (knowledge and cognitive processes)	This learning outcome primarily relates to demonstrating technology process knowledge. The outcome addresses the application cognitive process.
Type of pedagogy	In order to assess the ability of students to apply process knowledge it is appropriate to have students individually perform a constructive technology related procedure to evidence their understanding.
Modalities of representation	To capture the procedural nature of the task a video modality is suitable.
Synchronicity	As students are working independently, asynchronous capture is sufficient.

After the researcher gathered the description of the SMLA in each course, an Excel sheet with the information in Table 8 was created to include all the descriptions of the social media activities incorporated in this study to conduct content analysis of SMLA documents. Since the codes for the content analysis were formerly established, the researcher highlighted phrases or keywords in the learning activities that demonstrated types of knowledge or cognitive processes as presented in Table 8. Phrases or learning outcomes that demonstrated cognitive processes were highlighted in blue, and phrases that referred to the type of knowledge were highlighted in red. The process for identifying each coding category was challenging. The analysis of tweets was the most challenging due to the length constraint of tweets that did not allow ample clarification for the students' cognitive processes. However, with the help of Bloom's Taxonomy and the supportive verbs, the analysis was made easier. The researcher referred to the "Action Verbs" in the learning activities as cognitive processes, and referred to the "Content" or "What would students learn?" as knowledge domains as proposed by Krathwohl (2002).

A description of the analysis of the Personal Transformation Twitter Experiment is presented to illustrate the analysis process of the SMLAs as they were listed in the syllabi and course documents. In the Personal Transformation Twitter Experiment, students were asked to "identify" a skill and "develop" a plan, then to "record" their transformation and "prepare a pre- and a post-assessment" via Twitter. According to Bloom's Taxonomy, "identifying" supports students' "Remembering"; "developing" supports "Creating"; and "recording" supports "Understanding." The micro-reflection of

the students' transformation process refers to a metacognitive level of knowledge that Krathwohl refers to as the knowledge of oneself or the knowledge of one's cognition. In order to triangulate data from different sources, the faculty participants were asked to analyze the learning activities using the same method. Faculty were asked to analyze their SMLAs by looking at Bloom's Digital Taxonomy and at Krathwohl's knowledge domains.

Table 8

Example of Content Analysis of SMLAs as Listed in the Syllabi and Course Documents

Social Media Tools	Description of SMLA	Types of Knowledge			Cognitive Processes						
		F	C	P	M	Rem	Un	App	An	Ev	Cr
Microblogs	**Personal Transformation Experiment:** Each student will identify one skill of effective agents of transformation and develop a personal action plan for practice and reflection to develop this skill. These include the following: optimism and resilience; creativity and Innovation; risk-taking and initiative; effective communication; mindfulness and gratitude; and relationship-building. They will use Twitter as a form of micro-reflection to record their transformation				X	X		X		X	X

progress throughout the semester, prepare a pre- and post-assessment of their experiment, and offer a final reflection.

Interview Analyses

The initial and the follow-up interviews were audio-recorded and transcribed word-for-word, resulting in transcriptions of five initial interviews and five follow-up interviews ranging from between seven and 25 single-spaced pages. Both sets of interviews were analyzed using deductive coding (Miles & Huberman, 1994). Deductively, categories from the initial and follow-up interview questions were first established based on the research questions that were addressed in the interviews. These categories were:

- Social media tools used
- Criteria for the selection of social media
- Strategies for developing SMLA
- Cognitive processes perceived in SMLA
- Types of knowledge perceived in SMLA
- Faculty perceptions about social media
- Changes to the SMLAs
- Challenges

The initial interview addressed the following four main categories: Social media used, Strategies for designing social media learning activities, Cognitive processes that the activities promoted, and Faculty perceptions about social media value for student learning. The follow-up interview addressed the following five main categories: Strategies for designing social media learning activities, Challenges of using social media as educational tools, Changes to the SMLA, Types of knowledge in social media learning activities, and Faculty perceptions about the use of social media in educational contexts. Combined, the initial and the follow-up interviews resulted in seven main categories.

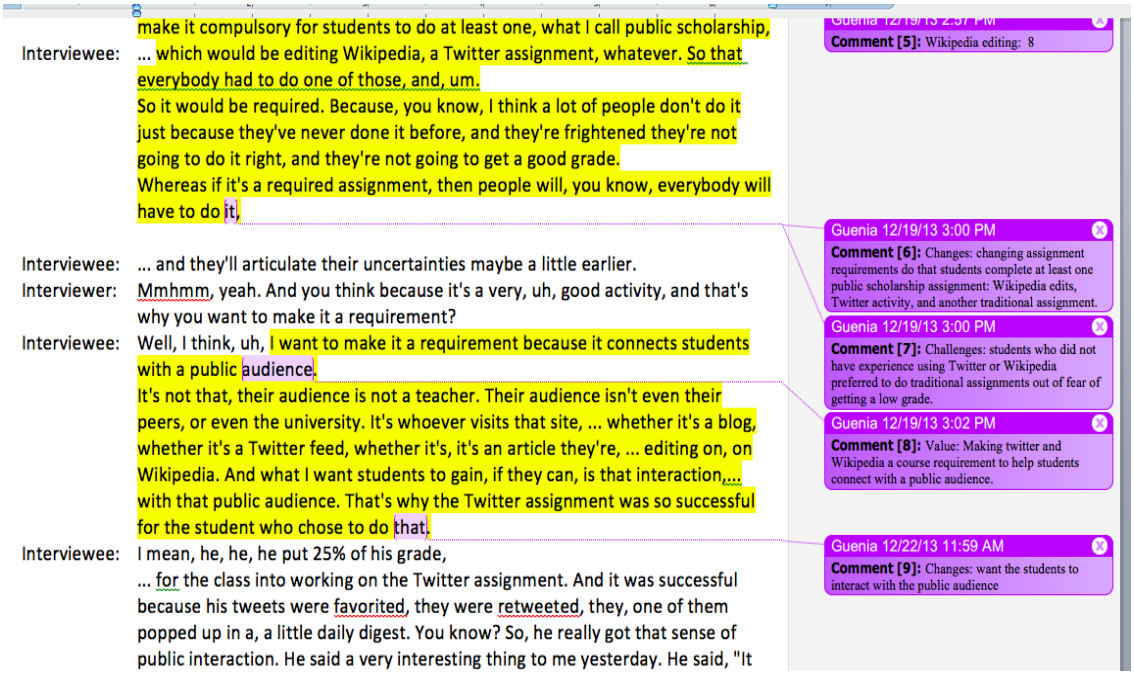
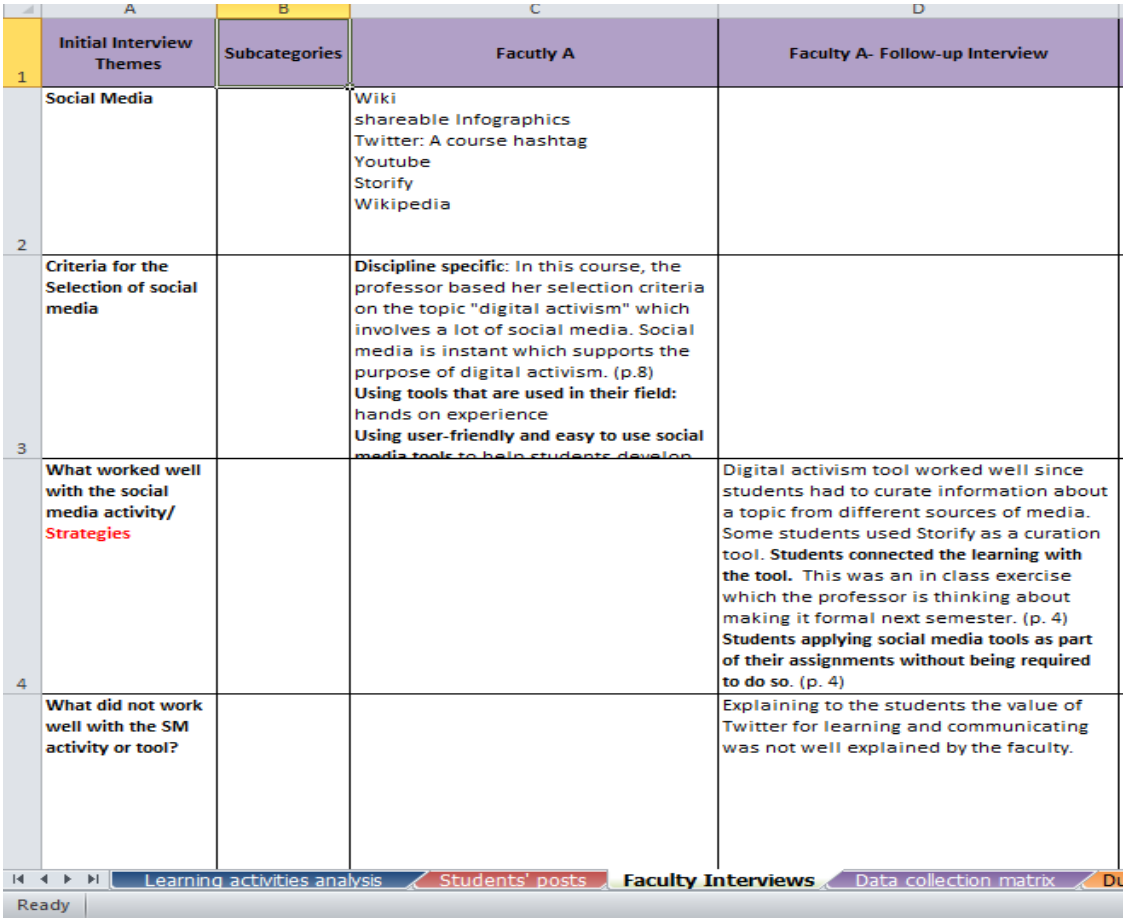


Figure 6. Example of how interviews were analyzed

The analysis of the initial interviews was conducted in November 2013 prior to the follow-up interviews in order to obtain member check in the latter. After the initial interviews were conducted, the researcher transcribed the interviews and read them twice, looking for information related to the established categories. The transcription and the analysis of the follow-up interviews took place in December 2013. In both sets of interviews, marginal comments were created using the commenting feature of Microsoft Word to refer to data in the interviews that related to any of the established themes (Figure 6). Analysis gathered from the initial interview was shared with the faculty participants during the follow-up interviews, where they were asked to provide member check and share any feedback related to the analysis. Evidence of these categories was highlighted in yellow in the text and corresponding marginal comments interpreted each section by referring to main categories: "Strategies," "Value of Social Media," "Challenges," etc.

Since this multiple-case study is holistic in nature, a meta-matrix (Figure 7) was created in order to focus on the findings across cases rather than on every individual case (Miles & Huberman, 1994). Maxwell (2013) argued that creating matrices is an important component of data analysis. The matrix was created in Microsoft Excel and included pseudonyms of the participants in a vertical format, and the deduced seven categories from the initial and the follow-up interviews in a horizontal format. Each faculty member was represented in the spreadsheet by two columns; the initial interview findings and the follow-up interviews findings. Marginal comments gathered in the interview documents

were copied and pasted into the matching cells in the Excel sheet. The design of the matrix allowed cross-case analysis by category and facilitated the holistic approach for conducting this multiple-case study. Figure 7 shows a screenshot of the Excel table that was created to capture and organize this data.



	A	B	C	D
1	**Initial Interview Themes**	**Subcategories**	**Facutly A**	**Faculty A- Follow-up Interview**
2	**Social Media**		Wiki shareable Infographics Twitter: A course hashtag Youtube Storify Wikipedia	
3	**Criteria for the Selection of social media**		**Discipline specific**: In this course, the professor based her selection criteria on the topic "digital activism" which involves a lot of social media. Social media is instant which supports the purpose of digital activism. (p.8) **Using tools that are used in their field:** hands on experience **Using user-friendly and easy to use social**	
4	**What worked well with the social media activity/** Strategies			Digital activism tool worked well since students had to curate information about a topic from different sources of media. Some students used Storify as a curation tool. **Students connected the learning with the tool.** This was an in class exercise which the professor is thinking about making it formal next semester. (p. 4) **Students applying social media tools as part of their assignments without being required to do so**. (p. 4)
	What did not work well with the SM activity or tool?			Explaining to the students the value of Twitter for learning and communicating was not well explained by the faculty.

Learning activities analysis | Students' posts | **Faculty Interviews** | Data collection matrix

Ready

Figure 7. Sample interviews data analysis matrix

Findings from interviews pertaining to main categories were examined for common patterns across cases, resulting in themes related to research questions 1a and 2. After the marginal comments were pasted into the matrix, the researcher highlighted common patterns related to individual categories across cases in different colors. For instance, Table 9 presents interpretations about the value of social media from the Faculty A and B1-B2 initial and follow-up interviews. After inserting the interpretations and examples from all faculty interviews related to each category, the researcher summarized each of the interpretations with a bold-faced heading. These headings were central, and simplified the identification of common patterns across themes. In order to identify common patterns within interview data, different colors were used to highlight common threads. For instance, the information highlighted in yellow refers to a common pattern about the value of social media. After examining all cases, a sub-category termed "Purposeful Use of Social Media" was created to refer to the value of social media as educational tools. Similarly, the blue highlighted sections resulted in a theme termed "Increases Visibility of Student Work." The analysis of the categories across cases revealed three main categories and five themes related to "Faculty Perceptions About Social Media Value for Student Learning," and six common patterns related to "Strategies that Faculty Use to Design SMLAs."

Table 9

Example of Identifying Common Patterns in Individual Themes Across Cases and Interviews

Faculty A- Initial Interview	Faculty A- Follow-up Interview	Faculty B1-B2- Initial Interview	Faculty B1-B2- Follow-up Interview
Promotes authentic learning: students are exposed to hands on experiences in this course by using the tools that digital activitsts use (p.6, 9). **Students connect with people in their field:** Students' tweets being included in a storify thread by a digital activist (p.7), which shows that SM gives the students an opportunity to belong to a community of practice. Even when one student gets this experience, his peers understand how information circulates and they can become a part of a learning	**Social Media can expose students to multiple modes for delivery of information.** (p. 5) Making discussions and debates **visible** (p. 7) Twitter as a learning tool which students can use later to **develop professionally**. (p. 8) Students experiment with **the tools they use every day**. (p. 9) **Creating for an audience**,which makes the product more purposeful. (p. 13) **Due to the topic of this course, social media is**	**Different, modern, and new.** Sharing knowledge creatively (p. 2). Students are all excited about the technology. **Podcasts as listening and speaking tools.** Podcasts serve as a tool for students to evaluate their listening and speaking skills. (p. 8) **Podcasts as speech improvement tools.** Students evaluate their speech by recording it several times and reflecting on it.	**SM helped students learn about each other**. **Podcasting as a tool that helps language learners critique their speaking** and going through several revisions before submitting their final podcast. This had a good impact on students' speaking skills. (p. 1, 2) **Writing for an audience** which pushed language learners to edit their posts several times before publishing their posts. (p. 2,3) Using Ted talks to help students become **lifelong**

community. **Making good use of technology (change)**: Using their cellphones for a good purpose, to send out a message as digital activists (thru SM) rather than only use them for entertainment. (p. 9) **Promotes active learning** (p.19) **Makes students' work visible** (p.19)	**necessary and makes a difference in the students' learning.** Students are exploring and using tools that digital activists use. (p. 17) Students not only gain knowledge of the content. **They also learn how to use the tools which is procedural.**(p.14)	**learners** who can take advantage of the media that is out there without being physically present in a structured classroom. The use of social media in the classroom. **These tools are already part of the students' daily lives**. (p. 10)

Analysis of Students Posts in SMLAs

Content analysis for the students' posts in SMLAs was also conducted. In order to achieve fairness among the analysis of students' posts in SMLAs, 30% of the posts in each SMLA were selected, resulting in a total of 343 student posts analyzed. The 30% of posts were sampled from students' beginning, middle, and end of activity, in order to analyze the students' work across the whole activity. After counting students' posts per SMLA, each of the posts per social media activity was multiplied by 0.3 in order to obtain 30% of the posts. Later, that result was divided by three, and 10% of the students' posts were selected from the beginning of the semester, 10% from the middle, and 10% from the end of the semester. For instance, in the Online Class Participation SMLA in the

IBIS course, there were a total of 463 tweets by the end of the semester. The following formula was used: (463 x 0.3) / 3, resulting in 47 tweets from the beginning, 47 tweets from the middle, and 47 tweets from the end of the semester being randomly selected and analyzed. Table 10 shows a breakdown of each of the SMLAs by total number of posts, the number of posts that were analyzed (30%), and the number of students who were enrolled in the courses.

Table 10

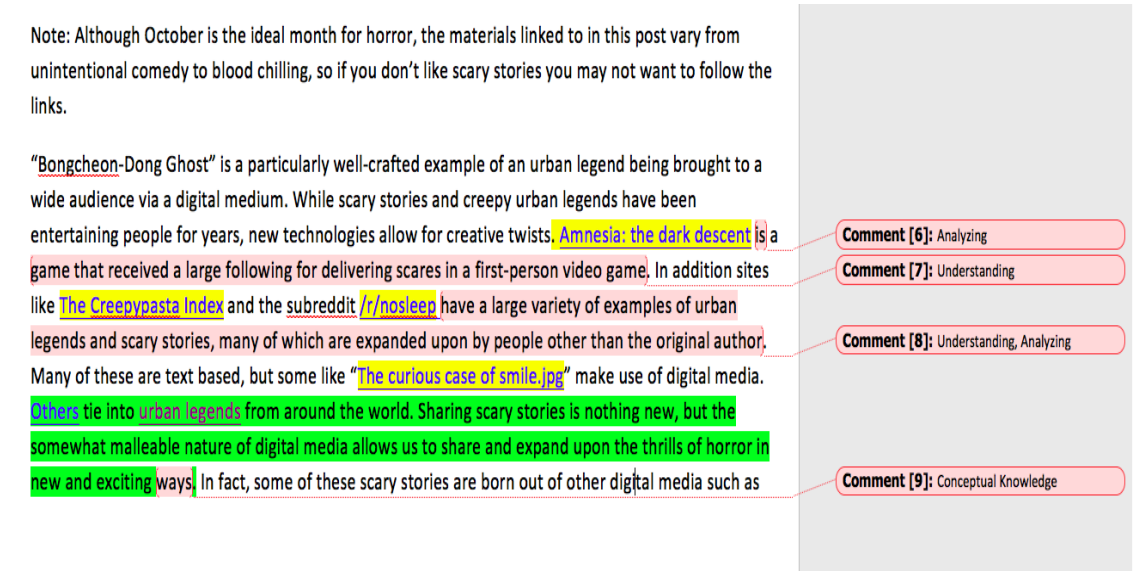
Social Media Learning Activities (SMLA) Included in This Study and the Number of Students' Posts That were Analyzed

Course	Social Media Learning Activities	Total Number of Students	Total Number of Posts per SMLA	Total Number of Analyzed Posts (30%)
Leading Change (LC)	Personal Transformat-ion Experiment	25	233 Tweets	86 Tweets
Introduction to Business Information Systems (IBIS)	Online Class Participation at Twitter	185	463 Tweets	141 Tweets
Digital Futures: Digital Activism (DFDA)	Digital Activism Twitter Projects		No analysis was conducted	
Food, Culture, and Technology (FCT)	Language Blog	6	48 posts	15 posts

Introduction to Digital Studies (IDS)	Digital Studies Course Blog	25	141posts	43 posts
Leadership Theory and Practice (LTP)	Collaborative Note-Taking	22	120 posts	36
Leading Change (LC) Digital Futures: Digital Activism (DFDG)	Wiki as LMS		LC: the students did not post anything on the Wiki. DFDA: no analysis was conducted	
Food, Culture, and Technology (FCT)	Podcasting	6	6 podcasts. They were analyzed as part of the language blog.	2
Food, Culture, and Technology (FCT)	Creating Infographics	6	Total= 6 infographics. They were analyzed as part of the language blog.	2
Digital Futures: Digital Activism (DFDG)	Participatory Action Video		No analysis was conducted	
Digital Futures: Digital Activism (DFDG)	Wikipedia		No analysis was conducted	

After sampling 30% of students' posts from every SMLA, analysis was conducted based on the framework in Table 8 which was also used for the analysis of the SMLAs as

listed in syllabi and course documents. The goal of the observations was to analyze the cognitive processes and types of knowledge that students achieve as a result of engaging with social media to complete a learning activity. Content analysis of students' actual tweets, blog posts, wiki posts, podcasts, and infographics was conducted based on the framework in Table 8. The same framework was used to analyze the SMLAs as listed in the syllabi, course documents, and students' SMLA posts, in order to achieve triangulation of sources. Every single post included in this study was analyzed based on cognitive processes and types of knowledge that students achieved (Figure 8). Again, Bloom's Digital Taxonomy, which represents the main verbs of cognitive processes and subcategories of each, was used to analyze students' posts. More specifically, evidence of any of the verbs was highlighted in yellow and explained in terms of Bloom's main verbs using marginal comment boxes. Krathwohl's (2002) description of the knowledge types was also helpful in spotting content that reflected the students' knowledge. Phrases or sentences that reflected knowledge domains were highlighted in green, and comment boxes were created to describe the type of knowledge achieved. Some of the analyses of student posts were conducted using a Word document, while others were conducted using markers and a pen to indicate cognitive and knowledge categories.



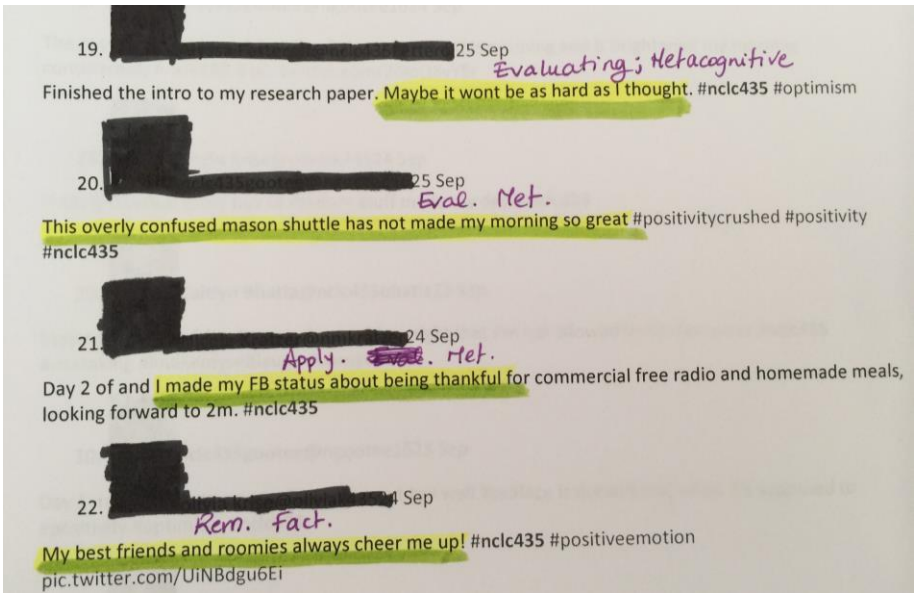


Figure 8. Example of data analysis of student posts in word and manually.

The first screenshot in Figure 8 belongs to the analysis of the Introduction to Digital Studies blog. The yellow highlighted areas are evidence of student cognitive

processes. According to Bloom's Digital Taxonomy, "linking" demonstrates Analyzing, and "summarizing and interpreting" reflect Understanding. The student in this post shows evidence of each of the mentioned cognitive processes, in addition to evidence of types of knowledge highlighted in green. The student in this post seems to demonstrate Conceptual Knowledge, which is defined as "the interrelationships among the basic elements within a larger structure that enable them to function together," (Krathwohl, 2002, p. 214). The second example in Figure 8 illustrates the analysis of students' tweets in Twitter Personal Transformation Experiment (PTE) SMLA. Since tweets are 140 characters by nature, analyzing them was more difficult than analyzing longer posts, because often little evidence of cognition and knowledge was demonstrated. Again, Bloom's Digital Taxonomy was helpful in analyzing the tweets. For instance, as suggested by the screenshot, students who demonstrated "judging, experimenting, testing, or critiquing" were engaged in Evaluation. Students who demonstrated "implementation" of the goals of the learning activity were "Applying" learning. In the PTE activity, students were asked to reflect on the development of selected skills. In many of the tweets, students demonstrated evidence of reflection on their self-knowledge that resulted in metacognitive knowledge.

Since the students' posts were numerous, data from this analysis were quantified. The researcher counted the frequency of each of the cognitive processes and the types of knowledge per activity, resulting in descriptive statistics to identify a common pattern and draw conclusions about student cognitive processes and types of knowledge in each

SMLA (Figure 9). Miles and Huberman (1994) referred to this method in qualitative research as "Counting," while Maxwell (2013) referred to it as quantifying qualitative data.

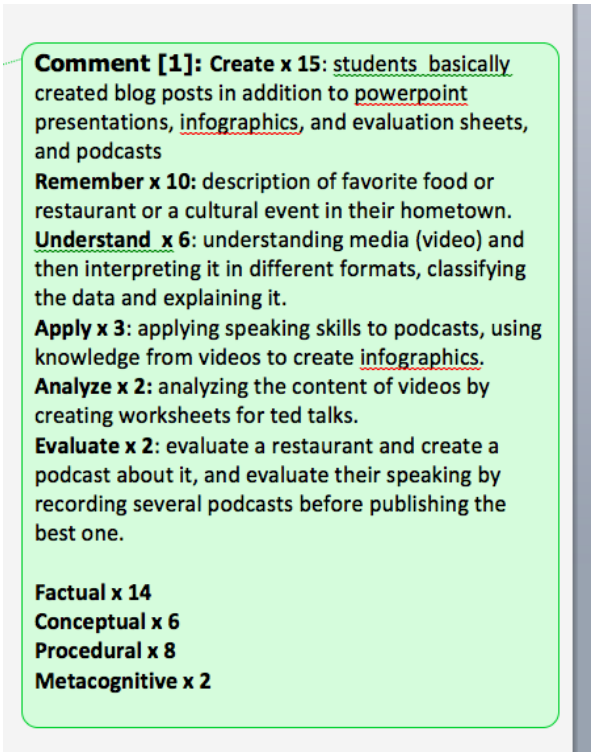


Figure 9. An example of how the analysis of the cognitive processes and types of knowledge of each of the learning activities was quantified.

In order to triangulate data, the data collected from the researcher's document analysis of the faculty description of the SMLA, students' SMLA posts, and the faculty interviews, were combined into one table (Tables 14-15 in Chapter 4) to reflect

convergences and divergences in cognitive processes and types of knowledge pertaining to each SMLA. Results from the analysis of the SMLAs and students' posts and faculty interviews were carefully examined through Tables 14 and 15 in Chapter 4, and resulted in findings associated with research questions 1b and 1c. Patterns across these findings were identified when evident, resulting in several themes.

Reliability

Reliability of the students' posts analysis was obtained by checking inter-rater reliability. A peer doctoral student in the instructional technology program was asked to conduct the same process of analyzing 30% of the total number of students' posts that were analyzed by the researcher, without looking at the latter's analysis. The researcher and the peer doctoral student met after the former had conducted the analysis of the student posts, and the researcher explained to her peer the purpose of the study and the process of the data analysis. The researcher's peer conducted the analysis alone and then shared the result with the researcher. After calculating the analysis responses that were in agreement, it turned out that the initial agreement levels were 85%. The researcher and the inter-rater then met to discuss the discrepancies to reach unanimous conclusions. Results from this discussion were applied to the almost 40% of posts that were already analyzed and to the remaining analysis of the posts. The inter-rater reliability indicated that the analysis conducted is logical.

Credibility

The credibility of this study was attained through obtaining member checks, triangulation of data, long-term involvement, and rich data (Maxwell, 2013). Member checks took place during the second interview, when faculty participants were asked to give feedback about the initial interview analysis. After conducting the analysis of the initial interviews, a Word document was created for each of the participants, including an analysis of each of the interviews. At the follow-up interviews, faculty were handed a copy of the analysis with a breakdown of the initial interview themes and interpreted evidence from their interviews. They were asked to look at the researcher's interpretations and give feedback about the accuracy of the mentioned information, clarify any vague interpretations, and add any missing information (Glesne, 2011). Triangulation of data took place through the use of multiple sources of data: interviews, documents, and observations, as well as through the multiple cases studied. Since the observations took place throughout the semester with intermittent beginning, middle, and end of semester observations, data was not limited to one phase of the semester, which provided richer data. Maxwell argued that long-term involvement in data collection leads to richer data. Richer data was also obtained by examining five different case studies and comparing them to each other.

The researcher avoided credibility threats in two ways. First, by separating her knowledge of social media tools and her current profession as an instructor from the other professors' experiences using social media. During the interviews and the observations,

the researcher played the role of an outsider who is not familiar with the topic. This caution was taken to avoid the researcher's biases described earlier in this chapter. In this case, several follow-up questions were asked to ensure clarification of data. Second, the researcher analyzed each of the data sources individually and sequentially, in order to establish triangulation and to avoid subjectivity.

CHAPTER 4: RESEARCH FINDINGS

Statement of the Problem

Several research studies have reported the positive impact of social media on student learning and engagement (Churchill, 2009; Domizi, 2013; Fox & Varadarajan, 2011; Hung & Yuen, 2010; Lichter, 2012; Menkhoff & Bengtsson, 2012; Rambe, 2012; Yang & Chang, 2012). The research also shows that students and faculty are using social media for learning in higher education contexts. However, little research has been conducted on how faculty are using social media in their courses, specifically, how they select social media tools and design social media learning activities (SMLAs). Furthermore, there is little research about faculty perceptions concerning the use of social media for educational purposes. Therefore more research is needed in this area to understand how experienced faculty are using social media in higher education, in order to develop best practices for implementing social media in teaching and learning contexts.

Purpose of the Study

This study aimed to explore how experienced faculty are using social media to support student learning in higher education contexts. More specifically, it intended to analyze the SMLAs that faculty are using in their courses, the cognitive processes that

students engage in through SMLAs, and the type of knowledge that is achieved. Additionally, this study aimed at exploring faculty perceptions regarding the effectiveness of social media as educational tools, their criteria, if any, for the selection of social media technologies, and strategies they used when designing SMLAs.

Research Questions

The study addressed the following research questions:

1. What types of learning activities are designed through social media?
    a. What cognitive processes do SMLAs promote?
    b. What types of knowledge do SMLAs promote?
2. What strategies do experienced faculty use to design SMLAs?
3. What are experienced faculty perceptions regarding the effectiveness of social media as educational tools?

Research Findings

The research findings are presented in response to the research questions. Several common patterns and overarching themes emerged from the data provided by answers to the research questions. First, the SMLAs integrated into the six courses that constituted the case studies for this study are described, and the most frequently used social media tools from these six courses are listed to demonstrate the learning activities designed through social media in the participating courses. Findings and overarching themes from data analysis are presented in Table 11. Analysis of findings related to research question

1a resulted in two overarching themes represented by four categories of the cognitive processes promoted by SMLAs. In response to research question 1b, two overarching themes supported by four common patterns in the type of knowledge promoted by SMLAs emerged from the data analysis. In response to research question 2, two overarching themes emerged from six common patterns in the strategies used to design SMLAs across participating faculty. Finally, analysis of initial and follow-up faculty interviews revealed five themes across the six cases about the effectiveness of social media as educational tools.

Table 11

Summary of Findings from Data Analysis Aligned With Research Questions

Research Question	**Findings**
1. What types of learning activities are designed through social media?	• Description of the SMLAs • List of most frequently used social media technologies
a) What types of cognitive processes do SMLAs promote?	**Overarching themes:** **(1) Both higher and lower levels of cognitive processes perceived through SMLAs** **(2) Perceived alignment between particular social media affordances and cognitive processes** a. "Remembering" and "Understanding" as basic cognitive processes promoted in SMLAs b. Blogs and wikis SMLAs may promote several cognitive processes c. Blogs, wikis, and media creation tools may promote the

		higher level of cognitive process of "Creating" d. "Applying" portrayed in executing and uploading in SMLAs e. SMLAs may promote "Analyzing" through linking and "Evaluating" through judging and critiquing
	b) What types of knowledge do SMLAs promote?	**Overarching themes:** **(1) All types of knowledge perceived through SMLAs** **(2) Perceived alignment between particular social media affordances and types of knowledge** a. Factual knowledge, a common outcome in SMLAs b. Conceptual knowledge supported by linking and tagging c. Procedural knowledge at the "Creating" level of cognitive processes d. Metacognitive knowledge through revisions and self-knowledge
2.	What strategies do experienced faculty use to design SMLAs?	**Overarching themes:** **(1) Faculty Reliance on social media affordances and fit with their courses** **(2) Integrating additional media sources to enhance SMLAs** a. Matching the discipline with the social media b. Selecting Social media based on affordances c. Taking advantage of the affordances of social media d. Including media sharing (website, video, audio) in the SMLA e. Integrating tools or social media affordances that support dialogue f. Other finding: Making the SMLA mandatory and not optional
3.	What are experienced faculty perceptions regarding the effectiveness of social media as educational tools?	**Overarching themes:** **(1) Increase visibility of student work = quality work** **(2) Help students develop technology skills** **(3) Have the potential to extend in-class discussion beyond the classroom** **(4) Purposeful instructional use of social media** **(5) SMLAs are effective educational activities as perceived by the faculty participants**

Research Question 1: What types of learning activities are designed through social media?

Description of the social media learning activities. A total of 12 SMLAs were identified in this study. Table 12 presents a summary of these 12 activities, and a more detailed description is provided in Appendix B. There were 10 structured SMLAs listed in the course syllabi and documents, and two unstructured activities that were not listed in the course syllabi and were gathered from faculty interviews (Table 12). Out of these activities, there were four microblogging activities, two blogging activities, three wiki activities, one podcasting activity, one infographic activity integrated into a blog, and one YouTube activity.

The 10 structured SMLAs described in the syllabi were graded, and represented from 5% to 100% of the total course grade. Seven out of the 10 activities were mandatory. The Digital Activism Twitter Project, Wikipedia activity, and the Online Class Participation in the Introduction to Business Information Systems (IBIS) course were optional. In the optional activities, students had the alternative to select SMLAs or traditional non-social media activities identified in the course syllabus that would count toward the course grade. For instance, the Twitter Online Class Participation in the IBIS course was optional, although it was described as a structured activity in the syllabus, and students could choose not to use Twitter but instead participate in face-to-face class discussions. The two unstructured SMLAs were wikis in the Leading Change (LC) and DFDA courses used to replace Learning Management Systems, and there was no

description for their use in the course syllabi. Faculty used these tools to share content with students and for student collaboration. Also, Twitter was used informally in the DFDA course. A course hashtag was created.to promote in-class participation and report student group work.

The use of the social media technologies to support the SMLAs was either private or open to the public, allowing any person can observe the students' work or interact with them. Nine out of 12 activities were public, while the other three were private. Microblogging or Twitter activities were all public because the tool does not have private features. Hence, anyone who searched for the course hashtags created for the specific courses could read the students' tweets, retweet them or respond to them. Both blogging activities, Language Course Blog in Food, Culture and Technology (FCT) course; and Course Blog in Introduction to Digital Studies (IDS) course, were public. Both are also searchable online, although only specified users can contribute to them. Wiki tools were private, and access to them is not possible without an invitation from the wiki administrator. However, Wikipedia activity was public because students had to edit an existing Wikipedia entry and could get feedback on their edits from the public. Podcasts and infographics in the FCT course were public because they were posted on a public blog. Finally, the Participatory Action Video in DFDA course was also private, since students posted their videos privately to YouTube and only students and faculty had access to them.

Table 12

Social Media Learning Activities (SMLAs) Included in the Study

Social Media and Course Title	Social Media Learning Activities	Private vs. Public	Structured vs. Unstruct-ured	Mandatory vs. Option-al	Course Grade Percentage
Microblogs Leading Change (LC) Introduction to Business Information Systems (IBIS)	Personal Transformation Experiment: Students used Twitter as a form of micro-reflection to record their transformation progress throughout the semester, prepare a pre- and post-assessment of their experiment, and offer a final reflection.	Public	Structured	Mandatory	15%
Digital Futures: Digital Activism (DFDA)	Online Class Participation at Twitter Students followed @mis301gmu at Twitter (http://twitter.com/mis301gmu) to participate in online class discussions.	Public	Structured	Optional	5%
	Digital Activism Twitter Projects: In these Twitter assignments, students had to research and follow their digital informants. Second, they had to explore the ideas and information to which they link to their informants. Third, they had to summarize the key content they are acquiring in 140 characters	Public	Structured	Mandatory	15%
DFDA	Twitter in-class and small group participation: in the Digital Futures: Digital Activism course, Twitter was used as an in-class participation tool where	Public	Unstructured	Optional	Unspecified

	students were asked to share findings from small group discussions.				
Blogs Food, Culture and Technology (FCT) Introduction to Digital Studies (IDS)	Language Blog: Students created their individual pages on Weebly and linked them to the class blog. The students' blogs included and introduction, posts about their "Favorite Meal", and links to their other course assignments which included infographics, podcasts, video analysis, and PowerPoint presentation.	Public	Structured	Mandatory	100%
	Digital Studies Course Blog: Each student contributed to the weekly class blog. There were three roles on the blog (Readers, Historians, and Responders), and each week a quarter of the class rotated through these roles (one group has the week off in terms of blogging).	Public	Structured	Mandatory	20%
Wiki Leadership Theory and Practice (LTP)	Collaborative Note-Taking: For this assignment, students worked in small groups to create notes on the assigned readings from their textbooks. The notes were collected and stored online using a wiki.	Private	Structured	Mandatory	25%
	Wiki as LMS: In two out of the six courses, the wiki (PbWorks) was used to replace the LMS. The professors used it to share the course content and to conduct group in-class activities. In one of the activities students had to work in groups to gather news about a topic from different social media	Private	Unstructur-ed	Optional	Unspecified

	sites.				
Podcasts FCT	Podcasting: Students had to listen to a restaurant review on a podcast and then record their own restaurant review on Podcast. Students had to practice and listen to their speaking several times before uploading the final Podcast.	Public	Structured	Mandatory	Unspecified
Infographic FCT	Creating Infographics: Students watched a video to create an infographic to represent ideas on a given topic from research about Corn products in the marketplace today. The students then shared the infographic on their blogs.	Public	Structured	Mandatory	Unspecified
YouTube DFDA	Participatory Action Video: Part I: Research and Identification During the first part of the semester, self-selected small groups (of 3-4 people each) will research and identify a group with whom they will create participatory action videos…. Part II: Exploratory Meetings Once they have partnered with a group, they need to organize at least two exploratory meetings, where they will learn more about their group's needs, and the nuances of the story it wants to tell… Part III: Proposal (Draft is due 7 October & final is due 16 October) Each group will present a proposal for its participatory action video to the learning community	Private	Structured	Mandatory	50%

	on 7 October… Part IV: Shoot & Edit their Participatory Action Video Students shoot and edit with their partner groups. Then they review footage on shooting days with members of their partner group….				
Wikipedia DFDA	Wikipedia: Project # 1: Students had to edit Wikipedia article on Digital Activism based on the course readings while meeting Wikipedia's requirement that editors source each new piece of information from reliable, authoritative, pre-existing content. Project #2: For this project, students had to edit a minimum of five Wikipedia articles related, very broadly, to the theory and practice of digital activism referenced via authoritative sources (like the readings).	Public	Structured	Optional	15% 10%

List of most frequently used social media technologies. Analysis of SMLAs in syllabi and course documents, and observations of the SMLAs, revealed that wikis, blogs, and microblogs were the most frequently used social media technologies in the participating courses. Wikis were used in three out of six courses, microblogs were used in three out of six courses, and blogs were used in two out of six courses. More specifically, wikis and blogs were used by faculty to share content and assignments, and as platforms for students to share their work or collaborate. None of the blogs and wikis

used, except for the blog platform in the IDS course, were supported by the institution. Except for the blog platform in the IDS course, blogs and wikis were free platforms that could be used simply by creating a profile and inviting other users. PbWorks was the platform used for wikis, and WordPress and Weebly were used for blogging. The use of other social media tools such as infographics shared on blogs, YouTube, Storify, Wikipedia, and Podcasts, were also evident in individual courses (Table 13).

Table 13

Use of Social Media by Course

Faculty Participant	Course Title in Which SM is Used	Social Media Used
Faculty A	Digital Future: Digital Activism (DFDA)	Wiki Wikipedia Microblogs YouTube Storify
Faculty B1 Faculty B2	Food, Culture, and Technology (FTC)	Blog Podcast Infographics
Faculty C	Leading Change (LC)	Wiki Microblogs
	Leadership Theory and Practice (LTP)	Wiki
Faculty D	Introduction to Digital Studies (IDS)	Blog
Faculty E	Introduction to Business Information Systems (IBIS)	Microblogs

Research Question 1a: What cognitive processes do SMLAs promote?

Cognitive processes are defined as the thinking skills that learners engage in to achieve a learning goal that is portrayed in learning tasks or activities. In this study, the SMLAs were analyzed using Bloom's original and digital Taxonomy of cognitive processes to identify the level of cognitive processes that students are expected to achieve while completing the learning activities, as well as evidence of students' cognitive processes in their SMLA posts. A description of cognitive processes was provided in Chapter 2 and 3. Table 14 presents the results from the analyses of structured SMLAs. Unstructured activities were not analyzed because they were not formally described in the syllabi and course documents, nor did the researcher have access to the observation. Red X shows the faculty participants' analysis of their SMLAs. Blue X shows the researcher's analysis of the SMLAs based on the course syllabi and supporting documents that described the SMLAs in each course. Green percentages show the analysis of the students' posts in the SMLAs based on the researcher's observations. Since the analyzed students' posts revealed more than one type of cognitive processes, the percentages presented in this row add up to more than 100%. In some activities, such as the Digital Activism Twitter Project, Participatory Action Video, and the Wikipedia SMLAs, the students' posts were not analyzed because student consent was not obtained, and hence, why percentages are not evident.

The triangulation of data analyzed from the three sources revealed convergences (blue, green, and yellow shaded areas in Table 14) and divergences (unshaded areas).

Convergence criteria were based on: (a) the concordance of the analysis of the cognitive processes in SMLAs by the researcher and the participants, and at least 50% of the students' posts in SMLAs as analyzed by the researcher (green shaded area); (b) the concordance of the cognitive processes analyzed by the researcher, the participants, and the researcher's analysis of the students' posts irrelevant of the percentages (yellow shaded area); and (c) the concordance of the cognitive processes analyzed by either the researcher, or the faculty participants and at least 50% of the students' posts in SMLAs as analyzed by the researcher (blue shaded area). Divergences were evident in areas where there was a lack of agreement between the researcher's analysis of SMLAs as listed in syllabi and course documents, the faculty participants' analysis of their SMLAs, and the students' posts in SMLAs. SMLAs that were not analyzed through students' posts will not be included in the findings of this section.

Table 14

Analysis of SMLAs Based on Bloom's Taxonomy

	Cognitive Processes					
Social Media Activities	Remember	Understand	Apply	Analyze	Evaluate	Create
Twitter: Personal Transformation Experiment (PTE)	X 37.2%	X 95%	8.13%	X X 12.8%	33.7%	

Twitter: Online Course Participation (and sharing resources)	X 50%	X X 22%	X X	X 12.9%	1.2%	
Digital activism Twitter projects		X	X	X X	X X	
Language Blog	X X 66.6%	X X 40%	X X 20%	X 13.3%	X X 13.3%	X X 100%
Digital Studies Course Blog	X 55.8%	X X 86%	X	X 67%	X X 58%	X 100%
Collaborative Note-taking	X 100%	X 100%	X 50%	X X 33%	X 83%	X 100%
Podcasting	X X 100%		X X 100%		X	X X 100%
Creating Infographics	X X 100%	X X 100%				X X 100%
Participatory action video		X	X		X	X X
Wikipedia	X	X X	X	X	X X	

Note. Red X shows the participants' analysis of their learning activities. Blue X shows the researcher's analysis of the activities before observing the students' posts. Green % shows the analysis of the cognitive processes in the students' posts in the SMLAs.

Green shaded areas represent the concordance of the analysis of the cognitive processes in SMLAs by the researcher, the participants, and at least 50% of the students' posts in SMLAs as analyzed by the researcher. Yellow shaded areas represent the concordance of the cognitive processes analyzed by the researcher, the participants, and the researcher's analysis of the students' posts irrelevant of the percentages. Blue shaded area represent the concordance of the cognitive processes analyzed by either the researcher, or the faculty participants and at least 50% of the students' posts in SMLAs, as analyzed by the researcher.

The three types of convergences in Table 14 suggest that Twitter Personal Transformation Experiment SMLA promoted "Understanding" and "Analyzing," while Twitter Online Course Participation SMLA promoted "Remembering" and "Understanding." The Language Blog SMLA supported Remembering, Understanding, and "Applying," "Evaluating," and "Creating." The Digital Studies Course Blog SMLA fostered Remembering, Understanding, "Analyzing," Evaluating, and Creating. Furthermore, Collaborative Note-Taking SMLA stimulated all the cognitive processes Remembering, Understanding, Applying, Analyzing, Evaluating, and Creating Finally; Podcasting SMLA supported Remembering, Applying, and Creating, while creating Infographics SMLA promoted Remembering, Understanding, and Creating.

The analysis of the data presented in Table 14 across courses and social media technologies revealed two overarching themes:

1. Both higher and lower levels of cognitive processes were perceived through SMLAs.
2. Alignment perceived between particular social media affordances and cognitive processes.

The overarching themes were based on common patterns observed in these findings:

a. "Remembering" and "Understanding" as basic cognitive processes promoted in SMLAs
b. Blogs and wiki SMLAs may promote several cognitive processes
c. Blogs, wikis, and media creation tools may promote the higher level cognitive process of "Creating"
d. "Applying" portrayed in executing and uploading in SMLAs
e. SMLAs may promote "Analyzing" through linking and "Evaluating" through judging and critiquing

"Remembering" and "Understanding" as basic cognitive processes promoted in SMLAs. The analysis of the SMLAs by the researcher and the faculty participants, as well as the analysis of the students' posts in SMLAs by the researcher, revealed that students engaged in "Remembering" and "Understanding" to complete the SMLAs. "Remembering" is defined as "retrieving relevant knowledge from long-term memory" (Krathwohl, 2002, p. 215) and is manifested in recognizing, listing, describing, identifying, finding, searching, googling, etc. "Understanding" is referred to as "determining the meaning instructional messages, including oral, written, and graphic communication" (Krathwohl, 2002, p. 215) and is portrayed in interpreting, summarizing, exemplifying, classifying, explaining, tagging, commenting, tweeting, etc. As mentioned earlier, students' SMLA posts were observed and analyzed in only seven out of 10 SMLAs. The analysis of students' posts in SMLAs showed that six out of seven SMLAs

engaged students in Remembering and Understanding. These activities included Twitter Personal Transformation Experiment, Twitter Online Course Participation, Collaborative Note-Taking, Language Blog, Digital Studies Course Blog, Podcasting, and Creating and Sharing Infographics. For instance, the Twitter Online Class Participation SMLA suggested 22% of the students' tweets showed Understanding and 50% showed Remembering. In this activity, students had to search for and locate articles related to their course discussions (demonstrating Remembering), and sometimes students posted a short, one sentence summary of the article (demonstrating Understanding).

Remembering
Understanding

@mis301gmu http://wrd.cm/1ckTEhC Interesting take on keeping robots out of our jobs. Goes back to people wanting interacting with people. (Student A)

Similarly, the Digital Studies course blog suggested that 55.8% of the students' posts exhibited Remembering, while 86% revealed Understanding. In the three roles that students were asked to play: "Historians," "Readers," and "Responders," they had to link the readings to knowledge from course readings or each other's' posts (Remembering), and often had to summarize readings (Understanding):

Remembering
Understanding

Blog post example from Digital Studies Course blog:

Readers: 4 Types of Gamic Action

December 2, 2013 by Student B

> In this chapter, Galloway explores the different types of gaming interfaces by placing them on an axis of machine vs. operator and diegetic vs. nondiegetic. The terms diagetic and nondiegetic were new to me prior to this article, but Galloway explained that he adopted these terms from film and literary theory to describe and analyze gamic action. Diagetic elements are those which concern the narrative world of the game. The nondiegetic elements of a game are those which are not concerned with the narrative or the world of the game's story. These are the elements concerned with gameplay which are either embedded in the game world or completely removed. (Student B)

The Collaborative Note-Taking SMLA showed a high level of Remembering and Understanding, both100% in posts, due to the structure of the SMLA that required the students to take notes from a reading. In this activity, students were engaged in several cognitive processes, including summarizing (Understanding) and searching for external sources to support a certain leadership way of thinking (Remembering).

	Collaborative Note-Taking Activity:
Remembering	For each Northouse chapter, please provide the following:
Understanding	Origin story (how the theory evolved)
	Summary of the theory
	Strengths and criticisms of the theory

Application of the theory (how would someone apply this to inform a leadership experience or their own leadership practice?) How can you learn more about this way of thinking about leadership? (including links)

Tagging (hashtagging) was evident in two out of seven observed SMLAs, Twitter Personal Transformation Experiment in Twitter Online course participation. In the Personal Transformation Experiment, students were asked to include hashtags (#) for the personal attributes that they selected to develop in themselves, such as #gratitude, #resilience, #creativity, #innovation, # risk-taking, #initiative, #effective communication, #mindfulness, and #relationship-building. In addition to the given hashtags, students took a step further in this course to include other hashtags that are not course required but theme-related, and they also included links to articles that match the topic. Classifying and tagging are both evidence of understanding according to Bloom's taxonomy.

Remembering

A great read on how to #network on campus #**NCLC435** http://college.monster.com/training/articles/12-network-on-campus … (Student C)

Understanding

Got a new record of 25 seconds tying my swiss seat at RC this morning! #thelittlethings #**NCLC435** (Student D)

> You're never quite ready to be truly thanked by someone you weren't aware you had such an impact on. #**nclc435** #humblebrag #gratitude (Student E)

Blogs and wikis SMLAs may promote several cognitive processes. Since wikis and blogs afford longer posts than microblogs, evidence of several levels of cognitive processes in one activity were triangulated from the researcher's and the faculty participants' analysis of SMLAs as listed in syllabi and course documents, and from the analysis of the students' posts in SMLAs. Specifically, the analysis of students' posts in the Collaborative Note-Taking, Language Blog, and Digital Studies course blog revealed most levels of cognitive processes across posts or within individual posts. For instance, in the Collaborative Note-Taking activity, students were expected to describe the origin of a theory (Remember), summarize it (Understand), critique it (Evaluate), apply it to real life situations (Apply), and finding other sources and linking them to the theory (Analyze). Students' posts revealed that several cognitive processes were involved.

> Remember: Followers: individuals with high organizational commitment who are able to function well in a change-oriented team environment... they are independent, critical thinkers with highly developed integrity and competency. (Student G)
>
> Understand: Summary of the theory
>
> Early Studies:
>
> 1. Looked at the dyadic relationship between the leader and follower

2. Found that within an organizational work unit subordinates became part of the in-group or the out-group based on how well the leader works with them and how well they work with the leader.
3. Personality and characteristics are part of this process (Dansereau et al. 1975) (Student H)

Apply: Leaders, especially on sports teams, need to be able to practice situational leadership when trying to understand how to approach playing different teams. The President of the USA should apply this type of leadership when working with Cabinet members to make decisions and come to conclusions. (Student I)

Analyze: Classification Types

1. Extraversion v. Introversion: Whether a person prefers to derive energy externally or internally
2. Sensing v. Intuiting: Whether a person prefers to gather information in a precise or in an insightful way
3. Thinking v. Feeling: Whether a person prefers to make decisions rationally or subjectively" (Student J)

Evaluate: Talking about followers and leaders: While I don't mind that both words have more than one meaning, I feel like this book is in favor of focusing on one meaning, which is the personable side of the what it is to be a follower/leader. I think that if we're going to be studying leadership, we should study both sides of followership/leadership and the pros and cons of both... the book shouldn't just

almost subtly mention the cons of one to make the other one look better. (Student K)

Similarly, Figure 12 reveals several levels of cognitive processes that students engaged in when developing the blog posts in the Digital Studies course blog. Analysis of students' posts suggested that Remembering was evident in 55.8% of the students' posts, Understanding in 86%, Analyzing in 67%, Evaluating in 58%, and Creating in 100% of the posts. The Language Blog SMLA also engaged students in cognitive processes on different levels. Remembering was evident in 66.6% of the analyzed posts, Understanding in 40%, Applying in 20%, Analyzing in 13.3%, Evaluating in 13.3%, and Creating in 100% of the posts. While Remembering, Understanding and Creating were perceived at higher percentages, Applying, Analyzing, and Evaluating were also evident to a lesser extent.

Blogs, wikis, and media creation tools may support the cognitive process of "Creating". Based on the definition in Bloom's Taxonomy which refers to Create as "putting elements together to form a novel, coherent whole or make an original product" (Krathwohl, 2002, p.215), five out of the seven explored SMLAs showed that students were expected to create or actually created products in observed posts. Bloom's taxonomy suggests that students at this level are expected to produce, make, and construct, which was evident in the way the activities were structured and the social media features that support the achievement of the learning goals. Following Churches (2009) digital verbs, the created products could be illustrated by students' blogging,

podcasting, videocasting, wiki editing, and filming; which could be demonstrated by the Digital Studies course blog, the Language blog, The Participatory Action video, the Collaborative Note-Taking activity, Creating Infographics, and Podcasting activity. Evidence of the creation level in these activities was articulated in each of their descriptions and the student products that were created.

> Participatory Action Video: Part IV: Shoot & Edit your Participatory Action Video: Leave yourselves plenty of time to shoot and edit with your partner groups. You will not be able to screen video daily with your groups, as Insights into Participatory Video recommends as the ideal, but do build time into your schedule to review footage on shooting days with members of your partner group….
>
> Creating Infographics: Students watched a video to create an Infographic to represent ideas on a given topic from research about Corn products in the marketplace today.

In the Language Blog, every student created a static blog page and included several entries based on specific activities that were listed on the main course FCT website. Students in this course were engaged in several SMLAs that contributed to their individual blogs. All of these activities promoted a Creating level of cognitive processes. A snapshot of individual students' blogs is presented in Figure 10.

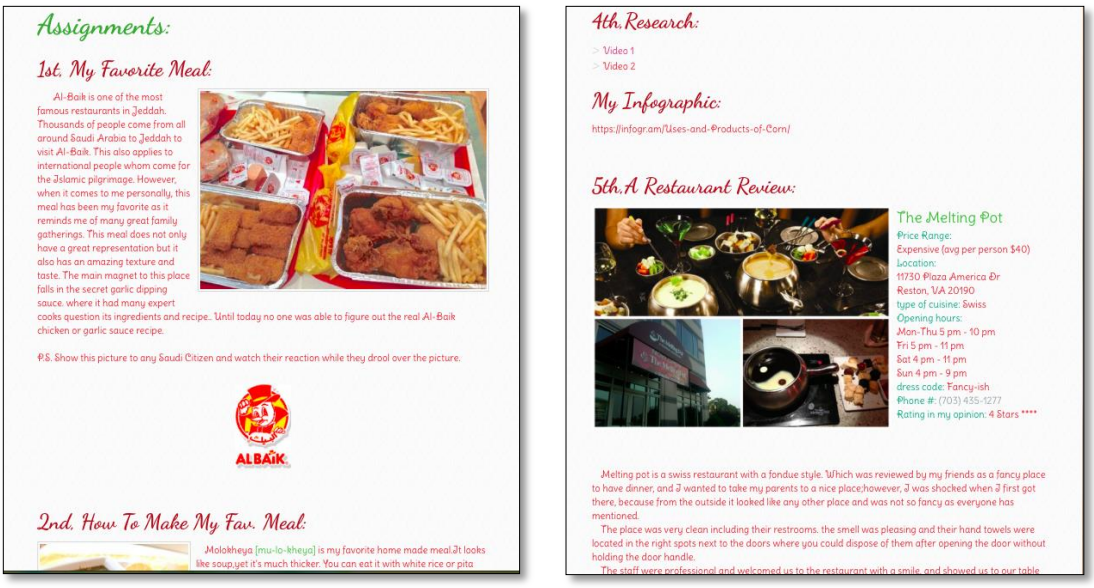


Figure 10. Sample blog posts in the Language Blog.

"Applying" portrayed in executing and uploading in SMLAs. Applying, which is implementing, playing, uploading, sharing, and editing, according to Bloom's taxonomy, was evident in three out of seven SMLAs. Based on the analysis of students' posts in SMLAs and the faculty and the researcher's analysis of the documents, Language Blog, Collaborative Note-Taking, and Podcasting seemed to engage the students in Applying. It was apparent to a higher extent in Collaborative Note-Taking (50%) and Podcasting (100%). In the former activity, the students were asked to do the following:

> Application of the theory (how would someone apply this to inform a leadership experience or their own leadership practice?)

Since this was a collaborative activity, students were expected to edit the group's posts, although this was not evident in the observation. The group seemed as if they had assigned a chapter to each group member to work on individually, and then post it on behalf of the group.

On the other hand, Podcasting activity engaged students in several cognitive processes, one of which was Applying. In addition to evaluating their own speaking and other restaurant reviews podcasts, students had to apply their learning to create their own podcasts:

> *A Restaurant Review Podcast*
>
> Goals:
>
> PART I: *Become your own listener* and identify areas of your pronunciation in English that need improvement, using Mason's Accent Archive and a podcast for self-practice.
>
> PART II: Listen to restaurant review examples, then make your own recording (Podcast--an online recording) of a restaurant review from your own experience. Language for the review will be taught in Steve's class.
>
> HW #2: Using a voice memo or voicemail message on your cell phone, record yourself speaking the following sentences: […]

SMLAs may promote "Analyzing" through linking and "Evaluating" through judging and critiquing. Linking is an attribute of Analyzing, based on Bloom's Digital Taxonomy. Linking was evident in three out of seven SMLAs that were observed.

Linking was much more evident in the Digital Studies course blog, where students were asked to include media and links in their posts and discuss them. All three roles that students had to play depicted Analyzing (67%). A higher level of analysis was evident in the Historians role, which every student had to play at least once during the semester.

Description of Digital Studies course blog SMLA:

Readers are responsible for posting initial questions and insights about the week's reading to the class blog by 10pm Monday night. There are a number of ways to do this. You can situate the reading among the other readings we've encountered in class; you can write about an aspect of the day's reading that you don't understand, or something that jars you; or you can formulate an insightful question or two about the reading and then attempt to answer your own questions. These initial posts should be about 250 words and strive to be thoughtful and nuanced, avoiding description and summary. Remember that to receive an "exceptional" score, each post must include an image or media clip that illustrates—rather than trivializes—its point. Furthermore, the source of the image must be clearly given.

Responders will build upon, disagree with, or clarify either a reader post or something from Tuesday's class discussion, by 10pm Wednesday night. These posts should be about 250 words. Remember that to receive an "exceptional" score, each post must include an image or media clip that illustrates—rather than trivializes—its point. Furthermore, the source of the image must be clearly given.

Historians are responsible for the class's "memory." Students in this group will find and share at least one relevant online resource by noon on Thursday. These resources might include news stories, journal articles, podcasts, archives, and so on. They may also include earlier posts from our own class blog. In addition to linking to the resource, the historians must provide a short (no more than a paragraph) evaluation of the resource, highlighting what makes it worthwhile, unusual, or, if appropriate, problematic.

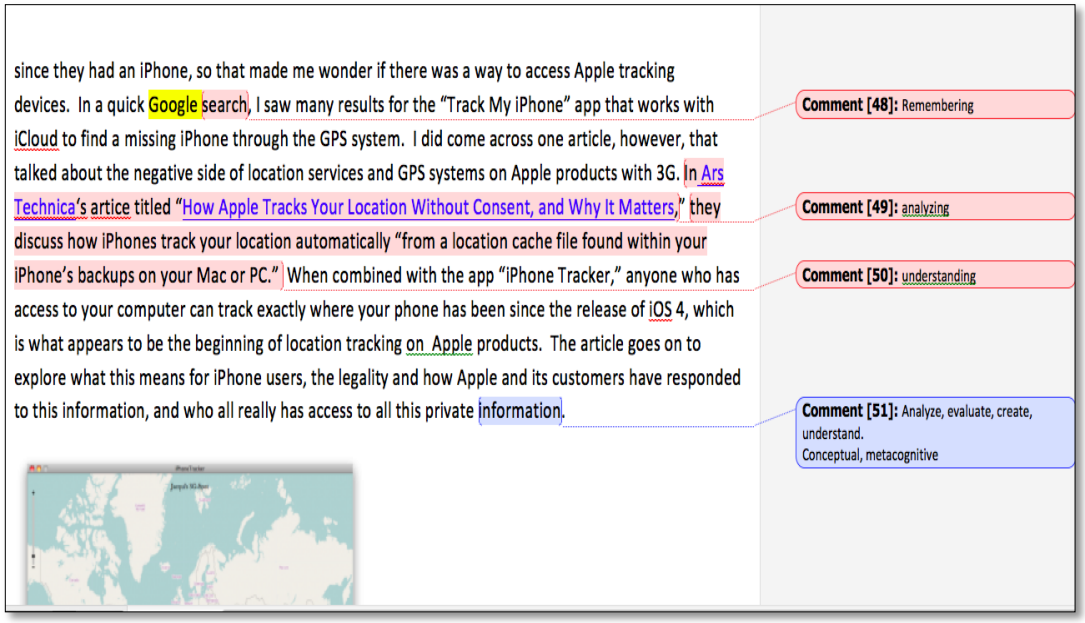


Figure 11. Evidence of student levels of cognitive processes in Digital Studies course blog.

Students' posts in the Digital Studies course blog revealed higher levels of cognitive processes, such as Analyzing, through the linking feature (Figure 11). Linking was also evident in the Twitter Personal Transformation Experiment, which was evident in 13% of the students' posts and in the faculty's and the researcher's analysis of the SMLAs.

As students included hashtags in the Twitter PTE project, they were also judging and monitoring their personal transformation attributes that reflect Evaluating (34%). Evaluating is demonstrated in hypothesizing, critiquing, and judging, and based on convergent data in Table 14, was evident in three out of seven SMLAs: Language Blog, Digital Studies Course Blog, and Collaborative Note-Taking. Students' posts demonstrated Evaluating to a larger extent in the Collaborative Note-taking activity (80%), where they were required to provide their view about the main points discussed in the summarized chapters.

> Your view of the top three points made in the chapter:
>
> Mindfulness: In this chapter, mindfulness is the process of understanding what is happening within you and around you in the moment. While it is important in that it allows us to understand our emotions, thoughts, interactions, and physical sensations, and it encourages listening to our intuition, it is not the only process we need to be following. It is important that we do not just focus on the moment, but we look to the past to avoid repeating mistakes, and we look to the future to give us vision and direction. There has to be a balance, not just a focus on one thing.

> Using your Talents and Strengths to Lead: According to the text, leaders work best when they understand their own selves, including how to best use their strengths and weaknesses. I agree with this viewpoint, because it allows us to understand our place in the world. I believe that it is easier to be a leader when I understand how and why I lead the way I do. This also helps me understand my group members better so I can tailor my interactions with them to best accomplish whatever work needs to be done. (Student F)

The analysis of 30% of the students' posts in SMLAs suggested that many of the students' posts met the expected cognitive processes set by the faculty or perceived by the researcher. However, the analysis also revealed some divergences between the analysis of the participants, the researcher, and the actual analysis of students' posts in SMLAs. Students engaged in higher or lower level cognitive processes that were not identified in the design of the learning activity or by the faculty. More explicitly, Twitter Personal Transformation Experiment and Twitter Online Course Participation, revealed that students engaged in unexpected cognitive processes. For instance, the analysis of students' posts in the Personal Transformation Experiment revealed that students succeeded in Understanding (95%), Applying (37%) the new leadership values, and in Evaluating (34%) their transformation as part of their tweets. These cognitive processes were not identified in the SMLA design.

[Apply #nclc435 #innovation My bedroom & closet doors = magnetic, so I

		bought magnets to hang up all my important papers there so I can see them! (Student L)
[	Evaluate	"No more tweets needed after today??? #gratitude that the assignment wasn't as bad as I thought. #nclc435", "A great read on how to #network on campus #NCLC435 http://college.monster.com/training/articles/12-network-on-campus (Student M)

Similarly, Twitter Online Course Participation SMLA suggested that students engaged in Remembering (49.7%) and Analyzing (12.9%) in addition to Understanding (22%), which was perceived by the researcher and the participants as well.

Research Question 1b: What types of knowledge do SMLAs promote?

As described previously on page 64, Krathwohl (2002) refers to the knowledge dimensions or types of knowledge as the WHAT that students actually learn by completing a learning activity. Faculty participants were asked to identify the types of knowledge related to their SMLAs (red X), and the researcher conducted the analysis of the types of knowledge perceived in SMLAs as listed in the course syllabi and documents (blue X). The students' posts in SMLAs were also analyzed in terms of types of knowledge (green percentages) (Table 15). Since the analyzed students' posts revealed more than one type of knowledge, the percentages in this row add up to more than 100%. In some activities such as the Digital Activism Twitter Project, Participatory Action

Video, and the Wikipedia SMLAs, students' posts were not analyzed and percentages are not evident because student consent was not obtained.

Similar to the analysis of the cognitive processes, there were areas of convergence (blue, green, and yellow shaded areas in Table 15) and areas of divergence (unshaded area) between the three sources. Convergence criteria were based on: (a) the concordance of the analysis of the types of knowledge in SMLAs, between the researcher and the faculty participants and at least 50% of the students' posts in SMLAs as analyzed by the researcher (green shaded areas); (b) the concordance of the types of knowledge analyzed by the researcher, the faculty participants, and the students' posts irrelevant of the percentages (yellow shaded areas); and (c) the concordance of the types of knowledge analyzed by either the researcher, or the faculty participants and at least 50% of the students' posts in SMLAs as analyzed by the researcher. Divergences were evident in areas where there was a lack of agreement between the researcher's analysis of SMLAs as listed in syllabi and course documents, the participants' analysis, and the students' posts in SMLAs. SMLAs that were not analyzed through students' posts will not be included in the findings of this section.

The three types of convergences revealed that Twitter Personal Transformation Experiment SMLA promoted "Conceptual" and "Metacognitive" knowledge while Twitter Online Course Participation SMLA supported "Factual and Conceptual" knowledge. Language Blog SMLA fostered "Factual, Conceptual, Procedural, and Metacognitive" knowledge and Digital Studies course blog supported "Factual and

Conceptual" knowledge. Collaborative Note-taking supported "Factual and Conceptual" knowledge while Podcasting supported "Procedural and Metacognitive" knowledge. Finally, Creating Infographics supported "Factual" and "Procedural" knowledge.

The analysis of the data presented in Table 15 across courses and social media technologies revealed two overarching themes:

1. All types of knowledge perceived through SMLAs;

2. Perceived alignment between particular social media affordances and types of knowledge.

The overarching themes were based on common patterns observed in these findings:

a. Factual knowledge, a common outcome in SMLAs;

b. Conceptual knowledge supported by linking and tagging;

c. Procedural knowledge at the Creating level of cognitive processes; and

d. Metacognitive knowledge through revisions and self-knowledge.

Table 15

Analysis of the SMLAs Based on Krathwohl's (2002) Knowledge Dimensions

	Knowledge Domain			
Social Media Activities	Factual	Conceptual	Procedural	Metacognitive
Twitter: Personal Transformation Experiment (PTE)	X 44%	X 65%	1%	X X 60%
Twitter: Online course participation	X X	X		

	68%	54%		
Digital activism Twitter projects	X X			X X
Language Blog	X X 93%	X X 40%	X X 53%	X X 13%
Digital Studies Course Blog	X X 65%	X X 95%		X 30%
Collaborative Note-taking	X 100%	X 100%	X	X 22%
Podcasting	X	X	X X 100%	X X 100%
Creating Infographics	X X 100%	X	X X 100%	
Participatory action video	X X	X X	X	
Wikipedia	X X			X X

Note. Red X shows the participants' analysis of their learning activities. Blue X shows the researcher's analysis of the activities before observing the students' posts. Green percentages show the percentage of types of knowledge in the students' posts in the SMLAs.
Green shaded areas represent the concordance of the analysis of the types of knowledge in SMLAs by the researcher and the participants and at least 50% of the students' posts in

SMLAs as analyzed by the researcher. Yellow shaded areas represent the concordance of the types of knowledge analyzed by the researcher, the participants, and the researcher's analysis of the students' posts irrelevant of the percentages. Blue shaded area represent the concordance of the types of knowledge analyzed by either the researcher, or the faculty participants and at least 50% of the students' posts in SMLAs as analyzed by the researcher.

Factual knowledge, a common outcome in SMLAs. Data analysis of SMLAs as listed in course syllabi and documents as well as the analysis of students' posts in seven SMLAs revealed that students achieved factual knowledge about the course content in five out of the seven observed SMLAs. Krathwohl (2002) refers to factual knowledge as the knowledge of terminology and specific details and elements. Factual knowledge was evident to a higher extent in activities that required students to discuss course-related topics and terminology. For instance, in Podcasting activity, students were expected to share a recorded restaurant review where they utter details about the restaurants' food, setting, and terminology related to the specific cuisine. Student N, a language student, narrates the attributes of the restaurant that she reviewed. As mentioned in the course website, the goal of this assignment is to improve student listening skills and knowledge of restaurant-related terminology.

Factual Knowledge

Language Blog- Melting pot is a Swiss restaurant with a fondue style. Which was reviewed by my friends as a fancy place to have dinner, and I wanted to take my parents to a nice place; however, I

was shocked when I first got there, because from the outside it looked like any other place and was not so fancy as everyone has mentioned.

The place was very clean including their restrooms. The smell was pleasing and their hand towels were located in the right spots next to the doors where you could dispose of them after opening the door without holding the door handle. (Student N)

In the Twitter online participation activity, students were expected to share external resources related to the class discussions that shows the interrelationship between elements of the course. Faculty E mentioned that students might have achieved some factual and conceptual knowledge by looking up and skimming external resources before sharing them on Twitter.

Factual Knowledge

Twitter Online Course Participation, Description of activity: Send thoughts and opinions on class topics and discussions to (Course Profile) as mentioned. If the instructor finds it interesting, he will retweet it to all followers.

Factual Knowledge

@mis301gmu The 10 Most Promising Jobs for the Next 10 Years. http://www.theatlantic.com/business/archive/2011/09/the-10-most-promising-jobs-for-the-next-10-years/244401/ … (Student O)

Factual Knowledge

@mis301gmu Computer merge with humans

http://news.bbc.co.uk/2/hi/technology/7325004.stm … (Student P)

Conceptual knowledge supported by linking and tagging. Conceptual knowledge was identified in five out of the seven examined SMLAs as suggested by the participants, the researcher's analyses of the SMLAs, and the students' posts. According to Krathwohl (2002), conceptual knowledge is referred to as the knowledge of classifications and categorizations. Knowledge of principles and generalizations was evident in the Twitter PTE, the Twitter Online Course Participation, both blogging SMLAs, the Collaborative Note-Taking SMLA, and the Participatory Action Video. For instance, in the PTE activity students were asked to develop a personal transformation plan for two leadership attributes, and they were required to reflect on their daily activities that related to these attributes. In a way, they were asked to classify their daily activities based on these attributes using hashtags, and develop interrelationships between Twitter and their personal development of the attributes. Students also included links to illustrate their personal transformation attributes. As a result, conceptual knowledge was perceived in 65% of the posts.

Conceptual Knowledge

Innovation video very good information!

http://www.youtube.com/watch?v=YKV3rhzvaC8 … #**NCLC435**

(Student Q)

> Parallel parking at night when it's raining is a good practice in patience and #resilience #becauseImfromthesuburbs #**nclc435**
>
> (Student R)

Conceptual knowledge was also apparent in 95% of students' posts in the Digital Studies Course blog activity. Students were asked to include resources and connected learning between different sources, creating generalizations.

Factual: knowledge of details and elements

Conceptual: Knowledge of classifications and categorizations

> Note: Although October is the ideal month for horror, the materials linked to in this post vary from unintentional comedy to blood chilling, so if you don't like scary stories you may not want to follow the links.
>
> "Bongcheon-Dong Ghost" is a particularly well-crafted example of an urban legend being brought to a wide audience via a digital medium. While scary stories and creepy urban legends have been entertaining people for years, new technologies allow for creative twists. Amnesia: the dark descent is a game that received a large following for delivering scares in a first-person video game. In addition sites like The Creepypasta Index and the subreddit /r/nosleep have a large variety of examples of urban legends and scary stories, many of which are expanded upon by people other than the original author. Many of these are text based, but some like "The curious case of smile.jpg" make use of digital media. Others tie into urban legends from around the world… (Student S)

Procedural knowledge at the Creating level of cognitive processes. Procedural knowledge was mainly evident in activities that required students to create a product such as their Personal Language Blog, podcasts or infographics. In both activities, students engaged in a procedure to create the final product and to learn how to use it. Procedural knowledge as defined by Krathwohl (2002) involves knowledge of subject-specific skills, techniques, algorithms, and determining when to use procedures. The analysis of students' posts in the Language Blog revealed that 53% of the posts exposed students to procedural knowledge. Not only were students engaged in learning the language, they were also engaged in learning how to create a blog, podcasts, infographics, and PowerPoint presentations.

> Creating Infographics: Students watch a video to create an Infographic to represent ideas on a given topic from research about Corn products in the marketplace today.

Metacognitive knowledge through revisions and self-knowledge. Finally, metacognitive knowledge was identified in three out of seven activities that were examined. Students were expected to think about their learning or how they might use the subject matter to reflect on their own cognition. The design of the SMLAs in these courses suggested that students had several chances to reflect on their learning and revise their posts before sharing them. Four out of five faculty participants reported that students reflected on their work before sharing it publically, leading to multiple revisions and

improved quality of work. As reported by most of the faculty participants, students were writing for an audience rather than a professor, which made them more aware of the quality of their work:

> ... is that it strengthened their self-editing skills, because they have to put a lot of ... of text, on the blog and on their Weebly, and on feedback ... that .. . for the feedback loops for other students' projects. And it was more important to them ... because other people were seeing their writing, they wanted more time to edit. (Faculty B1)
>
> As opposed to, like, I know some classes at, [Institution Name] still use Listserve ... or Moodle or Blackboard, something like that, and I think the, um, you know, blogs are different from that. That's the public writing aspect, I guess, is, is that. (Faculty D)

In the PTE activity, students showed a level of engagement in metacognition (60%) since they were engaging in self-knowledge and were expected to demonstrate change in some of their leadership skills, then reflect on them. Some of the students' posts that showed metacognitive level of self-knowledge or knowledge about their cognition included:

Metacognition : Knowledge of Self	Grateful 2 have a career that helps me grow daily this leadership class makes me think & realize I am innovatively creative #nclc435 (Student T)

> You're never quite ready to be truly thanked by someone you weren't aware you had such an impact on. #nclc435 #humblebrag #gratitude (Student U)
>
> > It's ok not to be perfect. It's hard to remember to be grateful for all you accomplish when something goes wrong. #nclc435 #gratitude (Student V)

Research Question 2: What strategies do experienced faculty use to design SMLAs?

Faculty with experience using social media were purposefully selected in this study to demonstrate what has worked for them as they design their SMLAs. In the initial interview, faculty were asked about the criteria they used to select social media technologies, and how they paired it with the learning activity. In the follow-up interview, faculty were asked to describe what worked well with the SMLAs and what changes they would make to the activity. The two overarching themes that emerged in data collected for this research question were "Faculty Reliance on Social Media Affordances and Fit With their Courses," and "Integrating Additional Media Sources to Enhance SMLAs." These themes were the result of six common patterns observed across findings related to strategies that faculty use when designing SMLAs:

a. Matching the discipline with the social media,
b. Selecting social media based on affordances,
c. Taking advantage of the affordances of social media,

d. Including media (website, video, audio) sharing in the SMLA,

e. Integrating tools or social media affordances that support dialogue, and

f. Other finding: making the SMLA mandatory and not optional.

Matching the discipline with the social media. Four faculty mentioned that their course topics "Digital Activism," "Food, Culture, and Technology," "Introduction to Digital Studies," and "Introduction to Information Technology" prescribed the use of technology in their courses, in this case social media. Faculty A explained that she looked at the current social media trends and applied them to her course accordingly. She also explained that students should learn how to make use of the digital tools out there and adapt them to their field:

> … So to encounter a non-familiar tool or platform and learn how to use it right on the spot, because what they really need is, is a sort of attitudinal and you know, learning pers-, perspective, and I think the students here have got it that most of the tools that are used for digital activism were not designed for digital activism. They were adapted and subverted by individuals to do that. But I'm trying to get them into that cycle of searching and, and adaptation and subversion.

Faculty C and Faculty D also mentioned that sometimes they designed the learning activity and then selected a technology that could support it. For example, the Twitter Personal Transformation Experiment SMLA was created when Twitter was booming and the faculty wanted to foster engagement between students:

> With the Twitter definitely the project came first, so we wanted them to do a personal transformation experiment. And was thinking, How can I get them to think about it all the time? And then we're like Oh, my gosh, Twitter. Twitter was just becoming really blooming up a few years ago and that's when we ... So that definitely the idea for the learning came first and then the tool. (Faculty C)

Selecting social media based on affordances. The findings also suggested that the design of the learning activity and the selection of the social media technologies are interrelated. Three out of five faculty participants (Faculty D, Faculty C, and Faculty E) reported that they selected the social media tools first and then adapted the learning activities to the tools:

> This semester when I decided whether I'm going to use a blog or not, I already had a really good feel for what it can do and what I wanted to do…I liked blogs because, at least the WordPress blogs I'm using, they're, they're open and anybody can read them and I like for students to have that experience that they're writing for people other than just their class. So, if they, um, you know, occasionally just strangers will stumble across their blog and they don't often leave comments, but um, I think it's just really useful for students to have that public writing aspect. (Faculty D)

In the Digital Studies course, Faculty D reported that he was attracted to the features of blogs that can extend the discussion beyond the classroom, increase digital

communication, support writing for an audience, and support in-depth lengthy discussions. Indeed, the course theme matched the use of the blogs, but the faculty reported using blogs because of their affordances since 2006 for several other courses. Hence, the selection of the social media technologies becomes intuitive, sometimes because the faculty is familiar with the affordances of the technology. Similarly, in the Leading Change (LC) course, Faculty C selected Twitter because of its conciseness in conveying a message, “micro-reflection,” and its simplicity. Although the activity was already designed as mentioned in the previous paragraph, the affordances of the social media were attractive to the faculty:

> I really was looking for something that they, um, that everybody could use that, um, was simple ... I, I like ... I like the idea of micro-reflection, so I like the word limit. Some people, uh, you know, there's a way that you can have, um, an, a widget or something that gives you expand ... and you can write more on Twitter if you've seen that, some of the students figured this out, and I said, "No, you cannot use Twitter expansion" I can't remember what it's called, because the goal is 140 characters.

The same faculty selected wikis to replace the LMS and to introduce students to a user-friendly free platform they could use to organize their files in the workplace after they graduate:

> The Wikis, I think, like I said I've been dissatisfied with Blackboard for a long time... so I really was looking for a better way to structure the class and it

> provides support for groups where I could, it was not, um, not surveillance but I can check in… on their progress, or lack of progress. It's like almost accountability tool in some way, so probably I'd say, when the Wikis came along ... then I just, I switched the class to be supported by the Wikis. (Initial Interview)

In the IBIS course, Faculty E reported that he has been using Twitter for five years because it is a casual tool to promote class participation, announcements, and asking and responding to questions. In this case, the faculty perceived Twitter as a cool tool that could meet his purpose of giving students opportunities for virtual participation in large lecture courses:

> The first semester I taught, I started using Twitter… the reason, I guess, why Twitter, if you ask? I guess, I just want – I think Twitter would be more casual, you know… one hundred forty characters.

Taking advantage of the affordances of social media. Two of the faculty members reported that they would like to integrate more features of the social media tool that they are using. Faculty C explained that she would like to use more features of Twitter that support channeling, aggregating feeds and "thematizing." She also explained that she would like to promote more dialogue in her SMLAs by using the commenting features in both Twitter and wikis:

> What I haven't figured out how to use is the aggregation function in Twitter, where you can sort of like, make feeds, or whatever, of certain topic. Not just the searching with hash tags, but channels. That's what they're called, right? Twitter

> channels? I've had some thoughts of that, to be something, like, they could have to start their own channel on this certain type of leadership, or on the topics at hand. So I think there's probably more I could do with aggregating; thematizing is the word, maybe, on certain kinds of things.

Similarly, Faculty D explained that he would like to integrate more affordances of blogging tools that allow students to share resources and statuses briefly.

> I think, in the future, I want to experiment more with, different types of posts ...Like, I have the different roles, the story as responders, but, it, you know, increase the different WordPress themes, if I'm using WordPress ... have different templates for individual posts. So, it can be more like a Tumblr post, where you just add a link, or an image post ... Or just like a short status update post. So, I'm curious about playing more with the different templates... That the WordPress themes have, and seeing if that, kind of, encourages certain types of thinking or not. (Faculty D)

Including media sharing (website, video, audio) in the SMLA. Three out of five faculty reported the significance of including resource sharing in the design of the SMLAs. For instance, Faculty A explained that students were asked to search for media resources to support the development of the Participatory Action Video activity. She also encouraged students to use social media curation tools (such as Storify) as research tools to gather data from different sources of media:

You know, maybe SoundCloud for audio work, YouTube or Vimeo for, for video work. But that the students would actually be using the social media tools as research tools.

Faculty D also explained that students were asked to include a media sources in their blog contributions and relate them to the course readings or discussions. He thought that this design feature created a more creative and relatable experience:

And, this time, I told them that they had to include a photograph or some sort of, maybe a YouTube video or something. And that it had to be, like, actually useful. It couldn't have been something they put in there just to have, an image. And, I think that forced the students to be a little bit more creative, and dig a little bit deeper, to have some sort of, actual object that they were talking about in addition to the readings.

Finally, Faculty E explained that the Twitter Online Discussion in his IBIS course was designed so that students share resources related to the course content. He also explains that it was a beneficial activity to the students who tweeted and shared resources related to the course:

I mean I'm pretty sure it's going to be a learning process to individual students who tweet their news articles.

…One of the reason I am encouraging them to share the current news is to make them read the current news. One thing that I am saying to the class in the

beginning is that I don't want, I tell them this: I don't want you to skip the current news.

Integrating tools or social media affordances that support dialogue. Faculty participants repeatedly expressed the lack of dialogue in the design of their SMLAs. Except for minor situations in which students communicated in microblogs, faculty reported that students rarely engaged in dialogue. For instance, in the Twitter PTE Project students communicated directly with each other in some instances.

Student A posted:

"Take calculated risks. That is quite different from being rash" started a 30 day challenge today, definitely a calculated risk #nclc435

Student B responded:

@nclc435[XXX] day challenge for the win! #nclc435 #optimism

Communication took place, to a larger extent, between faculty and students as presented in figure 12.

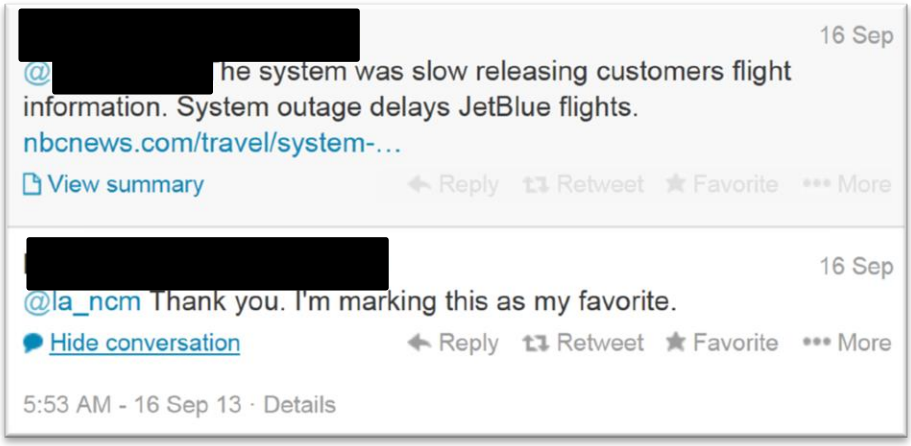


Figure 12. Communication between students and faculty (mainly by faculty)

Both Faculty D and Faculty C explained that the use of commenting features in wikis and blogs would improve the interaction between students, and that is a feature they are both considering when they revise the activity. Faculty D and Faculty B1 stated that they will consider integrating Twitter to promote student dialogue:

> I do think I'll use Twitter in a future semester. And, and like, if one of my goals is creating more of a classroom dialogue that expands beyond class, I think Twitter can be a good use of that. (Faculty D)

> So they're required to do all three, like, just like over the quest of these weeks so I want you to have, I me-, about equivalent amount of posting resources ...responding to peers and then posting your own reflections. (Faculty C)

Making the SMLA mandatory and not optional. Faculty A and Faculty E, who incorporated optional SMLAs, reported that students did not pick activities that were optional and social media based. Instead, they wanted to stick with traditional assignments. Faculty A gave students the option to choose between traditional and SMLAs, and thought that students took the safer route by picking traditional assignments to guarantee their grades:

> But the next time I teach, I'm going to, um, make it compulsory for students to do

> at least one, what I call public scholarship, ... which would be editing Wikipedia, a Twitter assignment, whatever. So that everybody had to do one of those, and, So it would be required. Because, you know, I think a lot of people don't do it just because they've never done it before, and they're frightened they're not going to do it right, and they're not going to get a good grade. Whereas if it's a required assignment, then people will, you know, everybody will have to do it.

Faculty E reported that the Online Twitter Participation SMLA was integrated for shy students who prefer to interact online, and that is why he kept it optional:

> And we're discussing like, fifteen or twenty minutes, but there are a lot of you know, they have a lot of opinions, but like I said, many of them do not have enough courage to speak up. So I tell them, "Come to Twitter and if you don't have opportunity, didn't have opportunity to speak up, you can use Twitter...

However, he noticed that students participated less starting mid-semester because the activity was optional. In order to promote effectiveness of learning activity, he reported that he would change the optional participation to mandatory, and students would get half of their participation grade from in-class participation and the other half from Twitter participation:

> Participation maybe is 5% that includes most offline and in-class twitter participation. One possibility that I can do is to split them, maybe 5% in class participation and 5% online participation

Research Question 3: What are faculty perceptions regarding the effectiveness of social media as educational tools?

In the initial and the follow-up interviews, faculty were asked to share their perceptions about the value that social media brings to their classrooms and its impact on student learning. An analysis of their responses resulted in five themes that highlight the role of SMLAs as effective educational tools: promoting visibility of student work, helping students develop technology skills, blending the digital world with the physical world, and fostering purposefulness of social media use. The analysis of the data obtained from the faculty responses resulted in five themes:

a. Increase visibility of student work and improve quality,
b. Help students develop technology skills,
c. Have the potential to extend in-class discussion beyond the classroom,
d. Purposeful instructional use of social media, and
e. Faculty participants perceive SMLAs as effective educational activities.

Increase visibility of student work = quality work. The six faculty members who were interviewed explained that social media makes students' work visible to their peers and to the public, and this results in student vulnerability. Hence, students tend to spend more time on their public assignments, which boosts their work quality.

> Because other people were seeing their writing, they wanted more time to edit, and ... they wanted to focus more on what their writing looked like, because it wasn't just their teacher looking. (Faculty B1)

Faculty also reported that the visibility of the students' work makes it more purposeful, as if they are addressing it to an audience. For instance, in the Participatory Action Video where students had to make a video and share it on YouTube, Faculty A clarified that it was purposeful. As for language learning, Faculty B explained that the visibility in social media pushed students to conduct several edits before publishing the final blog post, resulting in students developing their language skills.

> Because they, actually, through the, the whole semester, they were not, they didn't just make the participatory action video, but going through the process of making it, they learned what's the value of participatory action video. How might it be used for communities. (Faculty A)

> The feedback, the visibility of their work, and the idea that everything they're producing is a marketable product that... represents them, that it's a portfolio, there's a level of interest and motivation that's inherent in that, that it is something they're sharing socially. I don't think the same level of investment would have been there. And I think that that level of investment affects the language outcomes. (Faculty B1)

Several faculty members stated that the visibility of social media promoted peer learning.

> And then I also think they learn that their peers have lots of knowledge and lots to offer. So there's something about when you're either going something scary like that or vulnerable to have a support group. And then they have that team that's sort of saying, "Hey I found this great article," and that's trigger something in

someone else, and to watch their own influence… (Faculty C)

Although as discussed earlier students were not engaging in online discussions, they could still read each other's posts and learn from each other.

Help students develop technology skills. In addition to content learning, faculty reported that social media use in the classroom supported students in developing technology skills and even in becoming lifelong users of new social media tools. By helping students break the ice with new technologies, faculty explained that students could use social media tools beyond the course requirements. One faculty participant added that students were engaging in procedural knowledge of the technology when they were learning to use it. Two other faculty participants explained that students will not use a Learning Management System when they get a job. Instead, they will be using social media on the job, which is one reason why developing social media skill is relevant.

> Again, I think I told you this, but my big rationale is, I don't use blackboard, because when will you ever use blackboard in the real world? Never. Right? Blackboard is a private platform. And you will use social media and Twitter, and you will use these things in life. And these are tools you will have, forever. Well, until it changes; but you'll have ... The tools that will work in the workplace. (Faculty C)

Have the potential to extend in-class discussion beyond the classroom. Three faculty participants suggested that social media enriches the physical classroom setting. Resources and posts that students share on social media are often brought up in classroom

discussions as a warm-up activity or to supplement class discussions. In the Digital Studies course blog, students' posts served as an opening for every class discussion since students had to post their contributions about readings before the class session. Furthermore, in the Twitter online participation assignment, the faculty reported that students' posts were related to topics discussed in class that created a connection between the physical and the digital world of learning.

> And Twitter, again, no, I mean, the number of students this year in particular, who said, "So we kind of knew each other, and we did some ice breakers in class, but we didn't really know each other, until we interacted on Twitter." And it shocked the heck out of me, because we're in class three hours every Monday. […] The fact that they could listen to you bear your soul, and not feel like they knew you until they tweeted with you, blew my mind. […] There was, after that, that was why people wanted it the whole semester. After we did that, "Then, I just felt like we were so much more of a cohesive class." And they felt, for whatever happened with them, sharing these courses and ideas, and commenting each other, I think they could show like, this person, it's the similar, like, my friend or like, "This person supports me, and here's the evidence." You know? Where in class, they might not feel that. So it made the relationship very visible also, in a way that wouldn't been there before. (Faculty C)

Purposeful instructional use of social media. Three faculty participants stated that the use of social media in the classroom is associated with tools that students use

daily for fun and entertainment. Hence, taking advantage of the students' prior use of these tools and transforming them into purposeful uses was of value to student learning:

> Actually, part of the value of the social, of, of using social media, is it does help to push at least some students into the unknown, and into experimenting, and really seeing the value of what they use every day. (Faculty A- Initial Interview)
>
> I mean, really, for me, the overarching, the really overarching purpose of this learning community is help, to help our students understand that when they carry a cellphone around in their pocket, it's not an entertainment platform. They have the power to act for good in the world through that. (Faculty A Follow-up Interview)

Faculty E reported that social media helps his students open up to the world and acknowledge the great achievements that are happening outside the United States.

In addition to the common themes described, individual faculty also reported unique features of social media in promoting authentic learning, conversation, mindfulness of course-related topics, supporting different learning styles, encouraging creativity, and building a sense of community. Therefore, social media use in the classroom has the potential of exposing students to alternative, innovative ways of communication and learning.

SMLAs are effective educational activities as perceived by faculty participants. In the follow-up interview, faculty were asked to rate the effectiveness of their SMLAs on a scale of 10 – 1 being totally ineffective and 10 being extremely

effective. Findings from faculty ratings of SMLAs related to their courses are presented in Table 16.

Table 16

Faculty Ratings of the Effectiveness of SMLAs in Promoting Their Student Learning

Social Media Activities	**Faculty Ratings of the Effectiveness of SMLAs**
Twitter: Personal Transformation Experiment (PTE)	8
Twitter: Online course participation and sharing resources	5.5
Digital activism Twitter projects	8
Language Blog	10
Digital Studies Course Blog	8
Collaborative Note-taking	9
Podcasting	10
Creating Infographics	10
Participatory action video	8
Wikipedia	8

Faculty based their ratings on their observations of the student posts and individual student feedback as reported by Faculty A, C, and D:

> Even yesterday, they still talked all semester about how Twitter was the transition moment for the class, and they felt like they took notes differently online, than they did in the classroom, and that they got energized by seeing their peers work

on similar issues. And so I think, especially this year with Twitter, really work for helping them promote mindfulness, sharing resources around the topic, and building community. (Faculty C talking about Twitter Personal Transformation Experiment SMLA)

Everybody can now edit Wikipedia, and feels comfortable doing so. So, again, I would see, see that as successful. Not so successful in getting students to voluntarily choose to edit Wikipedia. (Faculty A talking about Wikipedia SMLA)

I would probably rate it an 8. I think… I had done something differently this time, which was I had never before encouraged them to use any kind of media ... and, this time, I told them that they had to include a photograph or some sort of, maybe a YouTube video or something.

And that it had to be, like, actually useful. It couldn't have been something they put in there just to have an image. And, I, I think that forced the students to be a little bit, uh, more creative, and, and dig a little bit deeper, to have some sort of actual object that they were talking about in addition to the readings. (Faculty D talking about the Digital Studies course blog)

Most of the activities in Table 16 were rated as effective except for Twitter online participation, which the faculty participant believed is partially effective. He thought that it was effective only for students who really participated and skimmed the articles before posting them. At one point in the interview, the faculty reported that he does not think

that students were serious about the activity, and did not read the tweets because it was an optional activity and counted as only 5% of the students' total grade.

Additional Findings

Additional discussions not related to the research questions occurred during the interviews. Thus, a common theme of challenges of using social media as educational tools emerged. Faculty reported several challenges that were specific to their courses or experience using social media in the classes. However, one common challenge was to get students comfortable with the idea of social media as an educational tool, rather than something used strictly for entertainment:

> I mean, really, for me, the overarching, the really overarching purpose of this learning community is help, to help our students understand that when they carry a cellphone around in their pocket, it's not an entertainment platform. They have the power to act for good in the world through that. (Faculty A)

Faculty attributed this challenge to students' lack of experience with certain social media such as Twitter, YouTube or Wikipedia, which made them resistant to try something new that could impact their grades. One faculty clarified that he hesitates to use other social media in the classroom because his students might be resistant to adopting it:

> And, and like, if one of my goals is creating more of a classroom dialogue that expands beyond class, I think Twitter can be a good use of that. A good way to achieve that. And I didn't use it this semester because I wasn't sure, um, how

many of my students would be interested in it, and how many would, you know, would have already been using Twitter. (Faculty D)

There were other challenges that faculty reported. Some were related to the degree of extra work that faculty has to take on when using social media in courses. One faculty reported that he could not keep up with the number of blog posts and commenting on them. He also said that he missed "some learning opportunities" for the students because he could not read all the posts before class to mention them in the class discussions:

> Well, and the challenge for me is always just keeping up on the blogs, and to comment on them. And there'll be times when things are just too hectic, so I don't have a chance to read them before class, And then I go back after class and I look at them, and I realize that they were talking about stuff of the blog that I should have included in the class discussion; they raised some good points. So, so I felt like, for me, in some ways, there were, there were some learning opportunities I missed. (Faculty D)

Other faculty participants also reported that it was hard to comment on students' tweets all the time and that they had to set daily time aside for tweeting. Along the same lines, Faculty E explained that students were tweeting less as the semester progressed, and it was a challenge for him to keep them motivated:

> You can like count the number of tweets. The number of tweets in many sense are tweeting online in the beginning of the semester, but it's kind of running

down, you know, yeah. So, maybe what I need to maybe encourage them more to participate in the twitter in the middle of the semester... (Faculty E)

Faculty D revealed that blogging did not promote dialogue in his course and in the future, he is considering using the comment feature of blogs so that students can interact with each other. He also mentioned that he is considering the use of Twitter in the future to support student interaction, as well as including a plugin in the blog platform so that students can share resources and statuses.

> I would like to put a little bit more responsibility on the students… To comment on each other's posts and to ... and instead of me bringing them in class to mention them, I, I would like the students to, kind of refer to each other's posts in class. (Faculty D)

Another professor who introduced three types of tweeters (Reflective, Dialogic, and Resource Sharing) in the beginning of the semester, reported at the end of the semester that only a few students engaged in discussions through the PTE activity, noting that she would like to emphasize these types of dialogic tweets in the future:

> I definitely plan to live in more of the dialogic part, like helping them think about interacting with each other. (Faculty C)

Summary of the Findings

A discussion of the findings is provided in Chapter 5. This chapter presented findings related to the research questions and the overarching themes that emerged from

common patterns identified in the analyses of the faculty interviews, SMLA documents, and students' posts in SMLAs. The themes revolved around the design of SMLAs, the cognitive processes and types of knowledge, and the perceptions of faculty about the effectiveness of social media as educational tools. The findings also included themes related to the challenges that experienced faculty face when using social media as educational tools.

CHAPTER 5. DISCUSSION AND CONCLUSION

Summary of the Study

This study explored how experienced faculty are using social media to support student learning. More specifically it analyzed the types of social media learning activities (SMLAs), their design, the cognitive processes that they support, and the types of knowledge that students engage in when completing SMLAs. The focus was on the analysis of the interaction between cognition and social media affordances, and faculty perceptions of social media as educational tools. A multiple case-study design was implemented and data was gathered from five different cases of six faculty using social media in their courses. The unit of analysis was represented by case, which consisted of the faculty participant and the course(s) he/she was teaching using social media. Data collected from faculty initial and follow-up interviews, analysis and observations of SMLAs, revealed that social media has the potential to support student learning and promote different levels of cognitive processes and types of knowledge. Results also revealed that experienced faculty select social media tools based on their technology affordances or alignment with their discipline, and that they design a SMLA or modify an existing traditional course activity to fit these selection criteria. Furthermore, the results of this study suggested that experienced faculty who use social media, specifically those that use wikis and blogs, use them as Learning Management Systems. Finally, the social

factor of social media was not evident in the design of the SMLAs, and faculty reported the need to promote more dialogue in future SMLA designs.

Discussion of Findings

The major findings and overarching themes presented in Table 11 in Chapter 4 are discussed below.

Social Media as Learning Management Systems

Analysis and observations of SMLAs revealed that four out of the five cases in this study used mostly wikis and blogs as social media in their courses, a finding that concurs with Moran, Seaman, and Tinti-Kane (2012), who suggested that wikis and blogs are faculty's most adopted social media tools for teaching. Furthermore, the findings revealed that social media is used to replace Learning Management Systems (LMS) and share course content or communicate with students. More specifically, in courses where blogs and wikis were used, the faculty did not use the institution's LMS to share content and communicate with students. Rather, wikis and blogs were used as an integrative platform to share content with students, post assignment descriptions and allow students to share their work. In previous studies, Meishar-Tal, Kurtz, and Pieterse (2013) and Salavuo (2008) reported the advantages of using social media as LMS in promoting collaboration and active learning over traditional institutional LMSs. However, this study revealed that collaboration was minimal or absent in the analysis of the SMLAs even in SMLAs that required collaboration such as the Collaborative Note-Taking activity.

Furthermore, this study suggested that the public nature of blogs gives them an advantage over LMSs, which are private in nature. The Digital Studies course blog and the Language Blog SMLAs were public, which made students' work visible beyond their peers. This finding concurred with previous studies that revealed blogs' usage as LMSs in some cases, for students to access course materials and to comment on each other's blogs, and in other cases, they are used as reflective journals or personal writing sites (Churchill, 2009; Farwell & Kruger-Ross, 2013; Gedera, 2011; Yang & Chang, 2012).

This study indicated that wikis resembled LMSs in their private features because users need access to participate in a wiki. However, this study did not confer with other studies that reported that wikis are primarily used as collaboration tools and support peer reviewing and editing (Donne & Lin, 2013; Franklin & Thankachan, 2011; Menkhoff & Bengtsson, 2012; Ozkoz & Elola, 2011; Park et al., 2010). The wikis in the Leadership Theory and Practice course and in the Digital Futures: Digital Activism course resembled LMS in their private access, but little evidence of collaboration was perceived. Hence, this study revealed that blogs and wikis were used for sharing course content rather than collaborative and interactive platforms.

Twitter as a Popular Course Tool

Although Moran et al. (2012) revealed that faulty use Twitter the least in their courses, Twitter was used by three faculty participants in three out of five cases in this study. The other three faculty participants reported that they would consider using

Twitter in the future. More specifically, this study revealed that faculty like to use Twitter because it promotes dialogue and provides students with more opportunities to participate in class discussions. Twitter assignments in this study were mainly a micro-reflection activity and course participation tweets about course topics. A more informal activity was in-class participation using Twitter in the Digital Futures: Digital Activism course. The findings in this study concurred with previous studies that revealed Twitter as a reflection tool (Domizi, 2013; Junco, Heibergert & Lokert, 2011) and a platform to post tweets about course related topics (Fox & Varadarajan, 2011; Lin, Hoffman, & Borengasser, 2013). However, there was little evidence of communication using Twitter in the observed SMLAs, a finding that contradicted previous research that claimed Twitter is a tool that supports communication with the professor and classmates (Fox & Varadarajan, 2011; Junco, et al., 2011).

The Absence of Dialogue

As described in Chapter 1, one of social media's roles is to promote social networking and connections in addition to shareable user-generated content. Hence, social media promotes dialogue among users in an effort to foster collective intelligence. The examined SMLAs in this study did not have any instructions for conversational or interaction tasks among students. This was evidenced in the description of the SMLAs and in the deactivation of the comment feature in the blogging activities, the lack of comments in wikis, and sparse commenting or re-tweeting between students on Twitter.

As a result, the communication took place mainly between faculty and students. A few times, students communicated with each other, and even less, communicated with members of the public. Even in collaborative activities such as the Collaborative Note-Taking activity, there was no evidence of communication between students. The examples presented above show that the design of the SMLAs were mainly used at the level of "private information management," and "basic interaction or sharing," while interaction was limited to faculty and students (Dabbagh & Reo, 2011a). This finding contradicts previous studies that examined the impact of social media on student learning, and reported the effectiveness of using social media interactively through commenting features to promote student interaction and familiarity with each other, as well as promote learner motivation and mass intellectuality (Churchill, 2009; Domizi, 2013; Franklin & Thankachan, 2013; Rambe, 2012; Yang and Chang, 2012).

Strategies for Designing SMLAs

This study did not reveal a formal approach or strategy for designing SMLAs. Rather, experienced faculty approached this task differently based on their familiarity with social media technology, the popularity of the tool in their discipline, and affordances of the technology. Faculty also suggested that SMLAs should be mandatory because students should learn to experiment with technology. This finding resonated with Lin, Hoffman and Borengasse (2013), who explained that Twitter activities should be structured and mandatory so that students participate in them.

According to Bower (2008), the design of the learning activity should come first, followed by the selection of the social media that matches the learning affordances of the activity. However, in a later article, Bower et al. (2010) explained that the design of the learning activity and the selection of social media are interdependent. When the participant faculty in this study designed the SMLAs, some were more intuitive in how they selected the social media technology because they had been using it for a while, while others designed the activity and selected the social media whose technology affordances supported the learning goals of the learning activity. On the other hand, others selected the social media technologies because they were popular and they could experiment with them and add an innovative layer to their course delivery. Therefore, experienced faculty strategies for designing SMLAs concurs with Bower et al. (2010), who emphasized the interdependence between social media tool and the design of learning activities. Integrating different media sources within a SMLA was also another design feature that faculty recommended to help students gather information from different sources.

As suggested in Table 14-15, ratings of the SMLAs by researcher and faculty revealed that four out of six faculty participants reported a limited number of cognitive processes or types of knowledge in the analysis of their SMLAs, while the researcher identified more or different cognitive processes in the SMLAs and the students' posts. The findings revealed that while faculty were not aware of Bloom's Taxonomy or did not

design SMLA with cognitive processes and types of knowledge in mind, the researcher's analysis showed that SMLAs promoted different cognitive processes and different types of knowledge. This finding suggests that faculty have little pedagogical training. In a previous study, Keengwe, Kidd, and Kyei-Blankson (2009) and Hughes and Zulkifli (2012) explained that faculty need organizational support and technology training in order to use technology in their teaching.

Evidence of Several Cognitive Processes and Types of Knowledge in SMLAs

As presented in Chapter 2 (Table 3), social media tools have different affordances that support different modes of representation including text, audio, images, linking, tagging, and commenting. As also mentioned in that same chapter, no empirical research has been conducted to link social media with cognitive processes or types of knowledge, except for the conceptual work conducted by Churches (2009), Bower et al. (2010), Bosman and Zagenczyk (2011), and Lightle (2011). While Bower et al. and Churches focus on the social media tools and the levels of cognitive processes and knowledge that each could promote, the analyzed SMLAs (Table 14 and Table 15) provided an in-depth analysis of the cognitive processes and types of knowledge that students engaged in while completing the SMLAs. Findings in Tables 14 and 15 suggested that wiki SMLAs can promote all levels of cognitive processes, and can support Factual, Conceptual, and Metacognitive knowledge. Blog SMLAs can also foster all levels of cognitive processes and can support all types of knowledge. Microblog SMLAs can promote Remembering,

Understanding, and Analyzing, and foster Factual, Conceptual, and Metacognitive Knowledge. On the other hand, Podcast SMLAs can support Creating, Applying, and Remembering, and promote all types of knowledge. Finally, media editing and sharing SMLAs can support Creating, Understanding, and Remembering, and promote Factual, Conceptual, and Metacognitive Knowledge.

Hence, the analyzed SMLAs in this study suggested that all social media tools could promote more than one type of knowledge or level of cognitive processes depending on the design of the SMLA and how students use the social media technology, a finding that contradicts Bower et al. (2010), Bosman and Zagenczyk (2011), and Lightle (2011). A sample of students' tweets from the Twitter Personal Transformation SMLA is presented below to reveal how each of the students completed the activity by engaging in different levels of cognitive processes and types of knowledge.

Remembering Factual — Decided to pick up some guitar last night to have a creative outlet for my singing #creativity #**nclc435** (Student X)

Analyzing Conceptual — http://www.ted.com/talks/martin_seligman_Positive Psychology is an interesting topic. The goal is to reach the "Meaningful Life". #**nclc435** #optimism (Student Y)

Evaluating Meta-cognitive — When you push yourself out of your comfort zone that is when you may make mistakes but it's the best way 2 learn Fall&getup I did!

#nclc435 (Student Z)

The findings pertaining to cognitive affordances and types of knowledge of SMLAs are attributed partially to the affordances of social media and partially to the design of the SMLAs. These findings reinforced Kozma's (1994) principles that technology has the potential to impact or influence student learning. More specifically, these findings indicated that the levels of cognitive processes and the knowledge dimensions (or types) students achieved when completing a SMLA are dependent upon the design of the SMLAs while taking advantage of the technology affordances of social media.

This study indicated social media affordances that could promote learning and drew a relationship between technology and learning, unlike other studies that only emphasized the positive impact that social media brings to the classroom and to learning in particular(Churchill, 2009; Domizi, 2013; Fox & Varadarajan, 2011; Hung & Yuen, 2010; Lichter, 2012; Menkhoff & Bengtsson, 2012; Rambe, 2012; Yang & Chang, 2012).

Observations and analyses of SMLAs revealed that there are design features in SMLAs that promote certain cognitive processes in the presence or absence of social media. For instance, when students were asked to summarize a chapter in the Collaborative Note-Taking activity, Understanding could have been achieved even in the absence of wikis. Similarly, in the Language Blog, students could have achieved Remembering and Understanding without having to post in a blog. However, this study revealed that social media affordances provided more opportunities for students to create

connections in learning and engage in metacognition. In cases where students had to search for external media sources to include them in their tweets, they were searching for and locating information; both of which are actions that support Remembering. The linking and the tagging features in social media have the potential to support students' conceptual knowledge through the interrelationships that are created with these technology affordances. Linking and tagging also promote Understanding and Analyzing as described by Churches (2009). These findings concur with previous research on the role of technology in promoting higher order thinking skills. Particularly, Sethy (2012) argued that using technology in learning activities promoted higher order thinking and problem solving skills. Sethy explained that browsing for resources, self-evaluation of assignments, interpreting facts or events in different perspectives, and re-organizing thoughts using technologies, support the students' learning of the content as well.

Furthermore, the publishing affordances of social media, whether publically accessible or only for peers, make room for the learner to rethink his ideas and polish them before posting online, promoting metacognitive knowledge and Evaluating. Faculty reported that the visibility of social media that engaged students in several revisions before publishing their work engaged them in metacognition. This finding concurred with Norris and Gimber (2013), who explained that social media technologies can support students' critical thinking and metacognition when used under the guidance of an educator. According to Bloom's taxonomy, reviewing and critiquing work is evidence of students' engagement in evaluation, which might not be similarly emphasized in

traditional assignments. By creating their workspaces in social media, students were also engaging in procedural knowledge as reported by the faculty participants and the observed SMLAs. Students developed technology skills as they created their products in SMLAs.

Overarching Themes From Experienced Faculty Perceptions About Social Media

Faculty perceptions revealed that social media serve educational purposes and could support student learning, a finding that concurs with Cao, Ajjan, and Hong (2013) who reported perceptions of faculty about social media as supportive of student learning outcomes. First of all, faculty participants have been using social media for at least five semesters, and some of them have been using the same SMLA repeatedly, which suggests social media use is effective. Second, all faculty participants rated the SMLAs as effective and promoted their student learning. Furthermore, faculty explained how social media produces quality student work because students are writing to an audience and making their work visible. Faculty also believed that the use of SMLA supports more than student learning; it has the potential to introduce students to technologies that they can use outside the classroom, and to tools that they can use purposefully for social improvements. Finally, faculty reported that social media connects students inside and outside the classroom making learning more authentic and part of daily student activities.

The integration of SMLAs in courses is accompanied by challenges as indicated in this study. Faculty reported the issue of finding time to manage coursework with

SMLA administration and responding to students. Faculty also had a challenge getting students to differentiate between the social media as entertainment tools and as educational tools. These findings added to research on social media challenges in education. Particularly, Moran, Seaman and Tinti-Kane (2012) reported that faculty are concerned about privacy in social media educational use, integrity of students' submissions, grading and assessment, inability to measure effectiveness, lack of integration with LMS, and lack of institutional support. Rambe (2012) also suggested that some social media posts in an educational context might not have academic quality.

Implications

Findings from this study implied the following:

- SMLAs can promote learning as perceived by faculty participants in this study.
- Wikis and blogs may replace Learning Management Systems as perceived by faculty in this study.
- Social media may promote interaction with well-structured activities that take into consideration the social affordances of the tools.
- Mandatory SMLAs may ensure student engagement.
- Designing SMLAs is a process of reciprocity between the selection of social media affordances and the fit of the tools.
- There is a perceived disconnect between faculty intended and observed cognitive processes and types of knowledge of SMLAs.

- Faculty should receive pedagogical training to design more effective SMLAs.

Findings from this study implied social media are viable tools in education, and designing effective SMLAs promotes student learning. However, faculty do not have a formal strategy to design SMLAs. Faculty are not taking advantage of the "social" affordances in social media when designing their SMLAs. Hence, faculty should take into consideration certain design strategies when designing their SMLAs. Faculty should consider using commenting features in social media to promote dialogue and engage students in a natural socially constructed environment as suggested by this and previous studies (Churchill, 2009; Domizi, 2013; Franklin & Thankachan, 2013; Rambe, 2012; Yang and Chang, 2012). Interaction can be supported by commenting features or by integrating other social media (such as Twitter) to promote discussion. Experienced faculty also reported that SMLAs should be mandatory and structured in order to be effective. Hence, if faculty wish to promote engagement in their courses and boost their student learning through social media, SMLAs should be mandatory to all students. Furthermore, this study revealed that integrating multiple resources into the design of SMLA engages students in richer learning. Hence, faculty should consider integrating instructions for including different media sources in the design of their SMLAs in order to create connections between learning and other resources. The linking and tagging features in social media have the potential to support higher levels of cognition and knowledge.

This study also implied that wikis and blogs can replace LMSs when faculty take advantage of commenting features to promote interaction. Moreover, this study suggested that different social media technologies could promote several levels of cognitive processes and types of knowledge depending on the design of the SMLA. The study suggested that social media have several affordances that could promote different cognitive processes and faculty should be aware of these affordances in order to take advantage of them and boost their student learning. This study implied that the design of social media activities could start with the selection of the social media tool, depending on the content of the course or the social media affordances, followed by the design of the SMLA or vice versa. This study also revealed that cognitive processes and types of knowledge observed in students' posts in SMLAs at some instances did not match the faculty intended goals for the SMLAs. In order to make the best use of them pedagogically, faculty should be provided with professional development workshops to introduce them to different social media and their affordances.

Limitations

Although the study examined the use of social media in higher education within cases and across cases, because of the non-experimental design of the study, the effectiveness of social media activities was not measured. Furthermore, the study was limited to faculty perceptions and students' posts in social media. Hence, students' perceptions about social media tools was not be explored. Students' perceptions are

important because they are the end users of the tools. Due to the complexity of cognitive processes, identification of students' processes was limited in cases where students had short posts on social media. Furthermore, this study included faculty from a single institution, which might have limited the external validity and the generalizability of the study. Given the exploratory and the descriptive nature of this study, the faculty participants were limited to six. Another limitation is expressed in the duration of some of the interviews, which were not thorough enough to provide ample explanation about the topic. Some interviews lasted 17-21 minutes because the faculty did not have much to say in response to questions. Finally, this study focused on a qualitative approach to understand perceptions of faculty use of social media, as well as the researcher's content analysis of the SMLAs.

Recommendations for Future Research

This study focused on faculty perceptions and analyses of learning outcomes by identifying cognitive processes and types of knowledge in SMLAs. Future research should involve students in self-identifying cognitive processes and the types of knowledge that they engaged in as a result of completing SMLAs. Future research should also explore students' perceptions about social media in education. Existing surveys about students' perceptions are quantitative, and little in-depth analysis is provided to understand what students visualize using social media to learn. (Dahlstrom, 2012, 2013). A quantitative layer should be added as a back-up for the qualitative method, in order to

measure students' GPAs in social media supported classes as opposed to control groups. Measuring effectiveness of SMLAs and combining them with experienced faculty perceptions about social media and supported cognitive processes could promote a grounded framework for best practices. Finally, this study included five faculty participants who were asked to report on their experience using social media. A larger number of experienced faculty should be interviewed in order to establish more generalizable results about their perceptions of social media as educational tools, as well as information about the strategies they use when designing social media activities.

Conclusion

This study and previous studies suggested that social media can not only be used as educational tools, but also to promote or enhance student learning of the subject matter and the social media technologies. Hence, designing SMLAs that take into account the technology affordances of social media can engage students in higher levels of cognitive processes and knowledge. Social media engage students in Creating, Evaluating, Analyzing, Applying, Understanding, and Remembering, while making their work visible and connected to other learners. Furthermore, social media engages students in conceptual and metacognitive knowledge through the technology affordances that are absent in traditional activities. Hence, there is no question as to whether faculty should adopt social media in their courses if it does enhance student learning. Understanding the technology affordances of social media is essential when designing an SMLA. Faculty

should be trained to identify these affordances and take advantage of the affordances of social media.

APPENDIX A

Faculty Interview Protocol

Beginning of semester interview

1. What courses are you teaching this semester?
2. What social media tools are you using in the courses that you are teaching this semester?
3. Is the use of social media optional for students or is it a course requirement?
4. Could you please describe the value that social media will add to your course? To your students' learning?
5. Did your selection of the social media come first? Or of the learning activity?
6. What were the criteria that you based your social media tool selection on?
7. What type of activities are students required to complete through the social media tools?
    a. Explain a task or two that they are supposed to do
    b. Describe a learning activity that you think (or students have reported) has enhanced students' learning.

    (If the participant has shared the syllabus with me before the interview)
8. Have you used the activity and the tool in any course before now? If yes,

a. What impact do you think this activity had on your students' learning in the past?
b. What changes have you made to the existing learning activity?
c. What level of learning do you think this (these) activity(ies) promote?

9. If not, what level of learning do you think this activity will promote?
10. Do you think the same level of learning will be achieved if the activity is not implemented in social media?

End of semester interview

1. On a scale of 1-10 (1 being not efficient at all, 10 being extremely efficient), how would you rate the social media activity that you used this semester?
2. What worked well with the activity?
3. What did not work well?
4. If you were to reimplement the same learning activity in the next semester, what changes would you make?
5. How well do you think the learning activity matched the social media tool?
6. Do you think another social media tool would be a better fit for the learning activity? Why or why not?
7. Would you modify the learning activity to match the social media features?
8. What level of learning do you think the learning activity promoted?
9. Do you think the same level of learning would be achieved if the activity was not implemented in social media?

10. I have analyzed the learning activity based on the description of the activity in the syllabus, our first interview, and observations. I used Bloom's Digital Taxonomy to analyze the learning that is taking place through the activity and the social media.

Could you please take a look at the table and give me any feedback that you have about my analysis? Feel free to add any ideas that you have.

APPENDIX B

Social Media and Course Title	Social Media Learning Activities
Twitter **Leading Change (LC)** **Introduction to Business Information Systems (IBIS)** **Digital Futures: Digital Activism (DFDA)**	**Personal Transformation Experiment:** Each student had to identify one skill of effective agents of transformation and develop a personal action plan for practice and reflection to develop this skill. These included the following: optimism and resilience; creativity and Innovation; risk-taking and initiative; effective communication; mindfulness and gratitude; and relationship-building. They used Twitter as a form of micro-reflection to record their transformation progress throughout the semester, prepare a pre- and post- assessment of their experiment, and offer a final reflection. A course hashtag was created to make the tweets searchable. **Online Class Participation at Twitter** Students followed @mis301gmu at Twitter (http://twitter.com/mis301gmu) to participate in online class discussions. This was completely optional, but it was a good venue for those who miss a class or feel hesitated to speak up during class. The instructor weighed online participation as much as in-class participation. Students could do the following on Twitter. • Send thoughts and opinions on class topics and discussions • Send titles and addresses of recent technical news articles related to class topics • Only retweeted tweets were considered as participation. • All class announcements were posted as well. **Digital Activism Twitter Projects**: In these Twitter assignments, students had to research and follow their digital informants. Second, they had to explore the ideas and information to which they link to their informants. Third, they had to summarize the key content they are acquiring in 140 characters. At the end of the Twitter assignment, students had to compose a 750-1000 word reflection on what and how they learned during the assignment, and discuss the ways in which they might apply the new knowledge, of the medium and of the field of digital activism, in the future. ● Project #1: For this assignment, Students need to curate a collection of between four and six regular twitter communicators in the digital activism field. They may focus on actors in a specific area of action to which they are individually committed. They should complete at least four tweets per week ● Project #2: In this assignment, students also had to curate a collection of informants. In this case, however, they were exploring three to four blogs maintained by individuals, or organizations (like Global Voices, for example), involved in digital activism. Students had to tweet at least 4 times per week. ● Project #3 Students had to follow the digital action of a political campaign of their choice (they could follow a candidate, a party, a partisan group, a non-partisan group (such as a collaboration to register voters prior to the elections, for example, like Rock the Vote), and so on). They had to analyze the key web site(s)

	for their chosen campaign, plus blogging, Facebook and twitter, e-mail, etc.. And they should be looking out for innovation in the use (and perhaps abuse?) of digital media. They had to tweet at least four times a week, content which informs, provokes their interest, and expands their understanding of digital activism in action.
DFDA	**Twitter in-class and small group participation:** in the Digital Futures: Digital Activism course, Twitter was used as an in-class participation tool where students were asked to share findings from small group discussions.
Blogs **Food, Culture and Technology (FCT)**	**Language Blog**: Students created their individual pages on Weebly and linked them to the class blog. The students' blogs included and introduction, posts about their "Favorite Meal", and links to their other course assignments which included infographics, podcasts, video analysis, and PowerPoint presentation.
Introduction to Digital Studies (IDS)	**Digital Studies Course Blog**: Each student contributed to the weekly class blog. There were three roles on the blog, and each week a quarter of the class rotated through these roles (one group has the week off in terms of blogging). Students in one group ("Readers") posted an approximately 250-word critical response to the week's reading by Monday night at 10pm. Students in another group ("Responders") either responded to these posts or to the classroom discussion by Wednesday night at 10pm. A third role ("Historians") scoured the Internet as well as the course archive to find resources related to the current material, and share these resource on the blog by noon on Thursday.
Wiki **Leadership Theory and Practice (LTP)**	**Collaborative Note-Taking**: Being prepared to discuss each week's topic is essential to a lively learning community discussion and for understanding leadership scholarship. For this assignment, students worked in small groups to create notes on the assigned readings from the Northouse text. At the courses conclusion, each student had a comprehensive set of notes on the most central scholarly leadership theories. The notes were collected and stored online using a wiki.
	Wiki as LMS: In two out of the six courses, the Wiki (PbWorks) was used to replace the LMS. The professors used it to share the course content and to conduct group in-class activities. In one of the activities students had to work in groups to gather news about a topic from different social media sites.
Podcasts **FCT**	**Podcasting**: Students had to listen to a restaurant review on a Podcast and then record their own restaurant review on Podcast. Students had to practice and listen to their speaking several times before uploading the final Podcast.
Infographic **FCT**	**Creating Infographics**: Students watched a video to create an Infographic to represent ideas on a given topic from research about Corn products in the marketplace today. The students then shared the infographic on their blogs.
YouTube **DFDA**	**Participatory Action Video:** **Part I: Research and Identification** During the first part of the semester, self-selected small groups (of 3-4 people each) will research and identify a group with whom they will create participatory action videos…. **Part II: Exploratory Meetings** Once they have partnered with a group, they need to organize at least two exploratory meetings, where they will learn more about their group's needs, and the nuances of the story it wants to tell… **Part III: Proposal (Draft is due 7 October & final is due 16 October)** Each

	group will present a proposal for its participatory action video to the learning community on 7 October… **Part IV: Shoot & Edit their Participatory Action Video** Leave yourselves plenty of time to shoot and edit with your partner groups. You will not be able to screen video daily with your groups, as Insights into Participatory Video recommends as the ideal, but do build time into your schedule to review footage on shooting days with members of your partner group….
Wikipedia **DFDA**	**Wikipedia**: Project # 1: Students had to edit Wikipedia article on Digital Activism based on the course readings while meeting Wikipedia's requirement that editors source each new piece of information from reliable, authoritative, pre-existing content. Students had to capture and save screen shots of the content you add every time they edited the article. And they had to visit regularly to check on the integrity of their edits, the reasons others might pose for removing their edits, and other editors' additions to the article. ● Project #2: For this project, students had to edit a minimum of five Wikipedia articles related, very broadly, to the theory and practice of digital activism referenced via authoritative sources (like the readings).

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