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EXAMINING GRADUATE STUDENT
PERSPECTIVES AND USE OF WEB RESOURCES
AND TOOLS FOR ACADEMIC SUPPORT

By

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A dissertation in practice submitted in partial fulfillment of the requirements
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ABSTRACT

This mixed methods study was conducted to examine University of Central Florida (UCF) graduate student use and perceptions of usefulness of Web resources and tools that may support academic work, research, and academic goals. The frameworks of Connectivism and Personal Learning Networks (PLN) were used as a foundation to support the importance of Web resources and tools in relation to student learning, academic support, and progression.

Qualitative and quantitative data was collected from active UCF graduate students using an electronic survey, with 998 participants completing the survey. Data analysis was conducted using an ANOVA one-way test to compare program mode types and the frequency of use with Web resources and tools. Participants that reported enrollment in face-to-face programs identified a higher frequency of use for Web resources and tools than participants in online programs. File-sharing tools and telecommunications applications were reported as used most frequently among the resources and tools identified on the survey, and these were also found as Web resources and tools perceived as the most useful. The examination of qualitative data showed that Zoom and Google Docs were reported most often by the participants as beneficial for use, which is consistent with the frequency of use and perceptions of usefulness data. The qualitative data also showed that participants are using the Web resources and tools the most to support course work, but they are also using these tools and resources for collaboration, research support, and cloud support.

Further research would need to be conducted to help understand the factors that may contribute to the statistical difference from these groups. Overall, the reported data supports that the graduate student study participants were using several collaborative tools regularly

and they were also identified as useful in support of academic course work, research, and academic goals. Further research could help to provide additional understanding related to the factors behind reported usage frequency and how Web resources and tools are identified for use.

ACKNOWLEDGMENT

I have traveled many paths through my academic career and all of the roads have led me to this point, completing my Doctoral program. I am a lifelong learner and I enjoy continuing the growth of my education. This Dissertation in Practice is dedicated to all the learners out there that never give up and keep moving forward despite obstacles.

I have been successful in completing my doctoral degree and this Dissertation in Practice because of my faculty adviser and mentor, Dr. Glenda Gunter. I am forever grateful to Dr. Gunter for her encouragement, guidance, and feedback provided while completing my program and my research. This has been an excellent, educational experience that has brought me to the point of being interested in conducting further research in the future, something that I thought I would never be interested in doing.

I can't thank my Dissertation Committee Members enough for their feedback, guidance and support through this process. The guidance from Dr. Hartshorne helped me to think deeper and more critically about my research, and it helped me to move my writing forward. The feedback provided from Dr. Vitale and Dr. Futch helped me to focus and strengthen my research topic and produce a valuable research study. Without the support of my Committee Members, this research would not be complete today.

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CHAPTER ONE: INTRODUCTION

Background

Technology growth and advancements over the last 50 years have played a huge role in how our higher education system has changed and evolved. Types of technology and access expansion have been altering the landscape of learning options and solutions. Gupta and Seth (2014) discussed that technology growth and expansion has influenced higher education with the development of a “dynamic internet culture” (p. 1). Technology and the Internet has been used for countless purposes in higher education, such as supporting courses and course content, networking, collaborating, and sharing information. Gan, Menkhoff, and Smith’s (2015) research assessed that using various Web-based tools and learning approaches supported enhanced learning experiences and aided in building collaborative learning environments. Web tools and resources are being used both formally and informally in the higher education setting, with research by Chen and Bryer (2012) outlining some of the ways that instructors have integrated informal learning with social media platforms into a formal learning environment and experience.

Dowing and Wilson (2017) researched how technology affects graduate education, examining the Web resources and tools used by doctoral students. Their research found that students were using various types of Web resources and tools to support their academic work, such as online library resources, writing software, social media, collaboration tools, and file sharing. Students used Web tools most often when they perceived that it would directly impact their work and when the Web tools weren’t time consuming to learn. Echeng and Usoro (2016) found that students are more likely to use Web tools when there is a perceived ease of use and convenient access. Their research also showed that students often needed guidance to understand

how to utilize Web tools effectively and in finding where to access the tools. This is particularly important for students that are unfamiliar with certain technologies and systems, such as using tools in a LMS (Echeng & Usoro, 2016).

Dowing and Wilson (2017) found that students were more likely to use Web tools and resources that would directly help them meet their goal of degree completion. Perceived usefulness of a Web tool was a factor found in the research of Hartshorne and Ajjan (2009) regarding student attitudes toward the technology. They also described attitude as a factor influencing the student's use of Web tools, such as blogs, wikis, social networking, and social bookmarks. Echeng and Usoro (2016) also found that tools not perceived as useful were less likely to be used, and that sometimes students needed direction on using the technologies.

The use of technology in higher education is not just supportive of academics but can be a part of the learning process. Siemens' (2004) Connectivism theory described that knowledge resides within technical systems and the system users access that knowledge by using technology tools, such as using a computer for Web courses or to access the Internet for blogs and news applications. With this theory, Web tools and resources can be viewed as both an academic support and learning tool that can assist students with achieving their academic goals.

Shrivastava (2018) described through the framework of Connectivism that Web resources and tools support student learning and understanding as they construct meaning with the use of technology and the information that it provides.

Bauer (2010) described that technology, and specifically the Internet, can assist an individual to craft their own personal network of diverse, on demand resources and information which creates their own Personal Learning Network (PLN). Some of the PLN tools that Bauer's (2010) research focused on were blogs, news sites, podcasts, wikis, and Twitter. Web tools and

resources that are part of a student's PLN might be where the student would begin to retrieve information and learn about any topic related to their interests or needs. This collection of tools can have both formal and informal resources (Bauer, 2010). Students can add to their formal course work by using informal information and learning resources and tools from their PLNs (Goria et al., 2019). Resources in a student's PLN can help them to learn, understand, and apply knowledge through formal learning environments.

Statement of Problem

Student success and retention are among top considerations at higher education institutes. Research conducted by Craft et al. (2016) identified that around half of the doctoral students that begin programs in the United States do not continue in their program through graduation. Additionally, online learning programs have seen considerable growth in higher education but attrition continues to be a challenge in online courses (Boton & Gregory, 2015). To assist with combatting student retention challenges, institutions offer support through student and academic services and resources which can help students to reach their academic goals. Harkins (2016) described that, "at the university level, there should be interventions, resources, services and tools for students to access for learning, success and retention" (p.79).

There are countless Web resources and tools available to higher education students that provide resources or avenues for collaboration, research, information discovery and project support with tools like citation management. Research has shown that today's students spend a considerable ration of time using digital technology (Lai & Hong, 2015), which are utilized in many different ways. Greenhow and Lewin (2016) found that Web applications, such as social media tools, were being used by student to communicate with peers and teachers for group discussions, to manage group projects, for collaboration, and information sharing. Research

findings showed that using social media tools and applications for both formal and informal educational purposes “demonstrated some elements of self-determination (in terms of learning purpose) and self-direction (in terms of learning process)” (p. 23). There are a variety of resources and tools through social network services that allow learners to enhance their learning relative to their individual styles and academics (Mahindru, 2018). Mahindru’s 2018) research supported that “tools are helping in improving class notes, prepare better assignments, conduct discussions, encourage synergistic work, and authoring” (p. 827).

Research has documented that there are many different types of Web tools and applications that students have available to use in support of their academic work. Defining what Web tools and resources that students are using and which are considered useful will provide information and guidance for potential opportunities to increase or enhance support to students, such as workshops focusing on Web resources and tools, and expanding access to Web applications. Understanding what Web resources and tools positively support academics can help higher education leaders and faculty to bridge graduate student persistence gaps by actively encouraging the use of identified helpful Web resource and tools and potentially enhancing these resources in a positive way. Providing students with knowledge and access to resources that they can utilize to enhance their academic work and efforts can help them to achieve their education goals.

While there are many online resources and tools available to students, it would be beneficial to understand which tools, such as productivity, collaboration, and storage tools, that graduate students perceive to be the most supportive and useful. Having further knowledge of what Web applications, such as wikis, webinars, and blogs, are found in graduate student’s PLNs could provide an opportunity to enhance and grow their PLNs with meaningful Web resources and tools and increase the support that they can turn to in their academics. Bailey, Jaggars,

Jenkins, and Columbia University's (2015) research into improving student outcomes through restructuring of programs and student support determined that initiatives needed to be a broad, collaborative process that involves a wide range of perspectives. This is important to consider when collecting information to develop new student support initiatives, such as developing a graduate workshop or deciding what type of new applications to provide to students. Gathering perspectives data related to multiple Web tool and resource topics, such as frequency of use, usefulness, and how they are supportive, can help to provide a holistic understanding of use that can assist with initiative development.

This study examined student perceptions and use of Web resources and tools for academic support among the graduate student population. The research took place at the University of Central Florida (UCF). Data collected from this study will be used to develop Web tools and resources support initiatives for UCF graduate students, such as professional development workshops. UCF is described as a research university with both undergraduate and graduate programs, and it is located in the metropolitan area of Orlando (UCF, n.d.). The University of Central Florida has an enrollment of over 69,000 students, with 9,549 students making up the graduate student enrollment in the Fall 2019 term (UCF Institutional Knowledge Management, 2020). Of the graduate students enrolled for the Fall 2019 term, about 26% were in fully online programs while less than 1% of undergraduate students were in fully online programs (UCF Facts 2019-2020, n.d.).

Graduate education at UCF offers hundreds of degree and track fields. US News & World Report currently has ranked 22 UCF graduate programs among the top 25 in the country (College of Graduate Studies, 2019). UCF offers over 30 fully online graduate programs and over 30 fully online graduate certificate programs. Graduate online program options have been

growing and expanding with new programs in development. They are supported through a collaboration effort of many UCF Colleges, departments and offices such as the UCF Online team, the Center for Distributed Learning, the College of Graduate Studies and the individual program departments.

The University of Central Florida has described its commitment to providing efficient services and academic resources to students (UCF, n.d.), and the College of Graduate Studies specifically describes a commitment to implementing new technologies to enhance services. The UCF College of Graduate Studies has been actively increasing the amount of available online academic support resources, such as increasing the number and variety of online workshops in their Pathways To Success program, which supports graduate students with academic resources and professional development opportunities, and they have recently included an online graduate student orientation to their student resources. Providing quality student academic support resources and tools helps the University to retain students as it can aid in academic progression, and as online education has shown to increase student access (Goralski & Falk, 2017), online support resources can potentially increase student access to them.

It is part of the UCF College of Graduate Studies mission to continuously improve technology, resources, and services to the UCF graduate community. Understanding the Web resources and tools that are playing lead support roles for graduate students will help to provide information for evaluation and potential improvement of services and available resources. Programs such as graduate workshops can help students learn about available Web resources and how they can be utilized for effective support in academics. Research as shown that Web resources and tools can be assets to students, which can help them to be productive and confident learners.

The University of Central Florida has many online academic resources available to graduate students. Many online resources are provided to the online learner in varying academic areas such as academic writing assistance, thesis and dissertation resources, library resources, and various workshops on topics including presentation strategies and research citation management tools. Also available to UCF students are a variety of Web applications that students are able to access via their student account, such as word processing tools, spreadsheet tools, design software, and statistics applications. Funding for any university resource is always a huge consideration, so understanding what Web resources and tools are being used and perceived as useful by students can assist with understanding what resources may be worth the investment.

Statement of Purpose

This mixed methods study examined graduate student use and perceptions of Web resources and tools to identify which were reported as useful in the support of their academic work. There is a great deal of attention placed on student retention and attrition in higher education. Student persistence is influenced by many factors, and one aspect is a student's access and use of appropriate support tools and resources. Available institutional support of varying types for online students does positively impact student persistence, as well as inadequate support poses a barrier (Lee & Choi, 2011). Grillo and Leist's (2013) research revealed that the greater number of hours that a student spent in support services was directly related to a higher GPA and ultimately student retention. Their study found that academic support plays a significant role in student persistence and retention, and various Web resources and tools help to provide this important academic support.

Some academic support can help increase understanding of course material or increase participation in academic courses or groups. Neubauer et al. (2011) studied aspects of

Connectivism and PLNs related to transforming the educational environment of students enrolled in a Public Affairs program. They found that learning was potentially enhanced, and students had a greater understanding of course material and concepts when educators encouraged students to utilize Web 2.0 resources. The encouragement of Web resources use also increased student participation in professional learning communities and growth of the students' PLNs. The study also showed that an increased number of resources in the student's PLN correlated to a higher course performance (Casquero, et al., 2016). Web resources and tools can be viewed as not just available resources, but instead assistive components to student learning. Student learning and understanding can potentially be enhanced through the growth of student PLN's which could ultimately aid with student persistence and retention gaps.

This study focused on examining the use and usefulness of Web support resources and tools used by graduate students to achieve their academic goals. Casquero et al. (2016) reported the importance of the personal learning environment, which is the student's learning environment, as important in the configuration of the personal learning network. Understanding what and how Web resources and tools are being utilized the most and how they are making a positive impact for graduate students could help to initiate action from higher education leaders and faculty to grow, enhance, and encourage the use of Web resources and tool that could further assist with student learning and progression.

Through surveying UCF graduate students, quantitative and qualitative data was gathered regarding the use and usefulness of Web resources and tools. Data was analyzed to determine results and qualitative survey questions added a richer clarity to quantitative analysis. Graduate students were surveyed through open-ended questions to share their stories related to online academic resource usefulness and the way that these tools have made a difference in their

academics. Further details about how the tools were used in academically supportive ways will aid in developing a workshop for graduate students about the purposeful use of Web resources and tools. Research had shown that students were more likely to use Web resources and tools if they perceived them as useful towards their academic goals (Dowing & Wilson, 2017), so having clearly defined uses and examples for graduate students may assist with them incorporating these tools and resources into their PLNs.

Research Questions

1. What Web resources and tools are graduate students using most frequently to support their academic course work, research, and/or other academic goals?
2. What are the differences in the frequency of student usage of Web resources and tools based on enrollment in a fully online, blended or face to face programs?
3. What are the graduate student perceptions of usefulness regarding the Web resources and tools that they are using to support their academic goals?
4. How are students using the resources and tools that they perceive as useful?

Conceptual Framework

Introduction

Theoretical frameworks assist with identifying variables of a study. Frameworks also help to provide the basis of a research approach and aid with data collection and data interpretation (Imenda, 2014). The theoretical frameworks in this study are related to how graduate students are utilizing and interacting with these Web resources and tools to supplement and enhance learning.

Connectivism

A theoretical framework that would contribute to the nature of learning with facilitation of Web resources and tools for academic support would be Connectivism. Connectivist theory was developed by Siemens (2004) with the idea that knowledge resides within technical systems and that users of those systems acquire knowledge by interacting with and within the systems. Siemens created a list of nine principles designed to describe how modern learning is taking place with the use of technology and the vast amount of internet resources available. Siemens stated the nine principles as:

- Learning and knowledge rest in differences 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 continuous 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. 24)

Principle four, The Capacity to Know More is More Critical Than What Is Already Known, is relevant when looking at the use of Web resources and tools to help graduate students with their academic learning. Utecht and Keller (2019) discussed that the immense amount of

information available online aids in learning and knowledge. They described that the principle is not related to how much someone knows, but how they acquire and apply knowledge for a greater understanding. Web resources and tools would fit with this principle as they have the potential to expand student learning and understanding. They can act as an extension or supplement to course learning and become part of the learning environment for a student.

Utecht and Keller (2019) discussed that with the Web our learning environments have grown and are continually developing with new information and new tools, even how we think about learning is evolving. Connectivism embraces the use of online information sources and tools as a way to learn and enhance learning. In Connectivism, learning is not confined or contained in limited sources related to specific content, but instead the content resides in a myriad of different resources containing a vast amount of information about a topic. This helps to add support to the importance of the use of Web resources and tools as a way to enhance graduate student learning by increasing their understanding and application of learned material.

Personal Learning Networks

The concepts of Personal Learning Environments (PLE) and PLNs can intertwine to form an intricate platform for learning. PLEs can be seen in the principle of Community of Inquiry (COI) where formal learning is taking place in a closed environment (Goria, Kostantinidiss, Kilvinski, & Dogan, 2019). PLNs are associate with the Community Indicator Framework (CIF) that proposes learning in an informal more open type of community (Goria et al., 2019). In the research from Goria et al. (2019), they view the PLE as the structure for learning and the PLN's are the tools and resources that are used to develop and enhance learning.

Moreillon (2016) discussed the self-regulation of PLNs and that the individual has many electronic resources to choose from to add to their network for learning and professional

development. Discussion boards, online workshops, webinars, blogs, Twitter and Facebook Groups among other tools and resources were mentioned by Moreillon as potential pieces of a PLN. Gorla et al.'s (2019) research showed that learning can be enhanced with the development and growth of the student's PLN. When students expand their PLN with informal learning, it aids in improving and enhancing their learning experience.

Beaudrie (2016) described the digital age PLN consisting of many online tools and resources. While Beaudrie's discussions were related to professional development in the workforce, many of the PLN tools and resources would be similar to that of a higher education student. Beaudrie suggested that the organization should play an active role in helping their workforce to build their PLN so that they can be independent learners and connect to information when needed and not just when presented. Figure 1 is an example representation of what a graduate student's personal learning network might contain:

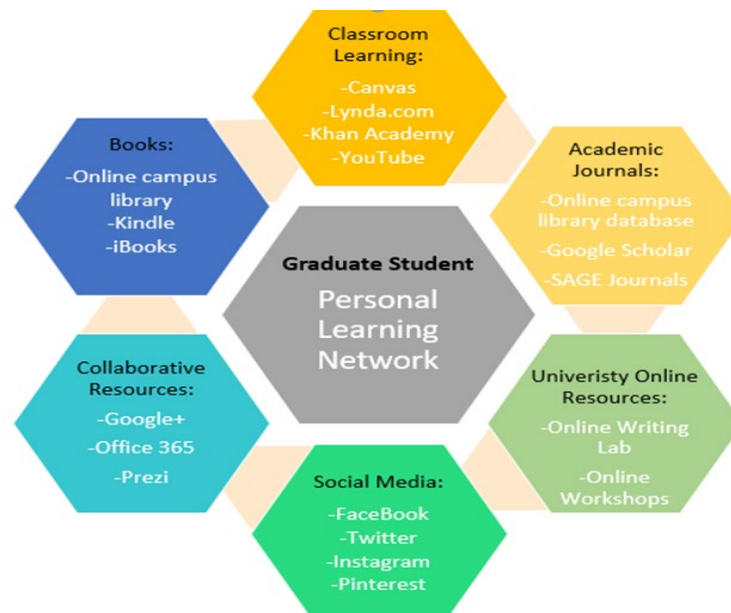


Figure 1: Example of a Graduate Student Personal Learning
 Note. Example graduate student PLN created by the researcher.

The resources depicted are only a handful of online resources and tools available to be a part of a student's PLN. Learning can take place and be enhanced beyond the classroom with these resources and tools, which is why it is important to understand how they are supporting graduate students. Actively supporting and offering access to effective Web resources and tools could enhance student learning, for example through the use of knowledge acquisition resources and collaborative tools, and ultimately the student's educational experience.

Significance of the Study

The significance of this study is to gain further understanding of the Web resources and tools that graduate students are using to support academic course work, research, and academic goals. Further understanding about graduate student use and perspectives of Web resources and tools can aid in providing meaningful professional development opportunities about supportive tools and resources and how graduates students are finding them beneficial. The study data could also help educational leaders when considering possibilities for new or expanded student access to Web applications.

There are many studies that examine student persistence and retention, many of these studies focus on course work, program satisfaction, teaching and teaching mode, and many various aspects related to the academic course work. This study will focus specifically on how Web tools and resources can aid with graduate student learning and academic support, and what tools graduate students feel are the most useful to assist with supporting their academic goals. Data collected in this study will assist with developing initiatives to help UCF graduate students build their PLNs to aid in their academics, such as creating a graduate professional development workshop focusing on Web resources and tools that can assist with academic goals.

Yang, Baldwin and Snelson (2017) stated that although there is a great deal of research related to student satisfaction with online learning, there is a lack of agreement regarding what maintains student persistence. The lack of data may make it difficult to pinpoint the elements of student persistence, but having a better understanding of the components that can contribute to student persistence is a step toward further identifying how to improve student satisfaction and potentially retention. Casquero et al.'s (2016) research supported that an increased student PLN was consistent with a higher earned grade. Student academic success could potentially help a student to persist with their academic goals. Understanding which PLN resources are supporting our graduate students in a positive manner can help educational leaders to identify which Web tools and resources they may want to encourage students to use.

Limitations

Limitations to the study may influence results. A limitation presented in this study is that the electronic survey will be distributed to the graduate student's campus email address. Not all students access their campus email address on a regular basis, so this could limit the number of students that received the survey and ultimately complete it. While the study will survey all graduate students at UCF in all graduate academic majors, it will not account for undergraduate students or graduate students at other higher education institutes. Additionally, the study survey will have a limited duration of being conducted in one academic semester.

This study took place during the COVID 19 global pandemic. Policies were implemented at UCF due to COVID 19 that required all Spring 2020 courses to move to online formats from March 2020 through the end of the semester, and all Summer 2020 courses were required to be conducted online. Programs courses that were typically face-to-face only had to move their courses to online formats due to the COVID 19 policies. This unexpected and unprecedented

adjustment to the academic structure at UCF may have had an influence on how the study participants responded in the survey.

Delimitations

This study surveyed active graduate students regardless of age, major, enrollment type, and program modality. All active graduate students were invited to share their perceptions via the survey tool. The online survey was available for completion from a variety of devices such as desktop and laptop computers, various tablets, and mobile devices. In the survey, while the focus was on a set of stated Web resources and tools, a write-in option was added to two of the quantitative questions in order to capture additional information and reduce the constraint of limited possible options.

Assumptions

This study assumes that all UCF graduate students have a campus email address and will have access to complete an electronic survey. The graduate students that will be surveyed are all considered active, so regardless of their current enrollment status they are considered to be active in a graduate program during the time of the study. A student is considered active if they have current enrollment or have had enrollment in one of the prior two terms.

Operational Definitions

Graduate Students: Graduate students are higher education students in a graduate level program. Graduate programs include Master's, Doctoral, Specialist, and Graduate Certificate programs. Graduate students may also be enrolled as non-degree seeking students, and this classification at the graduate level requires that a Bachelor's degree has been completed prior to acceptance and enrollment as a graduate non-degree seeking student.

Academic Support Resources: Academic support resources are centers, workshops, trainings, information sites and collections that offer support to students related to their academic course work and research. Typically support resources help students to gain knowledge and understanding to help them achieve their academic goals. An example of an academic support resource that students may utilize is a campus Writing Center that offers writing support to students. Support could be offered both in person and online, however this research focus is on support that is offered online.

Academic Support Tools: Academic support tools are tools can be used to assist students with their academic course work, research, or with other projects that support academic goals. This research study focuses on Web academic support tools; an examples of Web support tools may be using Endnote for reference citations or using Google Documents for academic document organization or collaboration.

Learning Management System: A Learning Management System (LMS) is a software application that can serve many functions, but it is typically used in some capacity for eLearning. It can be used for online courses, trainings, and workshops, and typically houses management tools for the course use, delivery, and assessment.

Student Persistence: Student persistence is the activity of students being actively engaged and enrolled in their academic program. Also, it may be considered the student's forward progression in their academic program or educational pursuit.

Personal Learning Networks (PLN): Personal Learning Networks are the tools and resources that are used to develop and enhance learning. These technology supported tools may include resources like communication tools, document sharing tools, video and graphics creation tools, and social media platforms.

Personal Learning Environments (PLE): Personal Learning Environments are the structures for a learning environment. An example of a PLE would be a course in an LMS. The system holds the structured learning environment for a course.

CHAPTER TWO: LITERATURE REVIEW

Introduction

Due to advancements and changes in technology, the landscape of learning has been transformed in the university setting and beyond (Eales-Reynolds et al., 2012). Higher education students are able to utilize many different types of Web resources and tools to support their academic endeavors in countless ways. This chapter examines research and theory frameworks related to technology and how it intertwines with learning and education. As previously stated, frameworks help to provide the basis of a research approach and aid with data collection and data interpretation for individuals (Imenda, 2014).

Connectivism In Higher Education

Bell (2011) described that classic learning theories like behaviorism and cognitivism that focus more on students being taught by teachers in a traditional face-to-face environment are not encompassing frameworks for our modern digital world. Connectivism theory provides a lens to view how learning and the digital world are entwining. Connectivism theory began with research by Siemens (2004), where he identified that knowledge resides within technical systems and system users acquire knowledge by interacting with and within the systems. Siemens described nine principles used to identify how modern learning is taking place with the use of technology and the Web. The nine principles listed in Chapter 1 described how the learner makes connections through technology use, and how learning can take place with and within those connections.

While Bell (2011) did not believe that the connectivism theory alone was a complete learning theory framework, he did believe that it was supportive to learning theories and encompassed the technology aspect that other theories may lack. Education leaders look for theories and reference in regard to technology use in education and the learning potentials and

impacts, and connectivism is a theory that may be able to help add to the discussions about how to move forward with educational and technology concepts. Reese (2015) did feel that connectivism was a framework to support how technology can be effectively used in the learning environment and that this theory should help mold online learning and instruction. Ultimately there is research to support that connectivism is a relevant theory to help guide how technology can support educational environments, students and instructors.

Marais (2011) stated that through the developments of technology our lives have become reorganized and there are shifts in how we learn and communicate. Learning can take place through our connections with technology, which can be a bridge to information or a communication avenue. Conradie (2014) described that connectivism theory helps to connect the new ways that we learn using new technologies and Web 2.0. Many traditional learning environments are now often blended in at least some ways, and an increased amount of student learning can take place with informal avenues through the use of technology and Web 2.0 applications (Conradie, 2014). Even in a more formal environment in a basic LMS, discussion boards can offer an informal learning channel with exchanges and information residing in the Web 2.0 communication tool (Reese, 2015).

Learning can take place through online collaborative tools that are used to create peer-learning opportunities. Content added into collaborative Web applications can provide an avenue for students to share and discuss material, as well as actively work on projects collectively. Dreamson (2017) found that design students using collaborative tools were able to use the tools successfully for annotative collaboration on projects. While Dreamson's (2017) research indicated that overall the online environment was not a sufficient replacement for the face-to-face environment, some of the learning processes were effective in the online collaborative

environment. Loewen (2016) also found that online collaborative environments produced successful learning experiences in religious study education. The online environment in Loewen's (2016) study was able to connect students from different cultures through the accessibility gained by technology, and student learning was taking place through interactions and project collaboration in the online environment. The researcher noted that some of the lessons learned were also related to learning about netiquette and using the Web tool which was not specifically related to the academic material.

Research by Aurangzeb (2018) studied blended learning environments in higher education and was partly viewed from the connectivism lens. Aurangzeb's (2018) research showed that students felt motivated by using technology even though it could be challenging. The learning opportunities in a blended learning environment through the use of technology like the LMS, information from the internet, and online communications through chats, email, and social media were seen as enjoyable by the students. This was in part due to the culture of technology use in the educational environment, which needs to be integrated into an institute's mission and supported (Aurangzeb).

Web Tools and Resources

Most people in our modern society use technology in their daily lives. Some of the commonly used Web tools and resources are social media applications, Internet search tools like Google search, and various communication, news, and entertainment Web applications. In 2019 there were over 204 billion mobile application downloads worldwide through app stores such as the Google Play Store (Hosting Facts, 2020). Web applications are moving into all aspects of our lives, including the educational environment. Connectivism helps to define how technology can play an important role in student learning, and PLN's help define how Web resources and tools

can form a unit of support to aid in and enhance student learning. These theories and concepts help to provide the connections between learning and technology, and constant growth and evolution of can be seen technologies continually evolve.

Social Media

Social media is described as various types of electronic communication that allows users to create content and “share information, ideas, personal messages, and other content” (para.1) through online communities (Merriam-Webster, n.d.). Social media tools can be used as an informal way to communicate and it can also help users to consume information of all types. Research by Tess (2013) described social media in contexts of “social networking sites, blogs, wikis, multimedia platforms, virtual game worlds, and virtual social worlds” (p. A61). Through Tess’s (2013) review of research, he found that instructors were increasingly turning to technology for enhanced instruction and encouragement of active student learning. He found that social media was working its way into some educational environments for example to enhance peer learning and journaling. Research by Awidi et al. (2019) examined a re-design of an architectural course that incorporated a Facebook group in an effort to enhance active student engagement. The results of study showed that overall students were satisfied with the course re-design to include the Facebook group and students reported feeling like a community with encouragement to learn while engaging in the group (Awidi et al., 2019).

Twitter and Instagram have been shown as information tools that can help students to learn information, particularly from a visual context (Arceneaux & Dinu, 2018). Students viewed Twitter and Instagram accounts from professional news organizations as credible and that the visual information help them learn about topics (Arceneaux & Dinu). Another social media resource that students perceived as a helpful tool and provided a deeper understanding of

material was through blogging and microblogging (Garcia et al., 2019). Blogs are a very popular social media tool and they are gaining some ground with integration into some higher education learning environments. Students reflected that they were comfortable using the blogging platform as a writing tool and that it was a familiar tool to them, although students did not find collaborative features in the blogging platform to be particularly useful to learning (Garcia et al., 2019).

Academically Focused Web Resources and Tools

There are many Web resources and tools that have specific focuses that are in line with academic uses. Tools for social bookmarking, reference management tools, and note taking applications all have direct uses for academic work and collaboration. Research by Dennen, Bagdy, and Cates (2018) studied social bookmarking in the higher education classroom; students were provided with brief instruction on using the tool, and the action of using the tool was imbedded into course activities. The researchers discussed that student use of social bookmarking in Diigo, a popular social bookmarking application tool, had benefits to both the student who had crafted a resource bookmark and the student peers that would use the tag to find relevant information.

With a variety of media platforms and applications being widely familiar to many students, they can be a benefit for support tools to share similar functionality and features. Tools that may be deemed as not intuitive or not user friendly may give students caution in trying or using a Web resource or tool. One example is with the use of Mendeley, an online reference management tool, which supports students to work and write together collaboratively in online learning. Khwaj and Eddy (2015) found that some students experienced difficulties in learning how to use Mendeley, and that the length of training with the tool needed to be expanded for

more successful and meaningful use. Technical ability of students and time needed for tool training is an important factor in deciding whether to encourage the use of a particular tool.

Students are also utilizing electronic note-taking tools and many of these tools can be used on various types of devices making them a versatile alternative to traditional note taking. Stacy and Cain's (2015) research on note-taking discussed that using note-taking application tools can have benefits for the student such as the speed in which notes can be taken, the legibility of the notes is clear, and the notes are typically searchable when an electronic tool is used. The researchers described that there are a wide range of note taking applications, and the tools that are most assistive with student learning are ones that go beyond copy and pasting features and include the ability to edit and add summaries to material, and also high-lighting abilities (Stacy & Cain, 2015). They also found that students were more likely to use an application that had been recommended by peers or had good product reviews.

Tools In The LMS

Learning Management Systems (LMS) in higher education are used to support online learning, typically with courses. Each LMS will have learning support features to assist with the eLearning experience. Support may be through editing tools, peer collaboration tools, access to library and/or writing support, and various other tools either housed within the system or externally on the Internet. While students use the LMS to access a course in a Personal Learning Environment (PLE) type of setting, various Web resources and tools available through the LMS will assist with providing student support within and beyond the PLE to create a broader learning environment.

Aurangzeb's (2018) research on blended learning described the modern LMS as much more than just the deliverer of online learning. The tools that are now available in many LMS's

make it a more comprehensive learning environment and learning tool. Communication tools were seen as important in Aurangzeb's (2018) research, as students had an avenue within the LMS to communicate with students and instructors. Aurangzeb (2018) also described that communication through social media platforms were components found to be helpful companion tools to the LMS.

Many LMS's have compatibility with or the ability to link to supporting resources that are found on the Web. Sittiwong and Manum (2015) found that link access through the LMS to appropriate social media applications were perceived as positive communication tools, and students also indicated an ease of use with the tools because of their familiarity with social media networks and platforms. Ross (2019) found that communication tools that were accessible from the LMS shared positive support from both students and instructors, with some of the relevant tools being email resources, messaging, and private group features. These communication tools were positive contributors in supporting online academics.

Not all Web tools available in or linked from the LMS have a common user format like many social media tools, and research has shown that sometimes students need further training on tools because they don't find them easy to use. Research conducted by Shoonenboom (2014) found that some instructors have a low intention to use the LMS and its available tools, and this was found to be related to the instructor's perceptions of task usefulness, ease of use, and relationship to tasks. This research showed that instructors and students are both influenced by perceptions regarding ease of use and usefulness. Without instructors helping to guide students to utilize appropriate tools in the LMS, students may be less inclined to use the available LMS tools particularly if they are unfamiliar with them.

External Tools. Forment et al.'s (2012) research focused on Google Doc tools and their integration into the LMS. Forment et al. described Google Docs as cloud-based office tools that function like an office software suite. Many Google tools may be familiar to students as they can be used for many purposes outside of academics and because they can be used for free. Google applications may help to transform an LMS into a more collaborative learning environment (Forment et al.). In their study, integration between Google applications and the LMS could be complex and sometimes functionality could be lost, but that integrations and connection tools were developing and being strengthened in some LMS systems.

The Google Drive resources and tools have been supported as an alternative to the LMS (Sadik, 2017). Sadik described the closed features of the LMS and the limits that can be hindering in the learning environment. The study showed that students had a positive impression of using Google Drive and they found it easy to use. The collaborative nature and ease of access to the cloud environment made it an ideal alternative tool to the LMS. This was a broader vision of the use of Google applications as the actual learning delivery system, while Forment et al. (2012) supported that Google applications are positive tool features to be used with the LMS.

Personal Learning Networks (PLN) In Higher Education

Goria et al. (2019) described that the concept of PLNs have progressed as learning has evolved through abundant technologies and Web resources. Learning can in part be taken into the hands of the learner as they play an active role in “organizing their own learning activities” (Goria et al, 2019, p. 88). Goria et al. also states that PLNs “highlight the central role of personal and professional connections of the individual through social media, digital tools, and other communication media, including offline ones” (p. 90). PLNs may be a part of closed learning

environments like PLEs, but they can also extend beyond to support learning from a broader, more open concept.

The PLEs and PLNs can work together to create a platform for learning. PLEs are part of the principle in the Community of Inquiry (COI) with formal learning being in a closed environment (Goria et al., 2019). Informal learning can take place in PLNs and are seen as an open type of community (Goria et al., 2019). PLEs form the structure for learning with PLNs as the tools and resources that are used to support learning. Learning can potentially be enhanced as a student grows and expands their PLN (Goria et al.). The growth of PLNs have the potential to bolster formal learning experiences through the support of informal avenues.

Tsang and Tsui (2017) describe that PLEs and PLNs are typically student centered and with these resources “a student develops deep cognitive skills for problem solving and collaborative work with others as well as acquires those qualities or attributes (e.g. self-regulated learning attitudes) required for lifelong learning after graduation” (pg. 229). In their research, they focused on Web resources and tools used in PLNs with their focus on Google+ and Feedly, a news application, being used and regarded as useful. Google+ was perceived by students as being the most user friendly and popular to use, as Feedly was a lesser known tool. Tools that have similar user qualities as social media platforms are often perceived as helpful and students seem to be motivated to use them.

Resources and tools in a student’s PLN may be supportive of independent work, supportive of collaboration, or may be integrated and supportive of both. Moreillon (2016) found students to be using a variety of electronic resources for learning and professional development such as discussion boards, online workshops, webinars, blogs, Twitter and Facebook Groups among other tools and resources. Research by Harding and Engelbrecht (2015) found student

using some of the same resources identified by Moreillon (2016), while their research focused on the use of these resources and tools for collaboration. Their research examined Personal Learning Network Clusters, groups of students that worked collaboratively in the same higher education academic programs, were productively using WhatsApp, Facebook, Skype, Google Talk, Google Drive, and YouTube together within each student's own PLN. The clusters consisted of mathematics students and computer science students, and each group used Web resources and tools within their PLNs to work collaboratively toward their academic goals. Both groups had very similar positive experiences using PLN tools collectively consisting of “enhanced social skills, better grasping of concepts, motivation, support and understanding are among the frequently mentioned benefits by both mathematics and computer science students” (Harding & Englebrecht, p. 180).

PLNs are sets of digital tools that students can reference to support their academic work. While some tools are collaborative and support working together as part of the learning process, there can be synchronous and asynchronous tools in a network. These Web tools and resources can be used for academics and professional growth.

Summary

Web resources and tools are prevalent as a support used by students in higher education. While the type of tools expand and the integration between systems and technologies evolve, the options for Web resources and tools to be used as academic support continues to grow. Research supports that students often have positive perceptions about the use of Web resources and tools and often describe collaborative tools as useful. While some tools may be perceived as easier to use than others, there are many tools that can assist with supporting academic work.

Web resources and tools are not all created equally, and with the large variety of tools and information available on the Web students may have an information overload or have trouble navigating through what may actually be a useful tool. A research study conducted by Eales-Reynolds et al. (2012) focused on a Web tool that aided students with developing critical thinking skills in order to validate and assess the Web resources found in their Web searches. The Web tool used in the study helped to facilitate an assessment of information and resources enabling the student to conduct a critical review of the source. Students reported that the tool was useful and helped in their understanding of how to critically review information and Web tools. The researchers noted that the study also showed that many students lacked the skills to critically analyze found Web material. This is an important fact to consider, that some students need more guidance than others to effectively utilize appropriate Web resources and tools. While we live in a digital age, we still need to understand how students use and interact with the Web.

CHAPTER THREE: RESEARCH METHODOLOGY

Introduction

This research study examined graduate student perspectives and use of Web resources and tools in supporting their academic work. The frameworks of Connectivism and Personal Learning Networks (PLN) were used as a basis to support the importance of Web resources and tools in relation to a student learning, academic support and progression. Neubauer et al. (2011) studied aspects of Connectivism and PLNs and their relationship in transforming an educational environment. Their research showed that learning was potentially enhanced, and students had a greater understanding of course material and concepts when educators directed students to Web resources. The encouragement of using Web resources increased student participation in professional learning communities and growth of the students' PLNs. Research also showed that the larger the PLN of a student related to a higher course performance (Casquero et al., 2016).

Shrivastava (2018) described the relevance of using technology tools through the framework of connectivism. Shrivastava's research showed that online resources and tools used by students created learning and understanding as they construct meaning with technology and the information that it provided. Students can add to their formal course work by using informal information from learning resources and tools through the building of their PLN's (Goria et al., 2019). Resources in a student's PLN can help them to learn, understand, and apply knowledge learned through formal learning environments.

The purpose of this study was to examine what Web resources and tools that graduate students are using, their perceptions of these tools, and how they are using them to support their academic course work and research. This chapter will outline the research study design, study population, instrumentation, data collection, data analysis, and the pilot study conducted.

Pilot Study

A pilot study was conducted to determine the strength of the research survey. There were three main goals of the pilot study:

- Examine the internal validity of the of the survey using Cronbach's Alpha statistical analysis;
- Verify that the survey questions were collecting the intended data to answer the research questions; and
- Review the collected qualitative and quantitative data and determine if any appropriate updates would aid in strengthening the survey instrument.

Conducting a pilot study can aid researchers with understanding challenges and weaknesses that may be present in their research study before they conduct the full study (Malmqvist, Hellberg, Möllås, Rose, & Shevlin, 2019). Malmqvist et al. (2019) discussed that conducting a pilot study can increase confidence in the research study and potentially create higher quality research results. The survey for this study was created using various studies as references and instruments as examples, so a pilot study was planned and implemented in order to examine the quality and validity of the research instrument before conducting the full study.

The pilot study proposal was approved by the UCF Institutional Review Board (IRB) in Spring 2020. Following the pilot study approval, email communications about the pilot study and the opportunity to participate voluntarily were sent to a convenience sample of roughly 40 graduate students who were enrolled in two UCF graduate courses that were taught in the Spring 2020 term. All graduate students enrolled in the two selected courses were invited to participate regardless of graduate student level, major, or enrollment status. Students who chose to

participate were directed to a survey link where they could anonymously complete the online survey in the Qualtrics system.

The pilot study survey was open to graduate student volunteers for approximately three weeks. Participants were able to access and complete the survey through the web link provided in their email invitation. Once the survey was closed, review of the data commenced. Fifteen students participated in completing the online survey. Data collected from the survey instrument was reviewed and analyzed to determine if the survey questions were appropriately answering the identified research questions and also to review internal reliability.

To review the internal validity of the survey, the Cronbach's Alpha was calculated for the two Likert-type scale questions in the survey, the questions regarding the use of Web resources and tools for academic support and then rating the usefulness of those tools. Cronbach's alpha is a statistical measure commonly used when creating or adapting research tests and scales that helps to determine the reliability (Taber, 2018). Data from the pilot study's two Likert-type scale questions were added to Excel and the Cronbach's Alpha was calculated. The Cronbach's Alpha measure was .82 which would be described as good or adequate in Taber's (2018) study of Cronbach Alpha results. This would indicate that the instrument may have adequate reliability.

Data collected from the survey was then reviewed to determine if the instrument was collecting the intended information. Comparing the data results with the research questions revealed that the survey instrument was collecting appropriate data that would be consistent with answering the research questions. While reviewing the qualitative survey question regarding which Web tools and resources that students found most useful and how they used them, several tools and resources that were not listed in the survey were identified by multiple students. To

incorporate the most relevant Web resources and tools into the survey instrument, two updates were made to the survey related to the student responses in the pilot survey.

The first update was to include Zoom as an example tool in the Web application category, Telecommunication (Video) Applications. The Web application category is used in the survey instrument where data is collected about graduate student use and then usefulness of defined categories. Zoom was referenced multiple times in the pilot study survey responses and appeared to be relevant to graduate student's Web tool and resources use. The initial examples included in this survey category were FaceTime and Hangouts, and the update was made to replace the example of FaceTime with Zoom.

The second update was to add an additional Web tools and resources category to the survey. The use of note taking applications was referenced by a participant in the collected pilot study data and seemed to be a Web application of possible relevance for graduate students. This additional category could add valuable insight to whether this is an application that is being used by graduate students and if it is seen as a meaningful application. The two identified updates were made to the survey instrument in preparation for the research study.

Research Design

The design for this research study was a mixed methods with quantitative and qualitative data collection via an electronic survey in the process of examining the stated research questions. Creswell and Clark (2007) described that there are multiple ways to view and analyze a research problem; and that using multiple research methods can be an appropriate approach depending on the nature of the study. Quantitative survey questions used descriptive statistics for analysis of the data. Qualitative data will be analyzed by coding the data into themes, and student stories and

perspectives from the open-ended questions will be highlighted to provide narrative and further understanding of the results.

Research Questions

The following research questions were used in the focus of this study:

1. What Web resources and tools are graduate students using most frequently to support their academic course work, research, and/or other academic goals?
2. What are the differences in the frequency of student usage of Web resources and tools based on enrollment in a fully online, blended or face-to-face programs?
3. What are the graduate student perceptions of usefulness regarding the Web resources and tools that they are using to support their academic goals?
4. How are students using the resources and tools that they perceive as useful?

Setting

The setting for this research study was the University of Central Florida (UCF). Data collected from this study will be used to develop Web tools and resources support initiatives for UCF graduate students, such as professional development workshops. UCF is described as a research university with both undergraduate and graduate programs, and it is located in the metropolitan area of Orlando (UCF, n.d.). The University of Central Florida has an enrollment of over 69,000 students, with 59,485 undergraduates, 489 medical students, and 9,549 students making up the graduate student enrollment in the Fall 2019 term (UCF Institutional Knowledge Management, 2020). Graduate education at UCF offers over 120 degree and track fields. US News & World Report currently has 22 UCF graduate programs ranked among the top 25 in the country (College of Graduate Studies, 2019). UCF offers over 30 fully online graduate programs and online graduate certificate programs.

Graduate online program options have been growing and expanding with new programs in development. They are supported through a collaborative effort of UCF Colleges, offices such as UCF Online, the Center for Distributed Learning, the College of Graduate Studies, and the individual program departments. UCF has been ranked by the U.S News & World Reports in the Top 15 Online Bachelor’s Programs in the Nation and in the Top 10 Best Online Bachelor’s Programs for Veterans (UCF Online, 2019). UCF Online supports the mission of providing high-quality education and student support while reaching beyond the limits of location.

Population and Participants

The participants in this study consisted of 998 UCF graduate students that had an active status during academic semester that the survey was administered. The overall UCF student enrollment for the Fall 2019 term was 69,523, with the graduate student enrollment of 9,549 (UCF Institutional Knowledge Management, 2020). Graduate students represented almost 14% of the UCF enrollment. Master’s degree seeking graduate students represent the largest group in the graduate population, with the breakdown of graduate student type presented in Table 1. Of the graduate students enrolled for the Fall 2019 term, 2,456 were enrolled in fully online programs making up about 26% of the graduate population (UCF Facts 2019-2020, n.d.).

Table 1

Fall 2019 Graduate Student Classifications

Graduate Student Type	Total Students
Doctoral	2290
Master’s	6569
Other Grad	312
Professional Certification	378

Graduate students with active status at UCF during the Summer 2020 term were invited to participate in the online research survey. A list of active graduate students was determined by data generated from the UCF Institutional Knowledge Management (IKM) office, which is considered the official source for UCF data. The UCF IKM office provides data tracking and analytics for student and faculty information. The office reports UCF's official data for state and federal reporting. A data request was submitted through the IKM office for an email list of all UCF graduate students with an active graduate student status. The student email data was compiled at IKM, and an email list of the graduate student was generated and provided to the researchers in an Excel file. The email list contained 11,545 graduate student's campus email address, and no additional participant data was present on the file.

Instrumentation

Data was gathered for this study using the Web Resources and Tools Student Perspective Survey instrument. The survey questions and categories were adapted from research and instruments related to Web resources and tools use in higher education. Research and survey instruments related to graduate and undergraduate students was reviewed. Based on the research, 13 Web resources and tools categories were selected to be part of the survey. A majority of the categories selected for the survey were identified from the research study conducted by Hartshorne and Ajjan (2009) regarding student's recognition of benefits of Web 2.0 tool use to accompany coursework and reasons that contributed to their use. Their study identified seven Web tool and resource/categories used by students that were fitting to the research questions of this study. The categories were integrated with adaptations: blogs, wikis, social networking, social bookmarking, instant messaging, Internet telephony, audio/video conferencing. The scale

categories for the Likert-type question regarding Web tool and resource uses was also referenced from an instrument in Hartshorne and Ajjan's (2009) research study.

Kobayashi's (2017) research that examined student preferences of media in online learning and internet technology related self-efficacy provided further input to the study survey. From Kobayashi's (2017) study, the online videos category was adapted and used as a category in the study, and scale categories from the study was utilized in survey question nine regarding perceptions of use for Web tools and resources. Social bookmarking was an additional Web resources and tools category added to the survey based on research conducted by Dennen et al. (2018) regarding student use and benefits of social bookmarking. Note-taking tools were added as a category based on responses to the pilot study, as well as research conducted by Stacy and Cain (2015) regarding student use of note-taking tools and benefits of use. Several Web resources and tools were adapted from research conducted by Humanante-Ramos et al. (2017) that involved usage trends of electronic devices and Web tools among engineering students. Humanante-Ramos et al. (2017) used a questionnaire to survey student regarding their use of Web tools and identified tool and resources such as file sharing/storage and creation tools that were adapted to the survey categories. Moreillon (2016) research identified many specific types of Web resources and tools used by students that were in Personal Learning Network Clusters, and this reference coupled with the other referenced research assisted in the decisions of specific appropriate categories.

The survey was created in an online format in order to provide increased access and anonymity. The Web Resources and Tools Student Perspective Survey was deployed in Qualtrics for data collection. The survey can be found in Appendix A. The survey contained four sections:

Demographic and Academic Information, Web Resources and Tools Use, Perceptions of Web Resources and Tools, and Student Stories of Web Resources and Tools.

The Demographics and Academic Information section of the survey collected data that described the characteristics of the sample population. Along with student demographic information, this section also collected academic data regarding enrollment status, college of study, online program participation, and types of course modalities taken (online, mixed mode, face-to-face). The survey question, what type of course mode is your program, prompted survey participants to identify the mode of their program as either face-to-face, fully online, or mixed mode. Data collected from this question aided in answering the research question regarding differences in student's usage of Web resources based on enrollment in a fully online, blended or face to face programs.

The Web Resources and Tools Use section of the survey prompted participants to rate their use of identified Web resources and tools. This survey question, to what extent do you use the following Web resources and tools to support your academic course work, research, and/or academic goals, provides data for the research question about what Web resources and tools graduate students are using most frequently to support their academics. A Likert-type scale was used to identify how the participants rated their usage of each identified Web resource or tool starting with the rating of 5 as "Always Use" to a rating of 1 as "Never Use".

The survey consists of 13 categories where student identified their frequency of use and perceptions of usefulness. The categories consist of 13 identified Web tools and resources with an example of specific tools for reference, and an additional category marked as "Other" where student participants can write-in any Web tools and resources that they are using that had not been listed on the survey. Table 2 displays the 13 identified Web resources and tools categories.

Table 2

Web Tools and Resources Categories

Web Tools and Resources Categories
Blogs
Online Surveys
Wikis
Social Networking
Social Bookmarking
Instant Messaging
Telecommunications Applications
Data Analysis Applications
Reference Management Tools
Video-Sharing
Webinars
File-Sharing Tools
Note-Taking Applications

In the Perceptions of Web Resources and Tools section of the survey, participants were questioned about their perceptions of the usefulness of the resources and tools that they are using. The data collected assisted in answering the research question, what are the graduate student perceptions of usefulness regarding the Web resources and tools that they are using to support their academic goals? The 13 previously identified Web resource and tool categories are also used for the survey question in this section. The instrument contained a Likert-type scale with ratings from 5 as “Very Useful” to 1 as “Not Familiar With Resource/Tool”.

In the last section, Student Stories of Web Resources and Tool, survey participants were asked to reflect on their perspectives and describe how they utilize Web resources and tools for educational purposes and how it is beneficial to their academic goals. This is an open-ended

question that invited participants to describe their experiences and share how they use these tools and resources to support academic course work, research, and academic goals. This question will aid in the data collection for the research questions, how are students using the resources and tools that they perceive as useful. The qualitative data collected from this open-ended question will help to provide a deeper understanding of how these tools are being used by graduate students in support of their academic goals. This data helped to determine which tools are used by students and perceived as useful by providing supporting examples of how these Web resources and tools are used by students to achieve their academic goals.

Data Collection

An email list of active UCF graduate students was requested through the UCF Institutional Knowledge Management (IKM) office. The requested email list contained student campus email addresses, and no other student information was present in the list. A total of 11,545 active graduate students were invited to complete the online Qualtrics survey. The data collection process followed the following steps.

The study proposal was submitted to the UCF IRB for review. Once the study proposal was approved, the active graduate student email list was requested and acquired from UCF IKM. The survey was then added to the Qualtrics application using a secure server. Students on the active graduate student email list were sent a notification email that they would be invited to participate in the research study. Next, invitation emails were sent to graduate students that included a link to the online survey. The survey was open to students for a three week period.

Student participants were able to complete the survey in the Qualtrics system and the data was recorded in the survey application on a secure server. At the end of the second week, a reminder email was sent to the graduate students providing notice of the upcoming survey

closing deadline. Once the survey was closed, the raw survey data and data analytics was accessed through the Qualtrics survey. The data was first reviewed for errors, such as removing survey entries where no information was recorded. The data was organized into three parts: data to be used with descriptive statistics, data to be used with the ANOVA one way test, and qualitative data to be reviewed and coded.

Data Analysis

Data analysis for R1 and R3 will use descriptive statistics to determine student use of Web resource and tool and perceived usefulness. Interval data will be collected using a numbered Likert-type scale with the survey questions. The use of descriptive statistics will help to describe the distribution, central tendency, and dispersion of the data. Descriptive statistics will help to show patterns within the data. Of the 13 categories in the R1 and R2 questions, 12 categories have specific Web tools and resources identified, and one category is identified as “Other” so that survey participants can identify any Web tools and resources that they are using that had not been listed on the survey. Items listed in the Other category will be reviewed and coded into appropriate categories. A breakdown of the categories listed in “Other” will be summarized.

In R2, examining whether there is a difference in the frequency of student usage of Web resources and tools based on enrollment in fully online, blended or face to face programs, analysis will be conducted with an analysis of variance (ANOVA) one way test. This test is used to compare the means of data samples for two or more groups (McDonald, 2014). The mean is calculated within each group, then the variance of the means is compared to the average variances of the groups. In this analysis, the independent variable in the test is the program mode, and the dependent variable is the student usage of the Web tools and resources. The Tukey

post hoc test also used in this study to examine significant differences in the data. The Tukey post hoc test calculates the significant difference between two or more means using a statistical distribution that determines the q value (Abdi & Williams, 2010).

Research question 4 will use qualitative methods of review and coding open-ended answers. Specific Web resources and tools identified by students will be tallied, and how they use the Web resources and tools will be grouped into themes. This data will support the question, how students are using the resources and tools that they perceive as useful. A number of selected quotes and summarized narratives from the open-ended questions will be used as examples to describe the qualitative data and themes. These summarized narratives and quotes will add details about specific use and usefulness of Web tools and resources that will increase the understanding of the quantitative data. Student's descriptions of how and possibly why they chose to use the resources and tools may help to identify any specific internal or external factors that had an impact when selecting the tool use.

CHAPTER FOUR: FINDINGS

Introduction

The purpose of this study was to examine graduate student perceptions of use and usefulness of Web resources and tools used for academic support. The Connectivism and Personal Learning Network (PLN) frameworks provided a base of support for the importance of Web resources and tools in relation to a student learning, academic support and progression. Further understanding of how Web resources and tools are a benefit to UCF graduate students can assist in the creation of professional development opportunities to help match students with these benefits, and also help provide information for educational leaders regarding potential Web tools and resources access opportunities that could benefit graduate students.

This study used a mixed methods design, both qualitative and quantitative data were collected. An electronic survey was created to collect data in order to answer the four research questions that guide the study. Survey questions were formatted with multiple choice, Likert-type scale questions, and short answer questions. The design for this study was a mixed methods study that was conducted using the following research questions:

1. What Web resources and tools are graduate students using most frequently to support their academic course work, research, and/or other academic goals?
2. What are the differences in the frequency of student usage of Web resources and tools based on enrollment in a fully online, blended or face to face programs?
3. What are the graduate student perceptions of usefulness regarding the Web resources and tools that they are using to support their academic goals?
4. How are students using the resources and tools that they perceive as useful?

This chapter is divided into five sections. The first section outlines the participant data related to demographics and academic data. The second section will provide data about question R1, which reviews graduate student frequency of use for specified Web resources and tools for academic support. The next section focuses on the review of data for question R2, the difference in the frequency of student usage of Web resources and tools based on enrollment in a fully online, blended or face to face programs. The fourth section outlines the data gather for R3 concerning graduate student perceptions of usefulness regarding the Web resources and tools that they are using. The last section in the chapter presents the qualitative data that reviews how graduate students are using the Web resources and tools that they perceive as useful.

Survey

All active UCF graduate students in the Summer 2020 term were invited to participate in the online research survey. An email list of graduate students classified with active student status during the Summer 2020 term was acquired through the UCF IKM office, and 11,545 active graduate students were invited by email to participate in the research survey. Email invitations were sent to the graduate students' campus email. The participants for this survey consisted of current UCF graduate students that volunteered anonymously to complete the survey. Students were able to access a Qualtrics survey link from the invitation email to complete the survey over a three-week period. A total of 1030 surveys were submitted. After removing surveys with no entered data, a total of 998 surveys had been completed.

Student Participant Profile

The population for this study was 11,545 active University of Central Florida (UCF) graduate students in the Summer 2020 term. The sample for this study consisted of 998 graduate

students that completed at least a portion of the survey and submitted it. The following sections provide further description of the survey participants.

Gender

Several gender categories were available in the multiple-choice question regarding participant gender. There was an additional write-in option available to participants to self-identify gender. There were 993 responses to survey question two, “What is your gender?” Respondents identifying as female made up the highest percentage at 68%, with individuals identifying as male the second highest at 30%. Table 3 displays the gender responses.

Table 3

Demographics of Survey Participants: Gender

Gender Type	Total	Percent
Female	680	68.48
Male	296	29.81
Non-binary/third gender	9	.91
Prefer not to answer	5	.50
Prefer to self describe	3	.30

Ethnicity

Ethnicity data was reported by 992 of the survey participants. The most reported ethnicity among the survey participants was 58% White, 16% Hispanic, 10% Black, and 10% Asian. The ethnicity data is displayed in Table 4.

Table 4*Demographics of Survey Participants: Ethnicity*

Ethnicity	Total	Percentage
American Indian or Alaska Native	1	.10
Asian	95	9.58
Black	103	10.38
Hispanic or Latino/a	158	15.93
Native Hawaiian or other Pacific Islander	0	0
White	572	57.66
Other	51	5.14
Prefer not to answer	12	1.21

Participant Academics

The survey had five questions that focused on academic details of the student participants. These responses assisted with providing an outline of the academic level of the graduate student participants, the college of study, enrollment status, course mode of program, and course modes taken. The survey participant academic data is detailed in the next sections.

Graduate Student Level. The first survey question asked students, “What is your current academic level?” Nine hundred and ninety-four (994) responded to question one. The academic level represents the type of program category that the student is enrolled. Participants could choose from five academic level options. The available options were Masters, Doctoral, Specialist, Graduate Certificate, and Other. The data totals revealed that Master’s level students were the largest group of graduate students to complete the survey, with Doctoral students

being the second largest group. Master's level students make up almost two thirds of the participants. Doctoral students make up almost a quarter of the students that completed the survey. The following Figure displays the student participants' academic levels.

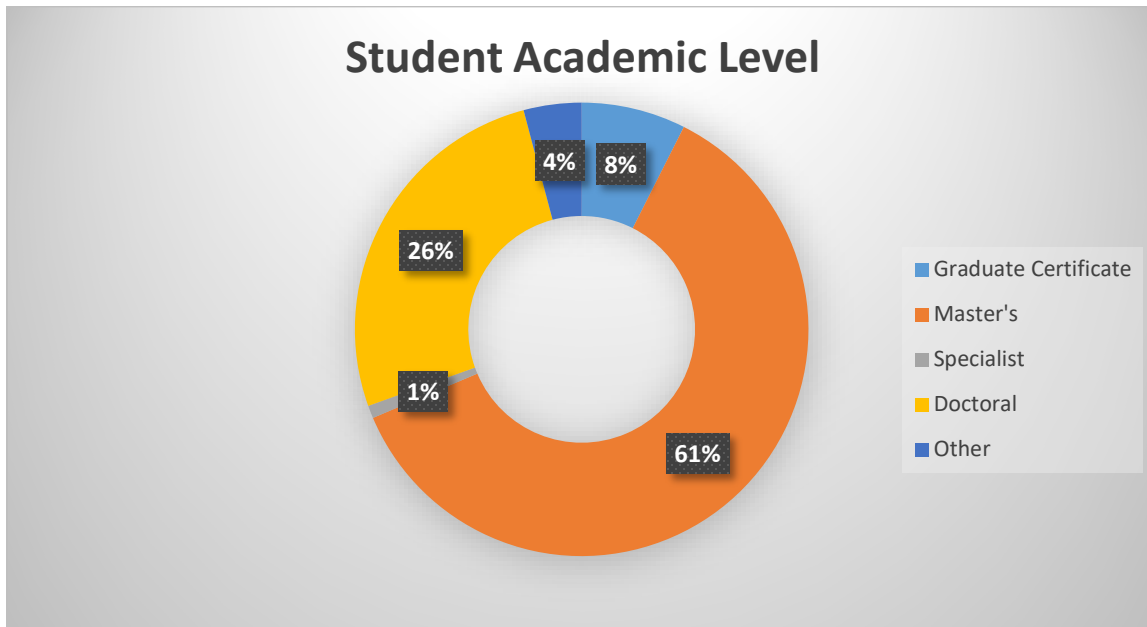


Figure 2: Student Academic Level

Note: Participant academic levels.

College of Study. Survey question four asked students to select their college of study at UCF. There were 993 survey participants that responded to question four. There were 13 college options available on the survey: Arts and Humanities, Burnett Honors College, Business Administration, Community Innovation and Education, Engineering and Computer Science, Graduate Studies, Health Professions and Sciences, Medicine, Nursing, Optics and Photonics, Rosen College of Hospitality Management, Sciences, and Other. These options represent the colleges at UCF, and Other is an available option for graduate students that may be nondegree seeking, transient, or any other students not in a specific college.

The College of Community Innovation and Education had the most student participants with over one quarter of participants identifying this as their college of study. The College of Graduate Studies had the next highest representation with just over 12% identifying this college. The following figure has a breakdown of all the college totals.

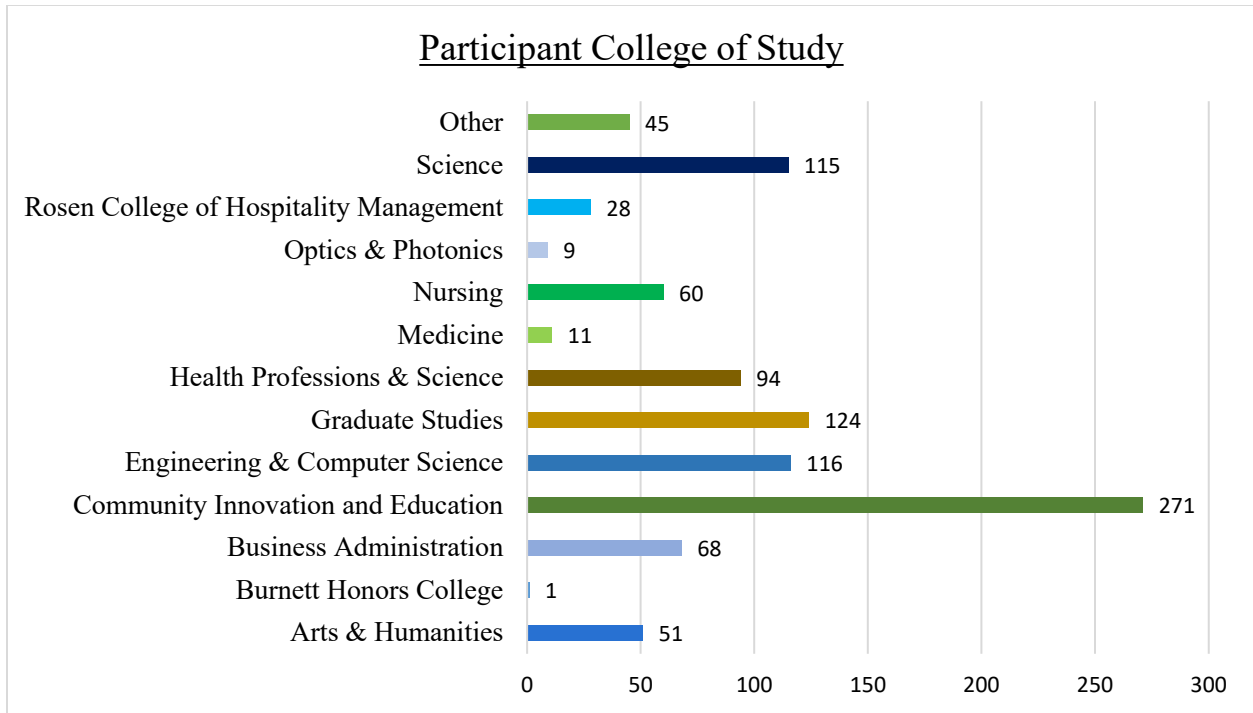


Figure 3: Participant College of Study
 Note. Participant identified college of study.

Enrollment Status. Enrollment status is determined per semester by the number of credit hours of a student’s current enrollment. Typically, at UCF, graduate students are considered full-time if they are enrolled in nine credit hours, with the exception of the Summer term where six credit hours is considered full-time. The response total regarding the student’s typical enrollment status was 994. There were 623 participants that identified full-time as their typical enrollment status, and 371 students that identified part-time. These totals are shown in Figure 4.

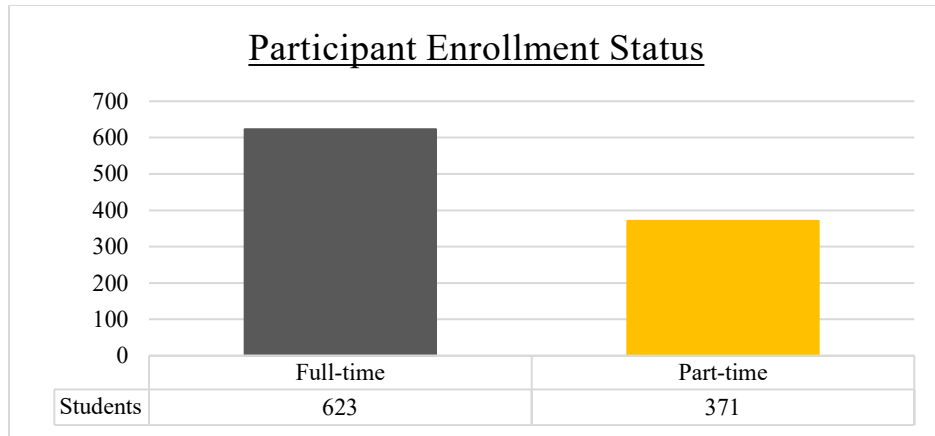


Figure 4: Enrollment Status
 Note. Participant enrollment status.

Program Modality. Question six in the survey asked the participants what their program modality was. The general types of program modalities at UCF are face-to-face, fully online, and mixed mode, which is a form of blended and includes both online, and face-to-face course work. While there may be other modalities for various courses, such as video-streaming, programs will typically describe that their program courses will be offered in one of the three referenced formats. For example, fully online programs will not have any courses offered in the face-to-face setting, and reversely fully face-to-face programs will not offer courses online.

There was a total of 993 participants that responded to the type of modality of their program. The program mode reported most often was face-to-face at 37%. The breakdown of the mode totals is shown in Table 5.

Table 5

Program Mode

Program Mode	Total	Percentage
Face-to-face	365	37
Mixed mode	350	35
Fully online	278	28

Of the participants that reported their program modality was mixed mode, 322 identified the estimate of their program course work that is completed online. Figure 5 displays the estimated amount of online course work.

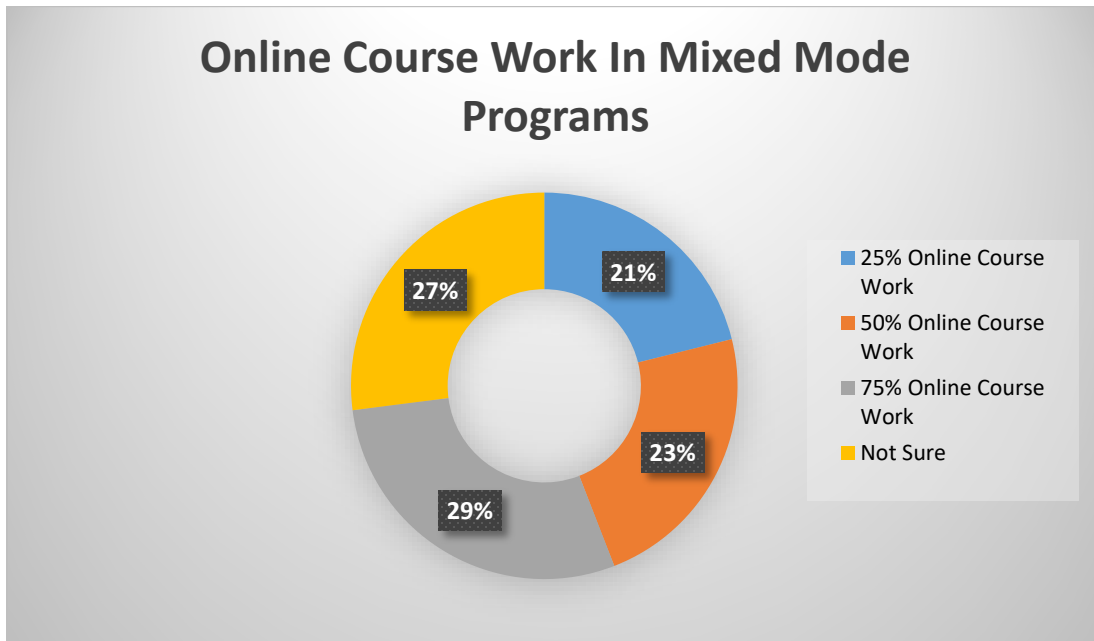


Figure 5: Estimate of Online Course Work In Mixed Mode Programs

Note. Participant estimate of online course work taken in mixed mode programs.

Course Modalities. Several different types of course modalities are offered within the graduate programs at UCF. Participants reported all applicable course modalities that they had

enrolled in as a graduate student: face-to-face, mixed mode/reduced seat time, video streaming/reduced seat time, active learning/reduced seat time, and fully online. There were 928 participants that responded to this question. Of the respondents, 454 reported taking only one type of course modality: 135 face-to-face, 271 fully online, 40 mixed modality, 8 video streaming. Enrollment in multiple types of course modalities were reported from 474 participants. In Figure 6, the top five reported course modalities and combinations of modalities are identified.

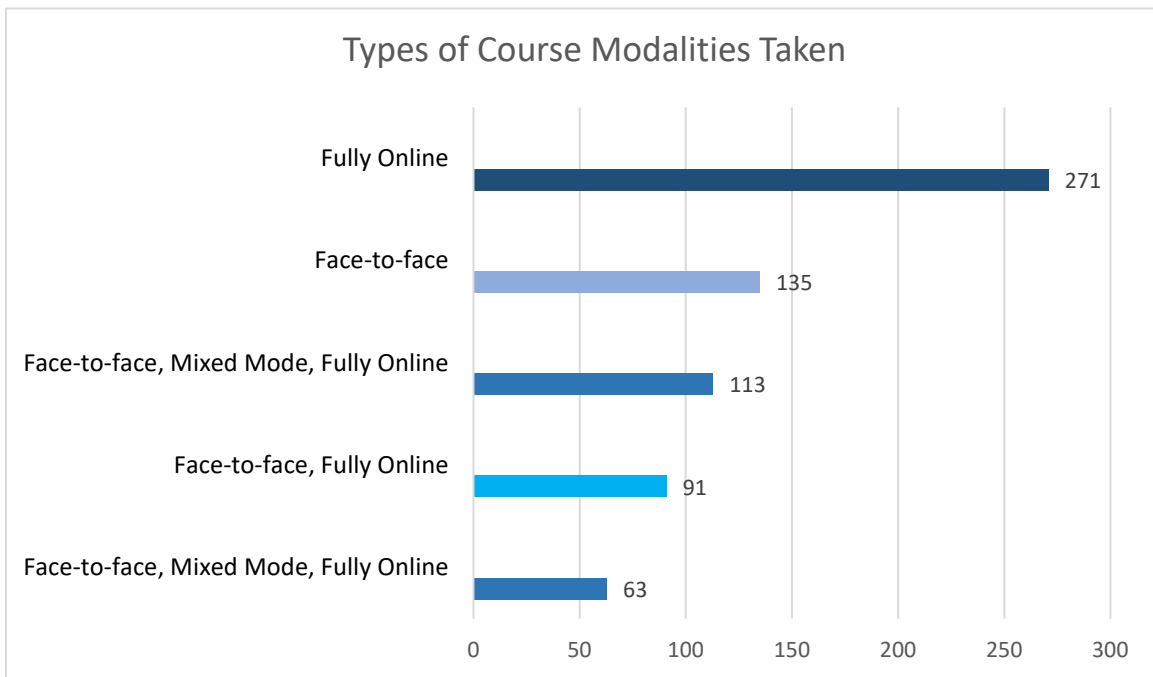


Figure 6: Course Modality

Note. Course modality enrollment of participants during graduate career.

Findings Research Question 1: What Web resources and tools are graduate students using most frequently to support their academic course work, research, and/or other academic goals?

This survey focus was to examine graduate students’ use of Web resources and tools and their perceptions of use. The first research question, “What Web resources and tools are graduate

students using most frequently to support their academic course work, research, and/or other academic goals?” focused on graduate student use of Web resources and tools. Survey question eight was used to collect data for the review of R1, where participants were asked to rate the extent that they used the 13 identified Web resources and tools to support their academic course work, research, and/or other academic goals. Survey participants were also provided with a write-in option in question eight, providing them the ability to add any Web resource, tool, or resource/tool category that was not already identified in the list.

The survey question contained a Likert-type scale for participants to rate their frequency of use per item category. The rating scale had 5 available options, with 5 as “Always Use”, 4 as “Use Frequently”, 3 as “Occasionally Use”, 2 as “Don’t Use But Plan To Use”, and 1 as “Don’t Use”. From the descriptive statistics, File-sharing had the highest mean of 4.09 which would place it in the overall “Frequently Used” rating. The second highest mean was Telecommunication Applications with the rating of 3.74 on the upper end of “Occasionally Use.” Blogs have the lowest mean at 1.68, which showed that the response is between the “Do Not Use But Plan to Use” and “Don’t Use” rating. Table 6 displays descriptive statistics for the responses to question eight.

Table 6*Descriptive Statistics For Frequency of Use: Web Resources and Tools*

Web Resource or Tool	Minimum	Maximum	Mean	Std Deviation	Variance	Count
Blogs (Ex.: Weebly, WordPress)	1.00	5.00	1.68	1.10	1.21	854
Online Surveys (Ex.: Kahoot!, Survey Monkey)	1.00	5.00	2.22	1.18	1.38	855
Wikis (Ex.: Wikihow, Wikipedia)	1.00	5.00	2.39	1.36	1.84	856
Social Networking (Ex.: Facebook, Twitter)	1.00	5.00	2.51	1.46	2.12	854
Social Bookmarking (Ex.: Digg, Pinterest)	1.00	5.00	1.73	1.14	1.30	855
Instant Messaging (Ex.: WhatsApp, Messenger)	1.00	5.00	2.81	1.50	2.26	853
Telecommunication (Video) Applications (Ex.: Zoom, Hangouts)	1.00	5.00	3.74	1.14	1.30	858
Data Analysis Applications (Ex.: SPSS, SAS)	1.00	5.00	2.52	1.49	2.21	854
Reference Management Tools (Ex.: Endnote, Refworks)	1.00	5.00	2.42	1.46	2.12	853
Video-sharing (Ex.: YouTube, Vimeo)	1.00	5.00	3.24	1.30	1.69	857
Webinars (Ex.: Lynda, EdWeb)	1.00	5.00	2.15	1.24	1.54	850
File-sharing Tools (Ex.: Dropbox, Google Docs)	1.00	5.00	4.09	1.09	1.18	857
Note-taking Applications (Ex.: Evernote, Simplenote)	1.00	5.00	2.08	1.38	1.91	852
Other Resource/Tool:	1.00	5.00	1.86	1.47	2.17	319

In Table 7, file-sharing tools were rated as used at the highest frequency with 73.63% of survey participants rating these tools as “Use Always” or “Use Frequently.” The second highest rated was telecommunications applications with 65.74% of survey participants rating these tools as “Use Always” or “Use Frequently.” Blogs are used with the least frequency with 7.79% rating them as “Use Always” or “Use Frequently”, and 75.06% of responses listed blogs as “Don’t Use” or Don’t Use But Plan To Use”. Social Bookmarking applications were also identified at a low rate of use with 74% of survey participant responses identifying that they “Don’t Use” or ”Don’t Use But Plan To Use”. The response percentages and counts per rating score of each category are presented in Table 7.

Table 7*Frequency of Use: Web Resources and Tools*

Web Resource or Tool	Don't Use	Total	Don't use but plan to use	Total	Use Occasionally	Total	Use Frequently	Total	Always Use	Total	Grand Total
Blogs	67.68%	578	7.38%	63	16.98%	145	5.04%	43	2.93%	25	854
Online Surveys	42.46%	363	8.65%	74	36.73%	314	9.12%	78	3.04%	26	855
Wikis	43.57%	373	3.62%	31	29.44%	252	16.82%	144	6.54%	56	856
Social Networking	41.57%	355	4.80%	41	27.87%	238	12.65%	108	13.11%	112	854
Social Bookmarking	65.96%	564	8.07%	69	16.37%	140	6.32%	54	3.27%	28	855
Instant Messaging	34.23%	292	3.87%	33	25.56%	218	18.87%	161	17.47%	149	853
Telecommunication (Video) Applications	8.28%	71	2.80%	24	23.19%	199	37.65%	323	28.09%	241	858
Data Analysis Applications	40.05%	342	11.36%	97	19.32%	165	14.99%	128	14.29%	122	854
Reference Management Tools	42.79%	365	11.72%	100	19.11%	163	13.95%	119	12.43%	106	853
Video-sharing	17.39%	149	4.55%	39	33.37%	286	26.14%	224	18.55%	159	857
Webinars	45.65%	388	14.47%	123	23.41%	199	12.12%	103	4.35%	37	850
File-sharing Tools	4.67%	40	2.68%	23	19.02%	163	26.72%	229	46.91%	402	857
Note-taking Applications	53.87%	459	13.15%	112	14.08%	120	9.27%	79	9.62%	82	852
Other Resource/ Tool:	72.10%	230	1.57%	5	7.21%	23	6.58%	21	12.54%	40	319

The last category in question eight, Other Resource/Tool, allowed for survey participants to write in their own Web resource or tool that they have used. While 319 survey participants chose a rating selection for the “Other Resource/Tool” write-in option, there were just 86 write-in responses. The top five responses were as follows: Online Libraries (11), Microsoft Office Applications (6), Canvas (4), Quizlet (4), and Grammarly (3). The responses listing Online

Libraries identified both the UCF Online Library and Online Libraries in general. The top write-in responses exhibited support through databases, LMS course support, study tools, and a variety of support that the Microsoft Office Suite would encompass.

The data review of survey question eight showed that the collaborative tools file-sharing and telecommunications applications are being utilized most frequently. However, not all collaborative type tools were used as often by the participants, such as Social Networking tools with just 25.67% and Instant Messaging with 36.34% of participants rating them as “Use Always” or “Use Frequently”.

Findings Research Question 2: What are the differences in the frequency of student usage of Web resources and tools based on enrollment in a fully online, blended or face-to-face programs?

Research question two, “Is there a difference in the frequency of student usage of Web resources and tools based on enrollment in a fully online, blended or face to face programs?”, focused on program mode types and the frequency of use with Web resources and tools. Data from survey question six regarding graduate student enrollment in face-to-face, mixed mode, or fully online programs, was compared with the responses to survey question eight about frequency of use for specified Web resources and tools.

A one-way analysis of variance (ANOVA) was used to determine if there was a significant difference between overall data results. This test is used to compare the means of data samples for two or more groups (McDonald, 2014). The mean per data row was calculated within each group, and then the variance of the means were compared to the average variances of the groups. The independent variable for analysis was program mode with three levels consisting

of face to face, mixed mode, and online modes. The dependent variable was the frequency of use of Web resources and tools.

A Tukey HSD test was used to look further at where the data differences were present. The Tukey HSD test is a post hoc test that can be used if a significant difference is found with the ANOVA analysis. The Tukey post hoc test was used in this study to look further at where the differences were found in the data. The Tukey post hoc test calculates the significant difference between two means using a statistical distribution that determines the q value (Abdi & Williams, 2010). This test was instrumental in understanding where the significant variations were present between the variety of program modes and the frequency of use with Web resources and tools.

A one-way between subjects ANOVA test was conducted to compare the frequency of Web resources and tools used of graduate students in face-to-face programs, mixed mode programs, and fully online programs. There was a statistically significant difference between the frequency of use for type of program mode at the $p < .05$ level for the three conditions [$F(2, 857) = 8.85, p = 0.000157$]. Post hoc comparisons using the Tukey HSD test indicated that the mean score for use frequency in face-to-face programs ($M = 2.68, SD = 0.61$) was significantly different than use frequency in online programs ($M = 2.20, SD = 0.72$). However, the use frequency in mixed mode ($M = 2.60, SD = 0.67$) did not significantly differ from the face-to-face and online programs. An examination of the results indicates that the use of Web resources and tools for academic support was higher among students in face-to-face programs than among those in online programs. Overall, survey participants in face-to-face programs reported using Web resources and tools at a higher frequency than survey participants in online programs.

Findings Research Question 3: What are the graduate student perceptions of usefulness regarding the Web resources and tools that they are using to support their academic goals?

This research study focused on both graduate student use of Web resources and tools and their perceptions of use. The third research question was, “What are the graduate student perceptions of usefulness regarding the Web resources and tools that they are using to support their academic goals?” Data was collected for this research question in survey question nine. Participants were asked to identify how useful the Web resources and tools were in supporting their academic course work, research, and/or academic goals. The same 13 Web resources and tools categories from question eight were listed in this question. As similar to question eight, participants were provided with a write-in option where they were able add in any Web resource or tool that they have used, and they were able to rate them. Table 8 displays descriptive statistics for the responses to question nine.

Table 8*Descriptive Statistics For Perceptions of Usefulness: Web Resources and Tools*

Web Resource or Tool	Minimum	Maximum	Mean	Std Deviation	Variance	Count
Blogs (Ex.: Weebly, WordPress)	1.00	5.00	2.22	1.30	1.69	818
Online Surveys (Ex.: Kahoot!, Survey Monkey)	1.00	5.00	3.18	1.35	1.81	815
Wikis (Ex.: Wikihow, Wikipedia)	1.00	5.00	3.34	1.23	1.52	815
Social Networking (Ex.: Facebook, Twitter)	1.00	5.00	3.11	1.18	1.39	815
Social Bookmarking (Ex.: Digg, Pinterest)	1.00	5.00	2.42	1.19	1.41	815
Instant Messaging (Ex.: WhatsApp, Messenger)	1.00	5.00	3.51	1.25	1.55	816
Telecommunication (Video Applications (Ex.: Zoom, Hangouts)	1.00	5.00	4.41	0.95	0.91	814
Data Analysis Applications (Ex.: SPSS, SAS)	1.00	5.00	3.08	1.77	3.12	817
Reference Management Tools (Ex.: Endnote, Refworks)	1.00	5.00	2.93	1.69	2.86	818
Video-sharing (Ex.: YouTube, Vimeo)	1.00	5.00	3.95	1.11	1.23	817
Webinars (Ex.: Lynda, EdWeb)	1.00	5.00	2.70	1.59	2.53	814
File-sharing Tools (Ex.: Dropbox, Google Docs)	1.00	5.00	4.55	0.90	0.80	817
Note-taking Applications (Ex.: Evernote, Simplenote)	1.00	5.00	2.55	1.59	2.54	819
Other Resource/Tool:	1.00	5.00	1.90	1.55	2.40	303

The descriptive statistics revealed some similarities to question eight, with file-sharing having the highest mean. The mean for file-sharing is 4.55 which would place it in the rating of “Somewhat Useful”. Social Bookmarking had the lowest mean of the defined categories at 2.42, showing that the rating is in the mid “Not Useful At All” category. The response percentages and counts per Web resources and tools categories are presented in Table 9.

Table 9*Perceptions of Usefulness: Web Resources and Tools*

Web Resources and Tools	Not Familiar With Resource/ Tool	Total	Not Useful at All	Total	Not Very Useful	Total	Somewhat Useful	Total	Very Useful	Total	Grand Total
Blogs	43.89%	359	17.85%	146	14.43%	118	19.80%	162	4.03%	33	818
Online Surveys	18.53%	151	13.25%	108	14.72%	120	39.02%	318	14.48%	118	815
Wikis	9.94%	81	17.79%	145	17.79%	145	37.18%	303	17.30%	141	815
Social Networking	9.33%	76	24.66%	201	23.31%	190	30.92%	252	11.78%	96	815
Social Bookmarking	27.36%	223	29.20%	238	21.72%	177	17.06%	139	4.66%	38	815
Instant Messaging	8.58%	70	14.71%	120	18.26%	149	33.82%	276	24.63%	201	816
Telecommunication (Video) Applications	3.56%	29	2.70%	22	3.81%	31	28.75%	234	61.18%	498	814
Data Analysis Applications	37.70%	308	4.04%	33	6.36%	52	16.77%	137	35.13%	287	817
Reference Management Tools	37.90%	310	6.36%	52	7.95%	65	20.90%	171	26.89%	220	818
Video-sharing	5.63%	46	6.36%	52	11.14%	91	41.00%	335	35.86%	293	817
Webinars	40.79%	332	7.37%	60	9.83%	80	25.43%	207	16.58%	135	814
File-sharing Tools	3.55%	29	1.22%	10	2.82%	23	21.18%	173	71.24%	582	817
Note-taking Applications	44.81%	367	8.06%	66	11.36%	93	18.80%	154	16.97%	139	819
Other Resource/ Tool:	71.29%	216	4.95%	15	1.65%	5	6.27%	19	15.84%	48	303

The data in Table 9 illustrates that file-sharing tools were rated the most useful with 92.42% of survey participants rating these tools as “Somewhat Useful” or “Very Useful.” Telecommunications applications were rated the second most useful tools with 89.93% of survey participants rating these tools as “Somewhat Useful” or “Very Useful.” Social bookmarking was

rated as the least useful with 21.72% rating the item as “Somewhat Useful” or “Very Useful”, and 56.57% of responses listed as “Not Useful At All” or “Not Familiar With Tool/Resource.”

The last category option in question nine allows for survey participants to write in their own Web resource or tool related to usefulness. There were 303 survey participants that selected a rating in this category, however there were only 58 write-in responses completed in the “Other Resources/Tool” option. The top five write-in responses with the answer counts were as follows: Online Libraries (6), Quizlet (4), Google (4), Webcourses/Canvas (4), and Microsoft Office Applications (3). The responses listing Online Libraries identified both the UCF Online Library and Online Libraries in general. All of the top five responses had a 100% “Very Useful” rating from participants, except for Quizlet with a 50% “Very Useful” rating.

Findings Research Question 4: How are students using the resources and tools that they perceive as useful?

The final question in the survey, question ten, focused on obtaining qualitative data through an open-ended question about how the participants have used the Web resources and tools that they feel have supported their academic and/or research goals. This data assisted with research question four, “How are students using the resources and tools that they perceive as useful?”. Sanjeev et al. (2010) described that qualitative research attempts to gather in depth data about thoughts and feelings, and that it helps to answer why something is taking place rather than just looking at what is taking place. While other questions in the survey focused on what students are using and perceptions of usefulness, question ten focused on the “how” supportive Web resources and tools were being used by UCF graduate students.

Question ten in the survey prompted participants to identify which category or specific resource/tool that they have found to be the most useful, and list ways that they have been

beneficial to their academic course work, research, and/or academic goals. This data provided a deeper look at how the survey participants are using Web tools and resources and presented further information about resources in the participant's PLNs. Gorla et al. (2019) described that with the evolution of technology, the concept of student PLNs has grown as students are better able to take ownership with the organization of their learning behavior and their actions of learning. There are countless Web tools and resources available that could be beneficial in some positive and supportive academic manner, so this question aimed to describe how students are using the Web tools and resources that they identified as beneficial tools which would be part of their PLNs.

There were 571 responses to question ten. Responses were analyzed to identify Web resources and tools and also the themes related to how the Web resources and tools were used. Responses varied with the amount of information details that were provided. Responses identifying types of Web resources and tools were tallied to gather a count of each specified item type or category, and identification of key words and phrases were used to code the responses into themes related to the use of the resources/tools. Some responses only listed Web resources and tools used or how they used Web resources and tools, while others listed both the resources/tools and how they were used. Many responses listed multiple resources/tools and uses. When multiple items were identified, each separate item was included in the total count of items, but not identified as a new response in the overall count of survey participant responses.

Web Resources and Tools Identified as Beneficial

In the first part of question ten, participants were asked to identify which category or specific resources/tools that they have found to be the most useful. From the 571 responses to question ten, the total count of identified Web resources and tools was 966. The number of items

identified per response ranged from 0-13 with a mean of 1.687. There were 169 specific types of Web tools, resources, and resource/tool categories identified among the responses. Of the 169 specifically identified items, 17 were identified in the responses ten or more times. These 17 items were highlighted as the top categories. The top Web resources and tools listed as beneficial were Zoom and Google Docs with each having over 100 responses identifying these tools. Both tools are collaborative in nature and appear to be assistive to graduate students. Table 10 lists the items and the total number of times that each item was referenced in the responses.

Table 10*Top Identified Web Resources, Tools, and Resource/Tool Categories*

Web Resources, Tools, and Resource/Tool Categories	Total
Zoom	122
Google Docs	108
YouTube	76
Google Drive	44
UCF Library Online	44
SPSS	35
Dropbox	25
Endnote	25
Google Scholar	18
Wikipedia	17
WhatsApp	14
Refworks	14
Google Suite	13
Instant/Text Messaging	12
Note-taking Apps	12
Social Media	12
File Sharing	10
TOTAL	598

The total of the top 17 items represents 62% of the total 966 resource and tool items identified. The remaining Web resource and tool items were identified in the responses less than

10 times each, with 103 of the items identified only 1 or 2 times. Many participants identified more than one item in their response.

How Web Resources and Tools Are Being Used

The second part of question 10 prompts the participants to list ways that the Web resources and tools are beneficial in supporting their academic course work, research, and/or academic goals. The collected data was reviewed to identify specific ways that participants expressed the Web resources and tools were beneficial. Of the total of 571 responses to this question, 426 answered this portion of the question. The data review revealed 682 specific references regarding how these resources and tools were used to beneficially support the participants' academics. The described uses for the Web resources and tools were analyzed for common themes, which are referenced in this study as usage themes. Some responses listed multiple usage themes. Usage themes per response ranged from 0-5, with a mean of 1.22. From the data review, there were 20 usage theme types identified. Of the beneficial usage themes, 14 were referenced in the responses four or more times, and these usage themes are identified as the top themes. The top beneficial usage themes were then placed into four usage groups themes that represented the general type of usage that emerged from the data review.

The four identified usage group themes that emerged were:

- Coursework Support
- Collaboration
- Research Support
- Cloud Based Support

Coursework Support emerged as a general usage group as many responses described use benefits that related to coursework like supporting assignment, papers, presentations, and

coursework practices like notetaking and studying, and supporting clarity of course material. Collaboration is another usage group theme that emerged from specific references of sharing items like documents, slides, ideas, and communicating with classmates and faculty. When group work and group assignments were specified, the usage theme was identified with the Collaboration Group Work theme within the Collaboration usage group. The Research Support usage group theme was determined from references related to research support, research papers, and thesis and dissertation support. Cloud Based Support was the fourth usage group theme that encompassed Web tools and resources use related to file storage and size, organization of materials, auto-saving, use across devices, and file sharing. Cloud Based Support emerged as a separate usage group from Course Work Support because there were many responses that referenced general cloud-based usage without specifying if it was used in coursework, research, or for any other specific task. The usage groups and themes are displayed in Table 11.

Table 11*Beneficial Usage of Web Resources and Tools*

Usage Groups Themes	Usage Themes	Total
Coursework Support	Course Work Support (General)	218
	Note-taking Support	16
	Study Resources	6
	Presentation Support	4
	Practicum, Intern & Clinical Support	4
Collaboration	Collaboration (General)	125
	Collaboration Group Work	83
	Networking	10
Research Support	Research Support (General)	61
	Academic Sources & Referencing	40
	Data Support	26
	Thesis/Dissertation Support	14
Cloud Based Support	Cloud Based Support	33
	Organization Course Work/Research	35

From Table 11, the Coursework Support usage group had the highest number of referenced usage themes from the survey responses with 248, and Collaboration was the second highest with 218 references. Usage themes were identified by reviewing each response for key words and phrases to aid in determining the type of support that was being referenced. If

multiple themes were identified in a response, each theme presented per response was listed in the total theme count under each appropriate Usage Theme. Some response phrases overlapped multiple usage themes, for example “collaborating on assignments.” This example of overlapping phrase was counted in both the Course Work Support usage theme and Collaboration (General) usage theme. Tables 12, 13, 14, and 15 are grouped by usage groups and pair usage themes and Web resources, tools, and categories associated with each usage theme. Many of the resources and tools are seen in multiple categories, as many responses described beneficial use for multiple supportive purposes. The following Tables also lists some of the key words and examples of phrases that assisted in the usage theme determination.

Table 12

Coursework Support: Usage Themes and Top Web Resources and Tools

Usage Themes	Top Web Resources, Tools, and Categories	Examples of Key Words and Phrases
Course Work Support (General)	<p>Zoom Google Docs YouTube Google Drive UCF Library Online SPSS Dropbox EndNote Google Scholar Wikipedia Google Suite WhatsApp Instant/Text Messaging Note-taking Apps File Sharing</p>	<p>Keyword examples: assignments, lectures, class papers</p> <p>Phrase examples:</p> <ul style="list-style-type: none"> • “help supplement my reading to assist in identifying key points” • “finding alternate explanations of course material” • “efficient way to...complete assignments and required coursework”
Note-taking Support	<p>Google Docs EndNote Note-taking Apps</p>	<p>Keyword examples: notes, note-taking</p> <p>Phrase examples:</p> <ul style="list-style-type: none"> • “consolidate notes in one location” • “follow along with lectures and add additional notes to them” • “stay organized with my notes and be able to reference past notes”
Study Resources	<p>YouTube Note-taking Apps</p>	<p>Keyword examples: study, quizzes, tests</p> <p>Phrase examples:</p> <ul style="list-style-type: none"> • “online flashcard and quiz generating website” • “creating games to study for tests” • ”provided with study options”
Presentation Support	<p>Zoom Google Docs YouTube</p>	<p>Keyword examples: presentation, PowerPoint</p> <p>Phrase examples:</p> <ul style="list-style-type: none"> • “useful tool...for presentations” • “beneficial because much of the course work is group work and presentations” • “collaborative tool for ...presentations”
Practicum, Intern & Clinical Support	<p>Zoom File Sharing</p>	<p>Keyword examples: intern, practicum, clinical</p> <p>Phrase examples:</p> <ul style="list-style-type: none"> • “Video conferencing and interning” • “provide effective therapy from a remote location” • “useful to collaborate between my supervisor and co-clinicians for telepractice”

Table 13*Collaboration: Usage Themes and Top Web Resources and Tools*

Usage Themes	Top Web Resources, Tools, and Categories	Examples of Key Words and Phrases
Collaboration (General)	Zoom Google Docs YouTube Google Drive Dropbox Google Suite WhatsApp Instant/Text Messaging Social Media File Sharing	Keyword examples: collaborate, share, communicate Phrase examples: <ul style="list-style-type: none"> • “meet with classes and group projects” • “sharing links relevant to coursework and assignments” • “essential for collaborations with colleagues”
Collaboration Group Work	Zoom Google Docs YouTube Google Drive Dropbox Google Suite WhatsApp Instant/Text Messaging Social Media File Sharing	Keyword examples: group projects, sharing, group work Phrase examples: <ul style="list-style-type: none"> • “group papers with other students” • ” sharing with peers, sharing for editing, group work” • “useful for my research since we are doing very collaborative work”
Networking	WhatsApp Social Media	Keyword examples: connect, network, professional Phrase examples: <ul style="list-style-type: none"> • “allows me to engage with other academic and researchers” • ” connect me with other people in my field” • “great for short professional communications”

Table 14*Research Support: Usage Themes and Top Web Resources and Tools*

Usage Themes	Top Web Resources, Tools, and Categories	Examples of Key Words and Phrases
Research Support (General)	Zoom Google Docs Google Drive UCF Library Online SPSS Dropbox EndNote Google Scholar Wikipedia RefWorks File Sharing	Keyword examples: research, conducting, published Phrase examples: <ul style="list-style-type: none"> • “useful resources for conducting research” • “researching for and downloading papers” • “access to academically published information makes research faster and efficient”
Academic Sources & Referencing	UCF Library Online EndNote Google Scholar RefWorks	Keyword examples: reference, bibliography, citations Phrase examples: <ul style="list-style-type: none"> • “creating a bibliography” • “inventory all my research articles” • “saves me a lot of time when making my reference lists”
Data Support	SPSS	Keyword examples: Data, analysis Phrase examples: <ul style="list-style-type: none"> • “SPSS and JASP are the tools I use to analyze data and create graphs.” • “benefited the most from data analysis tools” • “useful in every statistics course in order to run numbers and analyze data”
Thesis/Dissertation Support	Zoom SPSS EndNote RefWorks	Keyword examples: dissertation, thesis, research Phrase examples: <ul style="list-style-type: none"> • “create materials for my dissertation” • “organizing references for publications / dissertation” • “valuable tool towards writing my thesis”

Table 15*Cloud Based Support: Usage Themes and Top Web Resources and Tools*

Usage Themes	Top Web Resources, Tools, and Categories	Examples of Key Words and Phrases
Cloud Based Support	Google Docs Google Drive Dropbox Google Suite File Sharing	Keyword examples: multiple devices, automatic save, file sharing Phrase examples: <ul style="list-style-type: none"> • “can access any of my projects or assignments from any device on the go” • “online syncing and backup” • “automatically saves my work”
Organization Course Work/Research	Google Docs Google Drive Dropbox EndNote Google Suite RefWorks Note-taking Apps	Keyword examples: Organize, plan Phrase examples: <ul style="list-style-type: none"> • “keeps me organized and is an efficient way to share requirements” • “helped me too create a vision and plan for specific task assignments” • beneficial to me keeping my assignments organized”

The review of participant responses showed that Web resources and tools are used in a variety of supportive ways, with some being utilized throughout many different usage themes and usage groups. Table 12 highlights how the various resources and tools fall into the different usage themes and often into multiple support usages. The Course Work Support usage theme was referenced with the highest number of Web resources, tools, and categories, with 15 out of the top 17 referenced as supporting the participants’ course work. Many of the top 17 Web resources, tools, and categories have use purposes that would support coursework as well as other academic and research goals, and this was evident as participants elaborated on how they are using these items.

Participants were prompted in the second part of question 10 to list ways that the Web resources and tools are beneficial in supporting their academic course work, research, and/or academic goals. Participant descriptions of how Web resources and tools are used added further insight into the supportive benefits for graduate student academic endeavors. The Course Work Support usage group has many resources and tools that are being utilized in perceived beneficial ways. Note-taking applications were identified as used for Course Work Support.

Participant 971 stated,

“...using Notability as a graduate student and although note taking alone is not enough to remember all of the necessary information, I feel that it has helped me stay focused for longer periods of time...”

Participant 692 identified that,

“Online note taking programs such as one note is a great way to consolidate notes in one location with a helpful search feature.”

YouTube videos were also described as a tool for Course Work Support, an example was stated in Participant 411’s response, “In my opinion, YouTube provides valuable academic information. TED talks are abundantly helpful. I tend to be considered a visual/hands on learner. YouTube typically offers visual examples of any situation that I find myself stuck in, like a math problem.”

Many participant responses described more than one usage theme. The following example from Participant 896’s response described the Course Work Support usage theme and additional usage themes of Organization Course Work/Research and Collaboration (General), they stated, “Google docs is a godsend. No matter where I am I can access work...I've been able

to easily share projects with other students in my cohort, I've been able to keep my work organized an online repository.”

The Data Support usage theme only had one tool among the Top Web Resources, Tools, and Categories. While the Data Support usage theme is smaller with less referenced tools than other usage themes, participant descriptions showed the important benefits for support of academic course work, research, and academic goals.

Participant 546 stated, “SPSS has proven to be useful in every statistics course in order to run numbers and analyze data.”

Participant 626 provided another example of the SPSS tool coupled with another tool stating, “Data analysis tools (SPSS) and citation tools (Citavi) are incredibly useful in course work, research, and academic goals. These all require a significant amount of data analysis and SPSS and other tools are very useful.”

Participant responses to question ten provided understanding about how students are utilizing Web tools and resources, and that these tools are supporting graduate students in various ways. As represented in the usage groups and themes, graduate students are turning to Web resources and tools most often in support of coursework and for collaboration purposes. The survey responses also show that many of these items and themes are intertwined, which is expected as academics, research, and academic goals are interconnected in many ways.

Summary

Chapter Four examined the data findings of this study regarding graduate student perceptions of use and usefulness of Web resources and tools used for academic support. Data analysis revealed that file-sharing and telecommunications applications were the top two most frequently used Web resources and tools as well as being identified as the most useful tools.

These identified applications were consistent with the participant reported most beneficial resources and tools used from survey question 10, with the top two items identified as Zoom and Google Docs with each being represented in over 100 participant responses.

Participant descriptions of beneficial Web resources and tools used reported that resources and tools were used most often for the Course Work Support (General) usage theme and also for the Coursework Support group theme, however many Web resources and tools were shown to be used for multiple purposes of support. Analysis of Web resources and tools use frequency between participants in face-to-face, mixed mode, and fully online programs showed that participants who were enrolled in face-to-face programs reported using Web resources and tools at a higher frequency than survey participants enrolled in online programs. These findings provide a detailed summary of the Web resources and tools that the survey participants were using, their perceptions of usefulness for these tools, and how they are using the resources and tools that they find to be the most beneficial.

CHAPTER FIVE: DISCUSSION AND CONCLUSION

Chapter Five provides a discussion of the data analysis results presented in Chapter Four, and recommendations for future research are considered. The purpose of this mixed methods research study was to examine graduate student interactions with Web resources and tools to identify which tools are being used, reported as useful, and how they are being used in the support of academic coursework, research, and academic goals. The study also examines if there are differences in the frequency of Web resources and tools use among graduate students in differing program modes including face-to-face, mixed mode, and fully online programs.

Data was collected for this study through an online survey. All active University of Central Florida (UCF) graduate students were invited via email to participate in the study. Data findings were reviewed in Chapter Four, and Chapter Five provides a discussion about the findings and directions for future research.

Discussion Research Question 1: What Web resources and tools are graduate students using most frequently to support their academic course work, research, and/or other academic goals?

The examination of data revealed that the usage frequency varied widely between the Web resources and tools categories on the survey. The top four most frequently used categories were: file-sharing tools, telecommunications applications, video-sharing applications, and instant messaging. All four of these resources and tools can be used collaboratively while also supporting academic work, research, and academic goals. File-sharing tools and telecommunications applications are being utilized by well over half of the survey participants. The survey data supports that these tools are being used regularly by the participants in this study, which would likely mean that these tools were present in many of the participant's

Personal Learning Networks (PLN). Web resources and tools categories that ranked below the top five most frequently used only had about a quarter or less of the participants reporting “Always Use” or “Frequently Use” for the categories.

File-sharing had the highest percentage of identified usage where 73.63 % of participants reported that they “Always Use” or “Frequently Use” those tools. These collaborative tools could help to connect graduate students with peers and faculty to support academic work and research. File-sharing tools can provide students with the opportunity to share ideas, collaborate on assignments, and benefits of cloud storage and organization. From Siemens’ (2004) Connectivism theory, learning can take place from interactions with technology and the information that is contained within the technology tools. Information resides in and can be created within shared files, so file-sharing tools can be a direct support for peer learning, group assignments, and group research projects where active learning can take place. Corbett and Spinello (2020) discussed that through digital technologies both teachers and learners can be contributors to knowledge creation that can support learning. With file-sharing tools, students and groups have access to be content contributors with the ability to edit and collaborate on information in real-time within the shared cloud environment. This type of collaborative tool may also provide students with greater accessibility to peer and collaborative learning by providing easy access from multiple devices. Participants in the study frequently reported that they used file-sharing tools for collaboration, group work, and organization.

Telecommunications applications had the second highest frequency of use among the participants. These tools were also considered supportive tools for collaboration and communication. Tools like Zoom were identified in the participant responses as being utilized for academic support for activities like class lectures, faculty and peer communication, and group

work. These collaborative tools can support learning as an avenue for information exchange and interactive communication.

Social networking tools were not reported with a high frequency of use for academic coursework, research or academic goals; the study revealed 25.76% identified use frequency as “Always Use” or Frequently Use.” The lower use rating for this category was somewhat unexpected, as some previous research indicated that the use of social networking tools for academic support have positive applications for students. For example, earlier research conducted by Morton et al. (2019) found that a social work program’s use of social media tools potentially contributed to an increase in student engagement and participation within the program. Additional research conducted by Awidi et al. (2019) showed that social media tools helped students to build a sense of community within the class and the researchers noted that the platforms were familiar to many students. Awidi et al.’s (2019) research focused on social media tools that were structured within course activities and had specific uses and goals, so perhaps students are not regularly using social networking tools for academic support unless they have a specific structure for use and defined goals.

Some Web resources and tools can be accessed within LMSs, and a student’s use of these tools may be influenced by the attitudes of their instructors. Research by Bervell et al. (2020) described that in online and blended learning, the attitudes of educational facilitators towards the LMS were affected by concepts like expected effort needed and technical ability required for use. In their study, attitude played a role in how educational facilitators utilized the LMS, which influenced how their students used the LMS and the systems tools. With this concept, while social networking tools may be available within a LMS, attitudes toward using the Web tool could have an impact on overall use. Tools that are less frequently utilized or recommended by

peers and faculty may lead to fewer students trying and using the tools regularly. In this study, there were not any tools that stood out with a high percentage of students rating them as “Don’t Use But Plan to Use”, the highest tools with this rating were Note-taking applications and Webinars. Additionally, for tools that support collaboration and communication like the social networking tools, if peers and faculty are not using the tools for academic purposes, there would potentially be less of a benefit for use.

Some of the Web resources and tools were identified with a low level of use: blogs, social bookmarking, and note-taking applications. Many of the graduate student participants in this study were not utilizing these tools on a regular basis. Research by Dowing and Wilson (2017) found that students may be more likely to utilize Web tools and resources that they identified may directly assist with their degree completion. It is likely that the Web resources and tools being utilized at a low frequency of use may not be considered as beneficial in supporting their academic goals. Perceived usefulness of a Web tool was also a factor in Hartshorne and Ajjan’s (2009) research, and they described attitude as a factor influencing student use of Web tools, such as blogs, wikis, social networking, and social bookmarks. For this study, the perceived usefulness of some Web resources and tools in regards to meeting academic goals may be low among the study population and that is hindering the use of some Web tools. Attitudes and perceived usefulness of Web resources and tools may also vary among programs; some tools may have less relevance within specific curriculum. Other factors influencing low use may be that students are unfamiliar with some of the tools and need direction on using the technology which was a concept described in from Echeng and Usoro (2016).

Discussion Research Question 2: What are the differences in the frequency of student usage of Web resources and tools based on enrollment in a fully online, blended or face-to-face programs?

The second research question focused on program modality types and frequency of use with Web resources and tools. A one-way between subjects ANOVA test was conducted to compare the frequency of Web resources and tools use among the participants in face-to-face programs, mixed mode programs, and fully online programs. The data results found that there was a significant difference in frequency of use for type of program mode at the $p < .05$ level for the three conditions [$F(2, 857) = 8.85, p = 0.000157$]. A Tukey HSD post hoc comparison test showed that the mean score for use frequency in face-to-face programs was significantly different than use frequency in online programs. The results indicate that the use of Web resources and tools for academic support was higher among students in face-to-face programs than among those in online programs. Study participants in face-to-face programs reported using Web resources and tools at a higher frequency than participants in online programs.

This result was unexpected since online students are completing most if not all of their academic work in the online environment. Online students have a direct need to use Web resources and tools for their course work, potentially at a higher frequency than face-to-face students, but perhaps many online students find working within the online course LMS to be an effective tool and have less of a need to use additional tools. Many LMS systems have built in Web resources and tools like discussion boards and internal email, so there are often many collaborative tools already available. The survey data showed that the top frequently used Web resources and tools were collaborative tools, so the collaborative tools within the course LMS

may be effective and regularly utilized enabling students to meet many of their academic support needs.

The LMS for online courses at the University of Central Florida (UCF) is Canvas. Students can access a variety of external Web apps/tools from within Canvas, such as internal Wiki for collaboration, Wikipedia, Vimeo, Twitter, and Google Docs. Access to Web resources and tools through the online learning environment at UCF could assist with providing convenient access to a network of course work support tools for online learners. This provides further intrigue regarding the lower frequency of use of Web resources and tools for online students in contrast to the use of face-to-face students. The LMS was not listed as a Web resource and tool category on the survey so information about LMS use as a Web tool was not directly gathered.

Research comparing course work of face-to-face students and online students shows both similarities and differences among the groups. Research conducted by Soffer and Nachmias (2018) examined course effectiveness criteria in several sections of the same course taught both online and face-to-face by the same instructor. Online courses were identified by the criteria in their study as having the same effectiveness in many ways or possibly being more effective than the face-to-face course sections. Their study reported that the online students identified a higher rate of understanding with the course structure, “better communication with the course staff, watching the videos lessens more, and higher engagement and satisfaction” (p. 535). While this study does not focus on the use of Web resources and tools in academic work, it demonstrated that Personal Learning Environments (PLE) created with the online course sections seemed to be effective environments and structures for student learning. Communication with the course staff was identified with a high rate of effectiveness in Soffer and Nachmias’s (2018) study, so this may be an indicator of effective communication tools within the online course structure. If online

course structures can effectively accommodate avenues for communications, which could also support collaboration, it may create less of a need for additional communication tools external to the course structure.

During the semester that the survey was deployed, the COVID pandemic was taking place and policies were implemented at UCF that required all Summer 2020 courses to be conducted online. While this was an unprecedented adjustment to the academic structure at UCF, it is unknown how this adjustment affected participant responses to the survey. Overall, differences in the groups provide an avenue for further investigation. Many factors could contribute to the program modality frequency difference in the Web resources and tools use, and further examination would assist in determining the relationships between graduate students, program modality, and Web resources and tools use.

Discussion Research Question 3: What are the graduate student perceptions of usefulness regarding the Web resources and tools that they are using to support their academic goals?

In this study, data was collected regarding participant perceptions of usefulness for the 13 Web tools and resources categories identified in the survey. The top four categories with the highest perceptions of usefulness were the same four categories identified with the highest frequency of use: file-sharing tools, telecommunications applications, video-sharing applications, and instant messaging. Wikis, online surveys, and data analysis applications were also identified in over half of the participant's responses as "Very Useful" or "Somewhat Useful".

Overall, many of the Web resources and tools were identified to be useful to some level when compared to the number of participants that had used the tools. For example, in the responses for Note-taking Applications, the highest number of responses identifying that they were "Not Familiar With Resource or Tool", and the responses of "Very Useful" and "Somewhat

Useful” would rank as the second highest with their combined total. A small portion of the participants that were familiar with note-taking applications identified them as “Not Very Useful” or Not Useful At All”, so the data illustrated that a majority of the participants that had used note-taking applications found them to be useful.

Similarly, Data Analysis Applications and Reference Management Tools had low response rates of “Not Very Useful” or Not Useful At All”. A majority of the participants that had used the tools identified them as “Very Useful” and “Somewhat Useful”. Over 30% of the responses for Data Analysis Applications and Reference Management Tools were “Not Familiar With Resource or Tool”. For the study participants that had used these tools, many of them are finding them to be useful. These are the types of tools that may be the most helpful for students to have the opportunity to learn more about, as these tools are not being utilized by a high number of the participants but they are reported to be useful for those that are using them for coursework and research support. Although, some tools such as Data Analysis Applications have features that might not be needed by students in all majors, so this would be something to consider when identifying possible trainings and workshops for professional development related to using Web resources and tools for academic support.

A large number of study participants, 37.90%, have reported that they are not familiar with Reference Management Tools, and this reporting may be similar to Data Analysis Applications where not all participants have a need to use the tools. However, the lack of familiarity may also be due to the complexity of use of the tools and some participants might not be eager to try them. Previous research found that reference management tools could be complex to use and the time that it would take to learn how to use the tools may deter some students from trying them. Khwaj and Eddy’s (2015) research of students using the reference management

application Mendeley found that some students had difficulties with learning to use the tool, and that it took time to learn to use the tool in a meaningful way. A student may be less willing to try a tool and determine if it is useful if they feel that it will be time consuming to learn and if they do not feel confident in their own technical abilities. This would be a consideration regarding a potential training or workshop about the tool, further information for students could be a helpful way to assist them with identifying benefits of use and further understanding of how to use the applications for academics.

Social Bookmarking had less than a quarter of the responses that identified the tool usefulness as “Very Useful” or “Somewhat Useful”, and 50.92% of responses identifying this category as “Not Very Useful” or “Not Useful At All”. This is consistent with the responses related to the use of the tools, over half of the use frequency responses were “Do Not Use” and a low number of responses identified this tool as something that they may plan to use. While a little over a quarter of participants reported that they were not familiar with social bookmarking tools, the data suggests that overall social bookmarking tools are not a popular in the participants’ PLNs for use with academics.

The usefulness perceptions of Web resources and tools was relatively consistent with what the participants identified that they were using. Collaborative Web resources and tools were found to be the most useful, and they were also reported to be the most used by the participants. Some tools that were shown by participants to be useful are not tools that seem to be familiar with a portion of the participants. These are factors to consider when identifying possible professional development opportunities or considering new Web resources and tools to promote or potentially sponsor access to.

Discussion Research Question 4: How are students using the resources and tools that they perceive as useful?

This study collected qualitative data to examine how participants were using the Web resources and tools that they perceived as useful. The top five Web tools and resources that participants identified were: Zoom, Google Docs, YouTube, Google Drive, and UCF Library Online. These are partially consistent with the quantitative data collected regarding Web resources and tools use, with Telecommunications Applications and File-Sharing being the top categories identified regarding use and perceptions of usefulness. Collaborative tools were consistently reported to have a higher frequency of use and perceived usefulness by participants.

Through the review of qualitative data, four main usage group themes emerged from the responses: Coursework Support, Collaboration, Research Support, and Cloud Based Support. These main group themes encompassed how the participants had described using and benefitting from the Web resources and tools overall. The data analysis also consisted of identified specific usage themes that further broke down how the tools were being used directly, like top themes of Course Work Support (General) and Collaboration (General). Course Work Support had the highest number of identified usage themes, which demonstrated that the participants are using these tools the most to support their course work. Participants often described the Web resources and tools with dual purposes, such as Google Docs, which may assist with writing papers, keeping assignments organized, and completing group work. Some tools were regularly reported with multipurpose functions, which may also be why they are used often and reported to be useful, like the file-sharing tool of Google Docs.

The usage themes that emerged from the qualitative data and formed the usage group themes were consistent with the quantitative data findings of use and perceived usefulness of

Web resources and tools. The top two usage themes were Course Work Support (General) and Collaboration (General). The top identified tools from the qualitative data were Zoom and Google Docs, which are both collaborative tools. Collaborative tools were consistently reported in this study as being frequently used and useful. Collaborative tools were often reported to help participants collaborate with peers and faculty, and also for assistance with group work. Further research related to the use of collaborative tools could help provide insight into the extent that these tools assist with learning or whether the benefit is more related to access.

Significance of the Study

This mixed methods study set out to examine graduate student use and perceptions of usefulness of Web resources and tools to identify which were reported as useful in the support of their academic work, research, and academic goals. This study found that file-sharing tools and telecommunications applications were being used most frequently among the resources and tools identified on the survey. This finding was consistent with the top identified Web resources and tools in the qualitative data, with Zoom and Google Docs reported most often by the participants as beneficial for use. File-sharing tools and telecommunications applications were also reported to be the most useful of the identified tools in the survey categories. The qualitative data also showed that participants are using the Web resources and tools most often to support course work, and additional usage groups themes that emerged were collaboration, research support, and cloud support.

Data analysis showed that participants that reported enrollment in face-to-face programs identified a higher frequency of use of Web resources and tools than participants in online programs. This is an important finding to consider in regard to creating professional development workshops and training, and understanding the needs of students enrolled in different program

modalities are different. Also, this leads to research being developed on factors related to tools usage of the students based on program modality. Further research would need to be conducted to help understand the factors that may contribute to the statistical difference from these groups. Development of trainings and professional development opportunities might not be adequate if a workshop focus would be to all graduate students, and further research could help to provide understanding of whether multiple workshops directed to students in different types of program modalities may be more effective.

Overall, the reported data supports that the study participants were using several collaborative tools regularly, and these Web resources and tools were also identified as useful in support of academic course work, research, and academic goals. The study data illustrated that the participants used Web resources and tools most often in support of course work and collaboration in academics. Further research could help to provide additional understanding related to the factors behind reported usage frequency and how Web resources and tools are identified for use.

Conclusion

This research study examined graduate student use and perceptions of usefulness of Web resources and tools to identify what is being used and reported as useful in the support of their academic work, research, and academic goals. Participants in the study reported Telecommunications Applications and File-sharing Applications as the most frequently used Web resources and tools, and also the tools that were perceived to be the most useful. The examination of qualitative data showed that Zoom and Google Docs were the most consistently used Web applications, which is consistent with the frequency of use and perceptions of usefulness data. Participants were using the Web resources and tools the most to support course

work, but they were also using them for collaboration, research support, and cloud support. Web resources and tools have a wide variety of assistive functions and can be either formal or informal resources (Bauer, 2010).

Data analysis revealed that participants in face-to-face programs reported a higher frequency of use for Web resources and tools than participants in online programs. Many factors could contribute to the statistical difference in the Web resources and tools frequency of use between these groups. The reported data supports that the graduate student participants were using several collaborative tools regularly and these tools were also reported as beneficial to the support of academic course work, research, and academic goals.

The data from this study could help to create meaningful workshops for UCF graduate students on topics regarding the use of Web resources and tools and how they could support academics. Creating opportunities for professional development related to the use of Web resources and tools could benefit students by helping them add to their PLNs. Larger student PLNs have been shown to be correlated with higher course grades (Casquero et al., 2016). Web tools can help students with many types of academic support, for example improved course notes, higher quality assignments, and course discussions (Mahindru, 2018).

The study data could also help educational leaders to make decisions related to access of Web resources and tools that could be sponsored through the university. Information illustrated in the study could assist with facilitating supportive actions; creating opportunities to support UCF graduate students by helping them to understand beneficial uses of Web resources and tools or to offer support with access to various supportive resources and tools. This study provided details about what types of support our graduate students are benefitting from, which could help guide how further support could be created or harnessed related to these Web resources and tools

and potentially help students build the supportive networks needed to persist in their academic goals.

Recommendations For Future Research

Considering the data results from this study along with previous research, additional research studies could help to provide understanding that may assist with the examination of how Web resources and tools can support students in their course work, research, and academic goals. The following recommendations for future study are suggested to further examine important themes that emerged from the data and greater understanding could be beneficial in the higher education setting.

With a significant difference found between Web resources and tools use and program mode, further research should be conducted to examine factors that may contribute to a higher frequency of use of Web resources and tools among students in face-to-face programs versus students in online programs. Additionally, further research would be needed to understand why there is a significant difference of Web resources and tools frequency of use with face-to-face and online graduate students. While research conducted by Soffer and Nachmias (2018) found that the effectiveness was the same for course sections of a particular course taught face-to-face and online, how students arrive at the end result of the course may be different depending on the course mode. This may include varying levels of support from Web resources and tools. It would also be suggested to further examine the use of internal and external tools in the LMS may help to provide understanding of its effects in the overall use of Web resources and tools and program mode. Additional research is suggested to examine the use of LMS resources and tools and perceptions of usefulness.

Future research should also be conducted to examine if the frequency of use of Web resources and tools to support academic course work, research, and academic goals has an effect on student attitudes toward academic persistence. Research conducted by Casquero et al. (2016) supported that a larger PLN of a student was consistent with a higher earned grade. Related to academic goals, research could be conducted to examine if the frequency of use of Web resources and tools to support academics has an influence on student grades. The additional access to different types of support may be related to both persistence and grades. Additional research should be conducted to examine how expanded access through the use of Web resources and tools assists with supporting student academics, such as greater access to collaboration opportunities and virtual versions of face-to-face resources

There are many factors that could influence the use frequency of Web resources and tools. Further research should be conducted to examine if peer and faculty recommendations influence the frequency of use of Web resources and tools to support academics. Some previous research showed that instructors were increasingly using technology to enhance learning, promote active learning and peer interactions (Tess, 2013), and additionally building learning communities using technology (Awidi et al., 2019). Factors related to Web resources and tools use may also be related to a student's previous academic experience. Future research should be conducted to examine differences in Web resources and tools use between a student's undergraduate and graduate careers.

APPENDIX A: ONLINE SURVEY INSTRUMENT



EXPLANATION OF RESEARCH

Title of Project: Investigating Graduate Student Perspectives and Use of Web Resources and Tools for Academic Support

Principal Investigator: Kelly Grieneisen Tillotson (Doctoral Student)

Other Investigators: Co-Investigator/Faculty Mentor: Glenda Gunter, PhD

Faculty Supervisor: Glenda Gunter, PhD

You are being invited to take part in a research study. Whether you take part is up to you.

This research study is part of a Dissertation in Practice project where the data collected will be analyzed and the results will be presented in the final research study report. This portion of the study will use an online survey to collect data from graduate students at UCF in order to increase understanding of graduate student perspectives and usage of Web resources and tools to support academic goals. The research study will help educational leaders to explore opportunities to provide guidance to graduate students regarding the use of Web resources and tools, such as designing a professional development workshop for graduate students about the supportive uses of Web resources and tools in academics. In addition, this research can help provide knowledge to educators and faculty regarding useful Web resources and tools that may be beneficial for use with educational instruction.

The online survey is comprised of four sections. The first section contains questions related to demographic and academic information. The following sections 2-4 consist of questions related to the use and usefulness of Web resources and tools used for academic course work and research, and the description of how the Web resources and tools are used.

This survey is entirely online. The time needed to complete this survey is approximately 5-10 minutes. Your participation in this study is voluntary. You are free to withdraw your involvement and discontinue participation in this study at any time without prejudice or penalty. Your decision to participate or not participate in this study will in no way affect your relationship with UCF, including continued enrollment, grades, employment or your relationship with the individuals who may have an interest in this study. No identifiable private information will be collected at any time. Only the researchers will have access to the collected information.

You must be 18 years of age or older to take part in this research study.

Study contact for questions about the study or to report a problem: Please contact the research team with questions about the study or to report a problem. If you have questions,

concerns, or complaints, or think the research has effected you in a negative way, please talk to the research team: Kelly Grieneisen Tillotson, Doctoral Student Investigator at Kelly.tillotson@ucf.edu or Dr. Glenda Gunter, Faculty Mentor, Department of Learning Science and Educational Research, Glenda.Gunter@ucf.edu.

IRB contact about your rights in this study or to report a complaint: If you have questions about your rights as a research participant, or have concerns about the conduct of this study, please contact Institutional Review Board (IRB), University of Central Florida, Office of Research, 12201 Research Parkway, Suite 501, Orlando, FL 32826-3246 or by telephone at (407) 823-2901, or email irb@ucf.edu.

By clicking the button below, you acknowledge that your participation in the study is voluntary, you are 18 years of age, and that you are aware that you may choose to terminate your participation in the study at any time and for any reason without any penalty.

Please note that this survey will be best displayed on a laptop or desktop computer. Some features may be less compatible for use on a mobile device.

- I consent, begin the study
- I do not consent, I do not wish to participate

Condition: I do not consent, I do not wish to participate is selected. Skip to: End of Survey.

Web Resources and Tools Graduate Student Perspective Survey

Demographic and Academic Information

1. What is your current academic level:

- Graduate Certificate
- Master's
- Specialist
- Doctoral
- Other

2. What is your gender:

- Female
- Male
- Non-binary/third gender

- Prefer to self-describe _____
- Prefer not to answer

3. Your ethnic background:

- American Indian or Alaskan Native
- Asian
- Black
- Hispanic or Latino/a
- Native Hawaiian or other pacific Islander
- White
- Other _____
- Prefer not to answer

4. Your College of Study at UCF:

- Arts & Humanities
- Burnett Honors College
- Business Administration
- Community Innovation & Education
- Engineering & Computer Science
- Graduate Studies
- Health Professions and Sciences
- Medicine
- Nursing
- Optics & Photonics
- Rosen College of Hospitality Management
- Sciences
- Other

5. What is your typical enrollment status?

(Full-time: 9 or more credit hours; 3 or more for Dissertation/Thesis credit hours)

- Full-time
- Part-time

6. What type of course mode is your graduate program?

- Face-to-face

- **Mixed mode (face-to-face and online courses)**
- **Fully online**

If mixed mode, please indicate the estimated percentage of online course work in the program.

- **25%**
- **50%**
- **75%**
- **Not Sure**

7. As a UCF graduate student, what type of course modalities have you taken? Check all that apply

- **Face-to-face**
- **Mixed mode/reduced seat time**
- **Video streaming/reduced seat time**
- **Active learning/reduced seat time**
- **Fully online**

Web Resources and Tools Use

In this section, please reflect on your use of Web resources and tools that you use for academic support with course work, research, and/or academic goals.

To what extent do you use the following Web resources and tools to support your academic course work, research, and/or academic goals:

Web Resource or Tool	Always Use 5	Use Frequently 4	Use occasionally 3	Don't use but plan to use 2	Don't Use 1
Blogs (Ex.: Weebly, WordPress)	○	○	○	○	○

Online Surveys (Ex.: Kahoot!, Survey Monkey)	○	○	○	○	○
Wikis (Ex.: Wikihow, Wikipedia)	○	○	○	○	○
Social Networking (Ex.: Facebook, Twitter)	○	○	○	○	○
Social Bookmarking (Ex.: Digg, Pinterest)	○	○	○	○	○
Instant Messaging (Ex.: WhatsApp, Messenger)	○	○	○	○	○
Telecommunication (Video) Applications (Ex.: Zoom, Hangouts)	○	○	○	○	○
Data Analysis Applications (Ex.: SPSS, SAS)	○	○	○	○	○

Reference Management Tools (Ex.: Endnote, Refworks)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Video-sharing (Ex.: YouTube, Vimeo)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Webinars (Ex.: Lynda, EdWeb)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
File-sharing Tools (Ex.: Dropbox, Google Docs)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Note-taking Applications (Ex. Evernote, Simplenote)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other Resource/Tool: -----	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Perceptions of Web Resources and Tools

Please identify *how useful* that the listed Web resources and tools are in supporting your academic course work, research, and/or academic goals. If you are not familiar with the resource/tool, please select the “Not Familiar With Resource/Tool” option.

Web Resource or Tool	Very Useful 5	Somewhat Useful 4	Not Very Useful 3	Not Useful at All 2	Not Familiar With Resource/Tool 1
Blogs (Ex.: Weebly, WordPress)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Online Surveys (Ex.: Kahoot!, Survey Monkey)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Wikis (Ex.: Wikihow, Wikipedia)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Social Networking (Ex.: Facebook, Twitter)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Social Bookmarking (Ex.: Digg, Pinterest)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Instant Messaging (Ex.: WhatsApp, Messenger)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Telecommunication (Video) Applications (Ex.: Zoom, Hangouts)	○	○	○	○	○
Data Analysis Applications (Ex.: SPSS, SAS)	○	○	○	○	○
Reference Management Tools (Ex.: Endnote, Refworks)	○	○	○	○	○
Video-sharing (Ex.: YouTube, Vimeo)	○	○	○	○	○
Webinars (Ex.: Lynda, EdWeb)	○	○	○	○	○
File-sharing Tools (Ex.: Dropbox, Google Docs)	○	○	○	○	○
Note-taking Applications (Ex. Evernote, Simplenote)	○	○	○	○	○

Other					
Resource/Tool:	○	○	○	○	○

Student Stories of Web Resources and Tools

In this section, please reflect on your perspectives regarding the use of the Web resources and tools listed above for the support of your academic goals.

Please identify which category or specific resource/tool that you have found to be the most useful, and list ways that it is beneficial to your academic course work, research, and/or academic goals.

APPENDIX B: IRB APPROVAL LETTER



UNIVERSITY OF CENTRAL FLORIDA

Institutional Review Board
FWA0000351
IRB00001138, IRB00012110
Office of Research
12201 Research Parkway
Orlando, FL 32826-3246

EXEMPTION DETERMINATION

June 19, 2020

Dear Kelly Grieneisen Tillotson:

On 6/19/2020, the IRB determined the following submission to be human subjects research that is exempt from regulation:

Type of Review:	Initial Study, Initial Study
Title:	Investigating Graduate Student Perspectives and Use of Web Resources and Tools for Academic Support
Investigator:	Kelly Grieneisen Tillotson
IRB ID:	STUDY00001858
Funding:	None
Grant ID:	None
Documents Reviewed:	<ul style="list-style-type: none"> • Gunter_signedHRP-251 - FORM - Faculty Advisor Review, Category: Faculty Research Approval; • HRP-254-FORM Explanation of Research, Category: Consent Form; • HRP-255_KGT.v2, Category: IRB Protocol; • Online Survey Tool, Category: Survey / Questionnaire; • Study_Invitation Email, Category: Recruitment Materials; • Study_Notification Email, Category: Recruitment Materials; • Study_Second Invitation Email, Category: Recruitment Materials;

This determination applies only to the activities described in the IRB submission and does not apply should any changes be made. If changes are made, and there are questions about whether these changes affect the exempt status of the human research, please submit a modification request to the IRB. Guidance on submitting Modifications and Administrative Check-in are detailed in the Investigator Manual (HRP-103), which can be found by navigating to the IRB Library within the IRB system. When you have completed your research, please submit a Study Closure request so that IRB records will be accurate.

If you have any questions, please contact the UCF IRB at 407-823-2901 or irb@ucf.edu. Please include your project title and IRB number in all correspondence with this office.

Sincerely,

A handwritten signature in cursive script that reads "Gillian Bernal".

Gillian Bernal
Designated Reviewer

APPENDIX C: STUDY RECRUITMENT EMAILS

Email 1: Notification Email

Hello UCF Graduate Student,

I hope that your semester is going well. I am a doctoral student in the Curriculum and Instruction EdD program and I am conducting a research study for my Dissertation in Practice regarding graduate student perspectives and use of Web resources and tools. Dr. Gunter is my adviser and I am working very closely with her on my research project. This email is to invite you to participate in the online survey that will be opening very soon.

When the survey opens, you will receive an email in you campus Knights email account with the online survey link. Participation is voluntary, and it should only take approximately 5-10 minutes to complete the online survey. Your answers will be completely anonymous. No personally identifying information will be collected. Thank in advance for your consideration to take part in the survey and to share your opinions and perceptions as a graduate student.

If you have any questions or comments about this research study, we would be happy to talk with you. Please contact Kelly Grieneisen Tillotson at Kelly.Tillotson@ucf.edu, we can set up a Zoom meeting or phone call as well.

Please check your Knights email soon for the online survey invitation email.

Best Regards,
Kelly Grieneisen Tillotson
Doctoral Student - Curriculum and Instruction, EdD
Kelly.tillotson@ucf.edu

Email 2: Invitation Email

Hello UCF Graduate Students,

Last week I reached out to you regarding a research study that I am conducting as part of my Dissertation in Practice. I am working closely with Dr. Gunter on this project; she is my faculty adviser in the Curriculum and Instruction EdD program.

You are being invited to participate in a research study that will collect data from UCF graduate students through an online survey. The data will help to increase understanding of graduate student perspectives and usage of Web resources and tools to support academic goals. The research study will assist educational leaders to explore opportunities to provide guidance to graduate students regarding the use of Web resources and tools, such as designing professional development workshops for graduate students about the supportive uses of Web resources and tools in academics.

Participation is voluntary, and it should only take approximately 5-10 minutes to complete the online survey. Your answers are completely anonymous. No personally identifying information

is being collected. Thank in advance for taking the time to share your opinions and perceptions. The insight we glean from your participation can help to move our research forward which could create future informational programs for graduate students to help them achieve their academic goals.

If you would like to participate in the research study, please access the survey by clicking this link: http://ucf.qualtrics.com/jfe/form/SV_9B98lifjKXGnf8N

If you have any questions or comments about this study, we would be happy to talk with you. Please contact Kelly Grieneisen Tillotson at Kelly.Tillotson@ucf.edu or by phone at 407-823-2895.

Thank you in advance for helping with this important study. This survey link will close on July 26, 2020.

Best Regards,

Kelly Grieneisen Tillotson
Doctoral Student - Curriculum and Instruction, EdD
Kelly.tillotson@ucf.edu

Email 3: Second Invitation Email

Hello UCF Graduate Students,

Thank you very much to all who have participated in the research study survey! Your input is greatly appreciated. This email is a reminder that the survey is still open for anyone that has not yet participated but would like to.

As a reminder, participation is voluntary and it should only take approximately 5-10 minutes to complete the online survey. Your answers are completely anonymous. No personally identifying information is being collected. Thank in advance for taking the time to share your opinions and perceptions about Web resources and tools usage to support academic goals.

If you would like to participate in the research study, please access the survey by clicking this link: http://ucf.qualtrics.com/jfe/form/SV_9B98lifjKXGnf8N

If you have any questions or comments about this study, we would be happy to talk with you. Please contact Kelly Grieneisen Tillotson at Kelly.Tillotson@ucf.edu.

This survey link will close on July 26, 2020.

Best Regards,

Kelly Grieneisen Tillotson

Doctoral Student - Curriculum and Instruction, EdD
Kelly.tillotson@ucf.edu

APPENDIX D: PILOT STUDY APPROVAL LETTER



Institutional Review Board
 FWA00000351
 IRB00001138, IRB00012110
 Office of Research
 12201 Research Parkway
 Orlando, FL 32826-3246

UNIVERSITY OF CENTRAL FLORIDA

NOT HUMAN RESEARCH DETERMINATION

March 4, 2020

Dear [Kelly Grieneisen Tillotson](#):

On 3/4/2020, the IRB reviewed the following protocol:

Type of Review:	Initial Study
Title of Study:	Pilot Study Examining Graduate Student Perspectives and Use of Web Resources and Tools for Academic Support
Investigator:	Kelly Grieneisen Tillotson
IRB ID:	STUDY00001505
Funding:	None
Grant ID:	None
Documents Reviewed:	• HRP-250 - FORM - Request for NHSR-KGT, Category: IRB Protocol;

The IRB determined that the proposed activity is not research involving human subjects as defined by DHHS and FDA regulations.

IRB review and approval by this organization is not required. This determination applies only to the activities described in the IRB submission and does not apply should any changes be made. If changes are made and there are questions about whether these activities are research involving human in which the organization is engaged, please submit a new request to the IRB for a determination. You can create a modification by clicking **Create Modification / CR** within the study.

If you have any questions, please contact the UCF IRB at 407-823-2901 or irb@ucf.edu. Please include your project title and IRB number in all correspondence with this office.

Sincerely,

Racine Jacques, Ph.D.
 Designated Reviewer

APPENDIX E: PILOT STUDY RECRUITMENT EMAILS

Email 1: Notification Email

Hello UCF Graduate Student,

I hope that your semester is going well. I am a doctoral student in the Curriculum and Instruction EdD program and I am conducting a research study for my Dissertation in Practice regarding graduate student perspectives and use of Web resources and tools. Dr. Gunter is my adviser and I am working very closely with her on my research project. This email is to invite you to participate in a pilot study to test the survey tool that we have created for the upcoming study.

Participation is voluntary, and it should only take approximately 5-10 minutes to complete the online survey. Your answers will be completely anonymous. No personally identifying information will be collected. Thank in advance for your consideration to take part as a volunteer to share your opinions and perceptions as a graduate student.

If you would like to participate in the pilot study, please access the survey by clicking this link:
http://ucf.qualtrics.com/jfe/form/SV_e5vXdJx1WGCamnH

If you have any questions or comments about this pilot study, we would be happy to talk with you. Please contact Kelly Grieneisen Tillotson at Kelly.Tillotson@ucf.edu or by phone at 407-823-2895.

Best Regards,
Kelly Grieneisen Tillotson
Doctoral Student - Curriculum and Instruction, EdD
Kelly.tillotson@ucf.edu

Email 2: Second Notification Email

Hello UCF Graduate Students,

Thank you to all of the volunteers that have participated in the pilot study thus far; your involvement is greatly appreciated. The pilot study survey link will remain open until April 10th, so if you have not taken the survey yet and would like to participate as a volunteer you are still able to do so.

As a reminder from the previous message, participation is voluntary and it should only take approximately 5-10 minutes to complete the online survey. Your answers will be completely anonymous. No personally identifying information will be collected. Thank in advance for your consideration to take part as a volunteer to share your opinions and perceptions as a graduate student.

If you would like to participate in the pilot study, please access the survey by clicking this link:
http://ucf.qualtrics.com/jfe/form/SV_e5vXdJx1WGCamnH

If you have any questions or comments about this pilot study, we would be happy to talk with you. Please contact Kelly Grieneisen Tillotson at Kelly.Tillotson@ucf.edu or by phone at 407-823-2895.

Best Regards,
Kelly Grieneisen Tillotson
Doctoral Student - Curriculum and Instruction, EdD
Kelly.tillotson@ucf.edu

APPENDIX F: PILOT STUDY ONLINE SURVEY

Pilot Study: Web Resources and Tools Graduate Student Perspective Survey

Welcome to the research study!

EXPLANATION OF RESEARCH

Title of Project: Pilot Study Examining Graduate Student Perspectives and Use of Web Resources and Tools for Academic Support

Principal Investigator: Glenda Gunter, PhD (faculty Mentor)

Co-Investigator: Kelly Grieneisen Tillotson (Doctoral Student)

You are being invited to take part in a pilot research study. Whether you take part is up to you.

This is a pilot study to review the validity and reliability of an online survey instrument that is to be used in an upcoming research project. This survey is proposed to be used in a project that will collect data to increase understanding of graduate student perspectives and use of Web resources and tools to support academic goals. The research study will help educational leaders to explore opportunities to provide guidance to graduate students regarding the use of Web resources and tools, such as designing a professional development workshop for graduate students about the supportive uses of Web resources and tools in academics. In addition, this research can help provide knowledge to educators and faculty regarding useful Web resources and tools that may be beneficial for use with educational instruction.

This is a two part pilot study. First, participants will be asked to complete an online survey. Once the invitation is sent via campus email, participants will have one week to complete the online survey. For the second part of the pilot study, the following week after the initial survey completion, participants will be asked to take the same survey a second time. After the second survey, participation is complete.

The online survey is comprised of four sections. The first section contains questions related to demographic and academic information. The following sections 2-4 consist of questions related to the use and usefulness of Web resources and tools used for academic course work and research, and the description of how the Web resources and tools are used.

This survey is entirely online. The time needed to complete this survey is approximately 5-10 minutes. Your participation in this study is voluntary. You are free to withdraw your involvement and discontinue participation in this study at any time. No identifiable private information will be collected at any time. Only the researchers will have access to the collected information. You must be 18 years of age or older to participate in the pilot study.

Study contact for questions about the study or to report a problem: If you have questions, concerns, or complaints, or think the research has effected you in a negative way, talk to the research team: Dr. Glenda Gunter, Faculty Mentor, Department of Learning Science and Educational Research, Glenda.Gunter@ucf.edu.

IRB contact about your rights in this study or to report a complaint: If you have questions about your rights as a research participant, or have concerns about the conduct of this study, please contact Institutional Review Board (IRB), University of Central Florida, Office of Research, 12201 Research Parkway, Suite 501, Orlando, FL 32826-3246 or by calling 407-823-3778.

By clicking the button below, you acknowledge that your participation in the study is voluntary, you are 18 years of age, and that you are aware that you may choose to terminate your participation in the study at any time and for any reason.

Please note that this survey will be best displayed on a laptop or desktop computer. Some features may be less compatible for use on a mobile device.

- I consent, begin the study
- I do not consent, I do not wish to participate

Condition: I do not consent, I do not wish to participate is selected. Skip to: End of Survey.

Q1. Please create a survey code. This code will need to be used when the survey is retaken. This will serve as a way to match the survey responses for the test-retest correlation analysis.

****If you are currently retaking the survey, please add your previously created survey code below. The code should include 3 numbers and one letter in any order.**

Demographic and Academic Information

Q2. What is your current academic level:

- Graduate Certificate
- Master's
- Specialist
- Doctoral
- Other

Q3. What is your gender:

- Female
- Male

- **Non-binary/third gender**
- **Prefer to self-describe _____**
- **Prefer not to answer**

Q4. Your ethnic background:

- **American Indian or Alaskan Native**
- **Asian**
- **Black**
- **Hispanic or Latino/a**
- **Native Hawaiian or other pacific Islander**
- **White**
- **Other _____**
- **Prefer not to answer**

Q5. Your College of Study at UCF:

- **Arts & Humanities**
- **Burnett Honors College**
- **Business Administration**
- **Community Innovation & Education**
- **Engineering & Computer Science**
- **Graduate Studies**
- **Health Professions and Sciences**
- **Medicine**
- **Nursing**
- **Optics & Photonics**

- Rosen College of Hospitality Management**
- Sciences**
- Other**

Q6. What is your typical enrollment status?

(Full-time: 9 or more credit hours; 3 or more for Dissertation/Thesis credit hours)

- Full-time**
- Part-time**

Q7. What type of course mode is your graduate program?

- Face-to-face**
- Mixed mode (face-to-face and online courses)**
- Fully online**

Q7a. If mixed mode, please indicate the estimated percentage of online course work in the program.

- 25%**
- 50%**
- 75%**
- Not Sure**

Q8. As a UCF graduate student, what type of course modalities have you taken? Check all that apply

- Face-to-face**
- Mixed mode/reduced seat time**
- Video streaming/reduced seat time**
- Active learning/reduced seat time**

- Fully online

Web Resources and Tools Use

In this section, please reflect on your use of Web resources and tools that you use for academic support with course work, research, and/or academic goals.

Q9. To what extent do you use the following Web resources and tools to support your academic course work, research, and/or academic goals:

Web Resource or Tool	Always Use 5	Use Frequently 4	Use occasionally 3	Don't use but plan to use 2	Don't Use 1
Blogs (Ex.: Weebly, WordPress)	○	○	○	○	○
Online Surveys (Ex.: Kahoot!, Survey Monkey)	○	○	○	○	○
Wikis (Ex.: Wikihow, Wikipedia)	○	○	○	○	○
Social Networking (Ex.: Facebook, Twitter)	○	○	○	○	○

Social Bookmarking (Ex.: Digg, Pinterest)	○	○	○	○	○
Instant Messaging (Ex.: WhatsApp, Messenger)	○	○	○	○	○
Telecommunication (Video) Applications (Ex.: FaceTime, Hangouts)	○	○	○	○	○
Data Analysis Applications (Ex.: SPSS, SAS)	○	○	○	○	○
Reference Management Tools (Ex.: Endnote, Refworks)	○	○	○	○	○
Video-sharing (Ex.: YouTube, Vimeo)	○	○	○	○	○
Webinars (Ex.: Lynda, EdWeb)	○	○	○	○	○

File-sharing Tools (Ex.: Dropbox, Google Docs)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other Resource/Tool: -----	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Perceptions of Web Resources and Tools

Q10. Please identify *how useful* that the listed Web resources and tools are in supporting your academic course work, research, and/or academic goals. If you are not familiar with the resource/tool, please select the “Not Familiar With Resource/Tool” option.

Web Resource or Tool	Very Useful 5	Somewhat Useful 4	Not Very Useful 3	Not Useful at All 2	Not Familiar With Resource/Tool 1
Blogs (Ex.: Weebly, WordPress)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Online Surveys (Ex.: Kahoot!, Survey Monkey)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Wikis (Ex.: Wikihow, Wikipedia)	○	○	○	○	○
Social Networking (Ex.: Facebook, Twitter)	○	○	○	○	○
Social Bookmarking (Ex.: Digg, Pinterest)	○	○	○	○	○
Instant Messaging (Ex.: WhatsApp, Messenger)	○	○	○	○	○
Telecommunication (Video) Applications (Ex.: FaceTime, Hangouts)	○	○	○	○	○
Data Analysis Applications (Ex.: SPSS, SAS)	○	○	○	○	○
Reference Management Tools	○	○	○	○	○

(Ex.: Endnote, Refworks)					
Video-sharing (Ex.: YouTube, Vimeo)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Webinars (Ex.: Lynda, EdWeb)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
File-sharing Tools (Ex.: Dropbox, Google Docs)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other Resource/Tool:	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Student Stories of Web Resources and Tools

In this section, please reflect on your perspectives regarding the use of the Web resources and tools listed above for the support of your academic goals.

Q11. Please identify which category or specific resource/tool that you have found to be the most useful, and list ways that it is beneficial to your academic course work, research, and/or academic goals.

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