Information Literacy Skills and College Students: A Mixed-Methods, Action Research Study of Students’ Knowledge and Self-Efficacy for Applying Information Literacy Skills to Their Academic and Social Lives

Jade Geary

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INFORMATION LITERACY SKILLS AND COLLEGE STUDENTS: A MIXED-METHODS, ACTION 
RESEARCH STUDY OF STUDENTS' KNOWLEDGE AND SELF-EFFICACY FOR APPLYING 
INFORMATION LITERACY SKILLS TO THEIR ACADEMIC AND SOCIAL LIVES

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DEDICATION

To my parents, Kenton and Regina, who have always taught me that I am destined for big things and not to give up when things get hard. To my husband, Chris, who never lets me stop chasing my dreams. To Katie, who is gone too soon, but I know is still cheering me on from heaven.
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To my husband, Chris. I could not have completed this journey without your constant support. Thank you for never letting me give up and for always reminding me that I can do this. I could not have picked a better life partner. Mom, Dad and Ethan, I could not have done this without your constant support. I am so thankful for you all on this journey.

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ABSTRACT

The purpose of this action research was to examine information literacy skills in undergraduate students. In particular, this research investigated students’ knowledge and self-efficacy of information literacy skills. Furthermore, this study explored students’ application of information literacy and how students apply information literacy skills to their academic and social lives. By developing a greater understanding of students’ knowledge, self-efficacy and the use of information literacy skills, it allows librarians to tailor information literacy instruction to fit students’ needs. The three research questions that guided this study were (1) What are undergraduate students’ knowledge of information literacy at the University of South Carolina Columbia campus?; (2) What are undergraduate students’ self-efficacy beliefs about their information literacy?; (3) How do undergraduate students use information literacy skills in their academic and social lives?

The data for this study was collected via quantitative and qualitative measures. An electronic questionnaire was administered to undergraduate students at the University of South Carolina \( n = 72 \). The quantitative questionnaire focused on students’ knowledge and self-efficacy of information literacy skills. At the end of the questionnaire, students were able to select if they would like to participate in a focus group interview by providing their email. After the quantitative questionnaire closed, focus groups were created. There were two focus groups broken up by academic year (i.e., freshman, sophomore, junior, and senior). The focus groups were focused on all three research
questions and thus investigating students’ knowledge, self-efficacy, motivation, and use of information literacy skills ($n=4$).

The qualitative findings of this study found that how their information needs impact students’ search for information. Further, students' research methods vary depending on their academic and social lives. Additionally, students felt that being able to find and access information was a fundamental human right. Lastly, the qualitative findings highlight that students‘ self-efficacy of their information literacy skills varied depending on the skill they were utilizing.
# TABLE OF CONTENTS

Dedication ......................................................................................................................... iii  

Acknowledgments ............................................................................................................. vi  

Abstract ................................................................................................................................v  

List of Tables ................................................................................................................... viii  

List of Figures ................................................................................................................... vii  

List of Abbreviations ....................................................................................................... viii  

Chapter One Introduction ....................................................................................................1  

Chapter Two Literature Review .........................................................................................10  

Chapter Three Methods ......................................................................................................39  

Chapter Four Analysis and Findings .................................................................................60  

Chapter Five Discussion .................................................................................................116  

References ........................................................................................................................140  

Appendix A IRB Approval .............................................................................................187  

Appendix B Information Literacy Questionnaire Email ..................................................188  

Appendix C Information Literacy Questionnaire Advertisement ....................................189  

Appendix D Information Literacy Questionnaire ............................................................190  

Appendix E Information Literacy Focus Group Questions .............................................196  

Appendix F Permission To Use The Self-Efficacy Scale Email .....................................198
LIST OF TABLES

Table 3.1 Research Questions Aligned with Data Sources................................................44
Table 3.2 Self-efficacy subscales.......................................................................................45
Table 3.3 Open Test of Information Literacy Categories versus the Information Literacy Framework Categories...........................................................48
Table 3.4 Sample Interview Questions with Research Questions Alignment ...............49
Table 3.5 Data Collection and Analysis Methods.......................................................... 51
Table 3.6 Participant and Researcher Role with Timeline ..............................................65
Table 4.1 Questionnaire Participants Grade and Gender.................................................. 61
Table 4.2 Self-efficacy Subscales with Cronbach’s Alpha.................................................64
Table 4.3 Initiating the Search Strategy Subscale .............................................................65
Table 4.4 Initiating the Search Strategy Subscale Mean and Standard Deviation..........66
Table 4.5 Locating and Accessing the Resources Subscale .............................................66
Table 4.6 Locating and Accessing the Resources Subscale Mean and Standard Deviation..........................................................................................67
Table 4.7 Assessing and Comprehending Information Subscale.......................................68
Table 4.8 Assessing and Comprehending Information Subscale Mean and Standard Deviation........................................................................................68
Table 4.9 Interpreting, Synthesizing, and Using Information Subscale Mean and Standard Deviation.............................................................................69
Table 4.10 Communicating Findings Subscale ...............................................................69
Table 4.11 Communicating Findings Subscale Mean and Standard Deviation..............70
Table 4.12 Evaluating the Product and Process Subscale Mean and Standard Deviation .................................................................71

Table 4.13 Cronbach’s Alpha if Knowledge Questions are Removed .................. 72

Table 4.14 Scholarship as Conversation Subscale .................................................. 74

Table 4.15 Information Creation as a Process Subscales ................................................. 76

Table 4.16 Searching as Strategic Exploration Subscale Information Has Value Measures of Central Tendency and Dispersion Subscale........................................ 77

Table 4.17 Information Has Value Measures of Central Tendency and Dispersion Subscale.............................................................................................................78

Table 4.18 Summary of Qualitative Data Sources ................................................... 79

Table 4.19 Focus Group Participants Demographic Information ............................ 80

Table 4.20 Themes that Emerged from Qualitative Data......................................... 88
LIST OF FIGURES

Figure 2.1 Information Literacy Competency Standards ................................. 14
Figure 2.2 Information Literacy Framework for Higher Education .................. 15
Figure 4.1 Races Represented........................................................................... 62
Figure 4.2 Majors Represented......................................................................... 62
Figure 4.3 In Vivo Coding process in Delve....................................................... 82
Figure 4.4 Descriptive Coding Process in Delve............................................... 83
Figure 4.5 Pattern Coding in Delve.................................................................. 85
Figure 4.6 Pattern Codes in Delve................................................................... 86
LIST OF ABBREVIATIONS

ACRL.......................................................... Association of College and Research Libraries
ALA ...................................................................................... American Library Association
CILIP..................................... Chartered Institute of Library and Information Professionals
IAKT ..........................................................I already know that
IFLA............................... International Federation of Library Associations and Institutions
IL................................................................. Information Literacy
OER................................................................. Open Educational Resources
OTIL .......................................................... Open Test of Information Literacy
PIL................................................................. Project Information Literacy
CHAPTER ONE
INTRODUCTION

National Context

Information literacy skills are vital for undergraduate college students across the nation, yet these students in this context do not grasp the purpose of information literacy skills. Information literacy is not a new term, but its necessity as a skill set has only increased as access to information continues to grow. Since 1989, the American Library Association (ALA) has noted the importance of information literacy skills. The "Presidential Committee on Information Literacy: Final Report" details skills required for students to become information literate, students need to recognize when information is needed and be able to successfully locate, evaluate, and effectively use information (American Library Association, 1989). Since that report, technology has evolved to the point where users can Ask Alexa via the Amazon Echo Dot to find information, complete a quick web search on a mobile device, or access a wealth of information from a computer. Finding and accessing information continues to evolve, but the problem becomes selecting information from a reliable source. Information literacy skills are essential for academic success and students’ personal lives and future careers. With the abundance of information, students must effectively sort through enormous amounts of information to find reliable and useful information (American Library Association, 2000). In addition to locating and using information correctly, it is also essential to understand the ethical issues surrounding locating, using, and sharing information.
Colleges and universities are now recognizing the importance of information literacy skills and beginning to incorporate them into the curriculum. This landscape and the budding technological landscape can be tricky to navigate as academic librarians are trying to “work both on the ground and in the cloud providing traditional face-to-face reference and library instruction, as well as virtual reference library instruction” (Halpern & Tucker, 2015, p. 113). Adding these skills to the curriculum can be completed in a variety of ways. Colleges and universities are making these skills a required component of the general education requirements. Some classes visit the library for one-shot instruction. By contrast, some professors may allocate assignments that necessitate research consultations. Additionally, there are courses where a librarian is embedded in the course to assist throughout the semester and support information literacy skills development. Furthermore, many libraries offer credit-bearing information literacy courses, create virtual tutorials, or provide research guides.

Even with these offerings, not every student is acquiring these vital skills. According to The State of America’s Libraries (2018) report, “Academic library staff provided instruction sessions (face-to-face as well as electronic) for more than 6.2 million students” (American Library Association, 2018, n.p.). Although these services are vital to student success, not every college and university offers all of these services. According to the Academic Libraries: 2012 report, “during fiscal year 2012, about 55 percent of academic libraries reported that they incorporated information literacy into student learning or student success outcomes” (Phan, Hardesty, & Hug, 2012, p. 2). Arguably, information literacy initiatives have grown since this report, but if integration in college libraries stands at 55%, colleges and universities must put efforts in place to improve
these statistics. Information literacy skills are vital for students to locate, evaluate
successfully, and use relevant information and are essential life skills students will carry
into their lives.

Considering, students have grown up with constant access to information via
computers and cell phones, many students already feel that they have the tools necessary
to find, access, and evaluate information (Gross & Latham, 2012; Gustavson & Nall,
2011; Molteni & Chan, 2015). Subsequently, because students feel that they have
mastered information literacy skills, librarians and other educators are often met with a
lack of student motivation to enhance these skills. Bell (2007) coined the phrase “I
already know this” (IAKT) to express the notion students share when encountering a set
of skills; students feel they have already mastered these skills. Concerning library
instruction, students often think that all library instruction is the same, even if it is made
available in various formats covering different topics. Consequently, it can be
challenging to motivate students who feel that they have already mastered information
literacy skills. The statistics show that students may feel they learned these skills, but
there is significant literature that notes otherwise (ICT Literacy Panel, 2007; Imagine
Easy Solutions & EasyBib.com, 2014a; Imagine Easy Solutions & EasyBib.com, 2014b;

Additionally, without understanding the importance of information literacy, it can
be difficult to stress the importance of developing these skills. Therefore, many questions
remain. What is undergraduate students’ knowledge of information literacy at the
University of South Carolina? What are undergraduate students’ self-efficacy beliefs
about their information literacy skills? What influences undergraduate students to become
information literate at the University of South Carolina? How and to what extent do undergraduate students use information literacy skills in their academic and social lives?

**Local Context**

This action research study occurred at the University of South Carolina, a Research 1 (R1) university. The R1 designation means that the Carnegie Commission on Higher Education has denoted that this university produces high levels of research output (The Carnegie Classifications of Institutions of Higher Education, n.d.). Additionally, this deems that a university has “awarded at least 20 research/scholarship doctoral degrees and had at least $5 million in total research expenditures” (The Carnegie Classifications of Institutions of Higher Education, n.d.). The University of South Carolina have eight different campuses, with the University of South Carolina, Columbia operating as the flagship campus. In the spring of 2018, 47,083 students enrolled throughout all eight campuses, with 24,190 students being undergraduate students at the University of South Carolina Columbia campus (University of South Carolina, 2018). The undergraduate population at the University of South Carolina, Columbia, was the focus of this study.

The University Libraries at the University of South Carolina has observed the need to include information literacy skills in the curriculum for numerous years. In 2008 an Information Literacy Plan was established to “move the University Libraries instructional efforts forward towards a comprehensive information literacy program model in which information literacy is integrated into the curriculum” (Information Literacy Team, 2008). Since this report, the library has only continued to increase instruction via bibliographic instruction sessions, tutorials, and a credit-bearing Information Literacy course, LIBR 101.
During the summer of 2015, the Research and Instruction department, responsible for LIBR 101, began collecting data on students’ information literacy skills on campus. The hope was to develop a greater understanding of the information literacy situation on campus, identify specific gaps in student information literacy skills, and gather data to report the importance of information literacy instruction. All students who take LIBR 101 participate in a pre-test that measures students’ information literacy skills before completing LIBR 101. The pre-test consists of 18 questions. Fifteen questions were information literacy-specific questions, and the remaining three were demographic questions. From summer 2015 to spring 2018, 4,014 students completed the pre-test. The pre-test data were tallied and arranged in a standard numerical grading system of A, B, C, D, and F. For a student to be considered information literate, they would need to score a C or better on the pre-test. Out of 4,014 students, 82 scored an A, 433 a B, 965 a C, 1,096 a D, and 1,438 an F (Geary, 2018). Thus, the vast majority of students, 63%, are not information literate. However, this population was arguably a small portion of the university population, and further research is needed related to students’ information literacy skills on campus.

**The Statement of the Problem**

Information literacy are essential skills that college students need to acquire (American Library Association, 1989; American Libraries Association, 2000; Association of College & Research Libraries, 2016; Project Information Literacy, 2018; University of South Carolina, n.d.). However, students are struggling to grasp these skills and apply them in their academic and social life. As a result, it is vital to find ways to encourage students to become information literate.
Action Research Purpose Statement

The purpose of this action research was to examine information literacy skills in undergraduate students. In particular, this research investigated students’ knowledge and self-efficacy of information literacy skills.

Research Questions

1. What is the level of undergraduate students’ knowledge of information literacy at the University of South Carolina Columbia campus?
2. What are undergraduate students’ self-efficacy beliefs about their information literacy skills?
3. How do undergraduate students use information literacy skills in their academic and social lives?

Research Subjectivities and Positionality

As part of the millennial generation, I am sensitive to the bad press regarding my generation. Specifically, researchers report that millennials must be educated differently (Gupta & Goyal, 2018). We lack digital citizenship skills, have an over-reliance on Google (Becker, 2009), and often do not ensure that the information that we read, and share is accurate. Professionals and purveyors of literature, professional learning, and other information sources about millennials are often condescending toward the millennial demographic, who also consume their literature and presentations. Millennials were born between 1980 and 2000 (Wilbanks, 2016) and are not new in education or the workforce. Consequently, some millennials are already in the workforce, have already passed through institutions of higher education, or are currently pursuing undergraduate or advanced degrees.
Like other faculty members, I see the need to break these stereotypes and educate our students, build the desired information literacy skills into their academics, and promote their use in their personal and professional lives (Wilbanks, 2016). I have held many roles in higher education. As a result, I am deeply invested in higher education students and all that the college experience offers. That is why I have always looked at furthering my education with the end goal of remaining in higher education.

I have worked in the Research and Instruction Department at Thomas Cooper Library, the main library at the University of South Carolina, Columbia’s campus, since January of 2014. I have worked in this department as a graduate student, staff member, and now as faculty. My work experiences have given me first-hand exposure to working with students at the Research Help Desk via phone, email, chat, and bibliographic instruction sessions. Additionally, I have taught LIBR 101 online since fall 2015. Through this particular course, I have conversed with students about their habits regarding information sharing and digital citizenship. Due to my experience, I have a deep understanding of the information literacy situation on campus and the skills students struggle to grasp.

As a librarian, I strive every day to help break millennial stereotypes and educate others on the importance of information literacy. Pursuing my Doctorate in Education in Curriculum & Instruction with an Educational Technology focus not only allows me to become a better Instructional Design Librarian but a better educator and educational technology leader. By conducting action research and collecting data on this critical issue, I can help shape our current, past, and future generations into utilizing information
effectively and efficiently. By identifying the motivational factors that influence higher education students, they can learn information literacy skills more successfully.

I see myself as an “insider in collaboration with other insiders” (Herr & Anderson, 2005, p. 36). Not only am I of the millennial generation, which many of the current University of South Carolina undergraduate students are, but I have also attended the University of South Carolina for my masters and now my doctorate. I understand the culture surrounding students here at the university. Additionally, I have worked my whole professional career at the University of South Carolina. I have lived in Columbia, South Carolina, since 2004, and attended high school in Columbia. I am fully immersed in all areas that are affected by this study.

**Definition of Terms**

**Information literacy**: “[The] set of integrated abilities encompassing the reflective discovery of information, the understanding of how information is produced and valued, and the use of information in creating new knowledge and participating ethically in communities of learning” (American Library Association, 2016).

**Information literate**: “[Recognize] when information is needed and have the ability to locate, evaluate, and use effectively the needed information” (American Library Association, 1989).

**Motivation**: “[The] direction of a student’s behavior, the level of effort expended, and the persistence of that effort is a cognitive construct with behavioral applications” (Matteson, 2014, p. 865). Additionally, it is noted in the literature the importance of distinguishing between intrinsic (internal) and extrinsic (external) motivation (Chang & Chen, 2015; Reynolds, Roberts, & Hauck, 2017; Ross, Perkins, & Bodey, 2016;).
**Self-efficacy:** “People’s judgments of their capabilities to organize and execute courses of action required to attain designated types of performances” (Bandura, 1986a, p. 391).

**Information Need:** “[Drive] for information seeking and access” (Oyediran-Tidings, Ondari-Okemwa, & Nekhwevha, 2019, p. S1).
CHAPTER TWO
LITERATURE REVIEW

The purpose of this action research is to examine factors influencing how undergraduate students at the University of South Carolina apply information literacy skills. In particular, this research will investigate students’ knowledge and self-efficacy of information literacy skills. The literature review aims to explore the following research questions enumerated below.

1. What is the level of undergraduate students’ knowledge of information literacy at the University of South Carolina Columbia campus?
2. What are undergraduate students’ self-efficacy beliefs about their information literacy skills?
3. How do undergraduate students use information literacy skills in their academic and social lives?

The research questions facilitated separating the variables in this study into three overarching themes, (1) information literacy, (2) undergraduate students’ information literacy knowledge, (3) undergraduate students’ self-efficacy beliefs about their information literacy skills, (4) undergraduate students’ motivation for using information literacy skills, and (5) undergraduate students’ application of information literacy skills in different contexts. Many library databases were used to locate literature on these topics, such as Dissertations & Theses Global, Education Source Complete, Library, ERIC, Information Science, & Technology Abstracts with Full Text, and Library Literature &
Information Science Full Text. Additionally, I mined sources to discover more articles to use in my research by searching for references in the bibliographies of articles I found. The immersion into the literature uncovered articles that offered additional insights into many aspects of the variables in the study and how they work together toward a solution to the research problem. A variety of search strategies were implemented to find the most relevant articles. The following keywords were utilized in my searches, along with a combination of Boolean operators: information literacy, perception, self-efficacy, skill, information literacy skills, performance, higher education, motivation, motivational factors.

In this literature review, there are five central themes (1) information literacy, (2) undergraduate students’ information literacy knowledge, (3) undergraduate student perceptions of information literacy, (4) undergraduate students’ motivation for using information literacy skills, and (5) undergraduate students’ application of information literacy skills in different contexts. Section one, information literacy, explores the various definitions of information literacy, the information literacy framework, the difficulty of teaching information literacy, and how fake news relates to information literacy skills. Section two focuses on undergraduate students’ knowledge of information literacy skills, the transfer of knowledge of information literacy skills to various disciplines, and information literacy skills measures. Section three explores undergraduate students’ perceptions of information literacy skills. Section four explores undergraduate students’ motivation, motivation and information literacy skills, how self-determination theory applies to information literacy, self-efficacy, and information literacy. Lastly, section five
will explore how undergraduate students apply information literacy skills in their academic and social lives.

**Information Literacy**

Information literacy skills are essential skills for college students to master for success academically and for professional and personal success (Campbell, 2008; Cooper, 2019). Due to the conventional structure of information literacy instruction, student motivation is lacking (Bell, 2007; Latham, Gross, & Julien, 2019). Mandatory one-shot instruction sessions initiated by the instructor, where students and librarians only meet once, are an excellent example of instructional practices that do not enhance motivation and can be detrimental to students. The lack of repeated contact with students to build information literacy skills is problematic as one-shot instruction is often the typical way students receive information literacy instruction from librarians at the collegiate level.

Further, not every student understands the importance of these skills and why critical thinking skills are essential when locating, consuming, and using information. Researchers argue that being able to access information is a social justice issue within itself, and thus, being able to access and apply these skills is also a social justice issue (Gregory & Higgins, 2017; Levitov, 2017; Mathuews, 2016; Pegues, 2018; Saunders, 2017). With the vast increase of information that students have access to, “information discernment has become an essential skill in everyday life, as people are confronted by an unmanageable volume of contradictory ‘facts’ and opinions” (Cooper, 2019, p. 445). Consequently, it is essential to encourage students to become proficient in these skills.
This section will explore the following (a) information literacy in the profession, (b) difficulty in teaching information literacy skills, and (c) fake news.

**Information Literacy in the Profession**

Information literacy skills are critical skills needed to “find, retrieve, analyze, and use information” (American Library Association, 2000, n.d.). Although information literacy has been a buzzword in the 21st century, Paul G. Zurkowski introduced the term in 1974 as part of a governmental report. Since this report, the American Library Association has been deeply involved in defining information literacy skills and increasing librarians’ capacity to teach the skills. In 1989 the American Librarian Association noted that an information literate person could identify the need for information and then find, evaluate, and use it effectively (American Library Association, 1989). Although this definition was a guiding principle for years, there was a growing need for defining how to assess information literacy skills in higher education.

In 2000 the Information Literacy Competency Standards for Higher Education framework were developed by a team of 10 librarians. The competency standards offer a structure for evaluating higher education students’ information literacy skills (American Library Association, 2000). These standards were created as a way to guide academic librarians and their information literacy instruction. The competency standards have five frames seen in Figure 1. There has been an effort to create competency standards with specific disciplines in mind, such as nursing (Association of College & Research Libraries, 2013; Phelps, Hyde, & Planchon Wolf, 2015), journalism students, and professionals (Association of College & Research Libraries, 2011), and competencies for the workplace (Head, Van Hoek, Eschler, & Fullerton, 2013).
In 2016 the American Library Association adopted the Information Literacy Framework for Higher Education. “The Framework is organized into six frames, each consisting of a concept central to information literacy, a set of knowledge practices, and a set of dispositions” (Association of College and Research Libraries, 2016, n.p). The frames, as seen in Figure 2, are broken up into six frames.
Each of these frames has examples and ways to incorporate each frame. The term information literacy has been debated continuously across the globe. Some colleagues are even calling for the profession to stop debating the term and settle on a universal definition of information literacy (Owusu-Ansah, 2005). The American Library Association in the United States defines information literacy. Their definition is typically the sole information literacy definition that librarians and media specialists utilize in their work and when teaching information literacy components. Even though this is the definition that will focus this research, it is essential to explore two other standard definitions. This literature review examines the Chartered Institute of Library and Information Professionals (CILIP). CILIP defines information literacy as the ability to use critical thinking skills to locate, judge, and utilize information in balanced ways, which “empowers… citizens to develop informed views and engage fully with society” (Secker, 2018, p. 156).
**Difficulty in Teaching Information Literacy Skills**

Although information literacy skills are indispensable for society, teaching these skills is not always an easy feat. Librarians are exploring their practices (Conrick, & Wilcox, 2013; Dawes, 2019; Franke, & Sühl-Strohmenger, 2014; Kocevar-Weidinger et al., 2019; Zakharov, & Maybee, 2019; Ziegler, 2019) and their colleagues (Baro, & Keboh, 2012; Tuamsuk, 2013; Yearwood, Foasberg, & Rosenberg, 2015) to develop more significant insights into how to teach information literacy skills. Looking at how librarians teach information literacy skills is increasingly important to ensure that librarians are connecting with the students in their classroom. In addition to teaching these skills, it is essential to be mindful of cultural competence (Foster, 2018; Overall, 2009), reaching international students (Hicks, 2019), those learning English (Tran, & Aytac, 2019), and reaching differently-abled students (Sheidlower, 2017).

The plethora of information leads students to use strategies that lead to a phenomenon called *satisficing* (Sin, 2016). The term *satisficing* means students stop seeking information when they feel what they have found is “good enough,” even though it might not be the best possible information (Sin, 2016, p. 1794). Combined with the idea of satisficing, students feeling that they already have effective information literacy skills can make for a challenging classroom environment (Bell, 2007). As Rosman, Mayer, and Krampen (2016) note, one-shot instruction sessions that are a staple of information literacy instruction often focus on generic information literacy skills. This type of instruction is often criticized as it is generic in nature, focus on essential but specific library services, and does not allow students to have knowledge transfer of these skills to various disciplines or real-world scenarios (Anderson & May, 2010; Merry,
Newby, & Peng, 2012; Rosman, Mayer, & Krampen, 2016). Although embedding these skills in courses seems like an obvious choice as it will allow for the transfer of these skills, these courses require faculty buy-in and willing faculty members to tackle these courses.

One question surrounding information literacy skills is: What type of instruction are students receiving in their credit-bearing classes and from their teaching faculty members? There have been limited studies on how professors include information literacy skills in their curriculum. Weiner (2014) found that out of 299 faculty members are teaching information literacy skills in their courses. Still, those faculty members expected that students come equipped to their classroom with prior knowledge of information literacy skills. An issue that teaching faculty and librarians both often face is understanding the knowledge gap in their class; especially when it pertains to the misconception of what knowledge students should already come to the classroom with (Ercegovac, 2003; Saunders, Severyn, & Caron, 2017; Smith et al., 2013). Another method taken by researchers is to review syllabi to see what skills are being taught (McGowan, Gonzalez, & Stanny, 2016). Syllabi reviews can also be used as a tool to identify the information literacy skills students need to complete academic assignments (Dinkelman, 2010; McGowan, Gonzalez, & Stanny, 2016; VanScoy & Oakleaf, 2008) and ways to integrate information literacy instruction into courses (Beuoy & Boss, 2019; Maybee, Carlson, Slepdknik, & Chapman, 2015).

The logistics make it challenging to determine precise ways to teach information literacy skills. It is difficult for academic librarians to meet with all students on campus. Thus, information literacy skills must be practiced, or a foundation of these skills,
instructed by teaching faculty on campus. Due to the difficulty of teaching these skills, it has encouraged teaching faculty and librarians to collaborate to best aid students (Amstutz, & Whitson, 1997; Argüelles, 2015; Bapte, 2019; Wadson, 2019; Wishkoski, Lundstrom, & Davis, 2018; Xu, & Gil, 2017).

**Fake News**

In the era of fake news, librarians have primarily found it imperative to aid students and the general public in verifying the credibility of the sources they access and review. One of the frames of the ACRL framework, authority is constructed and contextual, directly aligns with the issue of students being able to evaluate, information, and recognize degrees of authority. Yet, there are also conversations about if the ACRL framework is enough to fight fake news (Faix & Fyn, 2020). Authority is an area of focus that is essential to librarians (Bluemle, 2018). Due to fake news being seemingly political in nature, this can be difficult to navigate. Various definitions of fake news by people in positions of authority further complicate the ability to discern factual information from news and other sources (Weiss, Alwan, Garcia, & Garcia, 2020). A key component of understanding fake news is effectively evaluating the news (Anderson & Correa, 2020).

The need to educate the public on how to spot fake news and how to locate factual information when unsure about a source became an international need. As a result, one of the leading international organizations, the International Federation of Library Associations (IFLA), created the popular “How to Spot Fake News” graphic to highlight the importance of this issue. Further, examples of findings, such as Facebook and other forms of social media using user preferences to influence and persuade others (Cadwalladr & Graham-Harrison, 2018; Cooper, 2019; Osboren & Parkinson, 2018), are
on the rise. Cambridge Analytica is an example of a scandal that used micro-targeting and propaganda techniques for political gain (Cooper, 2019; Osborne & Parkinson, 2018). Findings like these demonstrate the need for applying information literacy skills in everyday life.

The frequent overabundance of information, use of advertising, propaganda, and micro-targeting to persuade others “make information literacy and discernment essential components within educational systems at all levels” (Cooper, 2019, p. 445). Based on the barrage of information encountered by social media users each day, coupled with the fact that many college students obtain their news and information from social media, it becomes critical to aid students in determining the credibility of sources. Judging an information source’s credibility is extremely important when looking at the era of fake news (Musgrove, Powers, Rebar, & Musgrove, 2018). In addition to creating quick fact sheets like the one by IFLA, librarians create courses (Neely-Sardon & Tignor, 2018), curriculum (Cooper, 2019; Glisson, 2019), LibGuides (Neely-Sardon & Tignor, 2018), programming (Osborne, 2018), workshops (Hanz & Kingsland, 2020; Wade & Hornick, 2018), and other materials to help combat fake news and ensure that students know how to evaluate information effectively.

**Undergraduate Students’ Knowledge of Information Literacy**

It is difficult to determine if the instruction is effective on a broad or more localized scale without measuring information literacy instruction. Researchers are concerned with the efficacy of information literacy instruction in a general sense and in regard to more specialized practices, such as online instruction (Shaffer, 2011). Further, without an understanding of students’ skill levels, it can be challenging to ensure that the
instructor is meeting students’ needs. This section will review (a) information literacy knowledge, (b) knowledge transfer, and (c) measures of information literacy.

**Information Literacy Knowledge**

There are limited studies that focus on all aspects of the information literacy framework or students’ overall information literacy competency (Lanning & Mallek, 2017). A fair amount of the literature focuses on specific information literacy skills or frames. Some studies focus on students’ difficulties citing information for academic work (Greer & McCann, 2018; Kargbo, 2010; Nierenberg & Fjeldbu, 2015). Additionally, some studies look at students’ information literacy skills as they transition from high school to college (Dempsey & Jagman, 2016; Latham & Gross, 2008; Mittermeyer, 2005; Saunders, Severyn, & Caron, 2017; Varlejs & Stec, 2014). A limited amount of research exists identifying factors that influence undergraduate students’ information literacy skill levels. Lanning and Mallek (2017) attempted to identify elements. However, with students’ “generally poor performance on the pre-test,” it is hard to draw firm conclusions on factors that influence information literacy competency (Lanning & Mallek, 2017, p. 448).

A problematic finding is students’ insecurity and inaccuracy when citing references for academic work (Kargbo, 2010). As mentioned previously, it can be especially challenging as teaching faculty often think students obtained these skills before entering higher education (Kargbo, 2010). Faculty believe students have sufficient information literacy skills learned before entering college to support high-quality work and avoid plagiarism (Nierenberg & Fjeldbu, 2015). The overconfidence in students' information literacy skills can have severe implications because they may overlook
needed skills, leaving students with persistent deficits in their ability to discern high-quality information.

**Knowledge Transfer**

Knowledge transfer is an essential topic within information literacy as the application of these skills will vary from discipline to discipline. Reece (2005) notes that “without transfer, the work of trying to foster critical thinking and information literacy is in vain” (p. 485). Knowledge transfer occurs when “a broader pattern of transfer is the direct application of an explanatory concept to new instances well removed from the initial learning” (Perkins & Salomon, 2012, p. 249). Pinto and Sales (2008) reiterate this notion as they share the need for general versus basic information literacy skills. General skills are ones that everyone needs no matter their discipline or profession, whereas specific ones will vary from discipline to discipline (Pinto & Sales, 2008).

An example of this would be that everyone should be able to identify primary sources and differentiate among them. For example, a primary source for a historian versus a biologist are very different things. Pinto and Sales (2008) also note the importance of basic information literacy skills required to transfer from discipline to discipline. They suggested that “basic competencies are also called generic or transferable; they are transferable to a great variety of functions and tasks, and they prepare and equip the student to successfully become a part of work and social life” (Pinto & Sales, 2008, p. 58). The need for transferrable information literacy skills underscores the importance of information literacy skills for future professions and academic and students’ social lives.
Measures of Information Literacy

Project Information Literacy (PIL) and the Pew Research Center are two of the largest sources of statistical information and reports on information literacy. Organizations are beneficial, but the need for gathering data in our institutions is increasing. The problem then becomes accessing measures. Options for measuring information literacy skills are currently limited. These limitations can make it challenging to grasp how students are performing with these skills locally and internationally. Additionally, it is difficult to compare information literacy standards and competency levels without a standard format of measurement. The issue becomes more complicated because most of the measures are primarily focused on higher education (Hollis, 2018).

PIL is a non-profit research organization that researches information literacy. Their research has provided statistical information and fast facts about information literacy and students’ overall research process. As of June 2019 PIL, has collected data from more than 22,000 ‘early adults’ enrolled in more than 89 “U.S. public and private colleges and universities, community colleges, and 34 high schools”. PIL has also produced ten major research reports detailing aspects of students’ information use and more recently, graduates (n.p). This research can help librarians and other practitioners help students develop these skills, show the pedagogical differences in teaching information literacy and how others seek and retrieve information (Project Information Literacy, 2019a).

The Pew Research Center is a non-profit organization that completes a wide range of research on issues such as politics, trends, and even information literacy (Pew Research Center, 2018). As of July 2019, the Pew Research Center has 80 reports on
information seeking, 30 reports that appear in search of information literacy, and 40 reports that appear in a search for digital literacy. The Pew Research Center has a broad scope and adheres to rigorous methodological standards (Pew Research Center, 2018).

One of the first options when looking for information literacy tests are Project SAILS and TRAILS. Kent State University developed Project SAILS to create a standardized information literacy test (Project SAILS, 2019). Creating this test could help librarians increase their understanding of students’ actual information literacy skill levels and tailor instruction to meet these needs (Project SAILS, 2019). SAILS stands for Standardized Assessment of Information Literacy Skills. Project SAILS offers three forms of the information literacy test. They are all based on the ACRL Information Literacy Competency Standards for Higher Education (Project SAILS, 2019) and are aimed at higher education. The other commercial test is TRAILS. The acronym TRAILS stands for Tools for Real-time Assessment of Information Literacy Skills. The TRAILS project by Kent State University Libraries focuses on K-12 students’ information literacy knowledge (Kent State University Libraries, 2019). As this test focuses on K-12 education, it falls in line with the American Association of School Librarians’ Standards for the 21st-Century Learners and Common Core Standards (Kent State University Libraries, 2019). As of July 1, 2019 Project, TRAILS has moved to an Open Educational Resources (OER) platform.

In addition to these large-scale measures presented above, many institutions are developing their own measures. Some institutions’ measures have been utilized in scientific studies, and others have been used at a local institution (Geary, 2018; Geary, 2019). Because of the lack of validated information literacy measures and access to
measures in general, many institutions have resorted to developing their measures (Gardner, 2019). There is also an issue of access to these homegrown tests, leading many professionals to compile their lists to increase the availability of these exams (Muller, 2019). Examples of the homegrown tests can be found when performing a literature search, but literature searches do not include every measure used. Homegrown measures of information literacy take various formats and often vary in their narrowness of the methodological approaches. Further, these measures vary in being validated and not validated. It would be impossible to gather all past measures as many are not publicly available and have no record of existence outside of their home institutions. Even so, this section attempts to highlight a variety of necessary measures.

A standard methodology for information literacy measures is to employ their own surveys. These are often developed in-house and focus on behavior over skill level (Catalano, 2010; Matteson, 2014; Salisbury & Karamanis, 2011; Taylor & Dalal, 2017; Zimmerman, 2012). Salisbury and Karamanis (2011) provide a unique approach as they name their survey a pre-experience survey. This term seems to be unique in the literature and focuses on the fact that students arrive at university with prior knowledge of the material. In line with educational theory, drawing upon “students’ prior experience provides the scaffolding that enables them to augment their existing knowledge” (Salisbury & Karamanis, 2011, p. 45). Further, acknowledging prior knowledge in the classroom helps establish with students that information literacy is a lifelong learning activity (Crawford & Irving, 2007; Salisbury & Karamanis, 2011) but reaffirms that students have life experience that is valuable and can be brought to the classroom.
Pre-test and post-test allow researchers to better understand students’ skill levels before information literacy instruction and their skill level after instruction. Pre- and post-tests are a great way to see what skills students need assistance in developing and what skills students struggle with after completing instruction.

The University of South Carolina Libraries has made an effort to pre-test, and later pre-test and post-test, students who partake in credit-bearing information literacy courses. Measures were created during the summer of 2015 and deployed from the summer of 2015 to the summer of 2018 (Geary, 2018). During the summer of 2018 to the spring of 2019, three courses were given a pre- and post-test to measure information literacy skills (Geary, 2019). All three of these measures were developed in-house and never made available outside of the university except when Hollis, Rachitskiy, and van der Leer (2019) completed their review of past information literacy measures.

Lastly, looking at previous measures, a frequent measure is to combine previous tests to make a more robust test. Hollis, Rachitskiy, and van der Leer (2019) explored previously created measures in their study. They combined questions from seven information literacy measures and created new questions to develop a test that has 66 questions that cover general information literacy and 30 higher education questions (Hollis, Rachitskiy, & van der Leer, 2019). Their set of measures has been validated and is available for use (Hollis et al., 2019). Šorgo, Bartol, Dolničar, and Boh Podgornik (2017) also combined several individual modules to develop a vigorous, multi-stage information literacy test. The test has five different stages focusing on information literacy, internet confidence, and ICT skills.
Student Perceptions of Information Literacy

To better understand what skills students are receiving in their course classes, librarians are researching faculty perceptions (Champeswar, 2019; Cope & Sanabria, 2014; Gruber, 2018; Guth, et al, 2018; Perry, 2017; Stebbing, et al, 2019), and student perceptions (Campos, 2017; Detlor, Booker, Serenko, & Julien, 2012; Gamtso & Halpin, 2018; Kirker & Stonebraker, 2019; Marvel, 2015) and student preferences (Latham & Gross, 2013). Some studies examine a combination of librarians, faculty, and students (Ganley, Gilbert, & Rosario, 2013; Kim, & Shumaker, 2015; Meredith, & Mussell, 2014; Payton, 2003; Yevelson-Shorsher & Bronstein, 2018). By developing a deeper understanding of librarians, teaching faculty, and student perceptions, librarians, can not only see opinions on these skills but get a more in-depth look at motivational factors.

Research has shown students feel they have already obtained information literacy skills when they often lack these basic skills (Ivanitskaya, Ryan, & Marie, 2004). Ivanitskaya, Ryan, and Marie (2004) note that students’ perceptions of their information-seeking skills were often inflated (p. 170). Due to these perceptions, it is no surprise that previous research has indicated, via self-report, that students feel confident in their information literacy skills. Payton (2003) found that the majority of students (n=163) surveyed believe their information literacy skills are good (n=79) or very good (n=60). However, when asked about their ability to perform library research, these same students rated their skills as good (n=72) or satisfactory (n=44) (Paton, 2003). These findings are echoed by Marvel (2015), who found that the majority of research participants felt they were competent at the information literacy skills being examined in the study. Even
though students were confident about their scores, no students (n=562) received the highest score of 11, with the highest frequency of scores (n=122) at 6 points.

**Motivation**

Motivation is a process that cannot be observed, though it is evident in the effort put forth and the things people say (Schunk, Meece, & Pintrich, 2014). Yet, it is an essential influence on behavior (Deci & Ryan, 1987). Researchers have offered a variety of definitions for motivation. However, motivation in education is typically defined as “the direction of a student’s behavior, the level of effort expended, and the persistence of that effort is a cognitive construct with behavioral applications” (Matteson, 2014, p. 865). At its core, being motivated is “to be moved to do something” (Ryan & Deci, 2000, p. 54). Keller (2010) states that “motivation refers broadly to what people desire, what they choose to do, and what they commit to do” (p. 3). All three definitions emphasize the importance of motivating someone to action.

Deci and Ryan (1985a) presented three categories of motivation: autonomous (intrinsic), controlled (extrinsic), and lack of motivation (amotivation). Intrinsic motivation is self-motivated, and extrinsic motivation comes from outside forces (Patrick & Ahn, 2014). Extrinsic motivation can also occur when a person feels a sense of obligation to the task or accomplishment they must achieve (Hill, 2013). Extrinsic and intrinsic motivation do not always operate separately and can coincide (Patrick & Ahn, 2014). As Keller (2010) notes, that extrinsic and intrinsic motivation does not have to operate separately; in fact, both factors can be found in a given situation. Researching motivation, at its core, is an attempt to determine why people choose to do the things that they do (Keller, 2010). Studying motivation is a significant undertaking, as there are
numerous theories and schools of thought regarding motivation (Hill, 2013; Jacobi, 2018; Keller, 2010; Patrick & Ahn, 2014; Ryan & Deci, 2000). This section explores how motivation can be applied in higher education when teaching information literacy skills. This section will review a) motivation and academic achievement, b) motivation in information literacy instruction, and c) self-efficacy.

**Motivation and academic achievement**

Motivating students to action is a challenge that teaching faculty and librarians experience as they interact with students. Even though the literature on motivation is not lacking, studying motivation in relation to developing information literacy skills is essential. Keller opens his 1979 article stating that educators must offer “systematic attention” to issues involving motivation as it relates to instructional theory and educational technology (p. 26). Motivation in education applies to both higher education and librarianship that have experienced a boom in meeting students’ needs in the virtual environment.

Providing students choices in their education can enhance self-determination and intrinsic motivation (Brooks & Young, 2011). Brooks and Young (2011) note the importance of choice “as a fundamental aspect of motivation” (p. 48). Giving students the freedom of choice in their educational setting can be an empowering feeling and increase motivation. Flierl et al. (2018) echo this idea in their study. The findings in their study indicate that creating a “learning environment where students feel more autonomous, competent, and related” (Flierl et al., 2018, p. 35).
As Flierl et al. (2018) note:

When students perceive that they can make meaningful choices within a structure (autonomy), feel connected to fellow students, the instructor and the subject content (relatedness), and believe they are able to accomplish what is asked of them (competence), they tend to feel more intrinsically motivated to learn and are more engaged in courses. (p. 31)

The three information literacy requirements from Flierl et al. (2018) are essential when it comes to information literacy skills, as students often need a bit of persuading regarding why these skills are vital to them.

Further, there is a correlation in the research between students’ receiving positive feedback and motivation (Agricola, Prins, & Sluijsmans, 2020). This research highlights the importance of formative assessment and feedback aiding in the development and nurturing of self-regulated learners (Hounsell, 2003; Nicol & Macfarlane-Dick, 2006; Lerdpornkulrat, Poondej, Koul, Khiawrod, & Prasertsirikul, 2019). Interestingly, Agricola, Prins, and Sluijsmans (2020) focused on the effect of written versus verbal feedback. The researchers found that students had a better perception of the oral feedback, but it did not impact their self-efficacy or motivation (Agricola, Prins, & Sluijsmans, 2020). Yet Bohndick, Menne, Kohlmeyer, and Buhl (2020) found that the feedback did increase student motivation.

**Motivation and Information Literacy Instruction**

Many librarians are looking for faculty collaboration opportunities to help students further their information literacy skills by creating effective instruction (Hsieh et al., 2014; Paterson & Gamtso, 2017; Polkinghorne & Wilton, 2010). Some librarians are
even looking at incorporating instructional design principles to ensure that students are receiving the best instruction possible (Foster, 2018; Geary, 2020; Mullins, 2014; Mullins, 2016). With the increase in higher education institutions offering online classes and degree-granting programs, the need to develop virtual information literacy items has vastly increased (Lewis & Contrino, 2016; Sterling, Mckay, & Ericson, 2017). Halpern and Tucker (2015) note the increasing need for varying technical services while retaining traditional library services. Consequently, there was a need to cultivate virtual services to offer students such as LibGuides in Blackboard (Bowen, 2012), online credit-bearing information literacy courses (Catalano, 2015; Creed-Dikeogu, 2018; Geary 2018; Geary, 2019), and collaboration between librarians and teaching faculty to develop virtual courses with embedded information literacy skills (Easter, Bailey, & Klages, 2014).

Additionally, this need for ensuring students receive the best information literacy education possible has showcased the need for a new role in libraries: instructional design (Geary, 2020).

It is essential to take this a step further and look at how to motivate students to use information literacy skills and how librarians can design instruction that encourages learning. One option is to apply an informed learning approach. By creating learning environments with an informed learning approach, students can engage with the material and generate more agency over their work (Maybee, Doan, & Flierl, 2016).

**Self-efficacy**

Self-efficacy theory became highly popularized due to Albert Bandura (1977, 1986a, 1986b, 1995, 1997). Self-efficacy is “individuals’ beliefs about their capabilities to perform well” (Graham & Weiner, 1997, p. 374). It is part of the human experience to
make choices “about what courses of action to pursue and how long to continue what they have undertaken” (Bandura, 1986b, p. 393), which influences one’s motivation to complete a task or obstacle (Bandura, 1997). Alternatively, one’s perceived self-inefficacies can cause one to shun an activity due to the fear of not completing the task (Bandura, 1986b). People tend to tackle tasks that they feel competent completing, but when they feel inept at performing certain tasks, they will avoid them (Bandura, 1977, 1986b). Due to this, it is important to understand that perceived self-efficacy is one’s own perception of their availabilities to complete a task (Kear, 2000; Kurbanoglu, 2003). Thus, one’s perceived self-efficacy acts as a form of self-preservation in an effort to ensure that tasks and activities are capable for the individual (Bandura, 1986b). Therefore, it is not enough to know how to complete a task, but one must also feel confident completing the task (Bandura, 1977).

Self-efficacy has been applied to a vast array of disciplines. As Graham and Weiner (1997) note, this application has been supported empirically “not only on achievement behavior but also on such health related-concerns as coping with anxiety, pain tolerance, and the management of phobias” (p. 374). Graham and Weiner (1997) also mention that this theory can be viewed both at the individual and group levels. Self-efficacy theory has been applied to the field of higher education in both a broad sense and through very specific academic lenses such as information literacy. This application ranges from students with varying abilities (Kutscher & Tuckwiller, 2019), leadership (Maya, & Uzman, 2019), academic performance (Hayley et al., 2017).

Self-efficacy is an important factor when discussing information literacy. New information is created every minute in the 21st century, and due to the overabundance of
information, it becomes increasingly complex to sort through it. Since 2015 it is forecasted, the number of connected devices has doubled from 15.41 billion to 30.73 billion in 2020 (IHS, 2016). The IHS (2016) information highlights that it is the amount of information available and the sheer number of people with access to this information. The abundance of information is why information literacy skills are lifelong learning skills (Kozikoglu, & Onur, 2019). This rapid creation of information will only continue to multiply, so “individuals must be able to use the skill of information literacy with a strong belief and high confidence level” (Hee, Ping, Rizal, Kowang, & Fei, 2019).

Additionally, the large quantities of information make people susceptible to information overload (Aharony, & Gazit, 2019). This phenomenon can be paralyzing and decrease student’s information self-efficacy (Aharony, & Gazit, 2019). This vast amount of information not only affects our everyday lives. It is difficult to imagine a profession that has not been affected by technology or the information boom (Kurbanoglu, 2003).

With this abundant amount of information, it is imperative that users feel competent accessing and evaluating information and building information literacy skills can help. Like any skill, students must practice information literacy skills. In higher education, the hypothesis is that undergraduate students near the end of their academic career would have higher information literacy skills. Having higher self-efficacy skills when it comes to information literacy is beneficial for students. Medaille, Beisler, Tokarz, and Bucy (2021) found in their study that “greater self-efficacy contributes to a more positive and manageable research experience” (p. 105). Their research is not alone on information literacy and self-efficacy. Many researchers have explored self-efficacy and information literacy in a variety of contexts and disciplines. The literature represents studies focusing
on self-efficacy and undergraduate students (Geçer, 2014; Folk, 2016), education
students (Burchard, & Myers, 2019; Demirel & Akkoyunlu, 2017; Geçer, 2012), health
science students (Kloda, Boruff, & Cavalcante, 2020), library and information science
students (Aharony, & Gazit, 2020; Pinto & Pascual, 2016), nursing students (Amit-
Aharon, Melnikov, & Warshawski, 2020; Chow, & Wong, 2020; Özbıçakçı., Gezer, &
Bilik, 2015; White, 2018) and social science students (Pinto & Fernández-Pascual, 2017).
The variety of the literature represents the desire to understand how students perceive
their information literacy skills and their impact on students’ studies and future careers.

Furthermore, various measures are being developed to aid in understanding students’
self-efficacy and information literacy. These studies vary from general information
literacy skills and self-efficacy (Kurbanoglu, Akkoyunlu, & Umay, 2006) to more
focused measures that vary by discipline (De Meulemeester, Buysse, & Peleman, 2018;
Kurbanoglu, & Akin, 2010). Yet, these studies are limited and need to be further
explored. As previously indicated, belief in an ability to do something affects the
motivation to perform and complete tasks. Increasing student confidence and ability in
utilizing information literacy skills more effectively could motivate them to transfer them
to their everyday information literacy needs. Viewing students’ information literacy skills
via a self-efficacy lens helps librarians understand what skills students feel they have
already mastered. What becomes complicated with self-efficacy and information literacy
skills is that students often believe that they are more fluent in their information literacy
skills than they are.
How Students Use Information Literacy Skills

Librarians often wonder and ask students how they use information literacy skills both academically and in their social lives. With increased social media use for information-seeking purposes (Kim & Sin, 2016; Kim, Sin, & Tsai, 2014; Kim, Sin, Yoo-Lee, 2014), researchers need to develop a deeper understanding of how students find and use information. Of particular interest is how students consume news (Head, Wihbey, Metaxas, MacMillan, Cohen, & Project Information Literacy, 2018). It is essential to understand how students use information literacy skills, such as locating and evaluating sources, for their academic and social lives. Further, as Weber, Becker, and Hillmert (2019) found, information literacy skills require a transfer of knowledge; this means that students need to be able to apply these skills from across disciplines as well as transfer them to their social lives. One question that librarians face is if information literacy skills vary for students when applying them to their academic versus social lives. Head et al. (2018) found a difference between students’ information-seeking habits for their personal use versus their educational use. The most significant difference is the use of library databases for academic research at 66%. However, library databases were utilized far less frequently for personal use, only 7% of the time (Head et al., 2018). At the same time, social media networks are used at 56% for personal use versus 6% for academic assignments (Head et al., 2018). Although these are insightful insights into students’ information-seeking habits, this survey only represents 5,844 college students across 11 higher educational institutions in the United States (Head et al., 2018). This section will look at a) information need, b) academic use, and c) social lives.
Information Need

Oyediran-Tidings, Ondari-Okemwa, and Nekhwevha (2019) explain an information need as the “drive for information seeking and access” (p. S1). Jalali, Keshvari, and Soleymani (2020) define this as “a purposive and active behavior for fulfilling an informational need” (p. 1). Thus, the driving need for research is locating information based on need. Jalali, Keshvari, and Soleymani (2020) note that an outcome of this behavior is finding information from different resources and applying that information. The need to find and evaluate information for various purposes is universal, not particular to college students. Subsequently, there is research that focuses on information needs of various populations (Chow & Croxton, 2012). The literature on how students’ search for information varies. A great deal of the literature focus on specific information needs such as daily information seeking (Basch, MacLean, Romero, & Ethan, 2018; Huang & Kelly, 2013), fitness (Jalali, Keshvari, & Soleymani, 2020), and health information (Sbaffi & Zhao, 2020).

Researchers are attempting to better understand how students search for information (Kwasitsu, & Chiu, 2019). There is also research focusing on information seeking behaviors and academic performance (Weber, Becker, & Hillmert, 2019). Additionally, researchers are working to understand if and when students face anxiety while searching for information (Naveed, 2016). Exploring what part of the process causes anxiety for students allows educators to elevate this anxiety. Further, by understanding a students’ information need, such as if it is an academic or personal need, educators can increase their understanding of the tools students are using.
**Academic Use**

Considering how undergraduate students use information literacy skills, there is a wide range of literature on the topic. There are articles exploring student use and understanding of primary sources by way of archives (Jarosz & Kutay, 2017), information seeking and confirmation bias (Wittebols, 2016), evaluation techniques (List & Alexander, 2018), search strategies (Shultz & Zemke, 2019; Weber, Becker, & Hillmert, 2019), and electronic databases (Dukić & Strišković, 2015; Tanacković, 2018). A significant area of emphasis is students’ application of information sources such as Wikipedia for academic assignments (Colón-Aguirre & Fleming-May, 2012; Traphagan, Traphagan, Neavel Dickens, & Resta, 2014) and due students often relying on Wikipedia, how librarians can teach students how to effectively use web-based sources such as Wikipedia (Jennings, 2008; McKenzie et al., 2018; Pun, 2017). Further, faculty and librarians alike often feel that students have an over-reliance on familiar search strategies such a Google (D’Couto & Rosenhan, 2015). Problematically, many students do not understand how search engines work, and that search engines often confirm their previously held opinions on a subject over finding new ideas (Bhatt & MacKenzie, 2019). Although finding sources that confirm one’s beliefs might be a coinvent for students’ social lives, it is problematic for academic writing that requires the writer to show both sides of an issue.

**Social Lives**

The information boom and the ability to access information at all times give students access to limitless sources of information. Pew Research Center (2018) found that “14% of Americans changed their mind about an issue because of something they
saw on social media”. With the increase of fake news and statistics like the one provided above, it has become increasingly important to educate patrons on evaluating information both academically and socially. Nevertheless, the question becomes, what types of sources do students use to access information, and how do students evaluate the information?

Kim, Sin, and Yoo-Lee (2014) study looked at this very question posed above. Their study found that students are utilizing various social media platforms when searching for information. In particular, 90% of students reported utilizing Wikipedia and social media as information sources (Kim et al., 2014). These findings further indicate the need for including the importance of applying information literacy skills to students’ social lives (Kim et al., 2014). According to Kim et al. (2014), students do not spend a great deal of time evaluating the information that they engage with on social media platforms. Findings related to students lacking the motivation to evaluate the information they find on social media (Kim et al., 2014) are troubling when compared with Sin (2016). Sin (2016) concluded that social media users are aware that they encounter information via social media networks that may not be reliable. Thus, there must be a carryover of information literacy skills to students’ social lives.

**Chapter Summary**

This literature review section explored information literacy concepts, undergraduate students’ perceptions, motivation, knowledge, and use of information skills. Information literacy skills are essential for higher education students to succeed during their college career, future profession, and everyday lives. Further, it is difficult to ensure these skills are implemented into higher education beyond the library.
Additionally, students already feel that they have mastered information literacy skills and have no need to practice them further. The issues noted above, combined with the complexity of teaching information literacy skills and lack of student motivation, can make it difficult for librarians to successfully transfer these skills to students effectively. Even though aiding students in becoming information literate can be challenging work, it students need to develop the skills for their personal and professional lives.
CHAPTER THREE

METHODS

As discussed in chapter one, the purpose of this action research was to examine information literacy skills in undergraduate students. In particular, this research investigated students’ knowledge and self-efficacy of information literacy skills. The literature review aimed to explore the following research questions enumerated below.

1. What is the level of undergraduate students’ knowledge of information literacy at the University of South Carolina Columbia campus?
2. What are undergraduate students’ self-efficacy beliefs about their information literacy skills?
3. How do undergraduate students use information literacy skills in their academic and social lives?

Research Design

This study utilized action research-based (Mertler, 2017) to answer this study’s research questions. Action research is described as a systematic and cyclical process used by educators to improve issues that arise in their sphere of influence (Creswell, 2014; Manfra & Bullock, 2014; Mertler, 2017). Action research is “practitioner-based” and focuses on finding solutions for instructional issues in the classroom environment (Mertler, 2017, p. 3). Further, action research requires the research practitioner to be directly involved with the study participants (Mertler, 2017), which allows the researcher
to be intimately aware of the situation and participants, so they have a stake in the research.

Both traditional research methods and action research methods have their value as methods of inquiry. Action research was selected for this study because it enables those most engrossed in identifying an area that deserves investigation, collecting data on the problem, analyzing the data, and moving forward with a plan to implement change (Mertler, 2017; Mills, 2018). Additionally, this highly collaborative method seeks to answer research questions and make a change within the respective community (Bloomberg & Volpe, 2016; Denzin & Lincoln, 2013; McNiff, 2014; Mertler, 2017; Reason & Bradbury, 2008; Stranger, 2012).

This action research study followed a convergent mixed methods design. A mixed-methods design is beneficial to my research as it allowed me to combine quantitative and qualitative data to make inferences that enabled me to answer my research questions (Creswell, 2015). Utilizing both quantitative and qualitative methods offered a more substantive “understanding of the research problem than either form of data alone” (Creswell, 2015, p. 2). When researchers utilize both quantitative and qualitative methods in action research, the results produced are “more scientifically sound and more transferable results by synergistically integrating qualitative stakeholder engagement methods with quantitative outcome-based [sic] oriented approaches” (Ivankova, 2015, p. 9).

A convergent mixed methods design allowed me to collect my data at different times and analyze them separately (Creswell, 2014). Following a convergent mixed methods design allowed me to compare the data results to see that they confirm each
other (Creswell, 2014). Consequently, this method allowed me to combine both the strengths of quantitative and qualitative data to develop a deeper understanding of the data. The collection of data to make an informed decision is essential in a higher education setting involving numerous interested stakeholders. As a result, action research is a valuable process to develop an informed decision and transform a researcher’s sphere of influence. Having diverse and robust data were essential for my research as there were various stakeholders at play who were interested in this data to make informed decisions. Additionally, deploying a mixed-methods design allowed me to “obtain a more comprehensive view and more data about the problem” (Creswell, 2015, p. 15), which, in turn, lead to a greater understanding of the problem at hand.

**Setting and Participants**

This study was conducted on the main campus of the University of South in Columbia, South Carolina. As noted in Chapter 1, this is an R1 university and a state-funded school. The campus is in a diverse, urban environment. Students are required to complete various courses at this university, not only courses specific to their major but also to fulfill the general education requirements. One of the general education requirements is an information literacy requirement. In addition to credit-bearing courses that meet the information literacy requirement, roughly 3% of students also receive instruction from librarians. During the 2017-2018 school year, 11 Research and Instruction librarians provided instruction for 7,853 students via 408 instruction sessions that focus on information literacy skills.

This study's participants were undergraduate students from the university’s main campus located in Columbia, SC. According to the University’s Common Data Set, during
the spring 2021 semester, 25,391 undergraduate students were enrolled at the University of South Carolina Columbia campus (n.p.). According to the Office of Diversity, Equity, and Inclusion, the following information is available about the undergraduate population “63.9% are White, 27.9% African American, 0.5% Native American, 1.5% Asian, 5.3% Hispanic, 0.1% Pacific Islander, 1.7% Two or More Races” (n.d.). Additionally, as of spring 2021, there were 83 undergraduate degrees offered at the Columbia campus.

Purposeful sampling was utilized to ensure that all of the students were undergraduate students. Using purposeful sampling allows the researcher to obtain data to understand their research questions (Creswell, 2014). As the University of South Carolina has numerous campuses, graduate students, and professional degree-seeking students, students needed to meet the criteria of being an undergraduate student at the University of South Carolina Columbia campus. To ensure all participants fit this criterion, students were presented with this selection criteria before beginning the questionnaire. One student was removed from the results as they did not attend the Columbia campus.

Undergraduate students received an email invitation to participate via their academic departments. Additionally, I requested that the library liaisons email out the invitation to participate in the research study. For this, the library liaisons contacted the academic departments that they worked with and asked for the research study information to be shared with undergraduate students enrolled in their undergraduate programs. Flyers were also posted in various academic buildings with a link to the questionnaire. These three procedures were utilized to recruit eligible participants.
Demographic Information

A total of 72 individuals completed the questionnaire. Of the respondents there was a wide range of genders female ($n = 61$), males ($n = 8$), non-binary ($n = 2$), and preferred not to disclose their gender ($n = 1$). Freshman ($n = 12$), sophomores ($n = 14$), juniors ($n = 19$), and seniors ($n = 27$), yet the ages ranged from 18 to 70 years old ($M = 21.34$, $SD = 6.79$). Additionally race was also collected, African American ($n = 5$), Caucasian ($n = 58$), Asian ($n = 2$), preferred to not answer ($n = 2$), Latino ($n = 1$) and two or more races ($n = 4$).

After students completed the quantitative component, they were asked if they would like to participate in a focus group interview. All students who elected to participate in the focus group interviews were contacted via email providing them with a date and time for the focus group interviews. Of the 25 students that were emailed four students elected to participate in the interviews.

Data Collection

To answer the research questions, two methods of data collection were utilized. For quantitative data collection, a 56-question questionnaire (Appendix D) was sent to undergraduate students. This questionnaire contained five demographic questions, seven questions about their time spent online and technology use, 28 questions related to students’ self-efficacy of their information literacy skills, and 16 knowledge questions.

The focus group interviews were semi-structured interviews (Appendix E) conducted via Microsoft Teams. Using a mixed-methods approach allowed me to gain students’ perspectives on information literacy on a large and small scale.
The researcher obtained Institutional Review Board (IRB) approval before collecting data. Throughout data collection, I ensured that students’ responses remained confidential. To aid in ensuring student privacy for the quantitative data, identifying information was removed before analysis. Before data analysis, the entire column that contained students’ email addresses who wanted to participate in the focus group interview, were removed from the data set and randomized in Microsoft Excel. Thus, ensuring that their answer selections and emails could not be linked back together. Table 3.1 displays the research questions and data collection methods.

Table 3.1 *Research Questions Aligned with Data Sources*

<table>
<thead>
<tr>
<th>Research questions</th>
<th>Data sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. What are undergraduate students’ knowledge of information literacy at the University of South Carolina Columbia campus?</td>
<td>Questionnaire and focus group interview</td>
</tr>
<tr>
<td>2. What are undergraduate students’ self-efficacy beliefs about their information literacy skills?</td>
<td>Questionnaire and focus group interview</td>
</tr>
<tr>
<td>3. How do undergraduate students use information literacy skills in their academic and social lives?</td>
<td>Focus group interview</td>
</tr>
</tbody>
</table>

This section explains the data sources used in this inquiry, including (a) questionnaire and (b) focus groups.

**Questionnaire**

For the quantitative component of the research, a questionnaire was conducted via Microsoft Forms. The questionnaire consisted of 56 questions (see Appendix C), including one question for students to indicate their consent of participation in the focus group by providing their email address. The questionnaire was electronically hosted on Microsoft Forms. The questionnaire was divided into three sections (1) five demographic
questions including (i.e., age, gender, race, class standing, and major) and seven questions information on students’ past experiences with information literacy and technology use; (2) 28-question information literacy self-efficacy scale (Kurbanoglu, Akkoynunlu, & Umay, 2006); and (3) 16 questions adapted from the Open Test of Information Literacy (Hollis, Rachitskiy, & van der Leer, 2019).

**Self-efficacy scales.** The self-efficacy scale (Kurbanoglu et al., 2006) is a 28-item scale that measures college students' information literacy skills. This scale applies a seven-point Likert scale to allow students to share their confidence with each statement. Further, the scale is broken up into seven subscales. The questions for this subscale were presented via a Likert scale (1) Almost never true, (2) Usually not true, (3) Sometimes but infrequently true, (4) Occasionally true, (5) Often true, (6) Usually true, (7) Almost always true. As a whole, students felt confident and competent with the items presented in this section. The mean of the scores reflected in (6) usually true or (5) often true range for all questions. The seven subscales (Kurbanoglu et al., 2006) are as follows: (1) Defining the information need, (2) Initiating the search strategy, (3) Locating and accessing the resources, (4) Assessing and comprehending information, (5) Interpreting, synthesizing, and using information, (6) Communicating Information, and (7) Evaluating the product and process (p.742). Table 3.2 shows how many items are within each subscale.
Table 3.2 *Self-efficacy subscales*

<table>
<thead>
<tr>
<th>Self-efficacy subscale</th>
<th>Number of items in each subscale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Defining the information need</td>
<td>1</td>
</tr>
<tr>
<td>Initiating the search strategy</td>
<td>3</td>
</tr>
<tr>
<td>Locating and accessing the resources</td>
<td>8</td>
</tr>
<tr>
<td>Assessing and comprehending information</td>
<td>5</td>
</tr>
<tr>
<td>Interpreting, synthesizing, and using information</td>
<td>2</td>
</tr>
<tr>
<td>Communicating Information</td>
<td>7</td>
</tr>
<tr>
<td>Evaluating the product and process</td>
<td>2</td>
</tr>
</tbody>
</table>

The Kurbanoglu et al. (2006) scale has been validated and applied to various previous studies (Kilic-Cakmak 2010; Ross, Perkins, & Bodey, 2016; Stokes, & Urquhart; 2011; Usluel, 2007). Kurbanoglu et al. (2006) reported a Cronbach’s alpha of 0.91 for the English version of the self-efficacy scale. This falls within an excellent range of internal consistency (Taber, 2017).

**Information literacy knowledge questions.** The information literacy knowledge questions were adapted from the Open Test of Information Literacy (OTIL) developed by Hollis et al. (2019). The OTIL is based on the CILIP definition of information literacy. The purpose of the CILIP definition of information literacy is to provide an information literacy definition applicable beyond higher education. This was necessary as the ALA definition focuses purely on higher education. Thus, the OTIL questions can easily be applied to situations beyond higher education. There are two separate tests with a higher education add-on. In the original OTIL, there are 26 general questions and 30 higher education (HE) add-on questions.

Table 3.2 shows the original scale's intended focus versus the frames, in alignment with the Information Literacy Framework for Higher Education, which will
focus on this study. Overall, the Information Literacy Framework for Higher Education “emphasizes the research processes and skills to critically evaluate information and how information is accessed, presented, preserved, processed, and created while adapting to disciplinary approaches and needs” (Pun, 2020, p. 387). Thus, it focuses on the skills that most college students need to complete college-level research demands. As previously mentioned, the OTIL focuses on skills that apply to higher education and beyond. This research focuses on higher education students, and thus I wanted to ensure that the questions were as relevant as possible to the research participants. To do this, the OTIL categories were compared with the Information Literacy Framework for Higher Education. This framework is the leading framework for developing information literacy instruction in the United States. Thus, most students will receive information literacy instruction based on the Information Literacy Framework for Higher Education. Therefore, ensuring that the OTIL categories align with the Information Literacy Framework for Higher Education will allow for my research study's most relevant findings.

The OTIL category of *ability to discover and access information* can be easily compared to the Information Literacy Framework for Higher Education’s categories of *searching as strategic exploration or research as inquiry*. These categories examine the research methods students employ, what research resources students utilize to gather information, and how evaluation impacts students’ source selections (American Library Association, 2016; Miller, 2018). The OTIL category *critical thinking ability* has no category from the Information Literacy Framework for Higher Education that applies as the framework itself proposes critical thinking (American Library Association, 2016).
The OTIL category’s *ability to manage and store information effectively* was omitted. It can be a personal skill as everyone elects to organize and store their data in different ways.

Additionally, there is an Information Literacy Framework for Higher Education category that matches up with this skill. The OTIL category’s ability to use and create information directly aligns with the Information Literacy Framework for Higher Education information creation as a process. These categories reflect on the unique ways that information is designed in varying disciplines and how those sources are created (American Library Association, 2016; Miller, 2018). The ability to share and communicate findings from the OTIL category matches the Information Literacy Framework for Higher Education category scholarship as communication. These categories enumerate the barriers of information and scholarly conversations based on a students’ academic discipline (American Library Association, 2016; Miller, 2018). Lastly, the OTIL category understanding of ethical issues surrounding information matches up with the Information Literacy Framework for Higher Education information has value. These categories look at issues such as access to information and the impact of information (American Library Association, 2016; Miller, 2018). These can also be viewed in Table 3.3.

**Table 3.3 Open Test of Information Literacy Categories Versus the Information Literacy Framework Categories**

<table>
<thead>
<tr>
<th>OTIL categories</th>
<th>Information Literacy Framework for Higher Education categories</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ability to discover and access information</td>
<td>Searching as Strategic Exploration AND/OR Research as Inquiry</td>
</tr>
<tr>
<td>Critical thinking ability</td>
<td>OTIL category omitted as there is no equal match per the framework</td>
</tr>
</tbody>
</table>
Ability to manage and store information effectively  
OTIL category omitted as this is not a skill that I elected to focus on with students, which can be a very subjective skill.

Ability to use and create information  
Information Creation as a Process

Ability to share and communicate information  
Scholarship as Communication

Understanding of ethical issues surrounding information  
Information Has Value

The OTIL has been validated as the entire set was sent out to various library and information professionals after the development stage; for full disclosure, I was one of the librarians that helped validate the measure.

Focus Groups

A focus group was utilized because students often feel comfortable talking in groups, and there are often insightful comments that come from students feeding off of one another (Mertler, 2017). Conducting focus group interviews in this research helped me establish an account of students’ perceptions about, use of their information literacy skills. Further, it allowed me to examine their self-efficacy of their information literacy skills. Lastly it allowed me to look at the variance of how students apply their information literacy skills in their academic and social lives. It was imperative to ensure that all students can contribute during the focus group interviews. Table 3.4 shows sample research questions in addition to their alignment with the interview questions.

Table 3.4 Sample Interview Questions with Research Question Alignment

<table>
<thead>
<tr>
<th>Sample Interview Questions</th>
<th>Research Questions Alignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Define information literacy</td>
<td>Research Question One</td>
</tr>
</tbody>
</table>
Tell me about a time when you had to analyze conflicting sources. How would you go about analyzing these conflicting sources? For example, when compiling an annotated bibliography for a paper.

You see a post on social media. Something about this post seems suspicious, and you wonder if the information in the post is true. What do you do?

You are writing a speech for class. You have read numerous sources on the subject you will be speaking on. Your professor has said that you must have a slide for references at the end of your speech. Tell me what sources you would include on the references page and why you chose them.

It was my responsibility to “closely monitor the discussion” (Mertler, 2017, p. 136) and to restrain one or two individuals from dominating the conversation. The focus group meeting was recorded and transcribed for inductive analysis. Additionally, the focus group interviews were conducted utilizing Microsoft Teams and recorded to ensure a complete interaction was transcribed.

All participants were provided a pseudonym to ensure that they will not be identified to help protect students’ privacy. The focus group interviews were recorded and then transcribed using Temi (https://www.temi.com/), a transcription service that quickly and efficiently transforms audio files into transcripts. Each transcript was then saved as a separate Microsoft Word file. To ensure the accuracy of the transcription, I
went through the transcripts sentence by sentence. This allowed me to check if there were any discrepancies between the transcript and the recording.

**Data Analysis**

Data analysis methods are presented in Table 3.5. Specifically, the quantitative components were analyzed via descriptive statistics. The qualitative data were analyzed, utilizing inductive analysis techniques. To ensure student privacy for the focus group interviews, I applied pseudonyms to the transcripts. By analyzing all of my data sources and verifying that the themes are seen across all the data added validity to the study (Creswell, 2014). All of these methods will be discussed in more detail in the following sections.

**Table 3.5 Data Collection and Analysis Methods**

<table>
<thead>
<tr>
<th>Research question</th>
<th>Data sources</th>
<th>Analysis methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. What is undergraduate students’ knowledge of information literacy at the University of South Carolina?</td>
<td>• Questionnaire and focus group interview</td>
<td>• Descriptive statistics, inductive analysis</td>
</tr>
<tr>
<td>2. What are undergraduate students’ self-efficacy beliefs about their information literacy?</td>
<td>• Questionnaire and focus group interview</td>
<td>• Descriptive statistics, inductive analysis</td>
</tr>
<tr>
<td>3. How do undergraduate students use information literacy skills in their academic and social lives?</td>
<td>• Focus group interview</td>
<td>• Inductive analysis</td>
</tr>
</tbody>
</table>
Questionnaire

For the questionnaire, descriptive statistics were utilized. Descriptive statistics allowed me to transform the data collected via the questionnaire into more manageable chunks of numerical data for analysis (Mertler, 2017). Additionally, descriptive statistics aims to determine the central tendency. The central tendency measures allowed me to understand “what is typical or standard about a group of individuals” (Mertler, 2017, p. 179). This understanding was imperative for my research. Further, this type of analysis allowed me to develop a deeper understanding “of the collective level of performance, attitude, [and] opinion of a group of study participants” (Mertler, 2017, p. 179).

Additionally, for this research, a point biserial correlation was conducted. Bonetti (2019) describes this as “A point-biserial correlation can be defined in terms of a standardized mean difference” (p. 114). This type of analysis allows the researcher to measure the strength and direction between two variables (Bonetti, 2019). This correlation allowed me to analyze the validity of the knowledge questions in alignment with research question one.

Once the questionnaire closed, all of the data were downloaded into a .csv file and then imported into JASP for analysis. As Mertler (2017) notes, there are three ways to measure central tendency; these methods are mean, median, and mode. I employed the mean for this study to look at the average scores from participants. The mean was calculated for the self-efficacy questions and the knowledge questions. This allowed me to see what the average response was from students on these topics.

Additionally, I looked at measures of dispersion. Measures of dispersion “indicate what is different within a group of scores” (Mertler, 2017, p. 181). By looking at means
of dispersion, I was able to view the variety of understandings that study participants had about the research topic. To do this, I calculated the standard deviation of the self-efficacy and knowledge questions. The standard deviation allowed me to understand “the average distance of scores away from the mean” (Mertler, 2017, p. 181).

Lastly, I calculated the Cronbach’s alpha for the self-efficacy scale. The Cronbach’s alpha allowed me to test the reliability of the self-efficacy scale. This is an important measure to run as individuals are always evolving, and thus their answers could change if the measure was administered at a different time (Taber, 2017). Due to this difficulty, Cronbach’s alpha focuses on the measure's reliability at that specific point in time (Taber, 2017). The Cronbach’s alpha was calculated for the self-efficacy portion of this research study. Any subscales that did not fall within the moderate range or above were removed.

**Focus Groups**

Inductive analysis was used to analyze focus group interview data. The inductive analysis goal was to “reduce the volume of information that you have collected, thereby identifying and organizing data into important patterns and themes” (Mertler, 2017, p. 172-173). Before beginning the data analysis, all transcripts were reviewed to help me get familiar with the data. Once the transcript files were ready for analysis, the text was copied into Delve for coding. Delve is a Web 2.0 tool that easily allows a researcher to input their transcripts into the analysis software. Once the transcript is added, a researcher can then apply codes to the transcript. Inductive analysis via Delve enabled me to begin the coding process of breaking the data into more manageable chunks to identify themes and categories from the interviews (Creswell, 2014).
It was necessary during the analysis phase to identify key concepts and themes by coding and sorting the data (Lichtman, 2013). Creswell (2014) defines “coding as the process of organizing the data by breaking chunks and writing a word representing a category in the margins” (p. 198). For this research, I completed two cycles of coding to make sense of the data. During the first cycle of coding, I coded the transcripts using in vivo coding followed by descriptive coding (Saldaña, 2016). The second cycle of coding was pattern coding (Saldaña, 2016). Those two cycles of coding allowed me to see what recurring themes emerged across two focus group interviews. This process also allowed me to see what applies to the group at large versus what applies only to individual participants (Saldaña, 2016).

**Procedures**

The procedures for this study were broken up into three phases. Additionally, students were provided questions about electing to participate in the focus group interviews. Focus group interviews were conducted after quantitative data were collected. Students who volunteered to participate in focus group interviews were emailed in May 2020 and made aware of when focus group interviews would be conducted. Students were then asked to reply to the email if they were willing to participate in the focus group interviews. Table 3.6 provides a synopsis of the phases with both the participants’ roles, the researcher’s roles, and a timeline for each phase.

Table 3.6 Participant and Researcher Role with Timeline

<table>
<thead>
<tr>
<th>Phase one</th>
<th>Participants’ role</th>
<th>Researcher’s role</th>
<th>Timeline</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Complete questionnaire</td>
<td>Email questionnaire</td>
<td>Eight weeks</td>
</tr>
<tr>
<td></td>
<td></td>
<td>to liaisons, students, and place flyers around campus</td>
<td></td>
</tr>
</tbody>
</table>
The researcher obtained Institutional Review Board (IRB) approval before collecting data. Throughout data collection, I ensured that students’ responses remained confidential. To aid in ensuring student privacy for the quantitative data, identifying information was removed before analysis. Before data analysis, the entire column that contained students’ email addresses who wanted to participate in the focus group interview, were removed from the data set and randomized in Microsoft Excel. Thus, ensuring that their answer selections and emails could not be linked back together.

During Phase One, the researcher sent out the questionnaire. The questionnaire was delivered via email to students directly from the researcher, emailed to students via the library liaisons, and around flyers on campus. Each library liaison serves various academic departments on campus and has contact information for these departments. Thus, these allow the liaisons to have a working relationship with each department. Students were provided with a link to the questionnaire (Appendix A).

Additionally, the researcher placed flyers around campus about the study (Appendix B). If students wanted to participate in the questionnaire, they gave their consent by choosing to begin the questionnaire. Participants also had the choice to leave the questionnaire at any time.
In Phase Two, the researcher analyzed the quantitative findings of the study. After reviewing the quantitative data, I met with my advisor to review my initial findings. We then selected the best analysis procedures for my data. Once I completed descriptive statistics (i.e., mean and standard deviation), my advisor and I met to review the findings. We reviewed the numbers that were produced from the analysis. After studying the descriptive statistics, I then completed a validity analysis utilizing Cronbach’s alpha. Once I obtained the Cronbach’s alpha scores, my advisor and I met again to see what scores were within an acceptable range. Lastly, we ran a point biserial correlation of the data. Once we completed the quantitative analysis, we then moved onto the quantitative data.

After the results were analyzed, focus groups were formed. The researcher aimed to conduct four focus groups, but two groups were created based on class standing at the university. Participants were asked via email to participate in focus groups. Students then elected to participate in a focus group by providing their email to contact them to schedule focus groups.

Phase Three is when the focus group interviews were conducted. There were two separate focus groups based on class ranking. To participate in the focus group interviews, students had to have completed the questionnaire. To develop the focus groups, participants who indicated that they were willing to participate were emailed. In total, 25 students provided their email addresses to be contacted about the focus groups. All 25 students were emailed and equipped with a time for a focus group study. Ten students were emailed to participate in the senior focus group interview, but none responded, confirming that they would participate. Eleven students were emailed to
participate in the junior focus groups. Three junior students said they would be willing to participate in the focus groups, but only two were in attendance. Four students were emailed to participate in the sophomore focus groups. Of the four students, three elected to participate, but only two were in attendance. Lastly, no freshmen were willing to participate in the focus groups. Although this was not the original aim for the focus groups, due to the global pandemic, there was a decrease in student availability to participate in the focus groups. Thus, two focus groups were conducted, with each focus group included two students in the same grade. The grade classification of students (i.e., sophomore, juniors) formed the focus groups.

**Rigor and Trustworthiness**

An essential component of action research is to uphold measures that ensure rigor and trustworthiness. The methods that I used to increase my research rigor and trustworthiness include member checking, peer debriefing, and data triangulation (Mertler, 2017). Further, it is essential to offer thick, rich descriptions of my data collection methods, data, and findings (Leech & Onwuegbuzie, 2007). This section explains (a) triangulation of data, (b) member checking, and (c) peer debriefing.

**Triangulation of Data**

The themes illuminated in both sets of data were then compared via triangulation of the data. As Mertler (2017) notes, “triangulation is an inherent component of mixed-methods research designs” (p. 142). Triangulation involves reviewing multiple data sources and ensuring that the themes are the same throughout all data sources (Creswell, 2012). This is an essential component of mixed-methods research, as it allowed me to determine whether all of the data gathered produces similar findings (Mertler, 2017). While
completing this analysis stage, I identified information that helped answer my research questions (Metler, 2017). Triangulation allowed me to combine my various data sources and ensure that I am able “to build a coherent justification for themes” (Creswell, 2014, p. 201).

To complete the data triangulation for this study, data were aggregated to present a clear picture of the findings. The results of my data needed to be symbiotic throughout. To do this, the data were analyzed, and then the information was reviewed as a whole to ensure that the research questions were being answered with the data collected.

**Member Checking**

Creswell (2012) defines member checks as “a process in which the researcher asks one or more participants in the study to check the accuracy of the account” (p. 259). This allows participants to review the findings and ensure that they are adequately represented (Creswell, 2015; Mertler, 2017; Shenton, 2004). After the initial stage of data analysis was completed, I shared my preliminary findings of the study with the focus group participants via email. Students were then able to offer their thoughts on the findings and ensure the accuracy of my findings. All four students were emailed with preliminary results, and three of them responded, indicating that they agreed with the themes. Although, one student thought the second theme needed minor adjustments. One student had concern over the broader focus for question two and felt that information literacy should just be considered a justice issue in education.

**Peer Debriefing**

Peer debriefing was utilized to ensure that the research will be understood by people other than the researcher (Creswell, 2015). Additionally, peer debriefing allows an outsider
to review the entire research process (Mertler, 2017). Further, this process enables someone beyond the researcher to review the research and ensure that the interpretations and findings match the data and are not influenced by the researcher being too close to the study itself (Mertler, 2017). Peer debriefing was completing through the data analysis stage.

After the first round of *in vivo* coding, my advisor and I met the second round of *in vivo coding*, after descriptive coding, after pattern coding, and after analyzing the codes for themes. During each stage, my advisor and I reviewed the codes to develop meaningful codes for my research.

**Plan for Sharing and Communicating Findings**

The findings from this action research study will be shared via a variety of formats and venues. As Mertler (2017) notes, “sharing the results - either formally or informally - is the real activity that helps bridge the divide between research and application” (p. 259). The findings of this research would be shared in the following manners.

The findings will be shared within the University Libraries setting. The University Libraries' interested groups will be the Research and Instruction department, the Research and Instruction department Instruction group, the University Libraries Instruction team, University Libraries administration, such as Deans and department heads, and any interested library faculty or staff members. The findings will be shared in conjunction with the professional development committee of the library. This committee hosts monthly brown-bag events where people share their research, conference experiences, or other exciting information to the library. This will allow me to present my findings to the community that directly interacts with the population studied. The outcomes will be
essential for any library personnel that interacts with students or wants to understand students’ motivation regarding information literacy.

These findings will also be shared via conferences, the statewide library association, South Carolina Library Association, the national level of the Association of College & Research Libraries, and internationally at the Quantitative Qualitative Library Methods Conference, all pending acceptance. It is essential to ensure that all participants’ privacy is respected, so no identifying information was included in any findings.
CHAPTER FOUR
ANALYSIS AND FINDINGS

The purpose of this action research study was to determine the factors that influence the University of South Carolina undergraduate students to apply information literacy skills in their academic and social lives. Quantitative and qualitative data were collected to answer the following three research questions: (1) What is the level of undergraduate students’ knowledge of information literacy at the University of South Carolina?; (2) What are undergraduate students’ self-efficacy beliefs about their information literacy skills?; (3) How do undergraduate students use information literacy skills in their academic and social lives? This chapter will describe the analysis and findings of the data collected via the questionnaire and focus group interviews. The quantitative data will be discussed first, followed by qualitative data.

Quantitative Analysis and Findings

Quantitative data were collected via a questionnaire that was sent to students from March 2020 through May 2020. The questionnaire was composed of demographic questions, questions about internet use and library resources, self-efficacy questions from Kurbanoglu et. al (2006), and knowledge questions from Hollis et. al (2019). The Kurbanoglu et. al (2006) 28-item scale used for this study have a Cronbach’s alpha of .91. A total of 56 quantitative questions, including five demographic questions and seven questions about information technology use, were asked via the questionnaire (see Appendix C). Additionally, when assessed, the Cronbach’s alpha of the entire
questionnaire is .95 and has an excellent validity score (Taber, 2017). This section covers (a) demographic information and (b) self-efficacy questions.

**Demographic information**

A total of 72 students participated in the electronic questionnaire. As seen in table 4.1, all grade levels were represented via the questionnaire with the most participants being seniors ($n = 27$). The majority of participants were also female ($n = 61$). The age of participants ranged from 18-70.

Table 4.1 *Questionnaire Participants Grade and Gender*

<table>
<thead>
<tr>
<th>Grade</th>
<th>Gender</th>
</tr>
</thead>
<tbody>
<tr>
<td>Freshman $n=12$</td>
<td>Female $n = 61$</td>
</tr>
<tr>
<td>Sophomore $n = 14$</td>
<td>Male $n = 8$</td>
</tr>
<tr>
<td>Junior $n = 19$</td>
<td>Non-binary $n = 2$</td>
</tr>
<tr>
<td>Senior $n = 27$</td>
<td>Prefer not to answer $n = 1$</td>
</tr>
</tbody>
</table>

Students were also asked to identify their race to see if the population of participants were representative of the University of South Carolina Columbia campus population. Figure 4.1 highlights the different races represented by questionnaire participants. The majority of participants identified as Caucasian ($n = 58$).
Lastly, students were asked to self-report their majors. Figure 4.2 shows the abundance of majors represented by the questionnaire participants.

**Self-Efficacy Scale**

To determine the internal consistency of the self-efficacy questions, Cronbach’s alpha was assessed. Cronbach’s alpha allows the research to measure for internal
consistency (Ivankova, 2014). Manerikar and Manerikar (2015) share that values between .7 and .9 are considered acceptable, and values presenting at .9 are excellent. For this research, I determined that the values of Cronbach’s alpha beyond 0.7 were acceptable. Cronbach’s alpha for the self-efficacy scale developed by Kurbanoglu et al. (2006) was .96 for this study, suggesting excellent internal consistency (Taber, 2017).

For this research, the subscales in this questionnaire were examined by calculating Cronbach’s alpha. The reliability of the subscales for this study varied from .70 - .91 when looked at individually. One subscales, defining the information need, did not produce a Cronbach’s alpha as there as only one question in this subscale.

**Overall findings.** Prior to analyzing students’ self-efficacy of their information literacy skills, the validity of the self-efficacy questions was calculated via Cronbach’s alpha. Table 4.1 shows the results for using Cronbach’s alpha to calculate the subscales’ internal consistency. For the subscale initiating the search strategy, Cronbach’s alpha is .70, which is an acceptable internal consistency. The subscale locating and access the resources produced a Cronbach’s alpha of .91 and an excellent internal consistency. The subscale assessing and comprehending information has a Cronbach’s alpha of .87 and has an acceptable internal consistency. The subscale interpreting, synthesizing, and using information has a Cronbach’s alpha of .88 and thus has an acceptable internal consistency. The subscale communicating information produced a Cronbach’s alpha of .91 and has an internal consistency. The last subscale, evaluating the product and process has a Cronbach’s alpha of .14 which is not an acceptable internal consistency. The items will remain in the discussion as it is important to review students’ information literacy skills within this subscale.
Table 4.2 Self-efficacy Subscales with Cronbach’s alpha

<table>
<thead>
<tr>
<th>Subscale</th>
<th>Cronbach’s alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initiating the search strategy <em>(Items 9-11)</em></td>
<td>.70</td>
</tr>
<tr>
<td>Locating and accessing the resources <em>(Items 12-19)</em></td>
<td>.91</td>
</tr>
<tr>
<td>Assessing and comprehending information <em>(Items 20-24)</em></td>
<td>.87</td>
</tr>
<tr>
<td>Interpreting, synthesizing, and using information <em>(Items 25-26)</em></td>
<td>.88</td>
</tr>
<tr>
<td>Communicating information <em>(Items 27-33)</em></td>
<td>.91</td>
</tr>
<tr>
<td>Evaluating the product and process <em>(Items 34-35)</em></td>
<td>.14</td>
</tr>
</tbody>
</table>

After conducting the Cronbach’s alpha, the questionnaire was then analyzed via descriptive statistics. As mentioned, the questions for this subscale were presented via a Likert scale (1) Almost never true, (2) Usually not true, (3) Sometimes but infrequently true, (4) Occasionally true, (5) Often true, (6) Usually true, (7) Almost always true. The findings of this subscale indicate that students generally feel confident and competent applying information literacy skills in the (5) often true or (6) usually true range. The findings of each subscale will be discussed below.

**Initiating the search strategy.** In the subscale initiating the search strategy, items 14-16, students were asked to rank their confidence and competency related to searching for information. For this subscale, the Cronbach’s alpha was assessed at 0.70 and thus was an acceptable range. Table 4.2 highlights Cronbach’s alpha after items have been removed for the subscale, initiating the search strategy. When question Q14, I feel confident and competent to identify a variety of potential sources of information, was removed, the Cronbach alpha decreased to .62. Thus, Q14 needs to be included. Question Q15 notes that I feel confident and competent to limit search strategies by
subject, language, and date. When the Cronbach’s alpha was calculated after this question was removed, it decreased to .55. Therefore, Q15 needs to remain in this subscale. The last question in the subscale is Q16; I feel confident and competent to initiate search strategies using keyword and Boolean logic. When Q16 was removed from this subscale, the alpha dropped to .66 and thus needs to remain in this subscale.

Table 4.3 *Initiating the Search Strategy Subscale*

<table>
<thead>
<tr>
<th>Questions</th>
<th>Cronbach’s alpha after items removed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q14 I feel confident and competent to identify a variety of potential sources of information</td>
<td>.62</td>
</tr>
<tr>
<td>Q15 I feel confident and competent to limit search strategies by subject, language, and date</td>
<td>.55</td>
</tr>
<tr>
<td>Q16 I feel confident and competent to initiate search strategies by using keyword and Boolean logic</td>
<td>.66</td>
</tr>
</tbody>
</table>

As a whole, students felt confident and competent with the items presented in this section. Table 4.4 shows the mean and standard deviation for these questions.

Table 4.4 *Initiating the Search Strategy Subscale Mean and Standard Deviation*

<table>
<thead>
<tr>
<th>Questions</th>
<th>$M$</th>
<th>$SD$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q14 I feel confident and competent to identify a variety of potential sources of information</td>
<td>6.11</td>
<td>0.93</td>
</tr>
<tr>
<td>Q15 I feel confident and competent to limit search strategies by subject, language, and date</td>
<td>5.97</td>
<td>1.10</td>
</tr>
<tr>
<td>Q16 I feel confident and competent to initiate search strategies by using keyword and Boolean logic</td>
<td>5.35</td>
<td>1.47</td>
</tr>
</tbody>
</table>

The mean of the scores reflected in (6) usually true or (5) often true range for all questions. Students felt confident and competent when it came to identifying a variety of
potential sources of information ($M = 6.11, SD = 0.93$), but limiting search strategies ($M = 5.97, SD = 1.10$) and using keywords, and Boolean logic ($M = 5.35, SD = 1.47$) were not far behind.

**Locating and accessing the resources.** The subscale locating and accessing the resources contained items 17-24. This subscale focused on students’ confidence and competency in searching for and finding information sources. The Cronbach’s alpha for this subscale was .91 and thus had an excellent validity. Table 4.5 reflects Cronbach’s alpha after items removed for this subscale. When individual questions were removed from the subscale, it resulted in the Cronbach’s alpha becoming lower. Due to this, all questions in this subscale need to be kept.

<table>
<thead>
<tr>
<th>Questions</th>
<th>Cronbach’s alpha after items removed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q17 I feel confident and competent to decide where and how to find the information I need</td>
<td>.90</td>
</tr>
<tr>
<td>Q18 I feel confident and competent to use different kinds of print sources (i.e., books, periodicals, encyclopedias, chronologies, etc.)</td>
<td>.90</td>
</tr>
<tr>
<td>Q19 I feel confident and competent to use electronic information sources</td>
<td>.90</td>
</tr>
<tr>
<td>Q20 I feel confident and competent. I feel confident to locate information sources in the library</td>
<td>.89</td>
</tr>
<tr>
<td>Q21 I feel confident and competent to use the library catalogue</td>
<td>.89</td>
</tr>
<tr>
<td>Q22 I feel confident and competent to locate resources in the library using the library catalogue</td>
<td>.88</td>
</tr>
<tr>
<td>Q23 I feel confident and competent to use internet search tools (such as search engines, directors, etc.)</td>
<td>.90</td>
</tr>
<tr>
<td>Q24 I feel confident and competent to use different kinds (types) of libraries</td>
<td>.89</td>
</tr>
</tbody>
</table>

Table 4.5 *Locating and Accessing the Resources Subscale*

After completing the Cronbach’s alpha, descriptive statistics were then calculated. Table 4.6 showcases the means and standard deviations for these questions.
Table 4.6 Locating and Accessing the Resources Subscale Mean and Standard Deviation

<table>
<thead>
<tr>
<th>Questions</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q17 I feel confident and competent to decide where and how to find the information I need</td>
<td>6.21</td>
<td>0.90</td>
</tr>
<tr>
<td>Q18 I feel confident and competent to use different kinds of print sources (i.e., books, periodicals, encyclopedias, chronologies, etc.)</td>
<td>5.63</td>
<td>1.33</td>
</tr>
<tr>
<td>Q19 I feel confident and competent to use electronic information sources</td>
<td>6.38</td>
<td>0.86</td>
</tr>
<tr>
<td>Q20 I feel confident and competent. I feel confident to locate information sources in the library</td>
<td>5.25</td>
<td>1.49</td>
</tr>
<tr>
<td>Q21 I feel confident and competent to use the library catalogue</td>
<td>5.11</td>
<td>1.57</td>
</tr>
<tr>
<td>Q22 I feel confident and competent to locate resources in the library using the library catalogue</td>
<td>5.04</td>
<td>1.56</td>
</tr>
<tr>
<td>Q23 I feel confident and competent to use internet search tools (such as search engines, directors, etc.)</td>
<td>6.39</td>
<td>0.83</td>
</tr>
<tr>
<td>Q24 I feel confident and competent to use different kinds (types) of libraries</td>
<td>5.26</td>
<td>1.42</td>
</tr>
</tbody>
</table>

Students felt most confident and competent when using the internet search tools ($M = 6.39$, $SD = 0.83$) and the least confident using information sources in the library ($M = 5.25$, $SD = 1.49$). Although it is important to note that students did feel confident completing all of these skills, just with varying ability. In this subscale, there is a wide range of standard deviations ranging from 0.83 to 1.57.

**Assessing and comprehending information.** The third subscale assessing and comprehending information explores items 25-29. This subscale focused on students’ assessment of their confidence and competency to assess and understand various information sources. The Cronbach alpha for this subscale was .87. Due to this, the only question that could be removed is Q29; I feel confident and competent to evaluate WWW sources. When this question was removed from the subscale, Cronbach’s alpha stayed the same and thus can be removed. When questions Q25 – Q28 were individually removed,
it resulted in a lower Cronbach’s alpha, and therefore they need to remain in this
subscale. Table 4.7 reflects Cronbach’s alpha after items were removed for this subscale.

Table 4.7 Assessing and Comprehending Information Subscale

<table>
<thead>
<tr>
<th>Questions</th>
<th>Cronbach’s alpha after items removed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q25 I feel confident and competent to use many resources at the same time</td>
<td>.86</td>
</tr>
<tr>
<td>Q26 I feel confident and competent to determine the authoritativeness,</td>
<td>(\cdot .82)</td>
</tr>
<tr>
<td>currentness, and reliability of the information sources</td>
<td></td>
</tr>
<tr>
<td>Q27 I feel confident and competent to select information most appropriate to the information need</td>
<td>.83</td>
</tr>
<tr>
<td>Q28 I feel confident and competent to identify points of agreement and disagreement among sources</td>
<td>.83</td>
</tr>
<tr>
<td>Q29 I feel confident and competent to evaluate WWW sources</td>
<td>.87</td>
</tr>
</tbody>
</table>

After review Cronbach’s alpha, the mean and standard deviation were then conducted.

The results are presented in Table 4.8.

Table 4.8 Assessing and Comprehending Information Subscale Mean and Standard Deviation

<table>
<thead>
<tr>
<th>Questions</th>
<th>(M)</th>
<th>(SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q25 I feel confident and competent to use many resources at the same time</td>
<td>5.94</td>
<td>1.11</td>
</tr>
<tr>
<td>Q26 I feel confident and competent to determine the authoritativeness,</td>
<td>6.13</td>
<td>1.05</td>
</tr>
<tr>
<td>currentness, and reliability of the information sources</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Q27 I feel confident and competent to select information most appropriate to the information need</td>
<td>6.01</td>
<td>1.00</td>
</tr>
<tr>
<td>Q28 I feel confident and competent to identify points of agreement and disagreement among sources</td>
<td>6.00</td>
<td>1.06</td>
</tr>
<tr>
<td>Q29 I feel confident and competent to evaluate WWW sources</td>
<td>5.61</td>
<td>1.47</td>
</tr>
</tbody>
</table>
As seen in Table 4.7, overall these are skills that students feel comfortable using.

**Interpreting, synthesizing, and using information.** As previously noted, the Cronbach’s alpha for this subscale was .88. As this subscale only has two questions, there is no need to run an analysis for the Cronbach’s alpha when items were removed as both questions need to remain in the subscale. Table 4.9 displays the mean and standard deviation for each question in this subscale. Through these questions, it is apparent that students feel comfortable applying these information literacy skills.

Table 4.9 *Interpreting, Synthesizing, and Using Information Subscale Mean and Standard Deviation*

<table>
<thead>
<tr>
<th>Questions</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q25 I feel confident and competent to synthesize newly gathered information with previous information</td>
<td>5.71</td>
<td>1.20</td>
</tr>
<tr>
<td>Q26 I feel confident and competent to interpret the visual information (i.e., graphs, tables, diagrams)</td>
<td>5.58</td>
<td>1.16</td>
</tr>
</tbody>
</table>

**Communication information.** This subscale focused on students’ confidence and competency in communicating information. The Cronbach’s alpha for this subscale was .91. Table 4.9 reflects Cronbach’s alpha after items removed for this subscale. When Q32-Q38 was individually removed, it resulted in a lower Cronbach’s alpha. Due to this, all questions need to remain in the subscale.

Table 4.10 *Communicating Information Subscale*

<table>
<thead>
<tr>
<th>Questions</th>
<th>Cronbach’s alpha after items removed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q32 I feel confident and competent to write a research paper</td>
<td>.90</td>
</tr>
<tr>
<td>Q33 I feel confident and competent to determine the content and form the parts (i.e., introduction, conclusion) of a presentation (written, oral)</td>
<td>.89</td>
</tr>
<tr>
<td>Q34 I feel confident and competent to prepare a bibliography</td>
<td>.89</td>
</tr>
<tr>
<td>Q35 I feel confident and competent to create bibliographic records and organize the bibliography</td>
<td>.89</td>
</tr>
</tbody>
</table>
Q36  I feel confident and competent to create bibliographic records for different kinds of materials (i.e., books, articles, thesis, papers, web pages).
Q37  I feel confident and competent to make citations and use quotations within the text.
Q38  I feel confident and competent to choose a format (i.e., written, oral, visual) appropriate to communicate with the audience (i.e., students, colleagues).

Table 4.11 shows the mean and standard deviations for these questions. As seen from the results, these are skills that students felt confident and competent to apply.

Table 4.11  Communicating Information Subscale Mean and Standard Deviation

<table>
<thead>
<tr>
<th>Questions</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q32  I feel confident and competent to write a research paper</td>
<td>6.00</td>
<td>1.05</td>
</tr>
<tr>
<td>Q33  I feel confident and competent to determine the content and form the parts (i.e., introduction, conclusion) of a presentation (written, oral)</td>
<td>6.21</td>
<td>0.89</td>
</tr>
<tr>
<td>Q34  I feel confident and competent to prepare a bibliography</td>
<td>5.91</td>
<td>1.20</td>
</tr>
<tr>
<td>Q35  I feel confident and competent to create bibliographic records and organize the bibliography</td>
<td>5.71</td>
<td>1.20</td>
</tr>
<tr>
<td>Q36  I feel confident and competent to create bibliographic records for different kinds of materials (i.e., books, articles, thesis, papers, web pages)</td>
<td>5.58</td>
<td>1.16</td>
</tr>
<tr>
<td>Q37  I feel confident and competent to make citations and use quotations within the text</td>
<td>6.06</td>
<td>1.11</td>
</tr>
<tr>
<td>Q38  I feel confident and competent to choose a format (i.e., written, oral, visual) appropriate to communicate with the audience (i.e., students, colleagues)</td>
<td>6.04</td>
<td>1.01</td>
</tr>
</tbody>
</table>

Students’ felt most confident in this subscale when determining the parts of the information being presented ($M = 6.21$, $SD = 0.89$). Making citations and using quotes ($M = 6.06$, $SD = 1.11$), selecting an appropriate format to present information ($M = 6.04$, $SD = 0.90$).
and writing a research paper \((M = 6.00, SD = 1.05)\) had similar measurements of central tendency and dispersion

**Evaluating the product and process.** The Cronbach’s alpha for this subscale was extremely low with it producing a value of .14. Although the internal consistency is low, it was important to keep these questions to review students’ information literacy self-efficacy. Additionally, this subscale only has two questions and thus the Cronbach’s alpha when an item is removed will not be calculated. Table 4.12 showcases the mean and standard deviation for these questions. The mean and standard deviation for these sections are extremely low in comparison to the other sections. It is important to note that although students often feel confident applying specific skills, as seen in the previous section, they do not feel confident and competent to learn from previous experience or to criticize their own processes.

Table 4.12 *Evaluating the Product and Process Subscale Mean and Standard Deviation*

<table>
<thead>
<tr>
<th>Questions</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q25 I feel confident and competent to learn from my information problem-solving experience and improve my information literacy skill</td>
<td>0.64</td>
<td>.48</td>
</tr>
<tr>
<td>Q26 I feel confident and competent to criticize the quality of my information seeking process and its products</td>
<td>0.92</td>
<td>.28</td>
</tr>
</tbody>
</table>

**Open Test for Information Literacy Knowledge Questions**

The questionnaire contained 16 knowledge questions that were in alignment with the Information Literacy Framework. The highest possible score for this section was 16. Scores ranged from 0-16, with only a total of eight students who received a score of 16 \((M = 12.90, SD = 2.80)\).
To measure the validity of this subscale, Cronbach’s alpha was assessed. As previously noted, Cronbach’s alpha permits the research to measure for internal consistency (Ivankova, 2014). Manerikar and Manerikar (2015) share that values between .7 and .9 are considered acceptable, and values presenting at .9 are excellent. The Cronbach’s alpha for the knowledge questions was .74 and within an acceptable range for this study. Table 4.6. shows the Cronbach’s alpha for each question if the item was removed alongside the point-biserial correlation. In general, all of the questions can be kept. Question 45, 47, and 53 were removed for analysis as Cronbach’s alphas increased when these questions were removed from further analysis.

To assess the difference between the means, a point-biserial correlation was conducted (Bonetti, 2019). This type of analysis allows the researcher to measure the strength and direction between two variables (Bonetti, 2019). A point-biserial correlation is “used to compare the relationship between two variables if one of the variables is dichotomous” (Corder & Foreman, 2014, p. 139). This simply means that two conditions are being measured (Corder & Foreman, 2014). For this study, each item's mean (i.e., question) was compared to the mean of the overall sample. The Cronbach’s alpha and point-biserial correlation can be viewed in Table 4.13.

Table 4.13 Cronbach’s Alpha if Knowledge Questions are Removed

<table>
<thead>
<tr>
<th>Question</th>
<th>Cronbach’s alpha after items removed</th>
<th>Point biserial correlation of the knowledge questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q41 In the UK, people say 'aubergine,' and in the US, people say 'eggplant' for the same ingredient. You are searching for recipes online and you want to include both British and American results. Which of the following search strings will produce the most relevant results?</td>
<td>.74</td>
<td>0.27</td>
</tr>
</tbody>
</table>
Q42  What is the correct sequence of the elements in a research article?  
Q43  You need to write a report on the impact of technology on modern art. You have interviewed five local artists and audio-recorded the one-hour interviews. Which of the following would produce the most accurate and informative report?  
Q44  In which situation is it more efficient to consult an encyclopedia article rather than a journal article?  
Q45  Read each of the following scenarios and decide which one would be considered plagiarism.  
Q46  In your assignment, you want to describe the impact of human activities on climate change. Your initial search returned an overwhelming number of documents. Which of the following will help you narrow down your search without reducing the quality or accuracy of information?  
Q47  You have taken a photograph of your friend Jane posing by a fountain in Hyde Park. Who owns this photograph?  
Q48  For a research project that requires an original scientific contribution by the student, which of the following methods would be a good way to proceed?  
Q49  You were asked to speak at a local community centre about your work experience. You will be addressing currently unemployed individuals looking to get into your area of work. How would you approach the presentation?  
Q50  In your paper, you want to use some data from an article by another author. How do you proceed according to ethical principles and the protection of author’s rights?  
Q51  You have taken some photographs at a Museum of London event that marked the centenary of women being given the right to vote, focusing on the Suffragettes. Which of the following combination of tags should you apply to reach the maximum number of people interested in the subject?  
Q52  Which of the following is NOT an original, new piece of information you could create?
Knowledge question subscales. Further, the knowledge questions were broken into four subscales. The knowledge subscales are based on the Association of College and Research Libraries Framework for Information Literacy. The four frames that the questions focused on are (1) scholarship as conversation, (2) information creation as a process, (3) searching as strategic exploration, and (4) information has value. Descriptive statistics were calculated for each question and displayed via subscale. The following section will address the calculations via subscale.

Scholarship as conversation subscale. Table 4.14 displays the mean and standard deviation for this subscale. In this subscale, students were the most knowledgeable with identifying the elements in a research article \((M = 0.93, \ SD = 0.26)\) and the purpose of an abstract \((M=0.92; \ SD= 0.28)\). The ability to categorize information successfully \((M = 0.86, \ SD = 0.35)\) returned satisfactory results. Students struggled the most with choosing the most appropriate talking point for a presentation \((M = 0.79, \ SD = 0.41)\).

Table 4.14 Scholarship as Conversation Subscale

<table>
<thead>
<tr>
<th>Questions</th>
<th>(M)</th>
<th>(SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q42 What is the correct sequence of the elements in a research article?</td>
<td>0.93</td>
<td>0.26</td>
</tr>
<tr>
<td>Q49</td>
<td>You were asked to speak at a local community centre about your work experience. You will be addressing currently unemployed individuals looking to get into your area of work. How would you approach the presentation?</td>
<td>0.79</td>
</tr>
<tr>
<td>Q51</td>
<td>You have taken some photographs at a Museum of London event that marked the centenary of women being given the right to vote, focusing on the Suffragettes. Which of the following combination of tags should you apply to reach the maximum number of people interested in the subject?</td>
<td>0.86</td>
</tr>
<tr>
<td>Q55</td>
<td>What is the purpose of an abstract in a research article?</td>
<td>0.92</td>
</tr>
</tbody>
</table>

**Information creation as a process subscale.** The subscale information creation as a process focuses on the steps it takes to develop information and distribute it. These questions focused on distributing information, what makes original information, and how to compile information together. Table 4.15 displays the mean and standard deviation for this subscale. Students were most accurately able to select an appropriate presentation title ($M = 0.89$, $SD = 0.32$). Students also performed well when selecting the most accurate and informative report ($M = 0.85$, $SD = 0.36$) and selecting the most appropriate way to proceed using their own scientific contribution ($M = 0.85$, $SD = 0.36$). Students struggled the most with identifying what was not an original piece of information that could be created ($M = 0.75$, $SD = 0.44$).
Table 4.15 *Information Creation as a Process Subscales*

<table>
<thead>
<tr>
<th>Questions</th>
<th>$M$</th>
<th>$SD$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q43  You need to write a report on the impact of technology on modern art. You have interviewed five local artists and audio-recorded the one-hour interviews. Which of the following would produce the most accurate and informative report?</td>
<td>0.85</td>
<td>0.36</td>
</tr>
<tr>
<td>Q48  For a research project that requires an original scientific contribution by the student, which of the following methods would be a good way to proceed?</td>
<td>0.85</td>
<td>0.36</td>
</tr>
<tr>
<td>Q52  Which of the following is NOT an original, new piece of information you could create?</td>
<td>0.75</td>
<td>0.44</td>
</tr>
</tbody>
</table>

**Searching as strategic exploration subscale.** Searching as strategic exploration questions focuses on the fact that research takes many different forms and shapes; research is not linear. Table 4.16 displays the mean and standard deviation for this subscale. This particular subscale was one that students struggled with more, with the median answers ranging from the mean being 0.64 to 0.92. Students were most successful at determining how to narrow down their search without reducing the quality or accuracy of results ($M = 0.92, SD = 0.28$). The next question that students performed the best on was identifying when to use subject databases ($M = 0.82, SD = 0.39$). Students struggled with determining when to use an encyclopedia article versus a journal article ($M = 0.71, SD = 0.46$) and using the Boolean Operator of $OR$ to accommodate for word variations ($M = 0.64, SD = 0.48$).
Table 4.16 Searching as Strategic Exploration Subscale

<table>
<thead>
<tr>
<th>Questions</th>
<th>$M$</th>
<th>$SD$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q41 In the UK people say 'aubergine,' and in the US, people say 'eggplant' for the same ingredient. You are searching for recipes online and you want to include both British and American results. Which of the following search strings will produce the most relevant results?</td>
<td>0.64</td>
<td>0.48</td>
</tr>
<tr>
<td>Q44 In which situation is it more efficient to consult an encyclopedia article rather than a journal article?</td>
<td>0.71</td>
<td>0.46</td>
</tr>
<tr>
<td>Q46 In your assignment, you want to describe the impact of human activities on climate change. Your initial search returned an overwhelming number of documents. Which of the following will help you narrow down your search without reducing the quality or accuracy of information?</td>
<td>0.92</td>
<td>0.28</td>
</tr>
<tr>
<td>Q54 Which option is the most effective for locating articles that focus on a specific discipline area like Psychology or Engineering?</td>
<td>0.82</td>
<td>0.39</td>
</tr>
</tbody>
</table>

**Information has value subscale.** Information has value questions focused on the fact that information itself is valuable, not only monetarily but in the quest for knowledge. Additionally, information has value highlights the ethical issues that have to be considered concerning information. Table 4.17 displays the mean and standard deviation for this subscale. The descriptive statistics for the subscale contained the lowest scores of the set. This was also the category of questions that students felt less confident and competent to perform. Students performed well at deciding ethical use of others’ ideas ($M = 0.88$, $SD = 0.33$) and citing information in an ethical manner ($M = 0.83$, $SD = 0.38$).
Table 4.17 Information Has Value Measures of Central Tendency and Dispersion Subscale

<table>
<thead>
<tr>
<th>Questions</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q50 In your paper, you want to use some data from an article by another author. How do you proceed according to ethical principles and the protection of author’s rights?</td>
<td>0.83</td>
<td>0.38</td>
</tr>
<tr>
<td>Q56 When is it ethical to use the ideas of another person in a research paper?</td>
<td>0.88</td>
<td>0.33</td>
</tr>
</tbody>
</table>

**Qualitative Data Findings and Interpretations**

Qualitative data were collected in the form of semi-structured focus-groups interviews. Two focus group interviews were conducted via Microsoft Teams. The first focus group was with sophomores, and the second group was with juniors. Both focus groups lasted under an hour. All interviews were recorded then downloaded for transcription. Once transcription occurred and was checked, data analysis was performed using Delve. This section's information includes (a) qualitative data analysis and (b) presentation of findings.

**Qualitative Data Analysis**

The qualitative data sources included two focus group interviews. Due to the complexity of the COVID-19 situation, fewer students were recruited to participate in focus group interviews than initially planned. Although more data could have been collected during the Fall 2020 semester, it was not collected as students’ perceptions of information literacy skills may have drastically changed due to the majority of online courses. The impact of students’ having to complete the majority, if not 100% of their coursework online, could have significant implications for their information literacy skills. Thus, the perception of their self-efficacy and knowledge could have drastically changed and not have created as cohesive data. Therefore, a total of two focus group
interviews were performed, a sophomore and a junior focus group, during the late spring and early summer of 2020. As previously mentioned, students interested in participating in the focus group interviews were contacted via email when focus groups would be conducted virtually. If students remained interested in participating in the study, they were asked to reply and let the researcher know they would like to participate.

Table 4.18 shows the abundance of information ascertained from the qualitative data. Participants’ names were removed from the transcripts and replaced with pseudonyms to ensure their anonymity.

Table 4.18 Summary of Qualitative Data Sources

<table>
<thead>
<tr>
<th>Cycles of Analysis</th>
<th>Codes Applied</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Cycle</td>
<td></td>
</tr>
<tr>
<td>In Vivo</td>
<td></td>
</tr>
<tr>
<td>Sophomore Focus Groups</td>
<td>147</td>
</tr>
<tr>
<td>Junior Focus Groups</td>
<td>197</td>
</tr>
<tr>
<td>Descriptive</td>
<td></td>
</tr>
<tr>
<td>Sophomore Focus Groups</td>
<td>82</td>
</tr>
<tr>
<td>Junior Focus Groups</td>
<td>46</td>
</tr>
<tr>
<td>Second Cycle</td>
<td></td>
</tr>
<tr>
<td>Pattern Coding</td>
<td>40</td>
</tr>
<tr>
<td>Total</td>
<td>512</td>
</tr>
</tbody>
</table>

All four-focus group participants were females in their sophomore or junior years at the university. Their ages varied, but three out of four would be considered traditional students. Two of the participants are pursuing degrees in the health sciences, one student in social work, and one student in women and gender studies. Table 4.19 displays the demographic information of the participants.
Table 4.19  *Focus Group Participants Demographic Information*

<table>
<thead>
<tr>
<th>Pseudonym</th>
<th>Grade</th>
<th>Major</th>
<th>Gender</th>
<th>Race</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abagail</td>
<td>Sophomore</td>
<td>Public Health</td>
<td>Female</td>
<td>Two or more races</td>
</tr>
<tr>
<td>Heather</td>
<td>Sophomore</td>
<td>Public Health</td>
<td>Female</td>
<td>White</td>
</tr>
<tr>
<td>Katrina</td>
<td>Junior</td>
<td>Social Work</td>
<td>Female</td>
<td>White</td>
</tr>
<tr>
<td>Veronica</td>
<td>Junior</td>
<td>Women and Gender Studies</td>
<td>Female</td>
<td>White</td>
</tr>
</tbody>
</table>

All focus group interviews were conducted via the Microsoft Teams meeting tool. This tool allowed for the interviews to be recorded and saved as .mp4 files. Once the files were saved, they were then uploaded to Temi for transcription. Once Temi completed the transcriptions, Microsoft Word documents were created for each interview. After that, I reviewed the transcription files in Microsoft Word documents and revised sections as necessary. Once the transcription accuracy was confirmed, both focus group interview transcripts were uploaded to Delve for the first and second coding cycles. In this study, in vivo coding and descriptive coding were utilized for the first cycle of coding. In vivo coding allowed me to ensure that students’ voices were accurately represented (Saldaña, 2014). In contrast, descriptive coding allowed me to develop codes that portrayed students’ experiences (Saldaña, 2014). Lastly, pattern coding was utilized for the second cycle of coding. Pattern coding allowed me to take the abundance of information obtained during the first cycle of coding and summarize the data into more manageable concepts (Saldaña, 2014). In this section, the reader will be introduced to (a) first-cycle coding and (b) second-cycle coding.

**First cycle coding.** The first cycle included two rounds, with the first round being in vivo coding to understand the students’ verbiage (Saldaña, 2014). In contrast, descriptive codes allowed me to develop codes that summarized what participants were
sharing (Saldaña, 2014). This section covers the (a) In vivo coding, (b) descriptive coding, (c) preparing for second cycle coding.

**In vivo coding.** The first-round coding in the first cycle was in vivo coding. In vivo coding focuses on using the interviewee’s own words, allowing the research to honor the participants’ voices (Saldaña, 2016). To complete this coding cycle, it was imperative to read each sentence line by line to develop a deep understanding of participants’ reflections. Upon reading the sentence, participants’ own words would be utilized to create a code. This allows for the researcher to get familiar with the research participants’ voices. Via in vivo coding, I represented participants’ perceptions of information literacy in their own words. When coding, I paid particular attention to phrases that described the information that the participant was sharing. Using this method is in line with Saldaña (2014), who noted that “when selecting what portion of the interviewees’ transcript to use as the code, it is important to select the words or phrases that “stand out as significant or summative of what is being said” (p. 590). To make the coding selection, I highlighted the sentence(s) needed for the code and used the right-hand menu to type in a new code or search for a code that had already been employed. Figure 4.3 shows the coding process for the sophomore in vivo round. The codes are seen on the right, with the transcript on the left. Additionally, the codes can be viewed beneath the transcript for easily navigating the selected codes. For example, when participants described asking a friend for help when unsure about information, “ask a friend” was assigned.
During peer debriefing with my advisor, we noted that several codes did not represent the meanings that the participants intended to deliver. For instance, instead of using “ask a friend” to describe asking for help, I had just coded it as “help.” After this round of peer debriefing, I reviewed the in vivo codes in both the sophomore and junior transcripts, ensuring that they were meaningful. It was vital for me to revisit these transcripts with fresh eyes, and I intentionally stepped away from the coding procedures to clear my mind. Then I read through the transcripts again to check the codes and modify the codes if necessary. After completing in vivo coding, 147 codes were obtained from the sophomore transcripts, and 197 codes were obtained for the junior focus group.

Upon completing the in vivo coding, my advisor and I conducted another round of peer debriefing on the in vivo codes. We agreed that the edits produced much more meaningful regulations, except for some of the codes need further revisions to reflect the participants’ meaning. For example, instead of just having “research” as a code, “research a topic” was utilized. As a result, I was able to move on to the next round of coding.
**Descriptive coding.** The second round of coding used descriptive coding. Saldaña (2014) shares that “descriptive codes are primarily nouns that simply summarize the topic of the datum” (p. 593). The unit of analysis for this round of coding was meaningful units in each sentence. For this, I focused on the topics that summarized the meaning in the participants’ interviews. This round of coding was also conducted in Delve. Specifically, I highlighted meaningful units in each sentence and then applied new codes or added to pre-existing codes utilizing the right-hand pane.

The first round of descriptive coding produced 48 descriptive codes for the sophomore interviews and 23 for the junior interviews. After completing peer debriefing with my advisor, we determined that I had selected a too high level of codes and needed to revisit the codes. For example, “information literacy,” “sharing information,” and “confidence” did not provide enough information about the data. Figure 4.4 shows the descriptive coding process in Delve.

![Figure 4.4 Descriptive coding process in Delve](image)

After completing the second round of the first cycle of coding, my advisor and I completed peer debriefing. We determined that I needed to revisit the descriptive coding to ensure that all of the codes were meaningful. The new codes are noted in Table 15.
Eighty-two descriptive codes were created for the sophomores’ interview and 46 for the juniors’ interview. These codes were more focused, such as “confidence in searching,” “valuing counterclaim,” and “print reliable.” After meeting with my advisor, we determined that these codes summarized the data in a more meaningful way.

**Preparing for second cycle of coding.** Combining in vivo and descriptive codes allowed me to summarize the data in terms that made sense in the context of my research questions. To prepare for the second cycle of coding, I needed to step back from the coding process to clear my mind. Once I took a break from coding, I then began to visualize the codes (Saldaña, 2014) notes the importance of visualizing the codes. To complete my visualization, I attempted some code mapping in Microsoft Word. This was helpful for me to start seeing how the various codes worked together. After completing the visualization, I was cleared by my advisor to move on to second cycle coding.

**Second cycle coding.** The second cycle included two rounds of coding, the first round being pattern coding. Pattern coding allowed me to identify patterns that were appearing in the codes (Saldaña, 2014). The second round of coding is where the pattern codes were analyzed to develop categories and themes. This section covers the (a) first round of pattern coding and (b) second round of pattern coding.

**First round of pattern coding.** The second cycle of coding was coded using pattern coding (Saldaña, 2014). To do this, I revisited my sophomore and junior transcripts in Delve. I reread the transcripts and the codes assigned to each section to review what was being shared (Saldaña, 2014). As seen in Figure 4.5, the pattern codes started with PC to represent pattern codes, which allowed me to separate the pattern codes from the in vivo and descriptive codes as the coding procedures progressed. In total, 40 pattern codes were developed (i.e. PC search strategy, PC writing, etc.).
After completing the pattern coding, I met with my advisor to conduct peer debriefing. We determined that the pattern codes were sufficient and that I could move on to the second round of coding.

**Second round of pattern coding.** After completing my Delve coding, I then downloaded all of the codes from Delve into Microsoft Excel. Figure 4.6 displays the codes as seen in Delve. The purpose of this round was to elicit categories and themes. To do this, I focused on the pattern codes and their meanings to develop themes.
Once the codes were downloaded, I separated each set of codes into individual workbooks in Microsoft Excel. The pattern codes, all listed as PC, were placed into their workbook to continue with the pattern coding process. After reviewing the categories, I submitted them to my advisor for peer debriefing. Once we decided that categories were appropriate in Microsoft Excel, I then developed themes. Adding the codes to Microsoft Excel allowed me to categorize the codes into themes. To do this, I reviewed my pattern codes and then divided them into various categories. This allowed for three themes to transpire: (1) college students perceived that their research process is motivated by information need, (2) college students perceived that being able to find, access, and use information is a fundamental human right for social justice, and (3) college students perceived that their self-efficacy of applying information literacy skills varied by information need.

After the themes were created I met with my advisor to review the themes. After a few adjustments, an email was sent out to participants who participated in the focus group interviews. These participants were provided with the preliminary themes. In the email, participants were asked to share if they agreed or disagreed with the findings. If they disagreed, there were asked to share why. Of the four students that were emailed, three students responded. All three students agreed with the two of the themes presented. One student had concerns over the use of justice issue beyond education. Upon reviewing their feedback, the themes were revisited. From this, three themes emerged: (1) College students perceived that they applied information literacy skills to their academic and social lives in various ways based on information need, (2) College students perceived that being able to find and access information is a fundamental human right
related to social justice and (3) College students perceived that their self-efficacy of applying information literacy skills varied by the information resource(s) they were utilizing. These themes will be discussed in detail in the qualitative findings section.

**Qualitative Findings**

Qualitative findings were obtained from two focus group interviews via Microsoft Teams. Verbatim quotes are used throughout these sections to ensure that students’ perceptions are accurately represented. Three themes emerged from the data analysis, as seen in Table 4.20. These themes describe students’ perceptions of information literacy and their self-efficacy of information literacy skills. Three themes were developed from the focus group interviews that describe students’ information literacy self-efficacy and knowledge of information literacy:

1. College students perceived that they applied information literacy skills to their academic and social lives in various ways based on information needs.
2. College students perceived that finding and accessing information is a fundamental human right related to social justice.
3. College students perceived that their self-efficacy of applying information literacy skills varied by the information resource(s) they were utilizing.

Table 4.20 *Themes that Emerged from Qualitative Data*

<table>
<thead>
<tr>
<th>Themes</th>
<th>Categories</th>
<th>Sample Patterns</th>
<th>Sample Codes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. College students perceived that they applied information literacy skills to their academic and social lives in various ways based on information needs.</td>
<td>Information Need</td>
<td>Purpose</td>
<td>Back up Argument</td>
</tr>
<tr>
<td></td>
<td>Searching for Information</td>
<td>Search strategies</td>
<td>Google Library Databases</td>
</tr>
<tr>
<td></td>
<td>Use of information</td>
<td>Evaluation</td>
<td>Information literacy use</td>
</tr>
<tr>
<td>Source selection</td>
<td>Use resources</td>
<td></td>
<td></td>
</tr>
<tr>
<td>------------------</td>
<td>--------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Use of information literacy skills in academics</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2. College students perceived that finding and accessing information is a fundamental human right related to social justice.

3. College students perceived that their self-efficacy of applying information literacy skills varied by the information resource(s) they were utilizing.

**Theme 1: College students perceived that they applied information literacy skills to their academic and social lives in various ways based on information needs.**

This theme described different ways that students search for information based on their information need. As noted in the literature review, information needs are responsible for individuals' "drive for information seeking and access" (Oyediran-Tidings, Ondari-Okemwa, & Nekhwevha, 2019, p. S1). This theme showcases that students' search strategies vary based on a) personal research and b) academic research. This is since these two categories highlight what often influences students' searching behaviors. Thus the reasons for the type of information they find and select depends on the scope of their research question and interest.
In this research study, it became clear from the participants' quotes that how students search for information and what tools they utilize vary depending on the type of information that they need. The information need is thus going to influence the steps someone takes to fulfill the need. Greenberg and Bar-Ilan (2014) found in their research that most students tend to use a combination of search engines (i.e., Google or Google Scholar) and library databases and start in search engines. Utilizing search engines is consistent with the findings of this study.

Head and Eisenberg (2011) also found that most of their participants performed research to answer various questions they have. The distinction between academic research and personal research was also indicated in this study. It was unclear if students in the study felt it was easier to locate information for their personal lives or academic lives. However, Head and Eisenberg, 2010 found that 41% of students had an easier time searching for information for their personal lives.

As noted in the focus group, Katrina often shared that when verifying information that she would usually start "with I would first like Google it. Like if there's anything like specific". This theme encompasses four categories: a) information need, b) searching for information, c) use of information literacy skills in academics, and d) use of information literacy skills in social lives. categories will be described in detail throughout this section.

**Information need**

As previously noted, students apply their information literacy skills based off of their information need (Oyediran-Tidings, Ondari-Okemwa, & Nekhwevha, 2019. The American Library Association (2016) describes this process as "searching for strategic exploration" (n.d). This can also be viewed as students' information-seeking
behaviors or information need (Jalali, Keshvari, & Soleymani, 2020; Oyediran-Tidings, Ondari-Okemwa, & Nekhwevha, 2019).

Throughout my conversations with the focus groups, it became clear that there were differences in how students searched for information depending on their information needs, which is in line with previous research. Participants in this research study highlighted the various ways that they search for information. It also became apparent that research participants had different levels of experience researching for their academic studies. The differences will be emphasized in this section.

Three of the four focus group participants noted that they preferred to find articles that gave them an overview of the topic. For example, Veronica offered her perspective “I would say like I would find the first thing I would do is kind of find like an article that kind of goes kind of like more of an overview of what the topic is.” Students also shared that the type of sources they look for varies on how easily they can access the information. Heather noted that “really anything that I can command F and lookup keywords pretty much, I'll go for it.”

This idea of being able to skim through information is not unique to Heather. Lawrence (2016) notes this phenomenon in her paper that indicates the importance of understanding students’ behavior to aid them in building “students’ confidence in their abilities” while searching for information (p. 93). Further, this highlights the idea of satisficing (Sin, 2016). The term satisficing means students stop seeking information when they feel what they have found is “good enough,” even though it might not be the best possible information (Sin, 2016, p. 1794). Just as Heather noted, utilizing “command
F” to find information may mean that she is not taking in any information unless it is deemed the “right” information.’

For Abagail, part of her choice over what information sources to use is based on her understanding of sources' reliability. Whereas Heather noted that sometimes her searching behavior is dictated by the information need. Heather shared an experience of information-seeking about COVID-19 that is part of a school project:

we're primarily looking through, you know, public health, uh, reports and
recommendations from experts in different government, um, press releases about
everything that is COVID. So, um, that's been an interesting exercise in looking at, uh, kind of a niche sector of like information, but it's made me very confident in, um, you know, being able to go through like more like government, uh, it was like official sources and things and, um, just learning how to navigate that and in the best way.

As noted, this is an essential skill that the literature has been developing during the COVID 19 pandemic. In particular, there is developing literature on the importance of health professionals in helping patients decipher this information (Last, 2020).

Searching for information

In this study, this category reflected how students search for information. This included reflecting on the steps students take to begin searching for information and the various resources that students utilized when searching for information, how students applied information literacy skills, in particular how students searched for information (Kim & Sin, 2016; Kim, Sin, & Tsai, 2014; Kim, Sin, Yoo-Lee, 2014).
Additionally, it was crucial to examine the choices students make when searching for information. Previous research from Head et al. (2018) found that there was indeed a difference when students searched for academic research versus their social lives. Head et al. (2018) noted that 66% of students utilized library databases for academic research. In comparison, students used social media for only 6% of their academic assignments (Head et al., 2018). The findings Head et al. shared were also echoed in this research study.

**Use of information literacy skills in academics**

How students use the information they find for their courses and their personal lives is an area that has not had much research beyond Head and Eisenberg's (2010), whose findings mainly focused on educational use. Antidotally, it would be appropriate to assume that students often use the information to answer their curiosities or fulfill academic research needs. This can be echoed by the understanding that students search for information based on their information need (Huang & Kelly, 2013; Oyediran-Tidings, Ondari-Okemwa, & Nekhwevha, 2019).

Both students in the sophomore groups had on-campus jobs that required them to work with students to find and use information. When talking about locating information, Heather shared that when working with other students, they:

“kind of seek out sources that already confirmed the viewpoints that they have that kind of like confirmation bias.” Heather went on to share she helped students understand different ways to use information by: “recognizing the fact that it's always strong to have that counterclaim like you discussed that you can strengthen your, your primary line of argument by having those conflicting
sources” instead of just using sources that agree with their research project. In turn, Heather noted she would teach students a stronger way to use information: I like to take those two sources and pull out those major themes. So, like maybe I see a theme of, we did a lot of like, uh, I'm trying to think like moral and ethical issues. So, like pulling out maybe that theme of like honor or, uh, loyalty or something like that and how they both speak on that different ways and then kind of organizing, um, in that way.

The description Heather shared is one that another focus group participant shared about how they utilize information. Kathy indicated that she would look for information that was confirming what she already planned to write: “I typically would organize like the paper whatever I'm trying to do ahead of time […] this paragraph is talking about this specific thing, and then I'll look specifically for sources that cover that topic in-depth”.

Veronica also shared the importance of being able to use information: “It is the ability to utilize knowledgeable research. So, you have to be an expert really, an expert in the literature in the communication of that literature almost as if you were scholar.”

One component of how students use information is when they are using it to complete research projects. With this comes the need to cite information. This is an area that students often find difficult at the university (Geary, 2017; Geary, 2018). Students noted that how they use information depends on the professor. Kathy shared uncertainty with citing information: “I don't know I'm doing a speech video paper. I've included all my references that I've used. I mean I don't know there's a right or wrong. Like nobody said.”
Veronica noted she would cite everything:

I use all my sources. I would put all my sources as well, even if it's like sometimes I do just use like stories or sometimes like with the field that I'm in those kind of like civil rights organizations and that kind of thing that I can get information from. So, I'll cite those as well.

Kathy continued to share, “then, depending on the professor, I’ll even cite like images and that kind of thing that I put into it, but like how far I go depends on what the professor expects. But in general, just pretty much everything”. This idea of it depending on the professor is also echoed by Squibb and Zanzucchi (2020), who shared:

The number of references students used rested on a variety of factors, especially the rigor of the instructor’s expectations for required sources, a desire to lend additional quality or authority to the project, a need for background knowledge, and the level of effort needed to find and use relevant materials. (p. 160-161)

Concerning citing sources, Abagail and Heather had a bit of a different approach. They chose to focus on what was a major contributing factor to their research:

Abagail: Anything that has brought a major component to my research, I feel is really important to reference if I'm just taking like two words from one source. I don't. I don't see the necessity to validate that source just because you know that those two words could pop up anywhere at any time. So, they might even appear in the source that I'm already citing. Um, so I think that, yeah, I would just, I cite whatever it brings a major component.
Heather: I like to have like a few solid, I would say like five different solid sources that, um, are all kind of, you know, coming at the same point. And then, uh, taking, I do get a little bit lazy. I don't like to cite as many things cause APA can be very hard, but, um, probably taking the three that were most impactful, even if you know, the other two, I use some of the ideas, but it's a little bit of a carryover and overlapping. Um, I'll probably just go with the three that I mainly pulled from and just use those throughout and use that as my references.

It is clear from the focus groups that students at the University of South Carolina have varying ideas when they need to cite information.

Research participants also shared in their definitions of information literacy that they needed to understand if a source was accurate or valid:

Katrina: And understand like whether or not a source is valid. Like being able to check the credentials of the person who is writing it and whether or not it's from, like Uhm I don't know what the correct like word is like agency. Like you know, that's a valid source for like psychological sources or something that is like really verified. You know that it's a peer reviews that other people in the area have already looked at it like what makes it valid.

Research participants were also aware that there is a process that information gets reviewed before it is published, but it seems that the process is a bit murky for students. Abagail shared, “I think print can be a little more reliable just because so many people
have to check that print in order to make sure it's accurate.” Although some books do go through a lengthy review process, this comment made me wonder if students were aware that non-academic books are not reviewed for accuracy in the way students think they are.

This seemingly baseline conversation of how students evaluate research is not surprising when also couched within other research studies. Head and Eisenberg (2010) found:

Evaluating information was often a collaborative process—almost two-thirds of the respondents (61%) reportedly turned to friends or family members when they needed help and advice with sorting through and evaluating information for personal use. Nearly half of the students in the sample (49%) frequently asked instructors for assistance with assessing the quality of sources for course work—far fewer asked librarians (11%) for help. (p. 3).

Although it is unclear if students seek out help for both their personal and academic inquires. Abagail also noted during the focus group interviews that she would ask a friend if she was unsure about the information she was finding online: “I actually ask a friend if they've ever heard of the topics.”

Previous research has found that when students complete academic research, they often begin with the library website to access scholarly journals and use search engines less frequently (Head, 2007). When researching their everyday lives, it depends on the information need (Head, & Eisenberg, 2011).
The focus groups seemed to highlight the importance of using the resources they had available to them in addition to the internet. Katrina felt that library databases were the best solution for her to be searching:

[Library] databases all the way. Like 'cause I just think there's like so many there and I know like I don't know, this is kind of like weird, but I know it's like kind of an expensive resource at the University is paying for us to have. So, I'm really grateful to have like to have that. [...] I feel like it is really important because, like you know, we're paying for like in our tuition. We should be like know how to use it and be able to use it. I think I mentioned this earlier but being able to like use like the Academic Search Complete and then just choose all the different databases that you want at once like it just gives you so much information I want. And then, like all the different features down. I just think it's really awesome and has been super helpful for papers that have been great.

Katrina also shared that using the library databases is a skill that she had learned at the university and would transfer to her future career. Katrina disclosed:

I mean, it might seem kind of like trivial, but like being able to go on to the um like Academic Search Complete feature. Like going to choose databases and selecting all the ones that are relevant to like the specific thing that I'm trying to research. 'Cause that gives like so many more results, and then I've learned like how to narrow it down based on years. I only get like the modern sources and just like and then like narrowing it down to like America and that kind of thing. So just like knowing how to get the specific information that I’m looking for and making sure that I am getting stuff that's relevant. That like just takes down the
amount of time that it takes researching like so much. I think that's been like a
game-changer since I came here.

Katrina also noted that these were not new skills for her. She divulged in the focus group interviews:

As like someone who went like right from high school college, I feel like I was already pretty knowledgeable at everything. I feel like USC has done a really good job for people like me, at least. Because like I know in my classes, they almost always have like a day where we go to the library, and we meet like research assistant person for our college, and they go over like how to find all of the sources. And like for me, it seems like they're kind of like, you know, doing the same thing over and over. But I know that it is beneficial for like people who are newer to this type of information. Yeah, exactly when you're writing a paper, and you're having to come up with how to cite different individuals and authors.

Katrina's commentary highlights that she is aware of the differences that college students face regarding information literacy skills and how difficult it can be for some students.

Although Katrina felt well prepared for college-level research, this is not the case for all students (Geary, 2017; Geary, 2018; Smith, Given, Julien, Ouellette, DeLong, 2013; Zakharov & Maybee, 2019). There is a discrepancy that is found in established research and this action research study. Detmering and Johnson (2012) highlight the experience many college students face when completing college-level research. Conducting college-level research can be particularly difficult for senior students (Brent, 2017). This idea will be further explored in the social justice section of this chapter.
Use of information literacy skills in social lives

During the sophomore focus group interviews, Abagail and Heather shared the different ways they use the resources they have to evaluate if a restaurant is authentic or not:

Abagail: A lot of people who do go to authentic restaurants, they are either like really close to that part of whatever type of food they're eating. So, like Chinese food, a lot of Asians will eat the Chinese food. Um, so I feel like they have a really good sense of what is authentic and what isn't. Um, so those Yelp reviews I think are really good. Um, but then I, you know, if I have like any ethnic friends or people who are of a different ethnicity, I'll ask them like, well, what do you usually eat with like big celebrations and stuff? Does this restaurant kind of, um, model what you're trying to do? I know everybody's different. Everybody cooks it differently, but like, is it the same basis? This is the same concept.

Heather: Yeah. I totally agree with that. Um, using, you know, the kind of the people around you. Cause I feel like I like to get recommendations for things like that from another person who was tried it and, um, can speak on that.

The commentary provided in this section highlights the different resources that students have access to when trying to locate information and their comfort using a wide variety of tools. In the next area, we will be looking at the various types of information students find when completing their research.
Head and Eisenberg (2009) found in their study that 98% of students used Google for everyday analysis, and 59% of students utilized other search engines. Jalali, Keshvari, and Soleymani (2020) found that college students also use social media for specific information-seeking behaviors, such as fitness-related queries. This already shows a contrast between information-seeking behaviors that were highlighted in the academic lives section. Additionally, Head et al. (2018) found that students only use library databases for 7% of the personal lives research. In turn, they use social media for 56% of the time their personal searching (Head et al., 2018). This research study also reverberated these findings. Further, this section will explore how students a) find, b) evaluate, c) use the information for their academic research.

For all of the research, participants primarily started with Google when looking for information online. Abagail also highlighted an essential avenue that three out of four ($n = 75\%$) focus group participants also asked a friend for their research. These findings also echo the research participants who relied on social media for finding information about restaurants online or by asking a friend.

When searching for authentic restaurants, Abagail shared that she would "do that initial Google search and just look up restaurants, um, that people have gone to, or that have high reviews. But then I'd also kind of look at the Yelp reviews". For Heather, she would rely on familiar information sources. Heather shared:

[Using] Yelp and I specifically like to look at, um, like the terrible review, like a one-star review and then a five-star review […] but generally, I do a lot of like looking at those articles that are like best whatever in Columbia or things like that
and getting kind of ideas and then looking more specifically into it on like, uh, the website for the restaurant or those like Yelp reviews and things like that. Katrina used a similar tactic, but due to this research occurring during the COVID-19 outbreak, she looked for additional measures that she looked for. Katrina noted:

I look at different kind of websites that have the rank. I don't wanna go to five stars versus someone that has a deal of the day. So, I look at reviews along, like the open seating guidelines, and I'll talk about how they are rated in the food in the service.

Katrina also shared that she uses social media as a way to gather information. Katrina added, “if I wanna find out like whether or not places like authentic, I've been doing this like recently but kind of going on to their Facebook page.” By utilizing social media, Katrina felt that she was able to get a better feel for the owners and “to see o see what they're telling you about kind of their lived experience and how it's turned into the food that they are crafting.” Using social media to find information is something that students have been relying on. Head and Eisenberg (2009) found that 606 of their research participants, or 57%, utilized social networks for information-gathering practices.

Another vital component is how students are evaluating information that they find online. Students shared that they performed limited evaluations when it comes to their personal lives. Katrina stated that when encountering a post on social media that seems inaccurate, she would verify the information using a search engine:

[Especially] like there's always like rumors and stuff going on about like celebrities and that kind of thing. So, I would kind of like Google and see if
there's any knowledgeable sources. I have confirmed it like sources that have like fact-checkers and that kind of thing.

Veronica echoed this sentiment by sharing:

Yeah, same with me. You can hide with the Internet. So, something is gonna come out, and with just a little additional digging and then also looking for reliable sources would be being [sic] able to validate the content of something that's published.

Although this is a similar tactic, it shows that students are perhaps not aware that those first few links are advertisements or manipulated by the searching engine via Pageranks, and thus may not be the most accurate information Bhatt & MacKenzie, 2019; Head, 2008.

**Summary.** The first theme explained the variety of ways that undergraduate students find, evaluate, and use information based on their information need. These findings were discussed by contrasting students’ academic versus social lives. These sections also pulled from previous research that helped in understanding the conclusions of this research study. Furthermore, this theme provided an in-depth understanding of the variety of experiences of the information literacy skills covered in this section.

**Theme 2: College students perceived that finding and accessing information is a fundamental human right related to social justice.**

Researchers have shared that access to information is a social justice issue (Gregory & Higgins, 2017; Levitov, 2017; Mathews, 2016; Pegues, 2018; Saunders, 2017). This is elevated because students are bombarded with information daily that they need to decipher for validity (Cooper, 2019). Students in the focus group interviews also
discussed the importance of this issue. This theme encompasses two categories (a) accessing information, (b) social justice issues, and a summary.

**Accessing information.** Arguably, it is well known that globally, not all individuals have the same access to information (Butcher, 2009; Jemeli & Fakandu, 2019; Mathisen, 2015). This phenomenon is often referred to as the digital divide (Gorski, 2009; Lorence, Park, & Fox 2006; Rogers, 2016). In addition to not accessing information, some students face barriers of how to locate information. The perceived lack of access to information has been connected to low self-efficacy in information literacy skills (Hee, Ping, Rizal, Kowang, & Fei, 2019; Ivanitskaya, Ryan, & Marie, 2004; Kurbanoglu, 2003; Kurbanoglu & Akin, 2010), lack of facility with technology (Bardoff, 2015), lack of exposure to effective search strategies (Head & Eisenberg, 2011; Head et al., 2018) or paywalls that prevent access to the desired information (Abeles, 2013; Arunachalam, 2017). Either way, students shared the barriers they had faced accessing data and the observations made about others who were having trouble accessing information.

Abagail noted that there were “lots of barriers [ to finding information]. I have no idea how Google scholar works ”. Veronica echoed these frustrations and even suggested a student mentorship program created for senior or non-traditional students. Veronica noted how difficult it to get used to all of the information available “when we were first in school was not digital information.” She then continued to share that some of her classmates were having this issue:

Someone in one of my classes right now is embarrassed to ask. I don't even know how everything is on discussion board. So, it's just simple things like that that are
a most college students just whiz right through. So, I had recommended some sort of mentorship program.

Veronica concluded her thought with “the difference between a senior here in accomplishing their dreams able to and just giving up because they're frustrated with technology.” This is something that Katrina also recognized in her classes. In response to Veronica, Katrina revealed:

[Yeah,] I really appreciate what you said really. Because like there was an older woman who is in like my classes at the start of the fall semester, but she did end up having to drop out because her email like got hacked, and she couldn't figure out like what she was supposed to do.

Katrina then continued to note the lack of support his student had and indicated, “it was just really like heartbreaking to see because it seems like she just didn't have like any support” and how she had experienced her email being hacked but knew the steps to take to remedy the situation. Katrina then concluded with agreeing with Veronica that “so it's really sad to see knowing that like it's like if someone if you had a mentor like it could have been prevented from my perspective”.

This now brings us to why being able to access information is a social justice issue.

**Social justice.** Information literacy has long been looked at as a social justice issue (citation). The abundance of literature on this topic highlights that not only should the information be readily available to all, but that people need to know how to find the information (citation). During the time of this dissertation, there was a great deal of talk about fake news (Last, 2020; Naeem & Bhatti, 2020), information concerning the COVID-19 pandemic (Head, Braun, MacMillan, Yurkofsky, & Bull, 2020; Starcevic,
Schimmenti, Billieux, & Berle, 2021; Tangcharoensathien, et al., 2020), the role of social
media during the pandemic (Gottlieb, Dyer, & Courtney, 2020), and staying informed
(Brørs, Norman, & Norekvål, 2020; Marshall, & Ward, 2020; Xu, Zhang, & Wang,
2020). Additionally, many renewed conversations have begun about the tie between
information literacy and digital citizenship (Buchholz, DeHart, & Moorman, 2020).

These concepts were discussed throughout the focus group interviews due to the
ongoing events in these students’ lives. Heather noted the importance of being able to
find and understand information during the pandemic. She shares:

Due to the ongoing events in these students’ lives, these concepts were discussed
throughout the focus group interviews. Heather noted the importance of being able to find
and understand information during the pandemic. She shares:

During the pandemic, you know, being able to read a source and feel competent
that you can, um, not only understand what it was trying to say to you, but that it
is reliable and it's advice that you are able to follow and able to believe in, and
that can be applied to many different parts of your life.

Heather then continued, “I mean, it's, it's almost a part of being a good citizen because
you want to keep yourself informed.” This is an essential realization for students to have
as many researchers look at the inequalities of access to information during a pandemic
(Brørs, Norman, & Norekvål, 2020; Rodriguez, Clark, & Bates, 2020).

The pandemic has brought forth a part of the research process that most people are not
often aware of, and this is something that students are aware of. Heather noted this
unusual access to this information:
It's very interesting to also see that people are reading like pre-print articles and being like, well, you know, caveat, this is pre-print, but you know, we still have to use this information because we need to get moving on different solutions and developments and everything. So, um, that's kind of like an anomaly that we wouldn't usually see and people who usually wouldn't allow like using that kind of information. And it's interesting that we're in a kind of time where that's become necessary.

Heather shared how quickly information is changing and contradicting past information:

[Going] back to that COVID, um, thing, you know, we have so many official people telling us one thing. And then, all of a sudden, a new case study comes up where the information contradicting what these officials have told.

She then shared:

I think a couple of days ago, maybe even a week ago, they were told, or we were told that the virus is no longer a surface born or it can't stay on a surface. Well, you were telling us at the beginning important to you that it could stay on the surface for up to seven days.

Heather’s insights highlight an essential aspect of accessing information and understand if it is up to date and accurate. Heather also concluded, “I think that's really important in order to, um, validate, uh, what, what is happening and look at these studies and see for yourself that may be true or not.”

This commentary highlights the importance of all people being able to have access to information. During the COVID 19 pandemic, many restrictions were lifted by publishers to help ensure people had access to information (Brainard, 2021). Although it
addresses some of the access problems, it does not account for people with lower information literacy skills.

**Summary.** In these focus group interviews, it became apparent that even if an individual student felt comfortable researching the information, they were keenly aware of other students who had faced difficulties when it came to finding and using information. This echoes Secker (2019), who notes it is essential for intervals to be able to access and use data to "engage fully with society" (p. 156). As indicated by Katrina, this can have highly detrimental effects when students withdraw from their courses. Thus, it is important to continue exploring how to teach information literacy skills (Conrick, & Wilcox, 2013; Dawes, 2019; Gross, Latham, & Julien, 2018; Franke, & Sühl-Strohmenger, 2014; Kocevar-Weidinger et al., 2019; Zakharov & Maybe, 2019; Ziegler, 2019). Further, it is crucial to continue understanding how other academic professionals teach information literacy skills to ensure no students are left behind. Some ways to address this are to collaborate with teaching faculty (Amstutz, & Whitson, 1997; Argüelles, 2015; Bapte, 2019; Wadson, 2019; Wishkoski, Lundstrom, & Davis, 2018; Xu, & Gil, 2017) or aid in building information literacy practices into courses (Beuoy & Boss, 2019; Maybee, Carlson, Slebodnik, & Chapman, 2015).

**Theme 3: College students perceived that their self-efficacy of applying information literacy skills varied by the information resource(s) they were utilizing.**

As noted in the literature review, there is limited data on students' self-efficacy in their information literacy skills. The primary studies that focus on information literacy and self-efficacy are (De Meulemeester, Buysse, & Peleman, 2018; Kurbanoglu, & Akin, 2010; Kurbanoglu, Akkoyunlu, & Umay, 2006). Medaille, Beisler, Tokarz, and Bucy
(2021) share that if students have a high level of self-efficacy, that is made for "a more positive and manageable research experience" (p. 105). Due to this, it is imperative to understand student's self-efficacy levels of information literacy. This theme includes three categories: (a) students' comfort with information literacy skills, (b) self-efficacy of information literacy skills, (c) the information resources, and a summary.

**Students' self-efficacy of information literacy skills.** Concerning students' self-efficacy skills, their comfort with information literacy skills varied. To Heather, being comfortable with accessing information is a critical component of information literacy. She shares, "information literacy a is, um, kind of this being feeling comfortable and being able to, um, access different resources, understanding how the purpose of different resources and how you can apply them."

When it comes to sharing information, Heather noted that "I don't feel comfortable that I have that knowledge base, then I probably would not." Abagail agreed and commented, "I think, and as long as I can, like back it stated like why I'm leaving it, I think I share it." Veronica and Katrina took a more of an academic stance on sharing information and only wanted to share information that was researched and added to the discussion:

Veronica: I think, and perhaps this is just me, and I’m old, with the academics-to continue building on the information that is already done. And if my foundation is rocky and not accurate, then it is going to hurt me. It is going to fall sometime or another.

Katrina: I wouldn’t share unless like I did look into it and research it because there can be some like really important information that doesn't seem accurate, but it turns out that it is true, and then like in that case, I would want to share it.
Veronica: You know that interesting point. If I found exactly she said that there was value, perhaps it is an area or theory or hypothesis that has not been presented before. What I would do in that cause is issue some sort of authentication around it although this concept or theory that does not appear valid then cited somehow so there is some credibility around it. So that’s a good point.

There was a contrast between Katrina and Veronica, who often shared how overwhelming it was to return to school. Veronica shared, “I’m not having a problem finding information as compared to [when] I first went to college, and you used a librarian.” Even though Veronica felt that she could research materials independently instead of going through a librarian, she mentioned that “I am bombarded with information anytime I have to write a paper.” This feeling of being bombarded with information is one that students frequently express (Aaron & Gait, 2019). This feeling can lower one’s self-efficacy skills concerning information literacy (Aaron, Gait, 2019).

In addition to being bombarded with information, Veronica noted that “coming out of the corporate role and jumping into college, I've been learning about all these cool tools. So, it is a constant learning and understanding what is available out there”.

Veronica shared how willing she is to constantly learn when she asked Katrina to describe an unfamiliar search strategy. Katrina described in detail how to use one of the library databases:

So, I always just kind of Google like Thomas Cooper library databases, and then it's on the right-hand side. It says like most popular, and I think it's like Academic Search Complete. I always use that one. That's like my go-to because it's like a combination of a ton of different sources. And then you can choose which specific ones that you
want to get results from. And it has like little like tabs on the side where you can pick like OK I want them only from the past 10 years. I want them only from Africa. Like you get to like really pick and choose. And like it's super helpful.

This exchange highlights her own self-efficacy of being able to not only find information but to teach others how to find information.

Heather also shared how having someone educate her on how to look for information helped increase her self-efficacy:

I just had like a librarian workshop through one of my classes, and she did the full rundown of how to use the library database and all of that. And that was really helpful. So, it's gotten me more into using that and feeling comfortable with using that.

Katrina echoed how important it is to get guidance as she shared, she had a strong foundation coming to the university: “I feel like since high school like I've been given really good education on how to find information.” Katrina continued that having her professors share the same information helped increase her confidence. “I feel like since coming to college like all my professors kind of reiterate the same information, so I feel really confident with the process.” Katrina also noted she felt most comfortable when it was a topic she was already familiar with:

I would say that I do typically feel pretty confident when I'm writing things like research papers. I feel more confident when it's a topic that there is a lot of like data that agrees with each other than if it's like kind of a more divisive issue like that's when I feel most comfortable.

Familiarly with the issue is something that added Abagail to being confident as well. Abagail shared, “I think I felt most confident when I was doing research on type one diabetes, just because I have a personal relation to that disease.”
**Information resources.** In this study, students shared the variety of resources that they met online. With the massive amounts of information found online, it is imperative that students can effectively find and analyze information (American Library Association, 2000; Cooper, 2019). This need has been essential during the era of fake news (Musgrove, Powers, Rebar, & Musgrove, 2018). Additionally, there has been an increasing need for these skills during the COVID 19 pandemic (Juneström, 2021; Kimiafar, Dadkhah, Sarbaz, & Mehraeen, 2021; Last, 2020).

The abundance of information is something that students are keenly aware of. During the sophomore interviews, Heather and Abagail shared the variety of information that they encounter and how they narrow down that information:

Heather: Especially with the digital age, that's added a whole different component of, you know, being able to use databases and, uh, different online resources, but also being able to look up the table of contents of a book or the index of a book, just being able to, I don't know, it it's, we have so many different kinds of resources.

Abagail: Um, yeah, I think it also depends on like, if you have like the library at USC offers, um, librarians to further your research and that I think is a really good start. I think that by knowing like a broad topic, you can narrow it down by using information literacy and by using resources, um, like the, um, some of the dashboard that the, um, database. Yeah. Oh, in order to like use keywords and key terms in order to limit that search.
Students in this study also highlight that they often have to make choices about what types of resources to start with when looking for information. Abagail stated:

[If] it's like a really broad topic, but if it's something like pertaining to research, then I don't just look on digital. I look in print sources as well. I think print can be a little more reliable just because so many people have to check that print in order to make sure it's accurate.

In the junior focus group, Katrina and Veronica highlighted the importance of looking at various sources. In this conversation, Katrina and Veronica mainly focused on crucial cultural information needs as the Black Lives Matter movement and COVID 19 were occurring at this research time.

Veronica: Different opinions absolutely, but I have a tendency personally to rely on a lot of the scientific data. I try making decisions are really go to that area. And what is interesting if you look at the other scenario of what we've got going on with the black lives matter, yes there is data in there that substantiates what's happening […]also there is much discussion that will eventually come together with some of those objectives.

Katrina: I think for me like I think getting information from people with like a variety of backgrounds. Like looking at what like nurses and health professionals are saying about wearing a mask. Like kind of their pros and cons looking at like the reasons why people are not doing it. I think like
wearing a mask is kinda hard for me 'cause I feel like I see like all the pros, like a lot more, but if it was something different. Like I mean, for example, like looking at what health professionals are saying but also looking at like what government officials and like the president and like weighing all the pros and cons from that. But like making sure that you get information from a variety of different sources that are relevant to the specific topic.

Veronica: Almost as with him, then you have an academic component then you have a media component as well as professionals that are experts in that field, so you have the multiple intertwining circles contribute to the whole.

Even though Katrina and Veronica are focusing on research for their personal lives, they are still keenly aware of the need to find information from different sources. This also highlights the variety of sources that students are aware of and encounter when performing research for their everyday lives. Katrina also shared how important it was to know the different ways you can access information depending on the type of information you are looking for:

I think that another skill is like just knowing where to find databases. I know a lot of people go to Google scholar but also knowing like what resources you have like through your University. What like websites are public. Just knowing kind of like the breadth of places where you can get information from.
Abagail also echoed this notion by sharing: “I think a big part of information literacy is being able to, um, take an idea and then expand on that idea through looking at different resources, whether they be digital print or through a person.”

It became apparent that personal preference also needed to be considered when it comes to an understanding what sources students gravitate towards. Abagail shared, “I think I'd use a lot of print sources. I just, I like the feel of a book in my hand. [...] I mean, dyslexia is [sic] really hard when you're reading with like electronic”. So, I like the books. In response to Abagail Heather shared:

I'm actually kind of the opposite. I would say my go-to is definitely, um, online journals. And then, um, I do get caught up a little bit in like mainstream news articles, Washington Post, New York times, things like that. But, um, those are probably my go-to, I don't often use books, actually. I, because I never really do like print in your hand’s sources. So, it would be online books, and I find those are usually hard to navigate and hard to really find exactly the information that you're looking for because there's so much there.

Heather seems to share similar insights to the juniors' focus group interviews which did not even mention books.

**Summary.** This theme discussed the importance of one feeling capable in respect of completing tasks labeled as information literacy. This theme highlights students’ comfort with information literacy skills. Additionally, students perceived self-efficacy was discussed. Naturally, this echoes the basic foundations of self-efficacy put forth by Bandura (1977, 1986a, 1986b, 1995, 1997). Furthermore, this theme adds to how self-efficacy plays into students' use of information literacy skills. This section all discussed the information resources that students encounter while searching for information.
Chapter Summary

In summary, this chapter highlights the findings of the focus group interviews conducted with my research participants. The results showcase students’ understanding of information literacy, how students apply information literacy skills based on their information need, and their self-efficacy of information literacy skills.

Quantitative data revealed that most students were knowledgeable about information literacy skills and received instruction in high school or college. Further, this data highlights students’ self-efficacy of various information literacy skills. Qualitative data revealed three themes that highlight students’ understanding of information literacy, use of information literacy, and self-efficacy of information literacy skills, all based on information need. To develop a better understanding of the data as a whole, the quantitative and qualitative data's findings were integrated. The integration of this data and how it answers my research questions will be presented in chapter 5.
CHAPTER FIVE

DISCUSSION

The purpose of this action research was to determine how the University of South Carolina undergraduate students applied information literacy skills in their academic and social lives. To explore this topic, quantitative and qualitative data were collected to answer this study's research questions. The research questions were as follows: (1) What is undergraduate students' knowledge of information literacy at the University of South Carolina Columbia campus? (2) What are undergraduate students' self-efficacy beliefs about their information literacy? and (3) How do undergraduate students use information literacy skills in their academic and social lives? This chapter summarizes the study highlighting both the quantitative and qualitative results with reference to existing literature. As part of the summary of information, the following sections cover the (a) discussion, (b) implications, (c) limitations, and (d) conclusions.

Discussion

It is crucial to examine the findings of this research through the lens of other educational research. To answer the research questions for this study, the quantitative and qualitative data were combined and viewed through the lens of research-based findings of information literacy and self-efficacy. This discussion is organized by the three research questions presented at the beginning of this action research study.
Research Question 1: What are undergraduate students' knowledge of information literacy at the University of South Carolina Columbia campus?

In this study, undergraduate students at the research site had various understandings of information literacy skills. In general, students did have a working knowledge of information literacy skills and how to use them. Their definitions are, understandably, just not as thorough as the leading definitions provided by organizations such as the American Library Association (2000, 2016), Association of College and Research Libraries (2011, 2016), or CILIP (Secker, 2018). This is in line with some critiques about information literacy (Cowan, 2014; Kapitzke, 2003; Owusu-Ansah, 2003; Pawley, 2003; Tewell, 2015; Ward, 2006). These studies have impacted the teaching of information literacy as it is challenging the profession to continually see how these skills can be adapted (Banks, 2013; Foasberg, 2015; Seeber, 2015). With a new focus on these skills being addressed as critical information literacy skills (Tewell, 2015).

As highlighted in the literature review, many librarians and educators focus on how difficult it can be to teach information literacy skills. In particular, this can be because students feel they have already grasped these skills (Bell, 2007). This instruction method may not be enough to meet all students' needs as they only meet with the librarian one time and often less than an hour (Rosman, Mayer, & Krampen, 2016). As a result of these factors, literature has developed that critiques traditional information literacy practices and challenges one to find better ways to arm students with these essential skills such as critical information literacy (Downey, 2016; Tewell, 2015).

Students' level of understanding of information literacy can vary for a variety of reasons. For instance, 51.4% of students received information literacy instruction before
attending the University of South Carolina. At the same time, 48.1% did not receive any information literacy instruction before attending the university. Katrina was one of the students who received information literacy instruction before high school: "I feel like since high school like I've been given really good education on how to find information."

Overall, that is only 25% of the students from the focus group who received prior instruction. Combined with the previously mentioned, 48.1% reported no instruction before attending college, making an alarming number. This means students are coming into the university with prior knowledge of information literacy skills (Geary, 2017; Geary, 2018; Torell, 2020) and highlights the need for addressing critical information literacy skills in higher education. Although the University of South Carolina does offer four credit-bearing courses that teach these skills, not all students are required to take them.

Additionally, two of these courses are taught outside of the library and library school, and thus we cannot be sure what skills are taught in those classes. It is essential to note the potential impact of addressing these skills for all students at the university. This is where a large number of students are receiving their information literacy instruction.

Once students are at the university, most students, 79.2%, receive information literacy instruction, and 20.8% had not received information literacy instruction at the university. When asked how students are receiving their information literacy instruction at the university, students had various answers. Students primarily receive this instruction from their professors (n=39) with assistance from a library close behind (n=28). This leaves only five students from the questionnaire who feel that they have not received any information literacy instruction from a professor or librarian. This brings attention to the
fact that information literacy instruction is not standardized. Many instructors often
assume that students already have strong information literacy skills before entering their
classroom (Ercegovac, 2003; Saunders, Severyn, & Caron, 2017; Smith et al., 2013).

Although instructors must be empowered to teach their course matter without
interference, this lack of communication and standardization has resulted in librarians
having to see what skills students are being taught. For instance, many librarians are
conducting syllabi reviews to see what skills are being taught (McGowan, Gonzalez, &
Stanny, 2016; VanScoy & Oakleaf, 2008). Although many institutions, such as the
University of South Carolina, do not have available syllabi, and thus at some institutions,
this review cannot be completed.

Focus group participants also talked about visiting the library as part of a class
they were in. Katrina shared, "in my classes, they almost always have like a day where
we go to the library, and we meet like research assistant person for our college, and they
go over like how to find all of the sources.” Heather echoed a similar experience stating,
“I just had like a librarian workshop through one of my classes, and she did the full
rundown of how to use the library database and all of that.”. Noteworthy here is that both
Katrina and Heather spoke to having this experience. The data collected from these
respondents highlight the impact meeting with a librarian had on their information
literacy skills.

Furthermore, the questionnaire contained 16 knowledge questions that aimed to
develop a deeper understanding of students’ information literacy knowledge. Out of 16
total questions, some students received a perfect score on the knowledge section (n=8),
and only one student received a zero; it is suspected that this student just did not complete
Fifty-seven students got between 10-15 questions correct, and six students had nine to one correct answer ($M = 12.9$, $SD = 2.8$). Thus, on average, students received a score of 12.9 ($n = 72$). These findings highlight the range of understanding that students have with information literacy skills.

The triangulation of the data highlights that all of the students had an understanding of information literacy skills. It is safe to say that based on the data, that all participants had a baseline understanding of information literacy skills and how they can be applied to their life. The variance in these skills can be attributed to students’ prior knowledge of information literacy skills before attending university, their information literacy instruction at university, and how often they practice these skills in their academic and personal lives.

**Research Question 2: What are undergraduate students’ self-efficacy beliefs about their information literacy skills?**

Understanding students’ self-efficacy beliefs about their information literacy skills increase importance in the information literacy literature due to the abundance of information being created and disseminated (Kozikoglu & Onur, 2019). As we know, new information is being made daily, and thus, these skills are necessary now more than ever (Hee, Ping, Rizal, Kowang, & Fei, 2019). One’s self-efficacy beliefs are positive, can encourage them to complete a task or obstacle (Bandura, 1997). In contrast, one’s perceived self-inefficacies can prohibit them from completing a task (Bandura, 1986b). Perceived self-efficacy looks at one’s perception of their abilities to complete a task or assignment (Kurbanoglu, 2003). Thus, one must feel confident to complete the job they are facing (Bandura, 1977).
As expected, students’ self-efficacy belief varies from student to student. To assess students’ comfort levels, they were asked to rank their comfort and confidence with completing various tasks. Kurbanoglu et. al (2006) define these subscales as “A. Defining the need for information, B. Initiating the search strategy, C. Locating and accessing the resources, D. Assessing and comprehending information, E. Interpreting, synthesizing, and using information, F. Communicating Information, and G. Evaluating the product and process” (p. 742). To maintain the scales' validity, only initiating the search strategy, assessing and comprehending information, and communication information will be discussed as they produced an acceptable Cronbach alpha.

Students felt confident and competent when it came to identifying a variety of potential sources of information ($M = 6.11$, $SD = 0.93$), but limiting search strategies ($M = 5.97$, $SD = 1.10$) and using keywords, and Boolean logic ($M = 5.35$, $SD = 1.37$) were not far behind. This echoes what Heather shared during her focus group interview, “information literacy a is, um, kind of this being feeling comfortable and being able to, um, access different resources, understanding how the purpose of different resources and how you can apply them.” Heather’s understanding is similar to what students shared on the questionnaire. Students felt most confident and competent when deciding how to find the information they need ($M = 6.2$, $SD = 0.90$) and using electronic resources to locate the information they need ($M = 6.38$, $SD = 0.086$). Heather and Katrina also felt most comfortable using electronic resources. Heather shared:

I would say my go-to is definitely, um, online journals. And then, um, I do get caught up a little bit in like mainstream news articles, Washington Post, New York times, things like that. But, um, those are probably my go-to,
Heather also noted, “I don't often use books actually.” Instead, Heather “it would be online books, and I find those are usually hard to navigate and hard to really find exactly the information that you're looking for because there's so much there.”

Because of this overabundance of information, Heather shared, “Um, so really anything that I can command F and lookup keywords pretty much, I'll go for it.” Heather is not alone in these feelings. Heather’s statement brings up the idea of *satisficing* (Sin, 2016). The term *satisficing* means students stop seeking information when they feel what they have found is “good enough,” even though it might not be the best possible information they could find (Sin, 2016, p. 1794).

Katrina also preferred electronic resources but focused more on the library databases. Katrina shared:

I think that another skill is like just knowing where to find databases. I know a lot of people go to Google scholar but also knowing like what resources you have like through your University. What like websites are public. Just knowing kind of like the breadth of places where you can get information from.

In contrast, students had more trouble with such as print sources (*M* = 5.63, *SD* = 0.86), using the library (*M* = 5.25, *SD* = 1.39) the library catalog (*M* = 5.11, *SD* = 1.57), to locate resources using the catalog (*M* = 5.04, *SD* = 0.83), and using different types of libraries (*M* = 5.26, *SD* = 1.42) students were not always as comfortable. Abagail echoed these findings as she stated, "I think I'd use a lot of print sources. I just, I like the feel of a book in my hand". Abagail later shares why she prefers non-electronic sources, "it's harder for me probably just cause I'm not very tech-savvy." Not feeling tech-savvy is
something that many students can relate to and can be a hindrance to completing research.

This was also highlighted in the junior focus group interviews when Veronica asked Katrina to describe an unfamiliar search strategy. Katrina described in detail how to use one of the library databases:

So, I always just kind of Google like Thomas Cooper library databases, and then it's on the right-hand side. It says like most popular, and I think it's like Academic Search Complete. I always use that one. That's like my go-to because it's like a combination of a ton of different sources. And then you can choose which specific ones that you want to get results from. And it has like little like tabs on the side where you can pick like OK I want them only from the past 10 years. I want them only from Africa. Like you get to like really pick and choose. And like it's super helpful.

This exchange highlights Katrina’s own self-efficacy of being able to not only find information but to teach others how to find information.

Heather also emphasized how having someone help you understanding information literacy skills can increase your self-efficacy:

I just had like a librarian workshop through one of my classes, and she did the full rundown of how to use the library database and all of that. And that was really helpful. So, it's gotten me more into using that and feeling comfortable with using that.

Katrina felt that she received similar instruction in high school and college, and that increased her self-efficacy beliefs, “I feel like since coming to college like all my
professors kind of reiterate the same information, so I feel really confident with the process.”

Another critical component is being able to understand and validate the information. Katrina’s definition of information literacy focused on this, “understanding how to read information. like how to understand articles and that kind of thing. And understand like whether or not a source is valid”. To Katrina, the validity of a source is one “that's from someone knowledgeable in the area. In the area they're writing about. like being able to check the credentials of the person who is writing it”. Katrina also highlights useful sources from established organizations and peer-reviewed articles, “valid source for like psychological sources or something that is like really verified. You know that it's a peer review that other people in the area have already looked at it like what makes it valid”. Katrina’s understanding of information literacy is also echoed with the self-efficacy questions. Students felt most confident determining the authority, currency, and reliability of sources ($M = 6.13; SD = 1.05$). The ability to select the most appropriate source for the information need ($M = 6.01, SD = 1.00$) and being confident and competent to identify the agreements and disagreements among sources ($M = 6.00, SD = 1.06$) followed closely behind confidence in determining authority, currency, and reliability.

Another component of student’s self-efficacy belief seems to be when the data agree with each other. Katrina shared:

I would say that I do typically feel pretty confident when I'm writing things like research papers. I feel more confident when it's a topic that there is a lot of like data that agrees with each other than if it's like kind of
This also indicated the importance of familiarly with the topic Abagail shared “I think I felt most confident when I was doing research on type one diabetes, just because I have a personal relation to that disease.”

Communicating information students’ self-efficacy varied. Students’ felt most confident in this subscale when determining the parts of the presented information ($M = 6.21$, $SD = 0.89$). Students were not as confident or competent making citations and using quotes ($M = 6.06$, $SD = 1.11$), selecting an appropriate format to present information ($M = 6.04$, $SD = 1.01$), and writing a research paper ($M = 6.00$, $SD = 1.05$) had similar measurements of central tendency and dispersion. The focus group interviews highlighted that students do not always understand the purpose of citing information.

Abagail shared during her focus group interview that:

> When I came into college, I like if it has a citation. Oh, it must be valid. But, um, I think he able to like distinguish what a real citation in MLA format or APA or even Chicago style, what it's supposed to look like.

Although distinguishing citation formats is essential, that does not mean that students understand the parts of a citation or why they are essential to include in your work.

Heather also noted this lack of understanding. Heather shared the following when it came to what information she would cite for a speech:

> I like to have like a few solid. I would say like five different solid sources that, um, are all kind of, you know, coming at the same point. And then, uh, taking, I do get a little bit lazy. I don't like to cite as many things cause APA can be very hard, but, um, probably taking the three that were most impactful, even if you know, the other two, I use some of the ideas, but it's a little bit of a carryover and
overlapping. Um, I'll probably just go with the three that I mainly pulled from and just use those throughout and use that as my references.

Of course, Heather is correct that it is crucial to include impactful resources for your research. She does not account for the fact that people may want to find later the information you were using. This idea is defined as “scholarship as conversation” by the American Library Association (2016).

Katrina noted how it could be tricky understanding “how to cite different individuals and authors.” This confusion is also noted in the questionnaire. Students felt slightly less confident and competent in regard to preparing a bibliography ($M = 5.92, SD = 1.10$), creating bibliographic records and organizing them ($M = 5.71, SD = 1.20$), and creating records for various bibliographic materials ($M = 5.58, SD = 1.20$).

The triangulation of the data presented in this section indicates that students had varying levels of self-efficacy beliefs. For the most part, students had the highest self-efficacy beliefs when researching information online and utilizing their familiar information. Just like the knowledge section, students had lower self-efficacy beliefs when it came to preparing bibliographies. From previous knowledge tests, the perceived lower self-efficacy beliefs are based around fear of citing information incorrectly and being punished for doing so (Geary, 2017; Geary, 2018). Instead of looking at these mistakes as punitive, in turn, we should look at them as an opportunity to teach.

**Research Question 3: How and to what extent do undergraduate students use information literacy skills in their academic and social lives?**

A frequent theme in information literacy is attempting to understand how students apply their information literacy skills (Head et al., 2018). Further, researchers are curious
to know how students use these skills outside of their academic studies (Kim & Sin, 2016; Kim, Sin, & Tsai, 2014; Kim, Sin, S. Yoo-Lee, 2014). This research also aimed to develop a better understanding of how students apply their information literacy skills.

The application of information literacy skills beyond the classroom highlights the need for critical information literacy skills. For instance, students in this research study spend the majority of their time online surfing the web and social media. This research found that, on average, students spent zero hours in the library \( n = 28 \), one to five hours \( n = 42 \), or six to ten hours \( n = 2 \) per week. Yet students spend on average zero hours using University of South Carolina libraries’ electronic resources \( n = 30 \), one to five hours \( n = 33 \), six to ten \( n = 64 \), and more than 10 \( n = 3 \) per week. This is a stark contrast from the average time students reported spending online and social media daily. On average students spent zero hours browsing the internet \( n = 1 \), one to five hours \( n = 33 \), six to ten hours \( n = 16 \), and more than 10 \( n = 6 \). Whereas students spent the following on average on social media a day zero hours \( n = 3 \), one to five hours \( n = 49 \), six to ten hours \( n = 15 \), and more than ten hours \( n = 5 \).

When looking at the vast difference between how many average hours students spend utilizing the library’s electronic resources a week versus how many hours students spend browsing the internet and using social media, it is only safe to assume that the majority of where students get their information from is not through academic sources. Due to this, it is imperative that students are taught how to apply their information literacy skills to their academics and their social lives as well. Further, the distinction between students’ information literacy applications to their academic and social lives, it
is essential to view them separately. This section will be split into two sections (a) their academic lives and (b) their social lives.

**Their academic lives.** Students in the focus group noted how their academic endeavors encouraged them to look for sources they may not normally view in their social lives. Abagail stated in terms of compiling resources for an annotated bibliography, “having an open mind to look at other sources, primarily like, uh, hosing your argument or what you believe in, I think is a really good start.” Heather agreed and shared what this phenomenon is, “I agree with what you were talking about with like people that, uh, kind of seek out sources that already confirmed the viewpoints that they have that kind of like confirmation bias.” Students who participated in the questionnaires primarily focused on how information literacy skills were applied to their academic lives (n=34).

Concerning searching for information for their studies, students had a variety of approaches. Veronica noted that she starts with an “article that kind of goes kind of like more of an overview of the topic.” Veronica continued stating:

usually, those kind of sources are pretty unbiased just kind of general facts and information so kind of base like how I'm going to talk about the topic based on that and then find the research that goes more in-depth into the specific points that I'm trying to make which is the same thing.

Whereas Katrina more so focused on finding information to support her claims outlined for her research project, “I typically would organize like the paper whatever I'm trying to do ahead of time so […] then I'll look specifically for sources that cover that topic in-depth”.

129
Students in the focus groups also noted how important it was to utilize their academic research databases. Katrina shared “that it is like going to choose databases and selecting all the ones that are relevant to like the specific thing that I'm trying to research.” Katrina prefers to use the library databases over Google Scholar. Katrina noted,

There's like so many there, and I know like I don't know, this is kind of like weird, but I know it's like kind of an expensive resource at the University is paying for us to have. So I'm really grateful to have like to have that. So like being able to understand and like utilized that instead has been like I feel like is really important. Because like you know, we're paying for like in our tuition. We should be like know how to use it and be able to use it.

Yet, concerning primary sources, which students are often asked to locate, there was some confusion over this term. Veronica asked, “define primary resources?” Although Katrina had heard of primary sources, she had not encountered the term at the university, “I haven't really heard the term like primary sources like since I was in like high school and they had hoped looking up like people from like this 1700s and that kind of thing”.
The sophomore focus group was more familiar with primary sources as they are important for their major. Heather shared that:

primary sources, um, and public health that often looks like, um, you know, those it's research that, um, usually like groups that are trying to develop interventions or look into certain populations, um, either, you know, serving a target population one-on-one or doing a clinical study or some something in that nature.
Abagail noted that “I definitely agree with research, um, and case studies. Um, I see a lot of that with, with public health”. Heather also noted how primary sources could be used in public health research:

**Evidence base for developing, um, future, uh, interventions or, uh, community interventions for, um, trying to get certain health outcomes. So like developing like a smoking intervention in a certain community. So you take those primary sources where, uh, other people in the past have tried different kinds of interventions and using that to seeing what worked, what didn't work to develop future interventions.**

The varying degrees of understanding about primary sources make it clear that there needs to be more effort on explaining how these sources change from discipline to discipline. Further, this highlights a need to use standard language to describe source types.

A common component of conducting academic research is the ability to cite research so others can find it. As noted in other sections, this is something that can be confusing for students. Katrina stated the following about an assignment she was completing, “I've included all my references that I've used. I mean I don't know there's a right or wrong. Like nobody said”. Veronica agreed that she also includes all of her references,

I use all my sources. I would put all my sources as well but also mentions depending on the professor all even cite like images and that kind of thing that I put into it but like how far I go depends on what the professor expects but in general just pretty much everything.
This is a stark contrast between the sophomore focus group interviews where Abagail shared, “I would just, I cite whatever it brings a major component.” Heather had a similar thought process and agreed that she would “probably just go with the three that I mainly pulled from and just use those throughout and use that as my references.”

**Their social lives.** In general, most students who answered how they use information literacy skills in their everyday life reflected on its application to their academic work. Concerning finding information, 75% of the focus group participants started with Google. This is particularly true when finding information online about authentic restaurants. Abagail shared, “I do that initial Google search and just look up restaurants, um, that people have gone to, or that have high reviews.” After a brief Google search, Abagail would then “look at the Yelp reviews.” Heather also focused on using information sources she was already familiar with:

those articles that are like best whatever in Columbia or things like that and getting kind of ideas and then looking more specifically into it on like, uh, the website for the restaurant or those like Yelp reviews and things like that.

Focus group participants noted how they would utilize Google to verify the information they were unsure of:

Katrina: I would first like Google it. [...] I would kind of like Google and see if there's any knowledgeable sources. I have confirmed it like sources that have like fact-checkers and that kind of thing.

Heather: I am always just, you know, quick Google search and probably clicking on the top three items that come up, um, what I'm doing kind of an initial search.
It is clear from this research that students rely heavily on Google for their personal lives. Students’ also noted the importance of being able to find information during a pandemic. This was a topic that one of the focus group participants focused on a great deal. Due to the ongoing events in these students’ lives, these concepts were discussed throughout the focus group interviews. Heather shared how she used her information literacy skills to understand information about COVID 19:

During the pandemic, you know, being able to read a source and feel competent that you can, um, not only understand what it was trying to say to you, but that it is reliable and it's advice that you are able to follow and able to believe in, and that can be applied to many different parts of your life.

Heather also noted how quickly confusing it could be to navigate the barrage of information concerning COVID:

You know, we have so many official people telling us one thing. And then, all of a sudden, a new case study comes up where the information contradicting what these officials have told.

Heather also shared her frustrations with the how quickly information was drastically changing:

We were told that the virus is no longer a surface born or it can't stay on a surface. Well, you were telling us at the beginning important to you that it could stay on the surface for up to seven days.

Heather was also keenly aware of the oddity of the situation that COVID 19 has placed the world concerning information. Heather shared, “it's very interesting to also see that people are reading like pre-print articles.” The general public does not usually engage in
reading pre-print articles about health, and thus these articles have to be shared “with a caveat, this is pre-print, but you know.” She then continued to share the importance of having that information viable to the public and other researchers:

we still have to use this information because we need to get moving on different solutions and developments and everything. So, um, that's kind of like an anomaly that we wouldn't usually see and people who usually wouldn't allow like using that kind of information. And it's interesting that we're in a kind of time where that's become necessary.

It is important to note that Heather’s understanding of this situation is a bit advanced due to her academic path in public health. Thus, educators and information professionals must ensure that all their students understand this situation and its implications. Students tend to lack understanding of the scholarly review process and how long it takes from my own experience. Thus, the pandemic has created a renewed urgency of explaining to students the more typical publication process. The pandemic has also highlighted that not all information available to students is reliable or valid.

Based on the triangulation of data, it is clear that students are applying their information literacy skills to their everyday lives. These activities range from engaging in social media, answering queries via Google or other search engines, and determining how to search for information. However, this application is limited based upon their overarching knowledge of the process.

**Implications**

This action research study's findings advise implications for aiding students’ information literacy skills and information literacy self-efficacy beliefs. This section will
examine (a) personal implications, (b) implications for the research institution (c) impact on future research.

**Personal Implications**

As a result of this study, I have developed a greater understanding of students’ knowledge of information literacy. Although I had completed prior research on this area of study, it had all been quantitative. That data were helpful but only contained a limited view of students’ knowledge. By completing qualitative data, I developed a richer understanding of students’ information literacy knowledge (Creswell, 2013). This study helped me develop a deeper understanding of the critical part that qualitative studies play in the information literacy literature.

This research also increased my knowledge of the literature available on information literacy skills and information literacy self-efficacy. Due to the roles of librarians, most are not afforded time to contribute to the scholarly literature. This became increasingly apparent as I was searching for literature for this dissertation. The lack of literature has ignited a renewed interest in helping academic literature paint a better picture of information literacy.

**Implications for the Research Institution**

Before this research study, the University of South Carolina Libraries had been aiding in teaching information literacy skills via one-shot instruction sessions and credit-bearing information literacy courses. By the time this dissertation was completed, the University of South Carolina Libraries has not been offering credit-bearing courses for over a year. Students still receive information literacy credit for the Carolina Core via various classes offered at the university (Office of the Provost, n.d.). Yet, there is a
limited collaboration amongst faculty members across the university who teach these courses. Librarians have continued to work with faculty and students by offering one-shot instruction sessions, LibGuides, and video tutorials (University Libraries, n.d.). However, it is essential to note that not all professors ensure that their students are aware of these resources.

This research highlights the variance in information literacy knowledge and information literacy self-efficacy. Due to the university's lack of credit-bearing offerings and the impossibility of limited library staff working with every class at the university, an effort must be made to incorporate information literacy skills across the curriculum actively and consistently. Like any skill, information literacy needs to be practiced, especially when applying the skill to various disciplines (Perkins & Salomon, 2012; Pinto & Sales, 2008; Reece, 2005).

To prepare students for the workforce or graduate school, students need to have a high level of information literacy self-efficacy. To do this, the university needs to ensure that students are reviewing instruction on these skills regularly. Further, they need to apply these skills to varying disciplines (Perkins & Salomon, 2012; Pinto & Sales, 2008; Reece, 2005). As students matriculate through the university, the continued development of these skills will result in an increasing level of information literacy self-efficacy.

**Implications for Future Research**

Creswell (2013) highlights the importance of providing recommendations for future research. As previously noted, there is a need for more literature to be developed about students’ information literacy knowledge, skills, motivations, and self-efficacy.
Replicating this study on a larger scale, and not during a pandemic, would allow for a greater understanding of students’ knowledge of information literacy and their self-efficacy beliefs. This study could be duplicated and be researched across all University of South Carolina campuses or in partnership with other institutions of a similar size. Due to the lack of literature on the topic, it would be interesting to see this study duplicated on an even larger scale, such as in regions across the United States or international research.

Continuing to complete research on this subject will only benefit college students and significantly impact their information literacy skills. Further, more research would enable educators and librarians to make more educated decisions about information literacy instruction.

**Limitations**

As with any research study, this study has limitations. It is important to note that with action research, the aim is to identify a problem within one’s sphere of influence (Mertler, 2017). Thus, these findings should not be generalized outside of this context. This research does build upon past research on students’ information literacy knowledge at the University of South Carolina (Geary, 2017; Geary, 2018). Additionally, this research also builds upon the self-efficacy research (Kurbanoglu, Akkoyunlu, & Umay, 2006). This research also builds upon that of the Open Test of Information Literacy developed by Hollis, Rachitskiy, and van der Leer (2019).

The first limitation to this study is that data collection was occurring right at the height of the COVID-19 pandemic. I began attempting to collect dissertation data in March 2020. Coughlin, Cronin, and Ryan (2009) note that self-administered surveys often have low response rates; the pandemic exasperated this. My data collection method
was to place flyers around campus and ask faculty members to share the study with their students. The decreased presence on campus made it difficult to ensure that as many students as possible were aware of the questionnaire.

Further, there was a great deal of email fatigue during the pandemic. Due to this, emails were often missed, or additional emails were not sent out since faculty and students were already being bombarded with electronic communication. To try and mitigate this, the questionnaire remained open until the end of the spring semester. Additional attempts were made to gain further responses and focus group participants, but they were made in vain. Unfortunately, this resulted in the fewer questionnaire and focus group participants than I had initially hoped for. My advisor and I decided not to collect additional responses during the fall of 2020 as the data could be significantly impacted as the majority of classes were being offered online. Thus this could have affected students’ information literacy knowledge and self-efficacy and skewed the results.

Another limitation would be the questionnaire instrument and the focus group. Higher education students are often sought out for surveys and encounter numerous outlets online that are requesting their feedback (Van Mol, 2017). Due to the constant request for survey participants and lengthy surveys, students often encounter survey fatigue. Additionally, the survey's length can also result in survey fatigue (Lyberg & Weisberg, 2016). As my questionnaire was not a short one, it is possible that students decided not to complete the survey or opt-out entirely. Part of my questionnaire consisted of students showcasing their knowledge of information literacy skills. There could be an
error in this data due to students skipping a question, accidentally missing a question, or refusing to answer a question (Lyberg & Weisberg, 2016), resulting in inaccurate data.

Lastly, there can always be errors when analyzing the data. This can include coding the data or transcribing the data (Lyberg, & Weisberg, 2016). Although every effort was taken to minimize these errors, it would be foolish to acknowledge that it is possible.

Conclusion

Reflecting is a critical component of action research (Mertler, 2017). It is essential to engage in reflection throughout the entire action search process. Throughout this study, I was intrigued by the findings as I moved through my dissertation's analysis phase. I was impressed with students’ understanding of information literacy and realized my observations about their skills had previously clouded me.

Students in this study often indicated that research was “valid” or “not,” “right” or “wrong,” and this made me reflect on how often we presented information in a binary manner. This leaves no room for information to just be information without a moral code attached to it. This has made me question how I have taught information literacy skills in the past. This is something that I hope to address in my teaching and to further explore as a profession.

While there is a need for more research to be completed on this subject, this cannot be done without changes in the profession. Conducting research is a significant undertaking, and many librarians are not afforded any time to engage in scholarly activities. This is increasingly problematic because we can effectively teach research
skills and methods without being involved in the practice ourselves? This requires a cultural shift from the profession to allow for further exploration.

The information that I have gained during this research study will be invaluable as I continue my higher education career. The experiences that I have earned through this research allow me to be a better educator to students and advocate for change.
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APPENDIX A

IRB APPROVAL

Figure A.1. IRB approval letter
APPENDIX B

INFORMATION LITERACY QUESTIONNAIRE EMAIL

All undergraduate students at the University of South Carolina Columbia campus are invited to participate in a questionnaire to investigate information literacy skills and college students. Participants must be 18 or older and an undergraduate student at the University of South Carolina Columbia campus.

Your participation is strictly voluntary. The survey should take approximately 20 minutes to complete. The survey will ask questions about your school and workload, as well as burnout.

Your submission of this survey indicates your consent to participate in this study. Your responses will be anonymous. You may terminate your participation at any time during the survey. You can elect at the end of the survey to share your email address to be entered to win a gift card.

If you have questions or concerns about this study, you can contact the researcher directly:
Jade Geary
Instructional Design Librarian
University of South Carolina
APPENDIX C

INFORMATION LITERACY QUESTIONNAIRE ADVERTISEMENT

Figure A.2. Information literacy questionnaire advertisement
APPENDIX D

INFORMATION LITERACY QUESTIONNAIRE

Please select an answer to the following questions.

1. Sex
   a. Male
   b. Female
   c. Non-binary
   d. Prefer not to answer
   e. Other- with fill in

2. Race (Select all that apply)
   a. African American
   b. Caucasian
   c. Hispanic
   d. Latino
   e. Native American
   f. Asian
   g. Prefer not to answer
   h. Other with fill in

3. Grade classification
   a. Freshman
   b. Sophomore
   c. Junior
   d. Senior

4. Age

5. Major(s)

6. Did you receive information literacy instruction before attending UofSC?
   a. Yes
   b. No

7. Have you received information literacy instruction while attending UofSC?
   a. Yes Move to 8
   b. No Move to 9

8. Did you receive information literacy instruction from (check all that apply)?
   UofSC Librarian
   Professor
   UofSC Research Guide
   UofSC YouTube channel
   Instruction from a UofSC Librarian as part of one of your courses

9. On average, how many hours do you spend in the library a day?
10. On average, how many hours per week do you use the UofSC library electronic resources?
   a. 0
   b. 1-5
   c. 6-10
   d. More than 10

11. On average, how many hours per day do you browse the internet?
   a. 0
   b. 1-5
   c. 6-10
   d. More than 10

12. On average, how many hours per day do you use social media?
   a. 0
   b. 1-5
   c. 6-10
   d. More than 10

Answer the following questions in relation to the Likert scale below.

<table>
<thead>
<tr>
<th>7</th>
<th>6</th>
<th>5</th>
<th>4</th>
<th>3</th>
<th>1</th>
</tr>
</thead>
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<tr>
<td></td>
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<tr>
<td><strong>Almost always true</strong></td>
<td><strong>Usually true</strong></td>
<td><strong>Often true</strong></td>
<td><strong>Occasionally true</strong></td>
<td><strong>Sometimes but infrequently true</strong></td>
<td><strong>Almost never true</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Question</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>I feel confident to define the information I need</td>
<td></td>
</tr>
<tr>
<td>I feel confident to identify a variety of protentional sources of information</td>
<td></td>
</tr>
<tr>
<td>I feel confident to limit search strategies by subject, language, and date</td>
<td></td>
</tr>
<tr>
<td>I feel confident to initiate search strategies by using keyword and Boolean logic</td>
<td></td>
</tr>
<tr>
<td>I feel confident to decide where and how to find the information I need</td>
<td></td>
</tr>
<tr>
<td>I feel confident to use different kinds of print sources (i.e., books, periodicals, encyclopedias, chronologies, etc.)</td>
<td></td>
</tr>
<tr>
<td>I feel confident to use electronic information sources</td>
<td></td>
</tr>
<tr>
<td>I feel confident to locate information sources in the library</td>
<td></td>
</tr>
<tr>
<td>I feel confident to use the library catalogue</td>
<td></td>
</tr>
<tr>
<td>I feel confident to locate resources in the library using the library catalogue</td>
<td></td>
</tr>
<tr>
<td>---</td>
<td></td>
</tr>
<tr>
<td>I feel confident to use internet search tools (such as search engines, directors, etc.)</td>
<td></td>
</tr>
<tr>
<td>I feel confident to use different kinds (types) of libraries</td>
<td></td>
</tr>
<tr>
<td>I feel confident to use many resources at the same time</td>
<td></td>
</tr>
<tr>
<td>I feel confident to determine the authoritativeness, currentness, and reliability of the information sources</td>
<td></td>
</tr>
<tr>
<td>I feel confident to select information most appropriate to the information need</td>
<td></td>
</tr>
<tr>
<td>I feel confident to identify points of agreement and disagreement among sources</td>
<td></td>
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<tr>
<td>I feel confident to evaluate WWW sources</td>
<td></td>
</tr>
<tr>
<td>I feel confident to synthesize newly gathered information with previous information</td>
<td></td>
</tr>
<tr>
<td>I feel confident to interpret the visual information (i.e., graphs, tables, diagrams)</td>
<td></td>
</tr>
<tr>
<td>I feel confident to write a research paper</td>
<td></td>
</tr>
<tr>
<td>I feel confident to determine the content and form the parts (i.e., introduction, conclusion) of a presentation (written, oral)</td>
<td></td>
</tr>
<tr>
<td>I feel confident to prepare a bibliography</td>
<td></td>
</tr>
<tr>
<td>I feel confident to create bibliographic records and organize the bibliography</td>
<td></td>
</tr>
<tr>
<td>I feel confident to create bibliographic records for different kinds of materials (i.e., books, articles, thesis, papers, web pages)</td>
<td></td>
</tr>
<tr>
<td>I feel confident to make citations and use quotations within the text</td>
<td></td>
</tr>
<tr>
<td>I feel confident to choose a format (i.e., written, oral, visual) appropriate to communicate with the audience (i.e., students, colleagues)</td>
<td></td>
</tr>
<tr>
<td>I feel confident to learn from my information problem-solving experience and improve my information literacy skill</td>
<td></td>
</tr>
<tr>
<td>I feel confident to criticize the quality of my information seeking process and its products</td>
<td></td>
</tr>
</tbody>
</table>

Please select the answer that you feel most correctly answers the question.
41. In the UK people say 'aubergine' and in the US people say 'eggplant' for the same ingredient. You are searching for recipes online and you want to include both British and American results. Which of the following search strings will produce the most relevant results?
   a. Aubergine AND Eggplant AND Recipe.
   b. Aubergine Eggplant Recipe.
   c. (Aubergine OR Eggplant) Recipe.
   d. I do not know.

42. What is the correct sequence of the elements in a research article?
   b. Abstract / Introduction / Material and Methods / Results / Discussion / Conclusions / Bibliography.
   c. Abstract / Conclusions / Introduction / Bibliography / Material and Methods / Results / Discussion.
   d. I do not know.

43. You need to write a report on the impact of technology on modern art. You have interviewed five local artists and audio-recorded the one-hour interviews. Which of the following would produce the most accurate and informative report? best
   a. Transcribe the interviews into text and cut them down to be short enough for someone to easily read.
   b. Transcribe the interviews and extract quotes that specifically focus on the research questions, then group the quotes into general themes, using these to structure your report.
   c. Write up your thoughts and opinions on art, then listen through your recordings and add summaries of what an artist said, or direct quotes, where they fit your text.
   d. I do not know.

44. In which situation is it more efficient to consult an encyclopedia article rather than a journal article?
   a. You need reliable information.
   b. You need the most current information.
   c. You need an overview of a topic.
   d. I do not know.

45. Read each of the following scenarios and decide which one would be considered plagiarism.
   a. You find an article from the database Academic Search Complete. You skim about half of it and get some ideas. You include some of these ideas in your paper. You include a bibliography in your paper, but not this source.
   b. You read an encyclopaedia entry from Wikipedia and learn that John F. Kennedy was the fourth US president to be assassinated while in office. You place this fact in your paper but do not cite it anywhere.
   c. You attend a museum exhibit on the history of western popular music. While at the exhibit you get inspired by what you see. You write about
these ideas in your paper, but do not mention the exhibit anywhere in your paper.

d. I do not know.

46. In your assignment, you want to describe the impact of human activities on climate change. Your initial search returned an overwhelming number of documents. Which of the following will help you narrow down your search, without reducing the quality or accuracy of information?

a. I choose a smaller theme within the topic, input key words that match this theme, and search again.

b. I google climate change and find some websites with general information on the topic, and I summaries these.

c. I look for a related article written by a well-known author and rework the content of that article.

d. I do not know.

47. You have taken a photograph of your friend Jane posing by a fountain in Hyde Park. Who owns this photograph?

a. I do, because I am the one who took it.

b. Jane does, because it is a photo of her.

c. The Royal Parks do, because they own Hyde Park.

d. I do not know.

48. For a research project that requires an original scientific contribution by the student, which of the following methods would be a good way to proceed?

a. Collect the most interesting recent publications and use them as the basis for my thesis.

b. Look for experiments in research articles published by other authors and describe these experiments.

c. Formulate new conclusions by combining both my own research results and the existing literature on the topic.

d. I do not know.

49. You were asked to speak at a local community centre about your work experience. You will be addressing currently unemployed individuals looking to get into your area of work. Which of the following would be the most informative start to your presentation?

a. with a slide providing detailed description of my current job.

b. with an opening slide outlining what the presentation will include and what I hope they will learn from it.

c. with a slide summing up my current salary.

d. I do not know.

50. In your paper, you want to use some data from an article by another author. How do you proceed according to ethical principles and the protection of author’s rights?

a. I am allowed to make reasonable use of the data as long as I cite the source article.

b. I can only use the data if I obtain written permission from the author.

c. Under no circumstances can I use the data.

d. I do not know.
51. You have taken some photographs at a Museum of London event that marked the centenary of women being given the right to vote, focusing on the Suffragettes. Which of the following combination of tags should you apply to reach the maximum number of people interested in this subject?
   c. Centenary, Event, Photo, Museum.
   d. I do not know.

52. Which of the following is NOT an original, new piece of information you could create?
   b. A video of your neighbours showing their best gardening tricks.
   c. A set of highlights from a thick gardening book.
   d. I do not know.

53. You need to do a presentation in class on John Smith, an important figure in your field. Your tutor has told you to create an informative title for your presentation. Which of the following would meet the requirements of the assessment?
   a. A presentation on an important figure in my field.
   b. An overview of John Smith's major contributions.
   c. John Smith: The presentation.
   d. I do not know.

54. Which option is the most effective for locating articles that focus on a specific discipline area like Psychology or Engineering?
   a. A subject database.
   b. The library catalogue.
   c. The web (e.g. Google, Yahoo, Bing etc.).
   d. I do not know.

55. What is the purpose of an abstract in a research article?
   a. To provide a brief summary of the study, including the background, aims, method, and results.
   b. To give a brief excerpt from the article as a taster of the author's writing.
   c. For the editor to provide a critique of the article.
   d. I do not know.

56. When is it ethical to use the ideas of another person in a research paper?
   a. Only when you receive their permission.
   b. Only if you do not use their exact words.
   c. Only when you give them credit.
   d. I do not know.

Please select an answer to the following questions.
57. To be entered to win a gift card, please provide your email address:
   a. Email address:
   b. Prefer not to answer

58. Would you be willing to participate in a follow-up focus group interview?
   a. Yes, provide an email address
   b. No, move to the completion page
APPENDIX E

INFORMATION LITERACY FOCUS GROUP QUESTIONS

Opening
Researcher: Hello and thank you for attending today’s focus group. You all are here to talk about information literacy skills. Today’s group consists of X (freshman, sophomores, juniors, or seniors). To begin, I will need you all to fill out these consent forms. These are saying that you are willing to participate in the study and that you acknowledge that you can leave at any time. For today’s participation, you will receive a gift card. Please note that this session will be recorded, but no identifying information will be revealed in the study. If you have any questions at any time, please do not hesitate to ask.

This is a safe space, and all thoughts and opinions are valued. Please be respectful of your fellow participants.

Interviewee Background Questions
To warm-up, let’s begin with some background questions. Let’s go around the room and share the following: your major.

Thank you for sharing.

Questions
Let’s go ahead and begin with the questions.

1. Define information literacy.
2. What skills do you think are information literacy skills?
3. On the pieces of paper in front of you there are different definitions of information literacy. Take a few moments and read over these definitions. Then select the definition by circling the number next to that definition that you most identify with.
   a. Share which one you chose.
   b. Why did you choose it?
4. You see a post on social media. Something about this post seems suspicious, and you wonder if the information in the post is true. What do you do?
   a. Would you reshare it?
   b. Why or why not.
   c. What would you do before resharing it?
   d. How would you determine if the information was true or not?
5. Tell me about a time when you had to analyze conflicting sources. How would you go about analyzing these conflicting sources? For example, when compiling an annotated bibliography for a paper.
   a. Why or why not?

6. Tell me about a time that you had to evaluate information?
   a. What were the steps that you took?
   b. Does this differ depending on where you found the information?

7. You and your roommates want to get some authentic food for dinner this weekend. What strategies do you use to find authentic restaurants?
   a. How do you look for places?
   b. How to evaluate what you are finding?

8. Tell me why you think information literacy skills are important and
   a. Why you should possess information literacy skills?

9. Tell me about an information literacy skill that you feel you have developed or will develop while you are an undergraduate student that you think will be important for future employment opportunities?

10. Tell me about an information literacy skill that you feel you have developed or will develop while you are an undergraduate student that you think will be important for further studies such as a master, doctoral, medical, or law degree?

11. What do you use most often, Google Scholar versus the Library databases?
   a. Why do you choose either?
   b. What are the reasons that you make that decision?

12. You are writing a speech for class. You have read numerous sources on the subject you will be speaking on. Your professor has said that you must have a slide for references at the end of your speech. Tell me what sources you would include on the references page and why you chose them.
   a. Get to when they think they need to cite information

13. Talk to me about what a primary source means to your or to the field you are majoring in. How do you use primary sources?
   a. How do these differ from secondary sources?

14. What information literacy skills do you use often for your personal life?
   a. How do you use them?

15. How do you use information literacy skills in your academic life?
   a. How do you use them?

Closing
That is all of the questions that I have prepared for you all today. Is there anything else that you all would like to share?
Thank you for your time today. I truly appreciate it.
APPENDIX F

PERMISSION TO USE THE SELF-EFFICACY SCALE EMAIL

To: GEARY, JADE
Subject: Re: Request to use efficacy scale

Hello Jade,

Yes, you can use the scale.

Best
Serap

GEARY, JADE <gearyja@email.sc.edu>, 16 Ekil 2019 Çar, 20:27 tarihinde şunu yazdı:
Hello Dr. Kurbanoglu,

I believe we have met at the OQML conference. I am working on my dissertation on information literacy. In particular, self-efficacy, motivation, knowledge, and use of information literacy. During my literature search I came across your work on self-efficacy. I am writing to inquire if I can utilize the information literacy self-efficacy scale as one of my instruments for my dissertation. Of course, I would give the appropriate attributions within my work.

Thank you kindly for your consideration,

Jade