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Action Research on Instructional Scaffolding in Information Literacy Instruction for Community College Students

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ACTION RESEARCH ON INSTRUCTIONAL SCAFFOLDING IN INFORMATION LITERACY INSTRUCTION FOR COMMUNITY COLLEGE STUDENTS

by

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ABSTRACT

The purpose of this action research was to evaluate the effect of instructional scaffolding on information literacy skills of college students in an English Composition I (ENG 101) course at Urban Community College in the Southeast. Information literacy is defined as a set of skills to recognize an information need as well as locate, evaluate, and effectively use information (American Library Association, 2021). Community college students may have insufficiencies in their information literacy skills due to lack prior information literacy experience in academic libraries or completing research projects (Head, 2013; Hincliffe et al., 2018). I developed an intervention that involved instructional scaffolding to help the information literacy skills of community college students. This study focused on three overarching research questions. The first question sought to explore how instructional scaffolding affects community college students' information literacy skills at Urban Community College in the Southeast. The second question explored community college students' perceptions towards information literacy after attending an information literacy instruction with instructional scaffolding. The third question explored how community college students describe their experience with the instructional scaffolding on information literacy.

The study involved online tutorials and class discussions that utilized instructional scaffolding strategies. The estimated number of participants was 15 to 20 college students who enrolled in each English Composition I (ENG 101) course. A convergent mixed

methods approach was applied to collect both qualitative and quantitative forms of data at relatively the same time (Creswell, 2014; Rademaker & Polush, 2022), but the data was analyzed separately and then the results were compared to see if the findings confirm or disconfirm each other (Creswell & Creswell, 2018). Data collection consisted of Open Test of Information Literacy (OTIL), Perceptions of Information Literacy Skills (PILS) surveys, and student interviews. I analyzed the quantitative data with descriptive statistics and a paired samples t-test. I analyzed the qualitative data with inductive analysis.

Quantitative findings revealed that there was no significant change in students' information literacy skills from before the information literacy intervention to after the information literacy intervention. Quantitative findings also revealed that students perceived themselves to have developing information literacy skills where they are applying information literacy practices but are still learning. Qualitative findings revealed that students perceived the information literacy instruction to be helpful, students' search process changed to include more information literacy skills learned from instruction and resources from the library, and students gained more confidence in their searching. It is difficult to conclude the impact of the information literacy intervention from one semester's worth of interactions and further research needs to be conducted. More research about information literacy in the community college environment in general needs to be conducted as it is an academic area that lacks research on.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF SYMBOLS

α	Alpha is the level of significance.
d	Cohen's *d* is the effect size used to indicate the standardized difference between two means.
df	Degrees of freedom is the number of values in the final calculation of a statistic that are free to vary.
M	Mean is the mathematical average of two or more numbers.
p	Probability under the assumption of no effect or no difference.
SD	Standard deviation is a measure of how dispersed the data is in relation to the mean.
t	Test statistics for t-test.

LIST OF ABBREVIATIONS

ACRL.....American Colleges & Research Libraries

ALA .....American Library Association

D2L Desire2Learn

IL.....information literacy

LMS .....learning management system

OTIL ..... Open Test of Information Literacy

PILS .....Perceptions of Information Literacy Skills

QEP .....Quality Enhancement Plan

SACS.....Southern Association of Colleges and School

SACSCOC ..... Southern Association of Colleges and Schools Commission on Colleges

UCCS ..... Urban Community College in the Southeast

ZPD .....Zone of Proximal Development

CHAPTER 1

INTRODUCTION

National Context

The U.S. Department of Education (2017) reported that there were 1,462 community colleges (1,047 public and 415 private) in the United States in 2017. Ma and Baum (2016) explain that community colleges play a vital role in the American education system because they make education accessible, flexible, and affordable to many college students by having open admissions policies, low tuition, and close proximity to students' homes. These key factors make post-secondary education attainable to many students who normally would not have an opportunity to attend college, such as minority, low-income, and adult students. Sixty-two percent of public community colleges have an open-door admissions policy compared to 7.5% of public four-year colleges in 1999-2000 (U.S. Department of Education, 2017).

The open-door admissions policy brings to light academic issues of entering community college students, for they face different challenges than four-year college students, such as lack of digital literacy and lack of access to technology and internet. Community college students are often academically underprepared for the college with more than half enrolling in developmental courses (Contrada, 2019). The Beginning Postsecondary Students Longitudinal Study (BPS) from 2003-09 showed 68% of beginning students at public two-year colleges take one or more remedial courses in the

six years after their initial enrollment as compared to 40% of beginning students at four-year public colleges (Chen & Simone, 2016). Of the students who take remedial courses at two-year public colleges, only 49% complete all remedial courses attempted, 35% complete some, and 16% complete none (Chen & Simone, 2016). Students who complete the remedial courses have better academic outcomes (i.e., enrolling in college-level courses, persisting in college, transferring to a four-year college, and completing a postsecondary degree) than students who do not complete remedial courses (Chen & Simone, 2016).

These issues affect community college libraries and are better summarized by Nelson (2017) in that community college students have different goals, educational backgrounds, and levels of college-readiness which provides challenges for those institutions. Even though the American Library Association (ALA) provides guidelines for conducting instruction through the American College and Research Libraries (ACRL) Framework for Teaching Information Literacy for Higher Education, only parts of the framework are relevant to two-year college curriculum (Reed, 2015), and the framework does not address pre-existing issues community college students face (Contrada, 2019). For community college libraries to better apply the ACRL framework to their learning environment and develop effective information literacy instruction, it is necessary to understand what specific information literacy deficiencies beginning college students have.

The American Library Association (2021) defines *information literacy* as a set of skills to recognize an information need as well as locate, evaluate, and effectively use information. An information literate person is able to perform all of those steps

(American Library Association, 2019), but many community college students do not meet these requirements. Due to being academically underprepared for college, many community college students are new to research (Contrada, 2019). Head (2013) describes the results of a survey study conducted by Project Information Literacy that showed about half of the 11,000 student respondents have difficulty in assessing the quality of their research efforts. Another study conducted by Library Journal (2017) finds that the primary challenge identified for first-year students in regards to information literacy is recognizing reliable sources/evaluating sources for both two- and four-year colleges. The main information literacy problem among beginning college students is that they have difficulty identifying different information resources and evaluating the quality of those resources.

For the field of academic librarianship in general, further study needs to be conducted on ACRL framework and its application to information literacy instruction at community colleges. The Community College Libraries and Academic Support for Student Success (CCLASS) Project finds that community college libraries do play an essential role in student success initiatives if they provide customized approaches to services they offer and think more broadly of their role (Blankstein et al., 2019). Community college libraries need to find ways to offer effective information literacy instruction to a diverse student population, which may include numerous academically underprepared students. Building strong information literacy skills within beginning college students allows them to complete remedial coursework and have a greater chance of taking college-level courses and persisting in college.

Local Context

To protect the academic institution, faculty, and students, a pseudonym was given to the academic institution featured in this study (Urban Community College in the Southeast) and all citations involving the academic institution have been removed. The local context involved a two-year public college in the southeastern United States that is accredited by the Southern Association of Colleges and Schools Commission on Colleges (SACSCOC). The SACSCOC (2019) accreditation process requires institutions to provide a Quality Enhancement Plan (QEP) that recognizes keys issues identified by institutional assessment which focuses on student learning outcomes, or the environment supporting student learning, all of which must be aimed at accomplishing the institution's mission. In fall 2017, the college sent electronic surveys to 1,100 students and 124 faculty members within their institution as part of their QEP. One of the findings of the survey revealed that students lack awareness of available resources. This included student services within the college in general (i.e., class advisement, financial aid support, and student disabilities support) as well as resources and services within the college library. In addition to QEP survey findings, the college librarians received verbal feedback from course instructors that many students have trouble identifying scholarly sources for assignments.

The college has three physical library locations on seven campuses, with 10 full-time librarians combined to serve all of their academic community with in-person and virtual services. Librarians conduct information literacy instruction in-person, and more recently, virtually via Zoom due to the Covid-19 pandemic. A checklist of basic library information, which includes identifying information resources and distinguishing

scholarly resources, was developed by an internal college library committee in an attempt to offer consistent instruction in each information literacy instruction. Each librarian conducting the information literacy instruction has flexibility regarding what additional information they would like to teach and the method of teaching. The execution of each information literacy instruction varies from librarian to librarian. In past information literacy instructions, librarians have implemented group and individual activities, interactive games, class discussion, flipped classroom approach, and student surveys along with their presentations.

Librarians survey students after each information literacy instruction by giving them a web link to an online survey through a paid online tool, Springshare LibWizard, and collected 875 student responses from 2017 to 2020. Out of those student responses, 99% of responses either *strongly agreed* or *agreed* that the information literacy instruction provided helpful information that they can use. Very few negative responses were received. 1% of responses *strongly disagreed* or *disagreed* that the information literacy instruction provided helpful information that they can use. The few negative comments received were more focused on librarian performance or the classroom environment rather than the actual content presented, and some students already had the information literacy instruction for another class and felt the information presented was repetitive.

College students are not aware of available resources through the college, including library resources, and have difficulty identifying scholarly resources for assignments. The amount of information literacy instruction, including instructional scaffolding (i.e. expert modeling, questioning, providing feedback, and giving hints),

varies by each librarian conducting the instruction and some students may not receive any instructional scaffolding. Student survey responses show that attending an information literacy instruction was a positive experience and they gained information about library resources that is helpful to them. One proposal to alleviate students' issues is a study to evaluate the effect of a series of curated online instruction tutorials and class discussions that utilize instructional scaffolding on information literacy skills of beginning college students. The online instruction tutorials were planned in advance based on where the librarian perceived students to have difficulties with information literacy and were distributed throughout the semester in proximity to course assignments requiring research. The online instruction tutorials had static scaffolding where each student received the same base of information literacy instruction through expert modeling and receiving hints in practice questions. The class discussions were dynamic scaffolding and varied on student needs based on student interactions and conversations. The class discussions offered opportunities for further expert modeling and providing feedback from the librarian. Using an online instruction tutorial can help meet the varying needs of community college students by allowing students to learn on their own time and pace, offering consistent information across instructions, allowing equal access to distance education students, and accommodating different learning styles (Blummer & Kenton, 2015).

Statement of Problem

Students in the English Composition I (ENG 101) course at Urban Community College in the Southeast lack information literacy skills to identify scholarly sources that are necessary for successful completion of academic coursework and may not receive

adequate instructional scaffolding through information literacy instruction to develop their information literacy skills.

A campus-wide survey sent by the Urban Community College in the Southeast revealed that students lacked awareness of available resources. Contrada (2019) explains that community college students tend to face different challenges that lead them to be academically underprepared compared to four-year college students, such as lack of digital literacy and lack of access to technology and internet. When entering an information literacy instruction, it is very likely these community college students will be new to research (Contrada, 2019).

A study conducted by Library Journal (2017) found that the primary challenge identified for first-year students in regards to information literacy is recognizing reliable sources/evaluating sources for both 2- and 4-year colleges or universities. Some contributors of this problem include time limitations of a one-shot instruction as well as lack of computers in the classrooms that often restrict what kinds of hands-on or practice activities can be conducted in face-to-face bibliographic instruction. Students do not always have an opportunity to practice searching for scholarly resources with the guidance of a librarian present to answer questions or to give feedback to develop information literacy skills, leading to students not knowing how to perform searches for and/or properly identify scholarly resources.

Due to the autonomy of each information literacy instruction, the librarian conducting the instruction has the flexibility to include as much, or as little, information or activities they deem necessary into the instruction. This would include instructional scaffolding, such as expert modeling, questioning, providing feedback, or giving hints,

into the information literacy instructions. Student surveys showed that 1% of responses *strongly disagreed* or *disagreed* that the information literacy instruction provided helpful information that they can use. Some of the few negative student comments addressed librarian performance.

Purpose Statement

The purpose of this action research was to evaluate the effect of instructional scaffolding on information literacy skills for college students at Urban Community College in the Southeast.

Research Questions

1. How can instructional scaffolding affect community college students' information literacy skills at Urban Community College in the Southeast?
2. What are community college students' perceptions towards information literacy after attending an information literacy instruction with instructional scaffolding?
3. How do community college students describe their experience with the instructional scaffolding on information literacy?

Statement of Researcher Subjectivities and Positionality

My interest in librarianship began when I first started as a library assistant in a public library. I conducted programs for adults that ranged in technology skill levels, from basic *How to Use a Computer* classes to more advanced hands-on technology demonstrations. I enjoyed helping and educating others so much that I decided to pursue a Masters of Library and Information Science and continued on to a librarian position at a public community college. My experience in educational technology increased exponentially in my current position as I sought ways to help students learn more

effectively and efficiently. I wanted to improve my teaching skills by learning more about educational theories and practices as well as how to better apply educational technology to instruction, so I decided to pursue a Doctor of Education degree in Educational Practice and Innovation with a focus in Learning Design and Technologies. In pursuing a doctorate degree, I felt there were many requirements for an ideal researcher that I possessed, such as drive for seeking improvements within my environment, open-mindedness to new ideas, willingness to ask for help, and good communication skills.

Working with a diverse student population and wide range of library duties helped shape my pragmatic worldview. The ideology of pragmatism is problem-centered (Creswell, 2014) and neo-pragmatists highlighted the importance of common sense and practical thinking (Sundin & Johannisson, 2005). Pragmatism helps in my current profession to focus on the problem at hand to try to find solutions that would be applicable in a real-world setting. Concerning research, pragmatists believe research comes from actions, situations, and consequences, so the focus is more on the research problem than the actual research methods, giving researchers an opportunity to use whatever approach is best to understand the research problem (Creswell, 2014). This ideology allowed me the flexibility to use a combination of research designs (both qualitative and quantitative), known as mixed methods, and freedom of choice in research methods and techniques to gather different sources of data to develop a complete picture of the study problem.

My positionality for my action research was an external-insider position (Culbreath, 2016). Even though I work within the college, I am not in the classroom as a formal instructor and do not experience the gap in information literacy skills first-hand.

As a librarian, I work in support services that help students with their academic achievement. I notice the gap in information literacy skills when I work with students within the library, but not to the extent instructors view the information literacy deficiency applied in student work. In reading further literature, my positionality may also be described as insider in collaboration with other insiders to provide improved practice (Herr & Anderson, 2005). I do not have my own courses and worked in collaboration with an instructor for my action research. Working with another instructor was helpful in recruiting students from their class to participate in the study. The instructor and I collaborated on what we hope to come out of the study to have a greater impact within our learning environment.

From my personal experience, being a younger, female librarian, who is also a minority, I felt that students viewed me as more approachable than other library staff and often asked me for help. For my action research, I felt that student perception of me was similar. I normally had a positive perception of all students because of their goal of learning, and I hoped that they would participate in my study. For participants who were hesitant of my position and the study, I tried to alleviate issues by describing the research in detail, offering a timeline, assessing risks to ensure participants are safe, answering participant questions, and seeking informed consent (Zeni, 1998). My hope for this action research was to improve information literacy instruction for students and help them achieve their goal of higher education.

Definition of Terms

Efficacy

For this action research, I used a traditional definition for efficacy. According to Merriam-Webster Online (2021), efficacy is a synonym for effectiveness. Efficacy is the "power or capacity to produce effects; power to effect the object intended" (Oxford Dictionary Online, 2021, para. 1). In terms of efficacy, I examined the effectiveness of variables (i.e. instruction tutorials and information literacy instruction sessions) on another variable (i.e. students' information literacy skills).

English Composition I (ENG 101)

This course is a required course for many degrees at Urban Community College in the Southeast (UCCS) and can be college-transferred for course credit. UCCS's Academic Course Catalog 2022-2023 describes ENG 101 as a course that focuses on composition through theme assignments to reinforce effective writing. The ENG 101 course is designed to help incoming students with English composition and introduce them to basic techniques of research. Many students of the ENG 101 course are freshman status as it is a prerequisite for English Composition II (ENG 102), which many students take during their sophomore year.

Tutorial

In relation to computer science, a tutorial is a "program that provides instruction for the use of a system or of software" (American Heritage Dictionary of the English Language, 2000, p. 1860). Hrycaj (2005) further describes a tutorial as potentially covering any subject matter. Chen and Roys (2010) adds that a tutorial has a step-by-step structure and is a form of asynchronous interaction between the tutorial user and tutorial

creator. The student will be the tutorial user and the instructor will be the tutorial creator. Through the use of the tutorial, the student and instructor will not be able to communicate in real time.

Information Literacy

The American Library Association (2021) defines information literacy as "a set of abilities requiring individuals to recognize when information is needed and have the ability to locate, evaluate, and use effectively the needed information" (para. 1). An information literate person is able to identify their information need, effectively access and evaluate information, incorporate information into their knowledge base, and use the information ethically (Association of College and Research Libraries, 2000).

Scholarly Source

There is not a clear definition of *scholarly source* but many academic resources have listed qualities that make a source scholarly, such as "credible," "peer-reviewed," or refereed in an editorial review process (Davis & Cohen, 2001, p. 309; Metzger et al., 2003, p. 287; Calkins & Kelley, 2007, p. 153). Lloyd and Talja (2010) ask what counts as "authority" amongst practitioners and answers that "standard criteria, such as peer review for journal articles or prestige of a journal or monograph publisher, were given" (p. 175). For this action research, scholarly sources were considered to be from credible publications that have either been peer-reviewed or refereed.

Peer-Reviewed

Peer review is a "mechanism of self-regulation" in which published or organizational work is evaluated by scholars from a given field in order to "ensure that standards of quality are met, demonstrate credibility, and encourage improvement"

(Gelmon et al., 2013, p. 1). According to van Rooyen (2001), peer-reviewed studies constitute “good research” that is held to a higher standard than unsourced or “bad” research that did not pass a peer-review process. Information literacy often depends on an understanding of the value of peer-reviewed research and how to locate it (p. 86).

CHAPTER 2

LITERATURE REVIEW

Introduction

The purpose of this action research was to evaluate the effect of instructional scaffolding on information literacy skills in college students of the English Composition I (ENG 101) course at Urban Community College in the Southeast. The review of the related literature focused on the following research questions: (1) How can instructional scaffolding affect college students' information literacy skills at Urban Community College in the Southeast?; (2) What are community college students' perceptions towards information literacy after attending an information literacy instruction with instructional scaffolding?; and (3) How do community college students describe their experience with the instructional scaffolding on information literacy?

This review of related literature was based upon a thorough examination of a variety of resources. Based on the research question, six main variables were used to guide the literature search: (1) information literacy, (2) information literacy instruction, (3) information literacy skills, (4) instructional scaffolding, (5) tutorials, and (6) student perceptions of information literacy. The resources for this review were collected through a variety of methods. Most of the electronic databases were accessed through the University of South Carolina Libraries' aggregate search Find It. There were some searches of individual databases, such as *Academic Search Complete, Education Source, ERIC, Library, Information Science & Technology Abstracts with Full Text and Library*

Literature & Information Science Full Text. I searched the following keywords as individual phrases, but also in combination using Boolean searching or the Advanced Search feature: information literacy, information literacy instruction, library instruction, community colleges, community college libraries, library instruction tutorial, information literacy tutorial, tutorials, ALA framework, and instructional scaffolding. Some examples of searches I tried include:

- information literacy OR library instruction
- information literacy instruction AND community college libraries
- information literacy AND tutorials
- information literacy tutorials AND community colleges
- ALA framework AND community colleges

I accessed a few resources from Google Scholar, but preferred to use the databases from the University of South Carolina Libraries, as I was able to select the limiter *Peer-reviewed Journals* to assure the resources were scholarly in nature. The majority of the resources for this literature review (about 95 percent) were accessed electronically or online and the remaining resources were physical print books I accessed through the University of South Carolina's Thomas Cooper Library. Of the resources I found that I thought were beneficial to my study, I performed reference mining to review the references of those resources, which led to other individual resources or different search considerations altogether.

Along with the Introduction, the review of literature is organized into five main sections. The first section is the definition of information literacy and what abilities need to be encompassed to be considered an information literate individual as well as the

importance and challenges of information literacy. The second section discusses topics related to information literacy instruction, such as commonalities of successful information literacy instructions, delivery methods of information literacy instruction, importance of information literacy instruction, challenges of information literacy instruction, and gaps in the current effort to teach information literacy. The third section discusses reasons why information literacy instruction is important to community college students and challenges community college students face that may prevent their achievement of information literacy skills. The fourth section discusses topics related to instructional scaffolding, such as the definition of instructional scaffolding, types of instructional scaffolding, roles within instructional scaffolding, technology use with instructional scaffolding, advantages of instructional scaffolding, and disadvantages of instructional scaffolding. The final section is the theoretical background for this research study and how it relates to information literacy instruction.

Information Literacy

This first section defines the terms information literacy and information literate. This section includes an examination of the definition of information literacy and what abilities an individual needs to have to be considered an information literate person. Lastly, I discuss the importance of having information literacy skills and the challenges developing information literacy skills.

What is Information Literacy?

The term *information literacy* is commonly used in association with libraries and academia, but what does it mean? In short, the term *information literacy* has many definitions (Sample, 2020). There is difficulty defining information literacy because it

involves situational and contextual elements (Forster, 2015; Sample, 2020), but in the academic environment, a widely accepted definition of *information literacy* derives from the American Library Association (2021) that describes it as a set of skills to recognize an information need as well as locate, evaluate, and effectively use information. The concept of information literacy surpasses the media type, including both traditional and digital, as it refers to the ability to access information by identifying, locating, evaluating, organizing and applying (American Library Association, 2021; Goldstein, 2020; Irving, 2020).

The concept of information literacy can be applied to individuals and those individuals would be known as being *information literate*. Being an *information literate* person is based on a set of abilities or skills (Addison & Meyers, 2013; American Library Association, 2019; Sample, 2020). Scholars believe that there is a skills-based view of information literacy that involves a set of abilities or behaviors that is exhibited by the individual in their information seeking (Addison & Meyers, 2013; Irving, 2020; Sample, 2020). This is in line with the American Library Association (2019) description of an information literate person: (1) ability to recognize their information need, (2) have the ability to locate information, (3) have the ability to evaluate found information, and (4) effectively apply found information to their information need.

Importance of Having Information Literacy Skills

Simply stated by the American Library Association for the Presidential Committee on Information Literacy: Final Report in 1989, information literacy is a way to instill personal empowerment. Information literacy skills allow individuals access to information in the traditional sense (i.e. locating information/resources, identifying

truth/not truth, fulfilling information needs, etc.) but they also develop an individual's other attributes like curiosity, persistence, and patience (O'Connor, 2009). Information literacy skills are important during an individual's academic years but are also essential skills that can be used throughout their lifetime. *Lifelong learning* is defined as having these characteristics: (1) learning that occurs at all ages of life, (2) learning that is intentional and, (3) learning that is goal-oriented (Titmus, 1989).

Lau (2006) further adds that information competencies are an important element in lifelong learning. In 2000, Association of College and Research Libraries (ACRL) published *Information Literacy Competency Standards for Higher Education* to help shape lifelong learners by providing guidelines to identify informational needs, locate information resources, evaluate information resources, and apply found information to informational needs (Radom & Gammons, 2014). In terms of lifelong learning, information literacy skills are used in everyday routines and tasks, such as seeking health information (Guttman et al., 2018; Millar et al., 2020), job hunting (Mowbray & Hall, 2021), or online shopping (Ngwe et al., 2019).

Challenges Developing Information Literacy Skills

One of the biggest challenges in developing information literacy skills is learner attitudes. Learner attitudes range a broad spectrum from inflated research skills (Hinchliffe et al., 2018) to library anxiety (Muszkiewicz, 2017; Sample, 2020; Van Scoyoc, 2003). Both learners who feel overconfident in their research skills and learners who are intimidated by the library or research process are reluctant to ask for help from librarians. Additionally, learners have a "Google-centric" mindset (Hottinger, et al., 2015, p. 470) – these are learners who are overly dependent on Internet search engines for their

information needs (Bury, 2016; Detlor et al., 2012; Head, 2013; Refaei et al., 2015). Internet searches are popular due to convenience, accessibility, and ease of use (Van Scoyoc & Cason, 2006). Unfortunately, Internet search engines do not evaluate the validity of the source or accuracy of the information. This task is left to the learner.

Another challenge in developing information literacy skills is time constraints during information literacy instruction (Hartman & Fial, 2015; Hottinger et al., 2015). Many information literacy instructions are one-shot instructions where the librarian teaches all of the instructional content, which is typically related to a course or an assignment, in a 50 to 75-minute session (Gil, 2017). Wang (2016) points out that it is a daunting task to determine what to teach within this single session timeframe and adding student assessment or evaluation can be too time consuming. Oftentimes, there is delayed follow up (Gil, 2017; Wang, 2016) to observe if students truly understood the content of the information literacy instruction. A final challenge is situational barriers (i.e. lack time or transportation) or dispositional barriers (i.e. attitudes) that students may have (Seifi et al., 2020). These are variables that cannot be controlled by the librarian/instructor.

Information Literacy Instruction

This second section discusses topics related to information literacy instruction, including (1) a description of information literacy instruction, (2) delivery methods of information literacy instruction, (3) commonalities of successful information literacy instructions, (4) importance of information literacy instruction, (5) challenges of information literacy instruction, and (6) gaps in the current effort to teach information literacy.

Description of Information Literacy Instruction

As shown through numerous studies, information literacy skills can be taught by librarian/instructor to learners/users (Aleman & Porter, 2016; Blummer & Kenton, 2014; Homol, 2018: Moorefield-Lang, 2019; Rapchak, 2017; Saunders, 2018; Stadler et al., 2021; Stiwinter, 2013; Weeks & Putnam Davis, 2017). Information literacy instruction has been referred to by many names: library instruction, user education, or bibliographic instruction (Grassian & Kaplowitz, 2010). Though referred to by different names, the goal of information literacy instruction has always been the same: to teach individuals how to effectively perform research, evaluate information, and use information responsibly (Grassian & Kaplowitz, 2010). Information literacy instruction is typically at the point of need when individuals need to apply information literacy skills to find information (Jacklin & Robinson, 2013; Wang, 2016). Some examples of skills taught in information literacy instruction include distinguishing kinds of resources based on information needs (Gil, 2017; Henry et al., 2015; Hottinger et al., 2015; Raish & Behler, 2019), how to perform searches (Gil, 2017; Henry et al., 2015; Hottinger et al., 2015; Johnston, 2010), recognizing reliable resources (Hottinger et al., 2015; Johnston, 2010), and how to use information ethically (Association of College and Research Libraries, 2001; Grassian & Kaplowitz, 2010; Johnston, 2010).

Information literacy instruction has significant importance to college students. A benefit of information literacy instruction is that students feel that they would be able to apply knowledge learned from the instruction to future assignments (McCartin et al., 2019). Students were more receptive to information literacy instruction when they found out how the instruction benefits them immediately in their coursework (Gonzales, 2014).

By learning how to use library resources in information literacy instruction, students felt that they would save time and worry less about assignments in the future (McCartin et al., 2019).

Overall, studies indicate that information literacy instruction and library usage is associated with an increase in college GPA (Nichols Hess et al., 2015; Stemmer & Mahan, 2016; Wright, 2021). Information literacy instruction leads to positive learning outcomes and practices more than collections and facilities (Murray, 2015; Wright, 2021). There is a positive correlation in student retention in that information literacy instruction accounts for a small amount of increased retention, but it is still statistically significant (Murray et al., 2016; Wright, 2021).

Delivery Methods of Information Literacy Instruction

Traditional one-shot instructions were typically conducted face-to-face by a librarian as a single-class visit. One-shot instructions are course or assignment-specific and usually conducted at the point of need (Wang, 2016). In the one-shot instruction, the librarian teaches all of the instructional content in a 50 to 75-minute session (Gil, 2017). As technology has advanced, information literacy instruction has moved towards different variations online, such as screencast videos (Blummer & Kenton, 2015; Rapchak, 2017) or online tutorial (Stiwinter, 2013), all of which have helped alleviate some issues related to traditional one-shot instructions. Stiwinter's (2013) online tutorial was designed to deliver an interactive information literacy instruction to correspond with the college's English 101 course that met the needs of both the librarians and students.

Studies indicate that students benefit from information literacy instruction. There are multiple delivery methods for information literacy instruction and there does not

appear to be a right or wrong method. Information literacy instruction is effective both in person and online (Gonzales, 2014; Nichols Hess et al., 2015; Raish & Behler, 2019; Stiwinter, 2013). Regardless of the format, information literacy instruction has positive effects on students' information literacy skills and knowledge (Gall, 2014). Among students who have had face-to-face and online information literacy instruction, both groups experienced the same skill gains (Van Scoyoc, 2003).

Commonalities Among Successful Information Literacy Instructions

Among the studies examined for this literature review, there were common features and strategies described by the authors of their studies that were beneficial to making their information literacy instructions successful. These include: (a) flexibility, (b) interactivity, (c) visual communication, and (d) chunking.

Offers Flexibility

Offering different delivery methods of information literacy instruction can be a means of accommodating different learning preferences (Blummer & Kenton, 2015; Gonzales, 2014; Weeks & Putnam Davis, 2017) as well as helping alleviate lack of librarians available to lead instructions (Blummer & Kenton, 2015; Hartman & Fial, 2015; Held & Gil-Trejo, 2016; Johnston, 2010; Stiwinter, 2013) and allowing the instructions to be scalable to serve different student group sizes (Contrino, 2016; Held & Gil-Trejo, 2016; Homol, 2018). Online information literacy tutorials are an excellent example of flexibility in that they allow users access to instructional content 24 hours a day, seven days a week (Stiwinter, 2013) and students can review instructional content at their convenience, such as when they have free time or at a location of their choice (Blummer & Kenton, 2015; Stiwinter, 2013).

Interactivity

Allowing users opportunities to interact with content gives them a feeling of control over their learning and keeps them engaged with the content. Examples of interactivity in online information literacy instruction include allowing users to progress the tutorial at their own speed (Rapchak, 2017; Saunders, 2018; Stiwinter, 2013), providing a navigation menu for tutorials (Held & Gil-Trejo, 2016; Rapchak, 2017), providing quizzes to test user knowledge (Hartman & Fial, 2015; Held & Gil-Trejo, 2016), offering hands-on activities for practice (Henry et al., 2015), offering gaming elements to offer immediate feedback (Hottinger et al., 2015), or using authentic examples or scenarios (Goodsett, 2020).

Communicate Visually

Individuals learn more when words and pictures are both used in instruction (Rapchak, 2017). Visual elements in information literacy instruction can help learners more easily understand the content and retain the information presented (Aleman & Porter, 2016; Held & Gil-Trejo, 2016; Moorefield-Lang, 2019; Nichols Hess & Greer, 2016; Rapchak, 2017; Weeks & Putnam Davis, 2017). Software programs can allow content creators to add highlights or arrows to emphasize content to make them visually stand out and draw the learners' attention (Rapchak, 2017). Examples of visual elements can include screenshots/screen captures (Blummer & Kenton, 2015; Rapchak, 2017), GIF images (Aleman & Porter, 2016), YouTube videos (Moorefield-Lang, 2019), or screencast videos (Blummer & Kenton, 2015; Rapchak, 2017).

Break Information into Smaller Chunks

A common problem with information literacy instruction is information overload. Learners are exposed to too much information at once and are overwhelmed with all of the new information presented (Blummer & Kenton, 2014; Rapchak, 2017). Breaking instructions into manageable chunks reduces the chance of students feeling overwhelmed, resulting in the ability to retain the information more easily (Aleman & Porter, 2016; Goodsett, 2020; Hartman & Fial, 2015; Henry et al., 2015; Humphries & Clark, 2021; Moorefield-Lang, 2019; Nichols Hess & Greer, 2016; Rapchak, 2017; Saunders, 2018; Stiwinter, 2013; Weeks & Putnam Davis, 2017). Also, having multiple information literacy sessions allows learners to review information and build upon skills presented in previous information literacy sessions (Henry et al., 2015). Chunking can be seen as a form of microlearning where segments of learning can be "consumed quickly" by the learner (Torgerson & Iannone, 2020, p. 8).

Challenges of Information Literacy Instruction

Zhou and Lam (2019) point out the Internet as a primary source of knowledge because of its easy and efficient nature. This poses an issue as college students overuse websites with non-reliable resources, like Wikipedia or Google (Bury 2016; Detlor et al., 2012; Head, 2013, Refaei et al., 2015; Van Scoyoc & Cason, 2006). Students are unaware of the library resources that are available to them through the college and need help evaluating the resources they find (Refaei et al., 2015). Another challenge is even after information literacy instruction, students felt that they were able to find reputable sources for their assignment but were worried they would not find enough reputable sources to meet assignment requirements (McCartin et al., 2019). Students also felt the information

presented in information literacy instruction was helpful but presented in a boring way (McCartin et al., 2019). A final challenge with developing information literacy instruction is that not all students attend classes in person and one must figure out a way to deliver information literacy instruction that has quality and depth in an online environment for distance education students (Homol, 2018).

Gaps in the Current Effort to Teach Information Literacy

Community colleges are also referred to as *junior colleges* (Contrada, 2019) or *two-year colleges* (Ma & Baum, 2016; Nelson, 2017; Reed, 2015). Some scholars point out that there is a lack of research about community college groups (McFadden, 2016; Nelson, 2017; Terrile, 2021). McFadden (2016) states that, of the literature published about higher education between 1990 and 2003, only 8% of the literature mentioned community colleges. Latham, Gross, Julien, Warren, and Moses (2022) indicate that information literacy in the community college environment has been studied significantly less than the four-year college environment, and has led to a lack of literature about the topic.

Even though the American Library Association provides guidelines for conducting instruction through the American College and Research Libraries (ACRL) Framework for Teaching Information Literacy for Higher Education, Contrada (2019) points out that the ACRL framework does not address these pre-existing issues of community college students. These information literacy-related issues are of importance because they affect many students, not just community college students. These issues affect community college libraries and are better summarized by Nelson (2017) in that community college students have different goals, educational backgrounds, and levels of

college-readiness, all of which provide challenges for those institutions. In addition, only parts of the framework are relevant to a two-year college curriculum (Reed, 2015), and the framework does not address pre-existing issues community college students face (Contrada, 2019).

Community College Students' Challenges with Information Literacy Instruction

This third section investigates reasons why information literacy instruction is important to community college students as they face different challenges than four-year college students or traditional students. These challenges include: (1) lack of social support and resources, (2) lack of research experience, and (3) underprepared for academic expectations.

Lack Social Support and Resources

Community colleges play a vital role in the American education system because they make education accessible, flexible, and affordable to many college students by having open admissions policies, low tuition, and close proximity to students' homes (Ma & Baum, 2016; McPherson & Arbelo Marrero, 2021). These key factors make post-secondary education attainable to many students who normally would not have an opportunity to attend college, such as minority, low-income, and adult students (Chen, 2021; Freeman et al., 2020; Ma & Baum, 2016). Pre-college disadvantages faced by first-generation community college students include a lack of basic knowledge about college, lower levels of family support, lower levels of family income, and poor academic preparation in high school (McFadden, 2016). Contrada (2019) also points out that community college students face different challenges than four-year college students, such as lack of digital literacy and lack of access to technology and Internet. It is

important to recognize that these disadvantages may place community college students academically behind other incoming students.

Lack of Research Experience

Contrada (2019) asserts that more than half of community college students enroll in at least one developmental course and that community college students are academically underprepared for the college experience. A study by Hinchliffe, Rand, and Collier (2018) showed that community college students lack prior information literacy experience in academic libraries and completing research projects. Survey responses from the First Year Experience Survey: Information Literacy in Higher Education (2017) by *Library Journal* and Credo Reference reported that students lacked awareness of why they need to learn research skills and how research skills can be helpful (Hincliffe et al., 2018). Another significant study called Project Information Literacy (PIL) by Alison Head (2013) found that student interviewees admitted that their high school research habits were not sufficient for college-level research. Results from the study affirmed that half of student interviewees had uncertainties in assessing resource items and about a quarter of student interviewees were frustrated in trying to find information or conduct research for a course (Head, 2013).

Underprepared for Academic Expectations

Most first-year college students are not prepared for college-level writing. Kim and Dolan (2015) insist that first-year college students are not prepared for college-level writing due to the fact that they were exposed to standardized testing and writing personal essays. College instructors assume incoming freshmen have basic writing skills, including knowing how to conduct research (i.e. finding sources, checking

validity/reliability of sources, etc.) (Kim & Dolan, 2015). However, incoming college freshmen experience gaps between their high school instruction and the expectations of college instructors (Kim & Dolan, 2015).

Instructional Scaffolding

This fourth section examines instructional scaffolding, including (1) definition of instructional scaffolding, (2) types of scaffolding, (3) levels of instructional scaffolding, (4) roles within instructional scaffolding, (5) technology use in instructional scaffolding, (6) advantages of instructional scaffolding, and (7) disadvantages of instructional scaffolding.

Instructional Scaffolding

Wood, Bruner, and Ross (1976) first used the term *scaffolding* (Holton & Clarke, 2006; Shvarts & Bakker, 2019; Stephen, 2012). *Scaffolding* is defined as "a process that enables a child or novice to solve a problem, carry out a task, or achieve a goal which would be beyond his unassisted efforts" (Wood et al., 1976, p. 90). This definition of scaffolding is closely associated with Lev Vygotsky's Zone of Proximal Development theory (Holton & Clarke, 2006; Richardson et al., 2022; Shvarts & Bakker, 2019). Scaffolding refers to assistance or support offered from the instructor to student. Since I am working with adult learners, the Holton and Clarke (2006) definition of *scaffolding* as the "act of teaching that (1) supports the immediate construction of knowledge by the learner; and (2) provides the basis for future independent learning of the individual" (p. 131) better aligns with this research study.

The three traits of instructional scaffolding are (1) contingency, (2) fading, and (3) transfer of responsibility. Contingency refers to adjusted or tailored support. The

instructor adjusts support contingently depending on the learner's needs (Puntambekar & Hubscher, 2005; Reynolds & Daniel, 2018; van de Pol et al., 2010). Fading refers to the gradual withdrawal of scaffolding. The instructor decreases the amount of support as the learner develops more competence (Puntambekar & Hubscher, 2005; Richardson et al., 2022; Shin et al., 2020; Smit et al., 2013; van de Pol et al., 2010). Transfer of responsibility refers to when the responsibility of the performance of a task is transferred to the learner (Puntambekar & Hubscher, 2005; Richardson et al., 2022; Smit et al., 2013; van de Pol et al., 2010).

Types of Instructional Scaffolding

There are different types of instructional scaffolding that can be used in various learning situations. Van de Pol et al. (2010) explains that every learning situation is unique, so one type of instructional scaffolding may not be applied to every learning situation, and the same instructional scaffolding may not be applicable to the same learning situation for different learners or for the same learner at different times during the instruction. Included in this section are: (a) conceptual scaffolding, (b) metacognitive scaffolding, (c) procedural scaffolding, (d) strategic scaffolding, and (e) motivational scaffolding.

Conceptual Scaffolding

When a problem is defined, conceptual scaffolding helps guide the learner toward what to consider by showing relationships between concepts and giving hints (Hannafin et al., 1999; Richardson et al., 2022). Conceptual scaffolds can help learners prioritize what is important (Hill & Hannafin, 2001). A mechanism of conceptual scaffolding would be giving hints or recommending specific tools during the problem-solving

process (Hannafin et al., 1999). Expert modeling is another conceptual scaffolding mechanism, which can be presented in computer-based form, where an expert explains specific aspects of a problem they are trying to address (Li & Lim, 2008; Pedersen & Liu, 2002). A Pedersen and Liu study (2002) gives an example of expert modeling in Alien Rescue, a problem-based learning program for sixth grade science, where an astronomy expert discusses considerations in choosing a new home planet for a stranded alien.

Metacognitive Scaffolding

Metacognitive scaffolding can help learners assess what they already know and what they need to do during the learning process (Hill & Hannafin, 2001). Metacognitive scaffolding focuses on the learner's thinking process in how to solve a problem (Hannafin et al., 1999; Richardson et al., 2022) by framing the problem, providing feedback, and giving advice to learners (Zhou & Lam, 2019). Metacognitive scaffoldings support planning, monitoring, and self-evaluation during the development of learning tasks in computer environments (Huertas-Bustos et al., 2018). A mechanism of metacognitive scaffolding would be proposing self-regulating milestones and related monitoring (Hannafin et al., 1999). An example of this mechanism is present in the Ifenthaler (2012) study where university students were provided prompts to elicit reflection of their question responses and concept maps related to the human immune system.

Procedural Scaffolding

Procedural scaffolding guides learners in how to use available resources and tools (Hannafin et al., 1999; Hill & Hannafin, 2001; Richardson et al., 2022). Procedural scaffolding is helpful for online courses to help students with course orientation, course

expectations, and instruction on how to use course resources (Stavredes, 2011). An example of procedural scaffolding would be a class orientation session for a new course or an information literacy/library instruction. Procedural scaffolding can be seen in numerous information literacy studies, such as Homol (2018), Rapchak (2017), and Sample (2020), that teach university students about their respective libraries in general, library resources, and how to conduct research.

Strategic Scaffolding

Strategic scaffolding offers learners multiple approaches to solving a problem (Hannafin et al., 1999; Richardson et al., 2022; Stavredes & Herder, 2015). This approach is beneficial to meet the diverse needs of learners and provides "just-in-time support" (Stavredes, 2011, p. 79). A mechanism of strategic scaffolding would be providing learners with beginning questions to be considered before the problem-solving process (Hannafin et al., 1999). The Richardson, Caskurlu, Castellanos-Reyes, Duan, Duha, Fiock, and Long (2022) study used multiple strategic scaffolding practices, such as probing questions related to a case walk-through, observing videos, and posting discussion board responses. An information literacy-related example of strategic scaffolding would be the expert (i.e. reference librarian) suggesting different keywords, tools, or search limiters (Hill & Hannafin, 2001).

Motivational Scaffolding

Motivational scaffolding encourages learners to continue towards their learning goals and persist in their learning tasks (Richardson et al., 2022). Mechanisms of motivational scaffolding can be used individually or in combination (Belland et al., 2013). These mechanisms include "(a) expectancies for success, (b) perceptions of value

in the completion of the target task, (c) perceptions of self-determination of behavior, (d) perceptions of mastery goals, (e) abilities to regulate academic emotions, and (f) perceptions of belongingness" (Belland et al., 2013, p. 112). An example of motivational scaffolding is learner autonomy and what learners can expect for success.

Levels of Instructional Scaffolding

Scaffolds are ways that an instructor can offer support to students. There are two levels of scaffolds: (1) hard scaffolds, and (2) soft scaffolds (Saye & Brush, 2002). The difference between hard scaffolds and soft scaffolds is the timing of the scaffold and the planning of the treatment (Mojarrabi Tabrizi et al., 2019).

Hard scaffolds are static and typically fixed (Saye & Brush, 2002; Sharma & Hannafin, 2007). Hard scaffolds are planned ahead of time in anticipation of difficulties a typical student may have with a learning task (Sharma & Hannafin, 2007). While planning a lesson, an instructor will decide which areas may have problems based on their previous class experiences and decide where to offer support that may remedy those problems (Mojarrabi Tabrizi et al., 2019). Hard scaffolds are commonly used to support the general needs of a learner and can be embedded within learning environments (Saye & Brush, 2002; Simons & Klein, 2007). An example of hard scaffolds is providing background information when an instructor predicts that learners may be unfamiliar with specific concepts (Richardson et al., 2022).

Soft scaffolds are dynamic and are often customized (Saye & Brush, 2002; Shin et al., 2017). Soft scaffolds are situation-specific when someone who is more knowledgeable (i.e. instructor) offers help to someone who is less knowledgeable (i.e. student) with a learning task (Richardson et al., 2022; Saye & Brush, 2002; Shin et al.,

2017). With soft scaffolds, the instructor continuously diagnoses the understanding of learners and offers timely support when assistance or guidance is needed (Mojarrabi Tabrizi et al., 2019; Saye & Brush, 2002). An example of soft scaffolds can be a proposed teacher meeting with a group of students (Saye & Brush, 2002).

Both hard scaffolds and soft scaffolds are important to student success (Saye & Brush, 2002). Sharma and Hannafin (2007) state that learners can benefit from having both hard and soft scaffolds because hard scaffolds can support common learning needs, thereby relieving the instructor to provide "on-demand" support through soft scaffolds (p. 30).

Roles Within Instructional Scaffolding

The review of the literature shows that there are two primary roles involved in instructional scaffolding: the instructor role and the learner role. Both roles are necessary for instructional scaffolding to occur.

Instructor Role

The role of the instructor is to serve as the expert of the domain as well as the facilitator with effective skills and strategies that help support the learner (Puntambekar & Hubscher, 2005; Richardson et al., 2022; Smit et al., 2013; Wood et al., 1976). The instructor must plan lessons on the learner's future progress, not previous progress, to see the full potential of the instruction (Stadler et al., 2021). The instructor helps motivate the learner by offering support to achieve the learning goal (Puntambekar & Hubscher, 2005). The instructor evaluates the learner's responses over time and adapts the support based on the learner's needs (Puntambekar & Hubscher, 2005; Smit et al., 2013). The

instructor and learner have a shared understanding of the learning goal that is going to be achieved (Puntambekar & Hubscher, 2005).

Learner Role

The learner is the "less expert" of the two roles in instructional scaffolding (Wood et al., 1976, p. 89). The role of the learner is to be an active participant of scaffolded interactions with the instructor and offer feedback so that the instructor may assess their learning process (Puntambekar & Hubscher, 2005). There is correlation in the effectiveness of the instructional scaffolding based on the learner depending on the amount of time the learner works on the task independently and the amount of effort the learner puts into it (Stadler et al., 2021). The instructor and learner have a shared understanding of the learning goal that is going to be achieved (Puntambekar & Hubscher, 2005).

Instructional Scaffolding Strategies for Developing Students' Information Literacy Skills

Earlier discussed were overall commonalities among successful information literacy instructions. Among further review of studies, it was observed that there are also strategies among successful instructions involving instructional scaffolding. These include: (a) expert modeling, (b) questioning, (c) giving hints, and (d) providing feedback. Application of these instructional scaffolding strategies can be applied in combination with previously discussed information literacy strategies and features to create effective information literacy instruction.

Expert Modeling

Expert modeling is providing learners how an expert would approach a similar problem (Belland, 2013) or perform a given task (Pedersen & Liu, 2002). The intended purpose of expert modeling is to demonstrate a good strategy for solving a problem (Belland et al., 2013). Expert modeling can help learners see why the content is important, and when and how it is used (Brophy, 1999). Learners can see what they are doing that is similar to experts in professional practice (Herrington & Oliver, 2000; Powell & Mason, 2013). Expert modeling is typically presented as video content where the expert can give an introduction of them self and their profession, what they do on a daily basis, and summarize a problem-solving process they encountered in their profession (Belland et al., 2013). Homol (2018) provided expert modeling in their video tutorials where the librarian demonstrated how to conduct basic searches within the library resources that were conceptual in nature so that they could be applied across various courses.

Questioning

Questioning involves prodding the student to use information from what they already know (Kim et al., 2018) and to elicit responses that will help them move forward in their learning task (Belland, 2013). Questioning may be presented in the form of question prompts. Learners read the question prompts that direct their attention to important elements of a problem and encourage them to conduct certain tasks (Ge et al., 2010). The effectiveness of question prompts can vary by individual based on their abilities (i.e. prior knowledge, problem-solving skills, etc.) (Lee & Chen, 2009). In the Nichols, Hanan, and Ranasinghe (2013) study, students used an interactive simulation to

model ion behavior near a cell membrane. Students were able to modify the amount of potassium and sodium to view how the simulation would respond. Students were also given question prompts to consider other important elements in the simulation.

Giving Hints

Giving hints is providing learners with hints or clues that would help them move forward in their learning task (Melero et al., 2011). In a computer-based modality, hints can be provided in the form of a balloon or pop-up feature (Hannafin et al., 1999). Learners have the decision to self-select whether to receive a hint (Belland, 2017); the learner can choose to press the hint button or not. In the Chang, Sung, and Chen (2001) study, students created concept maps within a computer system that contained a hint function. When students selected the hint button, a pop-up window appeared with an appropriate hint based on the student's concept map compared to an expert's concept map.

Providing Feedback

Feedback is a central component of scaffolding (Chi, 1996; van de Pol et al., 2010). Most one-to-one scaffolding and peer scaffolding use the mechanism of providing feedback (Belland, 2013). Providing feedback is giving the learner information about the adequacy of the learner's performance (Belland, 2013). From a cognitive perspective, it is not helpful to learners when feedback only lets them know that they are right or wrong (Shute, 2008). Informational feedback, which focuses on the substantive elements of a learner's work, can help guide learners to the completion of their goals (Elliot & Dweck, 1988). After students viewed tutorial videos, Rosser and Willis (2016) addressed student responses through electronic feedback or in the face-to-face session.

Technology Use in Instructional Scaffolding

Yelland and Masters (2007) examined multiple studies where scaffolding was viewed in a broad sense and referred to any interaction between the teacher or computer and the student. As technology is becoming more prevalent, increased technology tools may be used as scaffolding in learning environments. Different types of interactive tools may have different effects on learners and learning outcomes (Delen et al., 2014). There are both benefits and inconsistencies in using technology to deliver instructional scaffolding. Further examination will be provided of the (a) benefits of technology use in instructional scaffolding, (b) inconsistencies of technology use in instructional scaffolding, and (c) examples of technology use in instructional scaffolding.

Benefits of Technology Use in Instructional Scaffolding

Sharma and Hannafin (2007) affirm that software scaffolding can help prevent cognitive overload in information intensive contexts by offering procedural structures to help students focus. Other advantages of software scaffolding include the ability to provide basic concept support to all students, multiple ways to present concepts, and offer consistent quality and assessment (Sharma & Hannafin, 2007). An example of scaffolding presenting concepts in multiple ways is the use of video in expert modeling. The video offers both visual and audio inputs that allow learners to view and hear temporal changes on screen allowing the instruction to be easier to follow (van der Meij & van der Meij, 2014). Visual and auditory information strengthens the presentation of the instruction and may overcome the limitations of a single modality (van der Meij & van der Meij, 2014).

Inconsistencies of Technology Use in Instructional Scaffolding

Technology has minimized some student difficulties by allowing individuals to access interactive materials and obtain just-in-time assistance, but there are few studies that investigate teacher roles, student support, and classroom use of scaffolding technologies (Kim & Hannafin, 2011). Additionally, limited research has been conducted on instructional scaffolding and self-regulated online learning environments as the topic is emerging (Delen et al., 2014). Scaffolding technology is rarely used without live support (Sharma & Hannafin, 2007). In practice, students experience difficulty using technology scaffolds and often require considerable assistance (Kim & Hannafin, 2011). Teachers tend to use technology scaffolds to supplement ongoing teaching approaches instead of relying on them solely to offer instruction.

Examples of Technology Use in Instructional Scaffolding

Rosenshine and Meister (1992) proposed that a scaffold could either be a tool or a strategy the instructor implements to support a learner. Examples of technology used in instructional scaffolding were examined in this portion of the literature review as they directly relate to this action research study. The first example is video-based tutorials used for instruction. van der Meij and van der Meij (2014) compared the efficacy of three tutorial models (paper-based, mixed-based, and video-based) in fifth and sixth grade students' software training. The results of the study favored video-based tutorials in that students' software skills were more accurate and performance level was higher. Possibly due to video-based tutorials offering visual and auditory information that allowed instruction to be easier to follow (van der Meij & van der Meij 2014). The second example is videos used as scaffolds in information seeking. Cojean and Jamet (2017)

used videos as scaffolding to help develop users' mental models for their information seeking activities. The videos provided users a conceptual model in information seeking and this helped to improve their processing skills, especially planning (Cojean and Jamet, 2017). Yelland and Masters' (2007) examination of previous studies suggested that the term scaffolding was used to describe any interaction between the teacher or computer and student.

Advantages of Instructional Scaffolding

A major advantage of instructional scaffolding is that the support is tailored to the learner (Puntambekar & Hubscher, 2005; Secovnie & Glisson, 2019; van de Pol et al., 2010). The instructor observes the learner throughout the instruction process and gauges the amount of support based on the learner's needs (Puntambekar & Hubscher, 2005). Another advantage of instructional scaffolding is that it is highly effective with metacognitive activities, such as improving task understanding, promoting reflection (Davis & Linn, 2000), and developing problem-solving skills (Kim & Lim, 2019; van de Pol et al., 2010; Zhou & Lam, 2019). In relation to information literacy, Zhou and Lam (2019) state that metacognitive strategies help students with their overall online searching efficiency for information. Finally, another advantage of instructional scaffolding is that, when using technology tools, the learner can be set on a structured task using the technology tools so that the instructor may be free to help other learners who need more attention (Puntambekar & Hubscher, 2005).

Disadvantages of Instructional Scaffolding

A disadvantage of instructional scaffolding is that the quality of an instructor's knowledge base (i.e. domain content and pedagogy techniques) affects learner outcomes.

Learners of instructors with a stronger knowledge base learn more than learners of instructors with a weaker knowledge base (Askell-Williams et al., 2012). The foundation of instructional scaffolding is a one-to-one interaction between the expert, also known as the instructor, and learner (Wood et al., 1976), so working with large groups of learners does not allow the instructor to tailor the supports to each individual learner (Puntambekar & Hubscher, 2005). A large group has multiple zones of proximal development and students who need additional help will not seek it (Hogan & Pressley, 1997). Another disadvantage is that every learning situation is unique, so instructional scaffolding techniques may look different in various learning situations and instructional scaffolding techniques may not be applied to every learning situation (van de Pol et al., 2010).

Another disadvantage of instructional scaffolding occurs when technology is incorporated into the instruction. When using technology as a scaffolding support, the instructional scaffolding may rely on the learner to self-regulate when to stop using the support instead of the instructor fading the support (Puntambekar & Hubscher, 2005). A final disadvantage is that the results of instructional scaffolding are hard to measure because the instructor would have to observe the learner's functions over time to know if they truly gained from the instruction (Humphries & Clark, 2021; van de Pol et al., 2010).

Theoretical Background

This fifth section examines the theoretical background for this research study. Constructivism, Zone of Proximal Development, and Theory of Scaffolding are defined

and further discussed with regard to how these theories are related to information literacy instruction.

Constructivism Learning Theory

Learning theories, or "worldviews," represent different views on how individuals obtain, process, retain, and recall knowledge (Chapman & Macht, 2020, p. 972). *Learning theories* define what is considered learning and knowledge, what learning processes look like, the different roles in learning, what motivates the learner, and the requirements for the teaching process (Chapman & Macht, 2020). All instructional approaches derive from some learning theory (Rovegno & Dolly, 2006). *Constructivism* is both a philosophy and theory that describes how learning is acquired. The theory of constructivism developed out of the response at the time to the empiricism and behaviorism learning theories (Kamii, 2016).

Empiricists believe that learning comes from knowledge from outside the individual and knowledge is obtained through the senses (Kamii, 2016). Behaviorists believe that learning occurs to a response to an external stimulus and it can be applied to positive or negative reinforcement (Chapman & Macht, 2020). Constructivists believe that learning occurs when an individual forms their own representation of knowledge based on their own prior knowledge and experiences (Chapman & Macht, 2020).

Constructivism has similar concepts to humanism in that learners are not passive recipients of information and link their prior knowledge and experiences to form meaning (Chapman & Macht, 2020). In constructivism, learners actively construct knowledge (Comstock, 2013; Kamii, 2016). A difference between humanism and constructivism is that humanists believe that knowledge is transmitted while constructivists believe that

individuals construct new knowledge (Chapman & Macht, 2020). As there are many definitions of *constructivism,* the following concepts are consistent in all the definitions: "people do not discover knowledge; they build it from within; people create knowledge by connecting new information to their previous knowledge; learning involves active restructuring of one's thinking; people create new knowledge by using personal experiences and social interaction" (Pelech & Pieper, 2010, p. 8). During the 1960's and 1970's, the introduction of cognitive thought and new computer technology led to what is referred to as "the cognitive revolution," which reduced the influence of behaviorism learning theory (Illeris, 2012, p. 20).

Constructivism is a relatively recent learning theory, as the term *constructivism* was not used before 1977, but early Greek philosophers Aristotle and Plato did identify that individuals form knowledge from previously constructed knowledge (Kamii, 2016). Constructivist learning theory is guided by the works of John Dewey, William James, Immanuel Kant, and Thomas Kuhn (Rovegno & Dolly, 2006), but is most highly influenced by the works of two 20th century psychologists, Jean Piaget (1896-1980) and Lev Vygotsky (1896-1934) (Comstock, 2013; Kamii, 2016; Rovegno & Dolly, 2006). The way each psychologist approached constructivism learning theory can be based on their cultural and educational backgrounds; Piaget was interested in more of the biological aspects of human development and had extensive research laboratories while Vygotsky's laboratory was in a school in Moscow for disabled children (Hagstrom, 2019; Pass, 2004). Piaget was influenced more by the sciences and Vygotsky was influenced more by the humanities (Pass, 2004).

The clearest example of constructivism comes from Piaget's 1954 book, *The Construction of Reality in the Child* (Kamii, 2016). Piaget believed that children build knowledge during their biological development and life experiences. Children form new concepts when they question old assumptions or when they assimilate or accommodate (Comstock, 2013; Stephen, 2012). A child assimilates when they simplify complex external phenomena to give meaning to an existing schema (Comstock, 2013). A child accommodates when they modify existing schema to adapt to new or conflicting stimuli (Comstock, 2013). Piaget also emphasized the role of the instructor in the learning process to aid how students construct new knowledge (Chapman & Macht, 2020).

Vygotsky had similar beliefs to Piaget concerning human development and learning, except he emphasized the communal/social aspects of the learning experience (Comstock, 2013). Vygotsky theorized that social interactions had an effect on human cognitive development in two different levels: one on the social level between people (interpsychological), and one on the individual level inside the learner (intrapsychological) (Vygotsky & Cole, 1978). According to Vygotsky, learning and development occur on two planes: on a social plane within interactions with others and on a psychological plane within the learner (Wang et al., 2011).

Pass (2004) describes Piaget and Vygotsky's theories as "parallel discoveries" where contemporary problems are addressed by scholars from different schools of thought, backgrounds, time periods, and locations (p. ix). From these definitions, modern interpretations of constructivism can be split among two branches: social constructivism or traditional constructivism. Social constructivism derives directly from Vygotsky and focuses more on the social aspects of knowledge (Comstock, 2013). Traditional

constructivism is based on Piaget and focuses more on the learner during the learning process (Comstock, 2013).

Zone of Proximal Development

The Zone of Proximal Development (ZPD) is a concept created by psychologist Lev Vygotsky in late 1920's where he theorized that children's cognitive development is enhanced with collaborative experiences with others (Ramani & Eason, 2014). Vygotsky believed that children learn though interactions with others, and over time, they are able to complete tasks independently based on the competencies and knowledge gained from the interactions (Illeris, 2012). When completing tasks, children learn better with the assistance of a more skilled partner (i.e. parent, instructor, or more knowledgeable peer) than on their own in that they may take in concepts and strategies to which they have been exposed; this process helps further their cognitive development (Ramani & Eason, 2014). ZPD represents a cognitive space between where children can do a task independently and where children cannot do a task even with the assistance of others (Ramani & Eason, 2014; Hagstrom, 2019). ZPD explains how the thinking of children change as they develop – it reviews what tasks an individual can do by themselves, what tasks an individual can achieve with assistance of others, and what tasks an individual cannot achieve even with the assistance of others (Hagstrom, 2019).

Vygotsky theorized that children do not learn by completing tasks they have already mastered and they do not learn from tasks that are over their developmental level (Ramani & Eason, 2014). He believed that the optimal level of learning is in-between these two stages where the task is just difficult enough for the child's developmental level but can be achieved with the assistance of a more skilled individual as presented in

Figure 2.1 (Ramani & Eason, 2014). If the task is too easy developmentally for the child, less assistance from a skilled partner is needed. If the task is too difficult developmentally for the child, more assistance from a skilled partner is required but does not ensure the child completes the task.

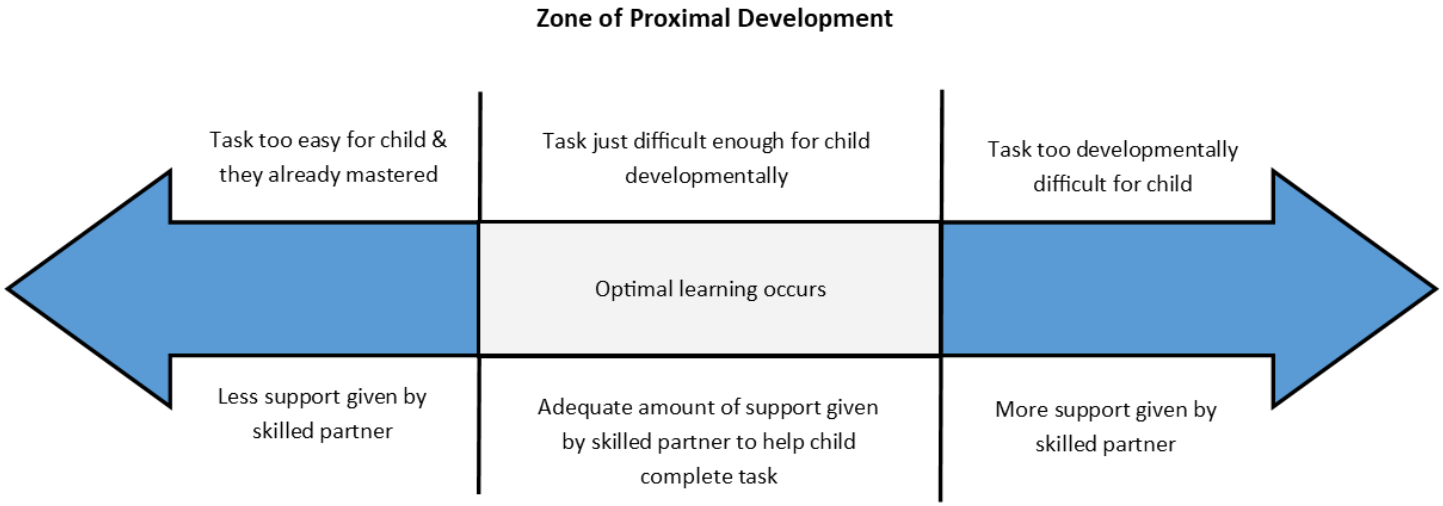


Figure 2.1 *Zone of Proximal Development Optimal Learning Space Illustrated*.

Learner's ZPD, or *optimal learning*, can be achieved in the classroom through scaffolding strategies. The more skilled partner, in this case the instructor, can adapt activities to the learner's level, ask the learner questions, demonstrate to the learner how to complete the task, provide tools or guidelines on how to complete the task, and provide feedback to the learner about the task (Ramani & Eason, 2014). In order for the activities with the ZPD to be effective, both the learner and instructor need to reach a consensus of the final goal and have a shared understanding of the tasks needed to be completed and what steps need to be taken to reach the final goal (Ramani & Eason, 2014).

Theory of Scaffolding

One of the most influential people during the cognitive revolution is American psychologist Jerome Bruner (1915-2016) (Illeris, 2012). Building off of elements of Vygotsky's concept of ZPD is Bruner's Theory of Scaffolding; both psychologists believed that learners learned best in a social setting (Stapleton & Stefaniak, 2018). Vygotsky introduced the concept of scaffolding in the ZPD where a more skilled partner (i.e. parent, instructor, or more knowledgeable peer) assists the learner in the learning process to construct knowledge, but he did not specifically use the term *scaffolding* (Shvarts & Bakker, 2019). In 1976, Wood, Bruner, and Ross first used the term *scaffolding* in their publication, *The Role of Tutoring in Problem Solving* (Holton & Clarke, 2006; Shvarts & Bakker, 2019) to describe assistance given from the adult, also referred to as "the expert," to "somebody who is less adult or less expert" (Wood et al., 1976, p. 89).

Scaffolding is defined as an instructional method where "a teacher models the concept or skill to be learned, leads students through guided practice activities, and then

offers various levels of teacher support while students practice the concept or skill independently" (Sullivan, 2009, p. 460). Scaffolding helps the learner stay on task by using emotions to help motivate the learner to achieve their learning goals (Stapleton & Stefaniak, 2018). In his book *The Process of Education* (1960), Bruner wrote about the stages of learning where he theorized that all learners may not be ready for learning on the first attempt, but learning can be achieved by the support and assistance of others, which led to his Theory of Scaffolding (Stapleton & Stefaniak, 2018).

Theories Applied to Information Literacy Instruction

The research process requires complex thinking to identify informational needs, formulate search queries, know where to look for resources/information, evaluate resources, and apply found information to informational needs. Each query is unique and requires individuals to apply thoughtful consideration into constructing keywords and phrases to formulate their search. Individuals take old knowledge and construct new knowledge from their experiences within the research process. The research process is very much trial and error. The constructivist learning theory would be ideal for the research process because learners actively construct knowledge as they progress (Comstock, 2013; Kamii, 2016).

Constructivism challenges traditional methods of instruction, such as memorization and lecture (Comstock, 2013). Lau (2006) states a constructionist approach allows learners to engage with the information to solve a problem and engage in the understanding rather than memorize information. Information literacy instruction requires an active learning process where learners have to actively participate in the activities and discussions of the instruction. Learners cannot be inactive recipients of information in

information literacy instruction because they will not gain the full potential of the instruction. The information from the information literacy instruction simply cannot be passed from librarian/instructor to the learners. Learners require opportunities to apply information literacy skills learned in an environment where they can ask questions. In higher education, constructivism can be seen in activities, such as problem-based learning, group work, collaborative assignments, and simulations (Chapman & Macht, 2020). Some examples of constructivist activities that are already being applied in information literacy instructions can be seen in studies conducted by Hottinger et al. (2015) utilizing group work or Sample (2020) offering augmented reality library tours.

Librarians can serve as the expert role by adapting activities to the learners' level, asking learners questions, demonstrating to learners how to complete the task, providing tools or guidelines on how to complete the task, and providing feedback to learners about the task (Ramani & Eason, 2014). By nature, librarians always want to be helpful, but there needs to be balance in the amount of support offered to learners. Too little support and learners will get discouraged or frustrated because the task is too difficult. Too much support and learners will become bored or disengaged because the task is too easy. Librarians need to find the zone of proximal development, or the "optimal learning" space (Ramani & Eason, 2014, p. 885), where they offer the right amount of support so that learners feel challenged but can still complete the task independently.

Librarians can offer support and guidance to learners in the research process through a variety of scaffolding strategies. From the studies reviewed, librarians can apply scaffolding strategies and features that other scholars have found successful in their instructions – expert modeling (Blummer & Kenton, 2015; Homol, 2018), questioning

(Blakeslee, 2004; Tardiff, 2022), giving hints (Mikkelson & McMunn-Tetangco, 2014), and providing feedback (Rosser et al., 2016; Sherriff, 2017). In applying scaffolding strategies to information literacy instructions, librarians can follow the three traits of scaffolding – contingency, fading, and transfer of responsibility (Puntambekar & Hubscher, 2005; van de Pol et al., 2010) – to ensure effective instruction.

First, librarians can observe learners in the research process and apply support contingently where needed. Second, librarians can fade support as learners progress in the research process. Third, librarians can transfer responsibility to learners as the learners gain confidence and competence about the research process. Examples of support librarians have given learners are tutorials (Gonzales, 2014; Homol, 2018; Rapchak, 2017), LibGuides, (Bergstrom-Lynch, 2019; Ream & Parker-Kelly, 2016), YouTube videos (Moorefield-Lang, 2019), screencast videos (Blummer & Kenton, 2015; Rapchak, 2017), and even augmented virtual reality library tours (Sample, 2020).

Chapter Summary

To summarize, this chapter of literature review contained five sections along with the Introduction. The Introduction described the methodology for conducting research, including the research questions, my search strategy, how research queries were conducted, what resources were utilized, and which keywords and phrases were used to formulate searches. The first section of this chapter defined what is considered information literacy and what it entails to be an information literate person. This section also discussed the importance of having information literacy skills and what challenges may arise in trying to develop information literacy skills. As shown in studies, information literacy skills are important for lifelong learning.

The second section of this chapter discussed topics related to information literacy instruction. This section defined information literacy instruction and described the type of content that may be taught in this type of instruction as well as recurrent strategies and features that scholars identified as what made their information literacy instructions successful. This section also discussed reasons why information literacy instruction is important, what challenges may arise in conducting information literacy instruction, and gaps in the current effort to teach information instruction. The third section was reasons why information literacy instruction is important specifically to community college students, the focus demographic of this study.

The fourth section of this chapter discussed topics related to instructional scaffolding. The section defined what is instructional scaffolding, the different types of instructional scaffolding, and the roles within instructional scaffolding. This section also discussed strategies that scholars identified as what made their instructional scaffolding successful. The final portion of this section discussed the advantages and disadvantages of instructional scaffolding. The final section of this chapter discussed the theoretical background of this study, which includes review of the works of psychologists Jean Piaget, Lev Vygotsky, and Jerome Brunner. The ideas of constructivist learning theory, Zone of Proximal Development, and Theory of Scaffolding are discussed in this section and how these theories relate to information literacy instruction. These theories would pair well with future information literacy instructions as they provide support to where learners need it most, but at the same time, encourage learners to construct knowledge and develop competencies to conduct research independently.

CHAPTER 3

METHODOLOGY

The purpose of this action research was to evaluate the effect of instructional scaffolding on information literacy skills in college students of the English Composition I (ENG 101) course at Urban Community College in the Southeast. The review of the related literature focused on the following research questions: (1) How can instructional scaffolding affect college students' information literacy skills at Urban Community College in the Southeast?; (2) What are community college students' perceptions towards information literacy after attending an information literacy instruction with instructional scaffolding?; and (3) How do community college students describe their experience with the instructional scaffolding on information literacy?

Research Design

This action research study was implemented to address the problem of practice that two-year college students at Urban Community College in the Southeast lacked information literacy skills that are necessary for successful completion of academic coursework. In education, traditional research is typically conducted by researchers who are separate from the environment they are studying (Duesbery & Twyman, 2020; Mertler, 2019a). As a result of my involvement in the educational environment I was studying, I conducted action research. Action research is a systemic inquiry conducted by individuals with vested interest in teaching and learning, which oftentimes are educators

who want to explore educational issues (Efron & Ravid, 2020; Mertler, 2019a). Action research also allows exploration of different settings and grade levels (Mertler, 2019b).

Compared to traditional research, action research focuses on the researcher's area of practice where they will have more influence for change. In an applied setting, action research has a focus, such as program, product, or method, with the aim of determining or enhancing its value (Mertler, 2019a). Action research also allows educators to study their own classrooms to better understand educational issues in an effort to improve the quality and effectiveness of instruction (Efron & Ravid, 2020; Mertler, 2019a). Mertler's (2019b) description of action research is one in which learning is less about individual retention of facts and more about applying what one has learned in a collaborative and practical manner with diverse people in various settings. This aligns with my pragmatic worldview in that the focus is on being problem-centered and real-world practice oriented (Creswell, 2014). From a pragmatist standpoint, research stems from actions, situations, and consequences; this leads to an increased focus on the research problem rather than the actual research methods, giving researchers an opportunity to use whatever approach is best to understand the research problem (Creswell, 2014). This ideology allows pragmatist researchers the flexibility to use a combination of research designs (both qualitative and quantitative) known as mixed methods and allows freedom of choice in research methods and techniques (Creswell & Creswell, 2018). Action research is not a linear process but a cyclical one and does not have an endpoint (Duesbery & Twyman, 2020; Mertler, 2019a). This is the same as library assessment, which works in stages of design, deploy, analyze, change design, and repeat that leads to useful assessment results to develop better instruction (Woitte, 2019).

Based on my problem of practice, the mixed methods design I used for this study was convergent mixed methods. The convergent form is where the researcher typically collects both quantitative and qualitative forms of data at relatively the same time (Edmonds & Kennedy, 2017; Creswell, 2014). In the convergent mixed methods design, the researcher analyzes both the quantitative and qualitative data separately, and then compares the findings of the results (Creswell & Creswell, 2018). A benefit of this method is the ability to converge information found through the data into the interpretation of the study (Edmonds & Kennedy, 2017; Creswell, 2014).

Setting and Participants

Setting

This action research study took place at a medium-sized, suburban, public community college in southeastern United States with a student population of about 12,000 students; about 55% of students attend full-time. The student population is 62% female and 38% male; 50% of the student population is White, 37% is Black, and a combined 13% is Unknown, Hispanic/Latino, American Indian/Alaskan Native, Asian, or Native Hawaiian/Other Pacific Islander. The study took place in two locations: one was in a physical classroom at the college because it was the students' natural setting; the second was online through the course's learning management system (LMS) course shell. The physical classroom was an instruction space within the library that includes an instructor's computer with internet access, screen projector, and whiteboards. The classroom could accommodate 30 students, and each student had access to a desktop computer with internet access. The LMS for the college was Desire2Learn (D2L) and all students of the college had access to D2L as soon as they were enrolled. Each course had

a course shell in D2L that housed online content, resources, and tools related to the course. Students had access to the tutorials, surveys, and discussion board through D2L for this action research study.

This action research study was conducted in two sections of an English Composition I (ENG 101) course that is designated as an on-campus course for the Spring 2023 semester. This ENG 101 course was a full semester (15-week) course that began on January 9, 2023 and ended May 3, 2023. The course met twice a week on Monday and Wednesday mornings. Each class meeting was scheduled to last approximately one hour and 25 minutes.

Participants

The participants of the study were college freshman in the English Composition I (ENG 101) course at the college. Participants were chosen for the study based on their enrollment in the ENG 101 course, which was a course that required standard usage of research. Another reason for choosing students of the ENG 101 course for the study was that the composition of the class was made up of students from different majors and programs of study that would better reflect the diversity in the student population of the college. As a librarian, I worked with another instructor to conduct this study. The total enrollment of the two sections of ENG 101 was 40 students (20 students per section). The demographics of the two ENG 101 sections combined included 22 males and 18 females. The participants were classified as freshman status in college and likely had limited exposure to the college environment.

Action/Innovation

Traditional one-shot instructions are course-specific single-class visits and usually conducted at the point of need (Wang, 2016). One of the main issues of the one-shot instruction for students is information overload (Blummer & Kenton, 2014; Rapchak, 2017) and librarian follow-up is often delayed to see if students truly understand the content presented from the one-shot instruction (Gil, 2017; Wang, 2016). When entering an information literacy instruction, it is likely that community college students are new to research (Contrada, 2019) and need additional guidance and support to learn skills necessary to be information literate and able to conduct research. My planned innovation involved both tutorials and activities with instructional scaffolding that addressed issues mentioned above. In this section, I discuss: (1) rationale for the innovation, (2) description of the innovation, (3) procedures of the innovation.

Rationale for the Innovation

My planned innovation focused on improving college students' information literacy skills, such as identifying information needs, understanding differences in resources, formulating search keywords and strategies, and identifying scholarly sources. There is evidence that proves multiple information literacy instructions are more effective than a single information literacy instruction (Henry et al., 2015; Hollister & Coe, 2004; Mery et al., 2012; Van Epps & Sapp Nelson, 2013). Class time limitations were a factor in my action research as I worked in a support role as a librarian and did not teach full-semester courses; I had to work with another instructor who allowed me access to their class. To solve this issue, I emulated a study by Stiwinter (2013) that was found to be successful in a community college environment using online instructional tutorials "to

create more time" for information literacy instruction outside the classroom (p. 15). Information literacy instruction is effective both in person and online (Gonzales, 2014; Nichols Hess et al., 2015; Raish & Behler, 2019; Stiwinter, 2013) so I wanted to maximize both delivery methods for my innovation. My planned innovation was composed of a series of units that encompassed: (1) an online instruction tutorial, (2) class discussion, (3) embedded librarian, and (4) Zoom office hours. Three of the activities of the unit (online instruction tutorial, embedded librarian, and Zoom office hours) were conducted outside of class time. This allowed me to utilize the face-to-face class time for class discussions.

There is strong evidence that students better retain information if the learning content is broken up into manageable chunks (Aleman & Porter, 2016; Goodsett, 2020; Hartman & Fial, 2015; Henry et al., 2015; Humphries & Clark, 2021; Moorefield-Lang, 2019; Nichols Hess & Greer, 2016; Rapchak, 2017; Saunders, 2018; Stiwinter, 2013; Weeks & Putnam Davis, 2017). A significant benefit of having multiple activities is that they break up one large information literacy instruction into smaller, manageable instructions for students to better comprehend the content presented. In addition to chunking the content, each of the activities involved instructional scaffolding. Instructional scaffolding is where "a teacher models the concept or skill to be learned, leads students through guided practice activities, and then offers various levels of teacher support while students practice the concept or skill independently" (Sullivan, 2009, p.460). Scaffolding mechanisms I applied in my intervention were controlling frustration, providing feedback, giving hints, indicating important elements to consider, modeling expert processes, and questioning (Belland, 2013; Van de Pol et al., 2010).

Different levels of scaffolding (hard and soft) were used in my innovation to provide support to students. Hard scaffolds were static and predetermined ahead of time when the instructor thought the students would need additional support (Sharma & Hannafin, 2007). An example of a hard scaffold in my innovation was the expert modeling in demonstration videos embedded in the online tutorials where it allowed content to be shown by the expert of the domain. Soft scaffolds were dynamic and changed dependent on students' needs to offer "just-in-time" support (Kim & Hannafin, 2011, p. 404). An example of a soft scaffold was questioning where the librarian framed problems to encourage students' thinking process (i.e. What would you do in the next step?). The librarian was able to give advice to students during this time as well.

Description of the Innovation

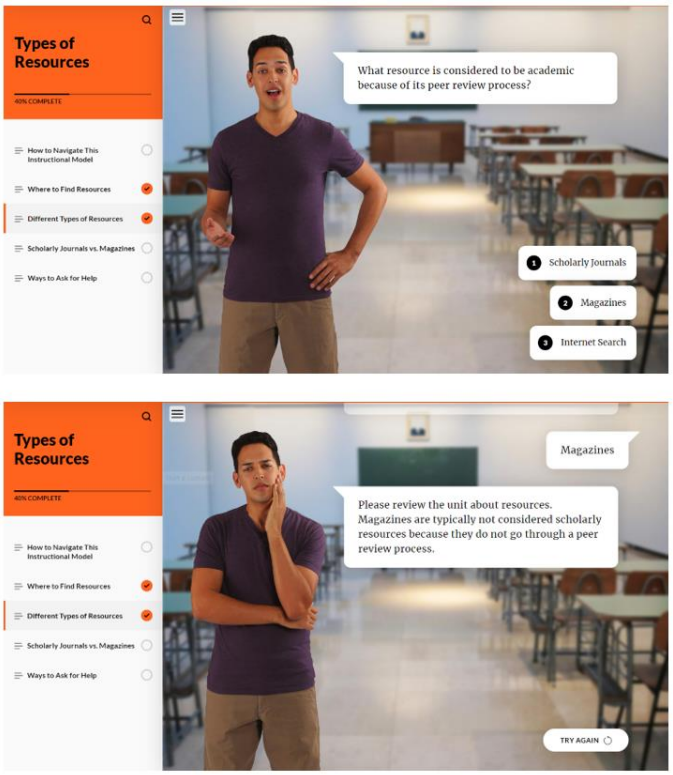
My planned innovation took place during the spring semester from January 2023 to April 2023. There were four units that were spaced about two to three weeks apart and each unit contained one online instruction tutorial (see Table 3.1 for tutorial content). The tutorials were created with Articulate Rise online training software and consisted of text-based instruction, screencasts of demonstrations, and interactive practice activities. Guidance was offered in the tutorials through step-by-step instruction in the screencasts and three quiz questions were distributed through each tutorial. Students' quiz responses elicited predetermined feedback immediately. If a student received negative feedback, it was suggested they review earlier portions of the tutorial before moving forward. Each of the tutorials took the participants about 20 minutes to complete along with any activities.

Table 3.1. *Tutorial Content with Alignment*

Tutorial	Tutorial Content	Type of Scaffolding Strategies	Content Alignment
Tutorial #1: Library Introduction	1. General library information (i.e. hours of operation, library location, circulation policies, etc.) 2. How to access the library website 3. How to access different resources through the library website (i.e. citation tools, tutoring services, LibGuides, etc.) 4. Different ways to contact the library for help	• Questioning • Providing feedback	• Ability to discover and access information • Understanding of ethical issues surrounding information
Tutorial #2: Distinguishing Resources	1. Features of different resources 2. Scenario examples of when to use resources 3. Where to find resources	• Questioning • Giving hints • Providing feedback	• Ability to discover and access information • Critical thinking ability
Tutorial #3: Basic Searching	1. Explanation of keyword search 2. How to develop keywords 3. How to use OneSearch 4. How to use library catalog 5. How to use limiters 6. How to use citation tools	• Questioning • Expert modeling • Giving hints • Providing feedback	• Ability to discover and access information • Critical thinking ability • Ability to use and create information • Ability to share and communicate information • Understanding of ethical issues

			surrounding information
Tutorial #4: Advanced Searching	1. How to use Boolean limiters 2. How to perform advanced searches in databases 3. How to perform advanced searches on the internet 4. How to use citation tools	• Questioning • Expert modeling • Giving hints • Providing feedback	• Ability to discover and access information • Critical thinking ability • Ability to use and create information • Ability to share and communicate information • Understanding of ethical issues surrounding information

Tutorial #1 was a library introduction that consisted of general library information (i.e. hours of operation, library location, circulation policies, etc.), how to access the library website, how to access resources through the library website, and different ways to contact the library for help. The hands-on activity was for students to explore the UCCS Library website. Tutorial #2 covered the topic of distinguishing resources and consisted of information about features of different resources, scenario examples of when to use resources, and where to locate resources. The hands-on activity was three real-life scenarios where each character needs specific information; students thought critically about and selected which resource to use in each scenario. Figure 3.1 is an example of instructional scaffolding (providing feedback) in a hands-on activity in Tutorial #2 created in Articulate.



Example of real-life scenario question prompt

Example of instructional scaffolding (providing feedback) giving immediate feedback to a student response

Figure 3.1. *Example of instructional scaffolding (providing feedback) in a hands-on activity in Tutorial #2.*

Tutorial #3 covered the topic of basic searching and consisted of an explanation of keyword searches, how to develop keywords, how to use OneSearch, how to use the library catalog, how to use limiters, and how to use citation resources. Figure 3.2 is an example of instructional scaffolding (expert modeling) in demonstrating how to access resources through the library website in Tutorial #3. Videos were created in Screencast-o-matic (now ScreenPal) and edited in either Animoto or Canva. The hands-on activity was a practice search to find specific items using the UCCS Library catalog. Tutorial #4 covered advanced searching and consisted of how to use Boolean limiters, how to perform advanced searches in databases, how to use citation resources, and how to perform advanced searches on the internet. The hands-on activity involved practice searches to find specific articles using Boolean limiters in a database.

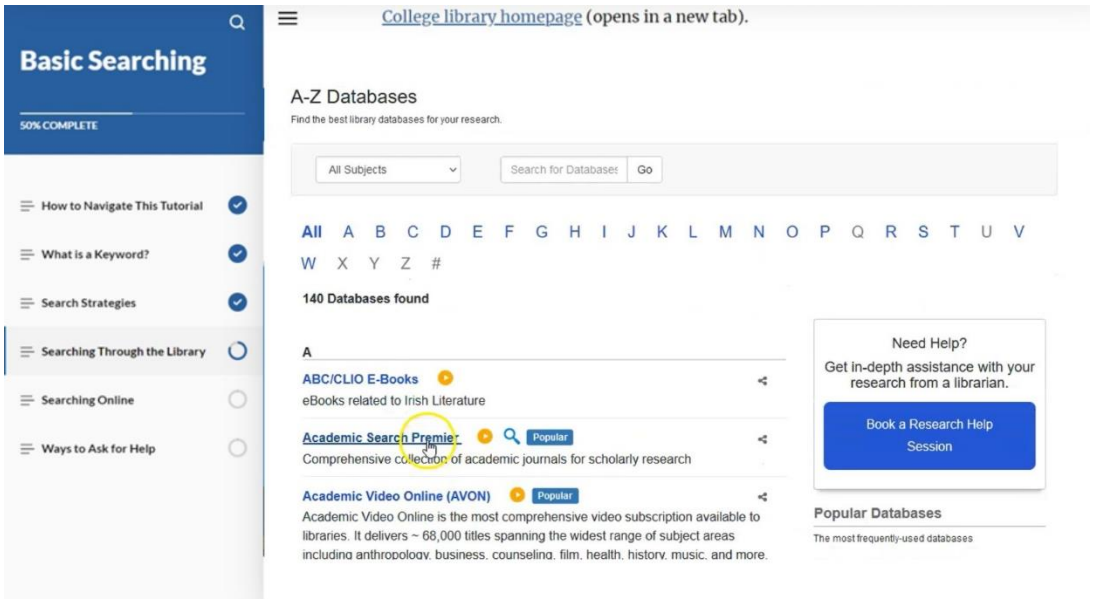


Figure 3.2. *Example of instructional scaffolding (expert modeling) in Tutorial #3. Note: Image edited to remove academic institution information.*

When a tutorial was assigned, the following class period included a 20-minute class discussion with a librarian. These discussion sessions were unstructured and students were able to ask questions freely about information literacy, resources, and research. These discussion sessions also served as opportunities for reinforcement of the content presented in the tutorials with the guidance of a librarian. The discussion sessions included Q&A, hands-on practice (i.e. student-led demonstrations of searches), or problem-based scenarios (i.e. librarian provide real-life examples of information need, and ask students which resource they would use and how they would find it). In both the tutorials and in-person discussion sessions, I applied student learning practices, such as offering explanations before showing a demonstration and providing step-by-step instruction to demonstrate the process to solve a problem (Rapchak, 2017). My planned innovation offered multiple information literacy activities to develop information retrieval and research skills before any urgency of need.

For the entire semester, the librarian was embedded in the online course shell in the learning management system to answer any questions students post in the discussion board. The discussion posts allowed the librarian to tailor responses based on student needs. The librarian was able to provide additional instruction, recommend specific resources/tools, and offer guidance or advice. In the period between each of the tutorials, the librarian held multiple Zoom office hours sessions. The librarian tailored responses based on student needs. The librarian was able to provide additional instruction, recommend specific resources/tools, and offer guidance or advice. If needed, demonstrations were provided through screen share that allowed content to be shown by the expert of the domain. Students could also practice their skills in the Zoom session. The librarian observed the student's screen through screen share and offered guidance or prompts (i.e. Why did you choose that resource? What steps would you do next?) in the activity.

Procedures of the Innovation

Tutorials were added in the course content area of the ENG 101 course shell in the learning management system before the semester began. In a 14-week semester, the first intervention activity of Tutorial #1: Library Introduction was assigned in the third week of the course by the instructor. Students had two days to complete the tutorial and any activities related to the tutorial before the next class period. Discussion #1 was in the subsequent class period at the beginning of class and led by the librarian. The discussion lasted approximately 20 minutes. Students were able to ask questions about the content from the tutorial or information literacy and the librarian answered those questions. If students did not have any questions, the librarian offered prompts in the forms of

questions (i.e. What makes a scholarly article scholarly?) or practice examples (i.e. You need to find a scholarly article for an assignment. How would you perform a search to find one?).

Embedded librarian discussion board was available to students for the duration of the semester. Students could post questions in the discussion board and the librarian responded with a tailored response within 24 hours. In the two-week period between Discussion #1 and Tutorial #2, the librarian held multiple Zoom office hours sessions to tailor answers to student needs. This pattern of assigned tutorial for homework, class discussion, and Zoom office hours session continued for Tutorials #2 through 4. The timeline for intervention activities of my action research as well as the instructor and student roles are shown in Table 3.2.

Table 3.2. *Timeline for Intervention Activities with Instructor and Student Roles*

Intervention Activity	Date	Instructor/Librarian Role	Student Role
Embedded Librarian/Discussion Board	Entire semester	• Post responses to answer questions students may have	• Post questions they may have for the librarian
Tutorial #1: Library Introduction	January 23, 2023	• Assign tutorial as homework assignment • Answer any questions students may have about assignment	• Complete tutorial • Complete activities related to tutorial • Notate any questions from about content presented
Discussion #1	January 25, 2023	• Lead class discussion • Prepare discussion prompts in case no student questions (i.e. discussion	• Ask questions • Participate in class discussion • Participate in activities

		questions, search examples, etc.) • Answer student questions	
Zoom Office Hours	Between January 26 - February 5, 2023	• Answer student questions • Give demonstrations (if needed) • Help guide in practice • Give advice	• Attend session • Ask questions • Participate in practice activities
Tutorial #2: Distinguishing Resources	February 6, 2023	• Assign tutorial as homework assignment • Answer any questions students may have about assignment	• Complete tutorial • Complete activities related to tutorial • Notate any questions from about content presented
Discussion #2	February 8, 2023	• Lead class discussion • Prepare discussion prompts in case no student questions (i.e. discussion questions, search examples, etc.) • Answer student questions • Notate student questions asked	• Ask questions • Participate in class discussion • Participate in activities
Zoom Office Hours	Between February 9 - 19, 2023	• Answer student questions • Give demonstrations (if needed) • Help guide in practice • Give advice	• Attend session • Ask questions • Participate in practice activities
Tutorial #3: Basic Searching	February 20, 2023	• Assign tutorial as homework assignment	• Complete tutorial

		• Answer any questions students may have about assignment	• Complete activities related to tutorial • Notate any questions from about content presented
Discussion #3	February 22, 2023	• Lead class discussion • Prepare discussion prompts in case no student questions (i.e. discussion questions, search examples, etc.) • Answer student questions • Notate student questions asked	• Ask questions • Participate in class discussion • Participate in activities
Zoom Office Hours	Between February 23 - March 12, 2023	• Answer student questions • Give demonstrations (if needed) • Help guide in practice • Give advice	• Attend session • Ask questions • Participate in practice activities
Tutorial #4: Advanced Searching	March 13, 2023	• Assign tutorial as homework assignment • Answer any questions students may have about assignment	• Complete tutorial • Complete activities related to tutorial • Notate any questions from about content presented
Discussion #4	March 15, 2023	• Lead class discussion • Prepare discussion prompts in case no student questions (i.e. discussion	• Ask questions • Participate in class discussion • Participate in activities

		questions, search examples, etc.) • Answer student questions • Notate student questions asked	
Zoom Office Hours	Between March 16 - April 2	• Answer student questions • Give demonstrations (if needed) • Help guide in practice • Give advice	• Attend session • Ask questions • Participate in practice activities

Data Collection Methods

Three data sources were planned to evaluate the effect of curated online instruction tutorials on information literacy skills in college students. Each data collection technique focused on different aspects and were performed at different points of the study to gather a more complete picture of the action research being conducted. The three data sources included: (a) Open Test of Information Literacy, (b) Perceptions of Information Literacy Skills surveys, and (c) student interviews. The data sources aligned with the research questions of this study as seen in the alignment table below (see Table 3.3). The data collection methods and their purpose are described in further detail in the following section.

Table 3.3. *Alignment Between Research Questions and Data Sources*

Research Question	Data Sources
RQ1. How does instructional scaffolding affect community college students' information literacy skills at Urban Community College in the Southeast?	• Open Test of Information Literacy (OTIL) • Student interviews

RQ2. What are community college students' perceptions towards information literacy after attending an information literacy instruction with instructional scaffolding?	• Perceptions of Information Literacy Skills (PILS) surveys • Student interviews
RQ3. How do community college students describe their experience with the instructional scaffolding on information literacy?	• Student Interviews

Open Test of Information Literacy

The higher education version of the Open Test of Information Literacy (OTIL) by Hollis et al. (2019a) was used for the pretest and posttest. The OTIL subscales and questions were validated by an expert panel of nine library and information professionals, which were recruited based on their experiences working in the information literacy field or as library and information science (LIS) researchers (Hollis et al., 2019b). The OTIL covered five subscales based on the Chartered Institute of Library and Information Professionals (CILIP) definition of information literacy: (1) ability to discover and access information, (2) critical thinking ability, (3) ability to use and create information, (4) ability to share and communicate information, and (5) understanding of ethical issues surrounding information (Hollis et al., 2019b). The OTIL included 10 multiple-choice questions (see Appendix B) in the form of objective knowledge assessment. Each question was scored as one point for a maximum of 10 points. The OTIL pretest and posttest were delivered through paper format.

Perceptions of Information Literacy Skills (PILS)

After the intervention was complete, information literacy perception surveys were given to all participants. Surveys help researchers gather a lot of information and a variety of information quickly (Efron & Ravid, 2020; Mertler, 2019a). Student responses

were used after information literacy instruction to help improve future instructions (Held & Gil-Trejo, 2016; Jacklin & Robinson, 2013).

The purpose of the Perceptions of Information Literacy Skills (PILS) survey in this study was to collect data on participant perceptions toward the information literacy intervention through self-assessment. The survey was delivered through paper format. There were 42 survey questions in the form of 7-point Likert-type scale. The questions are from the Perceptions of Information Literacy Skills (PILS) survey created by Yukhymenko, Foster, and Doyle (2018) and were validated by an expert panel recruited from the American Library Association (ALA) Framework Advisory Group (Doyle et al., 2019). For the Doyle, Foster, and Yukhymenko-Lescroart (2019) study that used the PILS survey, the Cronbach's alpha for each subscale reached .70 or higher, indicating an acceptable internal consistency.

The survey categories were based on the Association of College and Research Libraries' (ACRL) Framework for Information Literacy for Higher Education: (1) Authority Is Constructed and Contextual, (2) Information Creation as a Process, (3) Information has Value, (4) Research as Inquiry, (5) Scholarship as Conversation, and (6) Searching as Strategic Exploration (Yukhymenko et al., 2018). For my action research, I modified the question categories of the PILS survey to better align with the OTIL subscales since they are interrelated (see Table 3.4). The designed responses of the 7-point Likert-type scale will be 7 = *Expert*, 6 = *Advanced Developed*, 5 = *Developed*, 4 = *Advanced Emerging*, 3 = *Emerging*, 2 = *Advanced Novice*, and 1 = *Novice.* An example of a survey statement that was used is, "I evaluate research ideas and practices to identify

potential biases." All questions of the information literacy perception survey can be viewed in Appendix C.

Table 3.4. *Alignment Between OTIL Subscales and PILS Survey Categories*

		Open Test of Information Literacy (OTIL) Subscales				
		Ability to discover and access information	Critical thinking ability	Ability to use and create information	Understanding of ethical issues surrounding	Ability to share and communicate information
Perceptions of Information Literacy Skills (PILS) Survey Categories	Authority is Constructed and Contextual			✔		
	Information Creation as a Process			✔		
	Information Has Value				✔	
	Research as Inquiry		✔			
	Scholarship as Conversation					✔
	Searching as Strategic Exploration	✔				

Student Interviews

Another data source was face-to-face interviews with individual participants one-on-one after the intervention in the following class time(s). The intimate nature of the interviews may encourage participants to share more detailed responses about their experience in their own voice (Adams & Lawrence, 2019). The purpose of student interviews was to collect participants' perceptions of the intervention, and any challenges they may have had understanding the intervention and concerns in applying the information presented. Interviews allow interviewees to share their opinions and experiences as their own narrative (Efron & Ravid, 2020; Tracy, 2020).

The interviews were semi-structured with 14 prepared questions to start the conversation, but flowed from ideas exchanged between the researcher and study participant (Mertler, 2019a). The interview questions helped collect data to fulfill each research question of my action research. Interview questions related to research questions 1 and 2 derived from a highly cited study by Head and Eisenberg (2010), but were modified based on the research questions related to my action research study. Head and Eisenberg (2010) followed up with their participants through phone interviews to collect data about how students find, use, and apply information for coursework and personal use. Interview questions related to research question 3 derived from a study by McCartin, Evers, and Markowski (2019) and a presentation by Kurbanoğlu, Spiranec, Ünal, Boustany, and Kos (2022). The interview questions were revised from the original study to better align with the research questions of my action research as shown in Table 3.5. A subset of 14 participants were purposely selected to participate in the interview based on being enrolled in the ENG 101 course and a volunteer basis for selection. All participants who volunteered to be interviewed were interviewed. Each interview took 30 to 60 minutes to conduct and was recorded for future transcription.

Table 3.5. *Alignment Between Research Questions and Interview Questions*

Research Question	Interview Question
RQ1. How can instructional scaffolding affect community college students' information literacy skills at Urban Community College in the Southeast?	Tell me a little about the research assignments you have done in the last year. How did your information searching process change after attending the instructions? Let's talk about research for course assignments—the kinds of assignments that require you to find outside sources. What do you consider about a source when you are deciding to use it, how do you

	know if the information is "good" to use, or not, whatever that may mean to you?
RQ2. What are community college students' perceptions towards information literacy after attending an information literacy instruction with instructional scaffolding?	What is your definition of "research?" Describe your information searching process. Where do you begin when searching for information? What did you think about the search process? Concerning your ability to discover and access information, are you a good information searcher? Why or why not? Can you describe your biggest challenges or difficulties in finding and accessing information?
RQ3. How do community college students describe their experience with the instructional scaffolding on information literacy?	Which aspects of the information literacy intervention did you find most beneficial? Which tutorial content did you perceive to be especially important and useful? What would you say is the most difficult part of the course-related research? Did the instructional scaffolding make any difference with your challenges? How will you apply what you learned during information literacy intervention to your future research? Did you have difficulties in navigating through the tutorials? What questions or concerns, if any, do you still have about finding sources for the ENG 101 paper? Provide any other feedback or suggestions for improving the ENG 101 information literacy intervention.

Data Analysis

Mixed methods research design allows for evaluation of a variety of sources (Creswell, 2014). I used both qualitative and quantitative data for this study. Quantitative

data derived from the Open Test of Information Literacy and Perceptions of Information Literacy Skills (PILS) surveys. Qualitative data derived from the student interviews. Table 3.6 summarizes how the research questions align with the data collection methods and data analysis.

Table 3.6. *Research Questions, Data Collection Methods, and Data Analysis*

Research Question	Data Collection Methods	Data Analysis
RQ1. How can instructional scaffolding affect community college students' information literacy skills at Urban Community College in the Southeast?	• Open Test of Information Literacy • Perceptions of Information Literacy Skills (PILS) surveys • Student interviews	• Inductive analysis • Descriptive statistics • Paired samples t-test
RQ2. What are community college students' perceptions towards information literacy after attending an information literacy instruction with instructional scaffolding?	• Perceptions of Information Literacy Skills (PILS) surveys • Student interviews	• Inductive analysis • Descriptive statistics
RQ3. How do community college students describe their experience with the instructional scaffolding on information literacy?	• Student interviews	• Inductive analysis

Quantitative Data Analysis

The Perceptions of Information Literacy Skills (PILS) survey provided quantitative data from the Likert-type scale questions, which is a type of interval scale that is represented by a range of numbers assumed to be equidistant (Willits et al., 2016). This data source served as a small data set in and of itself within the study. Descriptive statistics were utilized to analyze the responses from the survey. Descriptive statistics help summarize and organize relatively large amounts of numerical data (Mertler, 2019a).

The scores of the Open Test of Information Literacy (OTIL) were reflected as the number of correct responses out of the 10 total questions (i.e. eight correct responses out of 10 questions will be a score of eight). Descriptive statistics were used to examine the central tendency (e.g., mean and standard deviation). For example, the mean score of the OTIL was determined by adding all the scores together and dividing the sum by the total number of tests in the data set. The standard deviation is defined as "the average distance of scores away from the mean" (Mertler, 2019a, p. 181) and was calculated using statistical software. To determine the effect of instructional scaffolding information literacy skills, a paired sample t-test was conducted on the mean scores of the pretest and the posttest using Jeffreys's Amazing Statistics Program (JASP), a free, open-source statistical software developed by the University of Amsterdam. Cohen's *d* was calculated to determine the magnitude of effect of the intervention (Adams & Lawrence, 2019).

I also used descriptive statistics to summarize the characteristics of each data source of the sample. Characteristics I observed for the quantitative data are the mean and standard deviation. The mean (*M*) is the arithmetic average of all the scores/responses in each data source. The standard deviation (*SD*) is a single number that summarizes the difference of the score/response from the mean (Adams & Lawrence, 2019).

Qualitative Data Analysis

After data collection, I transcribed the student interviews in full, making sure to accurately record participant responses. The qualitative data provided rich, detailed sources of data in large volume, so I used the inductive analysis process to generate specific themes to present findings (Johnson, 2002). I began my inductive analysis by coding the data.

Coding is categorizing chunks of data and assigning a word or phrase to represent it in the margins (Creswell, 2014). Beginning with the primary-cycle coding, I examined the complete data and select words or phrases that represent chunks of the data; these served as my initial codes (Tracy, 2020). In vivo codes may develop from participant responses due to language and terms that they use (Strauss, 1987). Following a method demonstrated by Peach (2014), I used Microsoft Word to hand-code the data because the computer program allows for efficient coding with the addition of comments to the transcription document and ease in extracting the coded comments to view independently in another document from the transcription.

I continued inductive analysis by a method where the extracted coded comments were uploaded to Microsoft Excel to observe any similarities within the codes or common patterns in a secondary-cycle coding (Tracy, 2020). I tried to elicit an abstract level of meaning by coding the codes themselves and reducing the number of categories. Finally, I turned the categories into themes and add definitions to further explain the themes. So that others can understand the meaning of my codes, I developed a codebook that contained key codes, definitions, and examples (Tracy, 2020).

Throughout the coding process, I used analytic memos to notate data for my personal reference that I felt had significance or something I needed to remember in the future (Tracy, 2020). I presented the qualitative findings as narrative text through themes and thick description. Thick description follow Holloway (1997) and Schwandt's (2001) definitions to look beyond detail in the data and examine context and meaning as well as study participant intentions in their behavior and actions.

Rigor and Trustworthiness

Trustworthiness is defined as the "accuracy or believability" of the data (Mertler, 2019a, p. 141). The data should be accurate from the standpoint of the researcher, the study participants, and the readers of the study (Creswell & Miller, 2000). Rigor deals with whether the researcher has applied their "time, effort, and thoroughness to practice their craft effectively" (Tracy, 2020, p. 293). In this section, I explain methods I used to ensure the rigor and trustworthiness of the data that will include: (1) triangulation, (2) audit trails, (3) prolonged exposure to research site, (4) member checking and (5) peer debriefing.

Audit Trail

In further efforts for transparency, I kept an audit trail of the work I conducted in this study by providing evidence and documentation of my decisions through analytic memos and field notes. An audit trail provided a record of how the study was conducted and how conclusions were made (Carcary, 2020).

Triangulation

My next method is triangulation, where I used different sources of data and various collection methods for this mixed-methods research design to collect both quantitative and qualitative data. I also collected multiple types of qualitative data from the same group of study participants, which offered me the opportunity to clarify any responses and gather more detail. Triangulation of different sources of data allowed me to build a reasonable explanation for the themes by converging data together (Creswell, 2014).

Prolonged Exposure to Research Site

Another method is that I spent prolonged exposure at the research site where I conducted extended observations and interactions with study participants to better describe narratives in my research findings (Creswell, 2014; Tracy, 2020). I visited the research site and interacted with study participants; at least four separate visits occurred during the semester in which the study was conducted.

Member Checking

Once the study was completed and I had an almost complete product of the study results, I conducted a member checking where I provided the results to study participants so they could have an opportunity to check for accuracy and provide feedback on the findings (Candela, 2019; Creswell, 2014).

Peer Debriefing

Finally, I included peers (i.e. dissertation chair and library colleagues) in a peer debriefing to help review my decisions about the research and to ask questions I may not have considered about the study (Creswell, 2014). Peer debriefing allowed for individuals not involved in the study, such as my dissertation chair, to provide their interpretation of the study.

Plan for Sharing and Communicating Findings

When sharing my study findings with various stakeholders, individual identifiers were avoided and the findings were presented on what was discovered about the group as a whole. My first priority was to share study findings and thank those who participated in the study - student participants and the course instructors who allowed me to study their classes; I contacted this group by individual email through their school email accounts. In

the email, I included a description of my study findings after performing the data analysis and encouraged participants to check for accuracy and offer feedback. The feedback was optional and participant feedback was not used in the data of my action research study. I clearly stated in the email that any provided feedback would only be used to improve the information literacy instruction for the future. Secondly, I plan to share study findings with members within my institution (library faculty, library director, and college administration) by conducting a presentation followed by a Q & A session at a library faculty meeting; presentation attendees have the option of providing feedback about the study anonymously via paper survey form or directly through our work email. My hope is that the findings from my study can inform colleagues about future information literacy instruction. Lastly, I plan to share my study findings at a state-wide professional library conference (i.e., South Carolina Library Association Annual Conference) so that other librarians can learn from my experience and consider collaborating on future information literacy studies.

CHAPTER 4

ANALYSIS AND FINDINGS

The purpose of this action research was to evaluate the effect of instructional scaffolding on information literacy skills of non-traditional college students in an English Composition I (ENG 101) course at Urban Community College in the Southeast. Both quantitative data (e.g., Open Test of Information Literacy pretest and posttest and Perception of Information Literacy Skills survey) and qualitative data (e.g., semi-structured interviews) were collected and analyzed. Data collection was based on the following research questions:

1. How can instructional scaffolding affect community college students' information literacy skills at Urban Community College in the Southeast?
2. What are community college students' perceptions toward information literacy after attending an information literacy instruction with instructional scaffolding?
3. How do community college students describe their experience with the instructional scaffolding on information literacy?

Quantitative Findings

The quantitative data source in this study were the Open Test of Information Literacy (pretest and posttest) by Hollis, Rachitskiy, and Van der Leer (2019a) and Perceptions of Information Literacy Skills survey by Yukhymenko, Foster, and Doyle (2018). This section briefly overviews the Open Test of Information Literacy and

Perceptions of Information Literacy Skills survey. Additionally, this section discusses the methods of analysis (e.g., paired samples t-test and descriptive statistics) used during the study. All analyses of the data were conducted using JASP.

Open Test of Information Literacy

Open Test of Information Literacy pretest and posttest were conducted in the form of paper-based quizzes during class. There were 40 total students enrolled in two sections of ENG 101. Thirty-three students completed the OTIL pretest, and 23 students completed the OTIL posttest. A total of 20 students completed both the OTIL pretest and posttest. Two students were eliminated from the data set due to missing data. Only the data from the 18 student participants who completed both the OTIL pretest and posttest was analyzed. The demographics of the students analyzed consisted of eight male students and 10 female students.

Descriptive statistics. Descriptive statistics are methods used to calculate, describe, and summarize research data in a logical and meaningful way (Vetter, 2017). Descriptive statistics can also help summarize and organize relatively large amounts of numerical data (Mertler, 2019a). In this study, descriptive statistics were used to examine the central tendency (e.g., mean and standard deviation) of the OTIL pretest and posttest to obtain the average scores of all study participants. Descriptive statistics were also used to summarize OTIL data so that the researcher could easily review if there was a change in the mean score of student responses from pretest to posttest.

The OTIL pretest and posttests included 10 multiple-choice questions. Table 4.1 displays the descriptive statistics for the Open Test of Information Literacy. Student

participants' mean score in the pretest was 6.44 (*SD* = 1.98), while the mean score in the posttest was 6.61 (*SD* = 1.91).

Table 4.1. *Descriptive Statistics for the Open Test of Information Literacy*

Instrument	*M*	*SD*
OTIL Pretest	6.44	1.98
OTIL Posttest	6.61	1.91

Note. N=18, *M* represents mean, *SD* represents standard deviation

Open Test of Information Literacy by Subscale. Table 4.2 displays the descriptive statistics for the OTIL pretest and posttest by subscale. The OTIL had 10 multiple-choice questions that were categorized into five subscales: (1) Ability to Discover and Access Information, (2) Critical Thinking Ability, (3) Ability to Use and Create Information, (4) Ability to Share and Communicate Information, and (5) Understanding of Ethical Issues Surrounding Information. Out of the 10 total OTIL questions, each subscale contained two questions.

Table 4.2. *Descriptive Statistics for Open Test of Information Literacy by Subscales*

OTIL Subscale	Pretest		Posttest	
	M	*SD*	*M*	*SD*
Ability to Discover and Access Information	0.64	0.49	0.70	0.48
Critical Thinking Ability	0.61	0.49	0.50	0.51
Ability to Use and Create Information	0.78	0.43	0.81	0.39
Ability to Share and Communicate Information	0.67	0.48	0.64	0.50

Understanding Ethical Issues Surrounding Information	0.53	0.51	0.67	0.49

Note. N=18

The mean score of subscales Critical Thinking Ability and Ability to Share and Communicate Information of the OTIL decreased from pretest to posttest. Subscale Critical Thinking Ability had the largest decrease in mean score from pretest to posttest with a change of 0.61 to 0.50. The mean score to subscales Ability to Discover and Access Information, Ability to Use and Create Information, and Understanding Ethical Issues Surrounding Information increased from pretest to posttest. Subscale Understanding Ethical Issues Surrounding Information had the largest increase in mean score from pretest to posttest with a change of 0.53 to 0.67.

Shapiro-Wilk test. Since the study had a small sample size, determining the variable of the OTIL pretest was important for choosing an appropriate statistical method. A Shapiro-Wilk test was performed and did not show evidence of non-normality (p = 0.13). Based on the outcome, a decision was made to use a parametric test, so a normal paired samples t-test was conducted.

Paired samples t-test. A paired samples t-test was used to determine whether the difference between participants' pretest and posttest scores was statistically significant (Adams & Lawrence, 2019). The result showed that there was no significant difference between the students' pretest score (M = 6.44, SD = 1.98) and posttest score (M = 6.61, SD = 1.91), $t(17) = -0.39$, p = 0.70.

The results showed that there was a significant increase in the subscale Understanding Ethical Issues Surrounding Information from pretest (M = 0.53, SD =

0.32) to posttest (M = 0.67, SD = 0.30), t(17) = -2.56, p = 0.02. Cohen's d value (d = 0.19) showed a small effect size. There was also an increase in the subscale Ability to Discover and Access Information from pretest (M = 0.58, SD = 0.35) to posttest (M = 0.69, SD = 0.35), t(17) = -1.46, p = 0.16 and in the subscale Ability to Use and Create Information pretest score (M = 0.79, SD = 0.26) to posttest score (M = 0.81, SD = 0.25), t(17) = -0.44, p = 0.67. However, the changes in both subscales were not statistically significant. The results showed that there was a decrease in the subscale Critical Thinking Ability from pretest (M = 0.61, SD = 0.40) to posttest (M = 0.50, SD = 0.42), t(17) = 1.72, p = 0.10, and the subscale Ability to Share and Communicate Information pretest score (M = 0.67, SD = 0.38) to posttest score (M = 0.64, SD = 0.34), t(17) = 0.27, p = 0.82. However, the changes were not statistically significant. Results of the paired samples t-test on the Open Test of Information Literacy subscales are shown in Table 4.3.

Table 4.3. *Results of Paired Samples T-Test on OTIL Subscales*

OTIL Subscale	Pretest *M*(*SD*)	Posttest *M*(*SD*)	*t*(*df*)	*p*	Cohen's *d*
Ability to Discover and Access Information	0.58 (0.35)	0.69 (0.35)	-1.46 (17)	0.16	-0.34
Critical Thinking Ability	0.61 (0.40)	0.50 (0.42)	1.72 (17)	0.10	0.41
Ability to Use and Create Information	0.79 (0.26)	0.81 (0.25)	-0.44 (17)	0.67	-0.10
Ability to Share and Communicate Information	0.67 (0.38)	0.64 (0.34)	0.27 (17)	0.82	0.06
Understanding Ethical Issues Surrounding Information	0.53 (0.32)	0.67 (0.30)	-2.56 (17)	0.02*	0.19

Note. N=18, *Subscale *p*-value lower than the alpha of 0.05

Perceptions of Information Literacy Skills Survey

Perceptions of Information Literacy Skills (PILS) Survey was created by Yukhymenko, Foster, and Doyle (2018) and validated by an expert panel recruited from the American Library Association (ALA) Framework Advisory Group (Doyle et al., 2019). The survey consisted of 42 survey questions in the form of 7-point Likert-type scale (see Appendix C). The PILS survey was administered as a paper format survey. A total of 15 students completed the PILS survey at the end of the study. The demographics of the student participants who completed the PILS survey consisted of seven male students and eight female students.

Reliability. Table 4.4 displays the reliability of each of the subscales of the PILS survey. The Cronbach's alpha was calculated to measure the internal consistency of the

PILS survey (Adams & Lawrence, 2019). The Cronbach's alpha score for each subscale was acceptable. There was no consensus on the descriptors to label the values after calculating alpha (Taber, 2018). The alpha values and their descriptors used in other studies ranged from excellent (0.93-0.94) to low (0.11) (Taber, 2018). For this action research study, alpha descriptors from these other studies identified by Taber (2018) were used to describe the Cronbach's alpha score for each subscale. The Cronbach's alpha scores for each subscale were as follows: the Authority Is Constructed and Contextual section was $\alpha = .92$ (strong), the Cronbach's alpha score for the Information Creation as a Process section was $\alpha = .72$ (good), the Cronbach's alpha score for the Information has Value section was $\alpha = 92$ (strong), the Cronbach's alpha score for the Research as Inquiry section was $\alpha = .96$ (excellent), the Cronbach's alpha score for the Scholarship as Conversation section was $\alpha = .92$ (strong), and the Cronbach's alpha score for the Searching as Strategic Exploration section was $\alpha = .88$ (good).

Table 4.4. *Perceptions of Information Literacy Skills (PILS) Survey Sections' Cronbach's Alpha Scores*

PILS section	Cronbach's Alpha Score
Authority is Constructed and Contextual	0.92
Information Creation as a Process	0.72
Information has Value	0.92
Research as Inquiry	0.96
Scholarship as Conversation	0.92
Searching as Strategic Exploration	0.88

Descriptive Statistics. Table 4.5 displays the descriptive statistics for the PILS survey by section. The PILS survey had 42 questions which utilized a 7-point Likert scale with the designed responses of *7 = Expert*, *6 = Advanced Developing*, *5 = Developing*, *4 = Advanced Emerging*, *3 = Emerging*, *2 = Advanced Novice*, and *1 = Novice*.

Table 4.5. *Descriptive Statistics for Each Section of the Perceptions of Information Literacy Skills (PILS) Survey*

PILS section	*M*	*SD*
Authority Is Constructed and Contextual	4.62	1.22
Information Creation as a Process	4.87	0.92
Scholarship as Conversation	5.32	1.08
Searching as Strategic Exploration	5.02	1.22
Information Has Value	4.60	1.36
Research as Inquiry	4.94	1.13

Note. N=15

The Authority Is Constructed and Contextual section included six items with a mean score of 4.62 (*SD* = 1.22) for student participant responses. The Information Creation as a Process section included five items with a mean score of 4.87 (*SD* = 0.92) for student participant responses. The Scholarship as Conversation section included seven items with a mean score of 5.32 (*SD* = 1.08) for student participant responses. The Searching as Strategic Exploration section included 11 items with a mean score of 5.02 (*SD* = 1.22) for student participant responses. The Information Has Value section included six items with a mean score of 4.60 (*SD* = 1.36) for student participant

responses. The Research as Inquiry section included six items with a mean score of 4.94 (*SD* = 1.13) for student participant responses.

Overall, the mean scores of all six sections of the PILS survey was 4.90, between *Advanced Emerging* (4) and *Developing* (5). Participants in the *Advanced Emerging* category described themselves as an emerging information user, which includes using basic functions of information retrieval tools, using information ethically with unintentional plagiarism, and experiencing some anxiety with citations. Participants in the *Developing* category described themselves as being comfortable using information literacy skills that use a range of tools to find information and understanding search tool concepts. The mean of the two sections of the PILS survey (Scholarship as Conversation and Searching as Strategic Exploration) was above *Developing* (5). Student participants felt comfortable using their information skills and would use them frequently in these two areas. The section of the PILS survey with the lowest mean score of 4.60 was Information Has Value, which also recorded the highest standard deviation of 1.36. The mean score of 4.60 was above the median of *Advanced Emerging* (4), which meant that student participants felt that they were emerging information users in this area. The standard deviation indicated that the students' scores were more spread out over a wider range in this category.

Qualitative Findings

The qualitative data source for this study was student interviews. Altogether, fourteen students from both sections of the ENG 101 class volunteered to participate in one-on-one interviews. In an effort to keep the qualitative analysis and findings confidential, each student participant in the study was assigned a pseudonym and a

number as shown in Table 4.6. The interviews followed a semi-structured format with fourteen predetermined, open-ended questions. The interviews were recorded and transcribed using Google Recorder. I reviewed the generated transcripts line by line as I listened to each interview separately. I edited the generated transcripts to correct any transcription errors from the automated process.

Table 4.6. *Student Demographics and Pseudonyms*

Student Number	Pseudonym	Gender	Age	Ethnicity
S1	Yuri	Male	31	White
S3	Leon	Male	18	Hispanic
S4	Connor	Male	20	Black
S5	Dylan	Male	19	White
S6	Sierra	Female	19	White
S9	Wesley	Male	31	Multiracial
S10	Odell	Female	38	Black
S11	Gianna	Female	19	White
S14	Greta	Female	18	Black
S15	Benjamin	Male	21	Multiracial
S18	Kennedy	Female	19	Asian
S19	Jasper	Male	37	Black
S20	Vanessa	Female	18	Indian
S21	Kelly	Female	22	Multiracial

Inductive analysis was performed to analyze the qualitative data. Inductive analysis is the process of analyzing qualitative data to reduce the data corpus into patterns and themes to present the key findings of the study (Mertler, 2019a). For this study, two cycles of coding were performed, yielding a total of 1,506 codes from 14 semi-structured interview transcripts. Table 4.7 displays a summary of the qualitative data sources.

Table 4.7. *Summary of Qualitative Data Sources*

Type of Qualitative Data Source	Number	Total Number of Codes Applied
Semi-structured interviews	14	1,506

First Coding Cycle

First-cycle methods. For the first coding cycle, I used an open coding method where I did not start with a list of pre-identified codes and approached the data with an open mind to allow the data to speak for itself (Cope, 2020; Gibbs, 2018). This method may also be seen as a bottom-up coding from grounded theory method that suggests that the codes derive from the data and not from the literature (Urquhart, 2013). I went through each interview coding line-by-line to get to know the data on an intimate level and encourage analytic thinking while being close to the data (Gibbs, 2018; Urquhart, 2013). Three coding methods were selected for the first coding cycle of the analysis process: in vivo, descriptive, and values. There is a consensus among scholars that it is best for beginning researchers to code by hand using hard copies of materials along with index cards and highlighters to learn the basics of coding before adding the challenges of learning new software (Cope, 2020). As this was my first study that involved qualitative analysis, I decided to use the hard copies of materials for my first cycle of coding. I printed out hard copies of each of the interviews on paper and hand-coded each interview

one at a time by writing notes in the margins, circling, underlining, or highlighting portions of the interview, as well as using sticky notes.

In vivo coding. First, I conducted in vivo coding by highlighting codes that originated from expressions, phrases, or terms used by student participants in the interviews (Cope, 2020). This type of coding helped me develop codes from the student's perspective by using their own language as they described their experiences and gave deeper meaning to the codes (Saldaña, 2021). For example, Dylan stated in the interview, "The things I take away from it is there are a lot of ways to gather information, but there are definitely right ways to, you know, know if information is credible or, you know, correct to use in research." I coded this as *correct to use* because it revealed the student's perception that there are correct and incorrect resources to use in research. In another example, Wesley stated in the interview, "Personally, I'm very comfortable with the search process and I've had a good experience with searching research." I coded this as *very comfortable* because it showed the student felt comfortable with the search process and had a positive experience with searching for research. Figure 4.1 is an example of my hand-coded in vivo codes for the first cycle of coding.

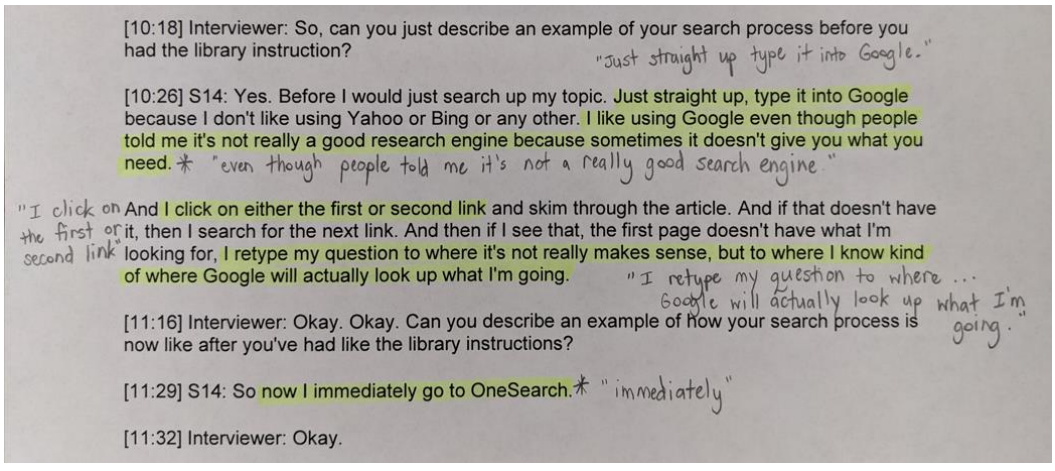


Figure 4.1. *Hand-coded in vivo codes in the first cycle of coding.*

Descriptive coding. Second, I conducted another round of descriptive coding, which helped me become more familiar with the data by analyzing the ideas further to be able to summarize them into a word or short phrases to catch the substance of the topic discussed (Saldaña, 2021). Examples of codes with this strategy included *helpful*, *easy to understand*, and *still need help*. For example, Connor stated in the interview, "It helped a lot. It was easier to find what I was looking for. And all that good stuff. Was very helpful, very useful." I coded this as *helpful* because the student viewed the information literacy instruction as helpful in developing their search process. In another example, Gianna stated in the interview, "It was, it was really easy to understand and it made just English itself a lot easier." I coded this as *easy to understand* because the student felt they did not have trouble following along in the information literacy instruction and that it was easy for them to comprehend. A final example is Jasper, who stated in the interview, "We still have kids in my class who asking questions that you could answer." I coded this as *still need help* because the student felt there were other students in their ENG 101 class who needed additional library help beyond the library instruction provided during the semester. Figure 4.2 is an example of my hand-coded descriptive codes for the first cycle of coding.

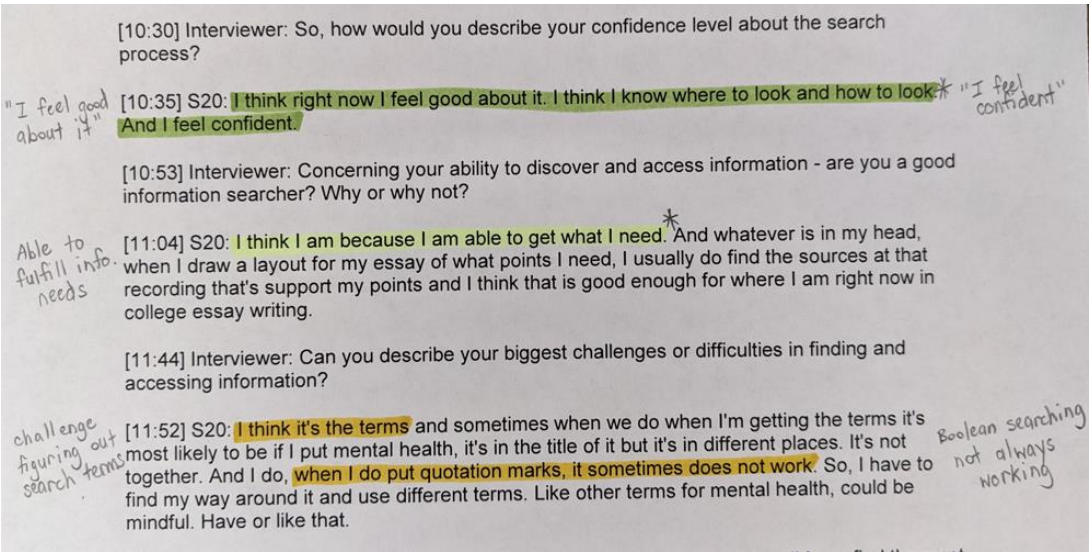


Figure 4.2. *Hand-coded descriptive codes in the first cycle of coding.*

Values coding. Third, I conducted values coding for the final round of first cycle coding. Values coding allowed me to assign the codes values, attitude, or beliefs to the qualitative data to represent the student participant's perspective or worldview (Geisler et al., 2019; Saldaña, 2021). Values is when an individual gives importance to something; this can be in the form of a person, thing, or idea (Saldaña, 2021). For example, I labeled the code *OneSearch and library resources helped a lot* as a value because the student saw the importance in the library resources. Attitude is how we feel about ourselves, another person, thing, or idea (Saldaña, 2021). For example, I labeled the code *feels like can do better* as an attitude because the student felt about them self that they could improve in their search process. Beliefs involve an individual's values and attitude "plus our personal knowledge, experiences, opinions, assumptions, biases, prejudices, morals, and other interpretive perceptions of the social world" (Saldaña, 2021, p.168). For example, I labeled the code *be really specific with key words on OneSearch* as a belief because the student's perception was that if you did not use specific keywords, then the search engine

would not return the results they wanted. I read through each interview separately again and assigned codes with the additional label of A (attitude), B (belief), or V (value) using sticky notes. Figure 4.3 is an example of my hand-coded values codes for the first cycle of coding.

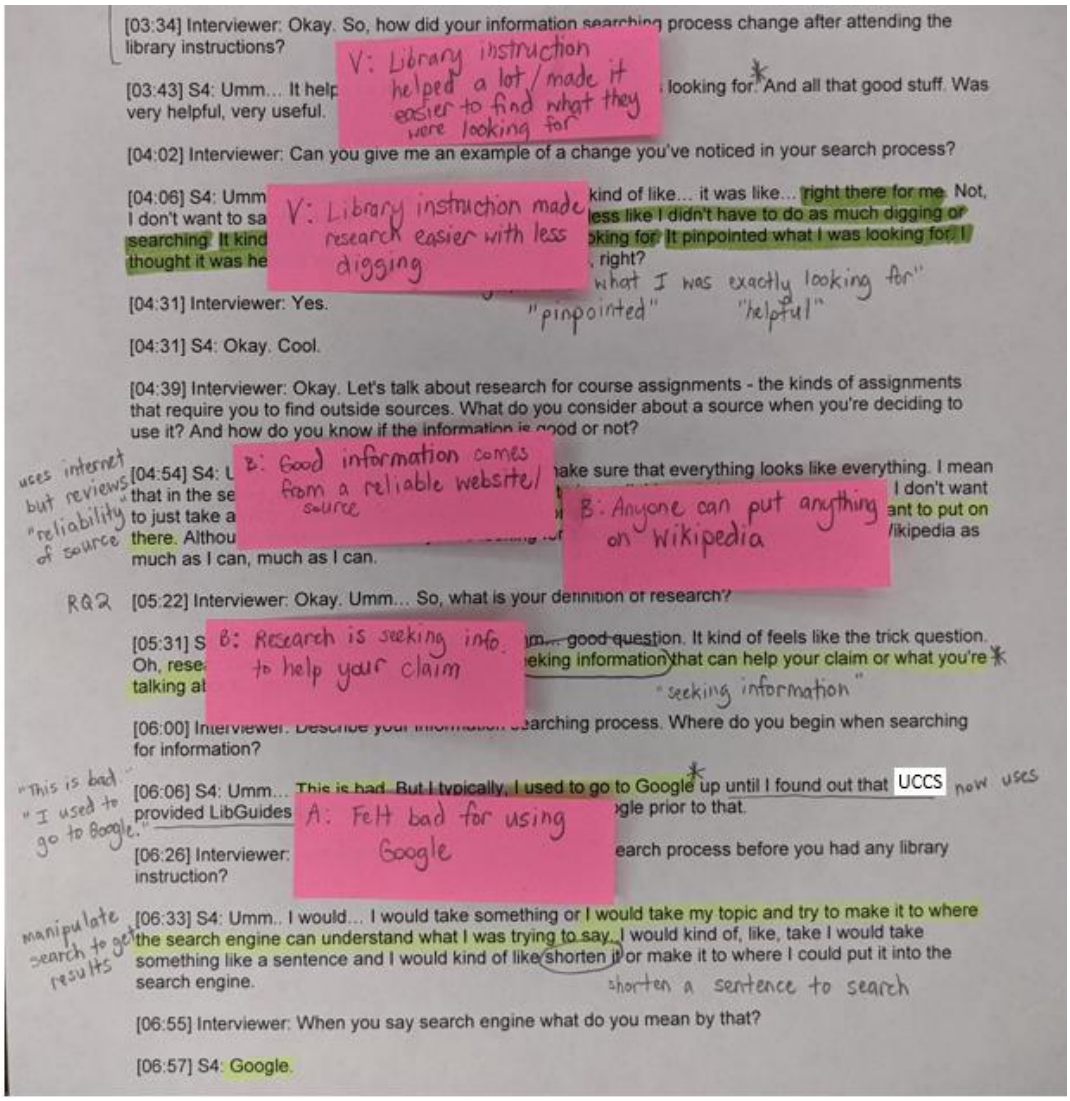


Figure 4.3. *Hand-coded values codes using sticky notes in the first cycle of coding. Note: Image edited to remove academic institution information.*

Transition to Second Cycle Coding. Coding on paper allows the researcher to have creativity and ease of access, but analysis is more conveniently conducted through

electronic versions (Gibbs, 2018). From the Google Recorder transcript, I was able to format each interview as a Word document and added all of my hand-written codes as comments within the document. I then extracted the comments from the Word documents into a Google Sheets spreadsheet so that all of the codes would be in one location and easier to work with. I created three tabs on a Google Sheets spreadsheet and labeled them as In Vivo, Descriptive, and Values. I combined all of the students' in vivo codes and put them in the In Vivo tab. I combined all of the students' descriptive codes and put them in the Descriptive tab. Finally, I combined all of the students' values codes and put them in the Values tab. Table 4.8 displays the summary of the types of codes from the qualitative source during the first cycle of coding. There were 441 in vivo codes, 679 descriptive codes, and 386 values codes. The total number of codes was 1,506.

Table 4.8. *Summary of the First Cycle Codes*

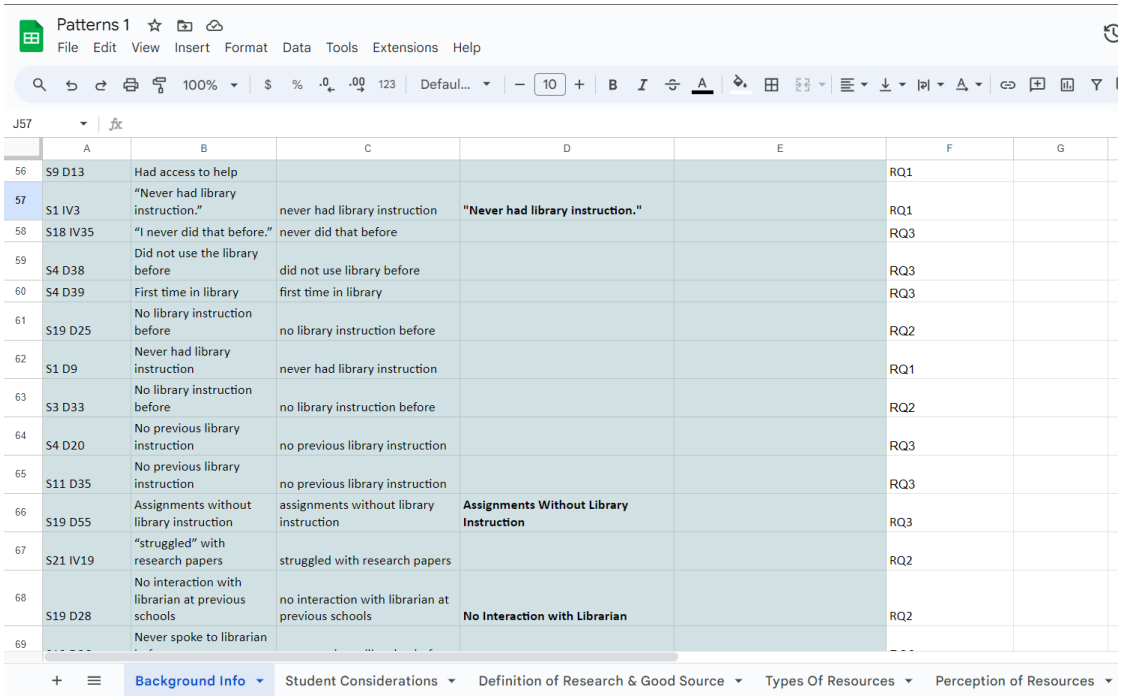
Type of Code	Number
In Vivo	441
Descriptive	679
Values	386
Total	1,506

After completing the first cycle of coding, my dissertation chair had peer debriefing meetings with me to review the codes and discuss the next step of coding. My dissertation chair suggested that I further review and revise the in vivo and descriptive codes to make them more concise. I went through a round of housekeeping of the 1,506 codes I had already created to clean the codes. I did not add any more codes in this housekeeping round; instead, I reviewed the already created codes to make sure that they

made sense and further shortened codes when possible. I sent my revised clean codes to my dissertation chair, and we agreed to move forward with the second cycle of coding.

Second Cycle Coding

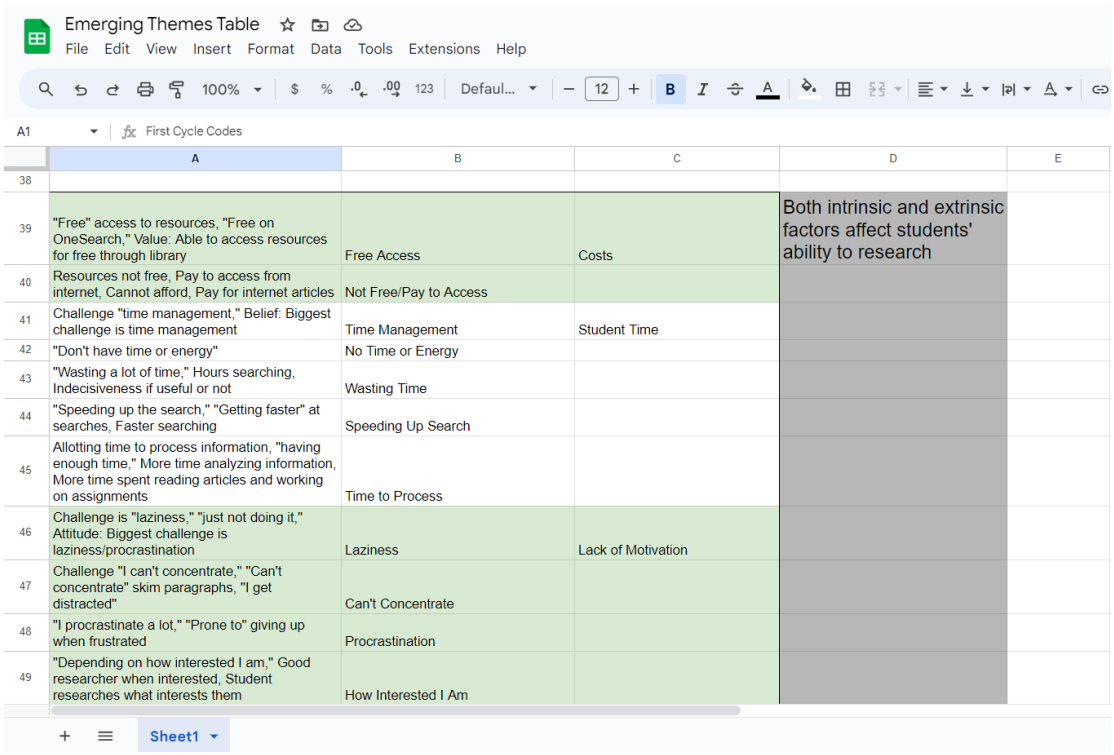
Second-cycle methods. Two rounds of pattern coding were conducted for the second cycle of coding. For the first round of pattern coding, I used concept mapping to make connections between the codes and start to view which ideas were recurring (Rossman and Rallis, 2017). I created another Google Sheets spreadsheet with multiple tabs and copied and pasted over in vivo and descriptive codes into groups that conveyed similar ideas or concepts. I also started changing the color of the spreadsheet cells of each group to better distinguish separate groups. An example of this first round of pattern coding would be grouping first cycle codes, such as *never had library instruction*, *I never did that before*, *first time in library*, and *no previous library instruction*, to the pattern code *Never Had Library Instruction*. This pattern code described the condition in which students who never had library instruction before their ENG 101 course. Figure 4.4 is an example of the first round of pattern coding in Google Sheets. This round of coding generated a total of 267 pattern codes.



	A	B	C	D	E	F	G
56	S9 D13	Had access to help				RQ1	
57	S1 IV3	"Never had library instruction."	never had library instruction	**"Never had library instruction."**		RQ1	
58	S18 IV35	"I never did that before."	never did that before			RQ3	
59	S4 D38	Did not use the library before	did not use library before			RQ3	
60	S4 D39	First time in library	first time in library			RQ3	
61	S19 D25	No library instruction before	no library instruction before			RQ2	
62	S1 D9	Never had library instruction	never had library instruction			RQ1	
63	S3 D33	No library instruction before	no library instruction before			RQ2	
64	S4 D20	No previous library instruction	no previous library instruction			RQ3	
65	S11 D35	No previous library instruction	no previous library instruction			RQ3	
66	S19 D55	Assignments without library instruction	assignments without library instruction	**Assignments Without Library Instruction**		RQ3	
67	S21 IV19	"struggled" with research papers	struggled with research papers			RQ2	
68	S19 D28	No interaction with librarian at previous schools	no interaction with librarian at previous schools	**No Interaction with Librarian**		RQ2	
69		Never spoke to librarian					

Figure 4.4. *First round of pattern codes in Google Sheets.*

In the second round of pattern coding, I started another Google Sheets spreadsheet to organize an emerging themes table using inductive analysis. I grouped pattern codes that were similar ideas or concepts to form categories and continued to color code these grouped categories. I started to include any ideas that I had for emerging themes in a separate column. Figure 4.5 is an example of the emerging themes table in Google Sheets. For example, I grouped clean codes that represented similar ideas, such as "*wasting a lot of time*," *hours searching*, and *indecisiveness if useful or not*, to form the pattern *Wasting Time*. Next, I grouped patterns related to time, such as *Time Management*, *No Time or Energy*, *Wasting Time*, *Speeding Up Search*, and *Time to Process*, to form a category *Student Time*. The category *Student Time* refers to how students view their use of time in relation to school and their coursework. Finally, a theme began to take shape of intrinsic and extrinsic factors that affected student research.



	A	B	C	D	E
38					
39	"Free" access to resources, "Free on OneSearch," Value: Able to access resources for free through library	Free Access	Costs	Both intrinsic and extrinsic factors affect students' ability to research	
40	Resources not free, Pay to access from internet, Cannot afford, Pay for internet articles	Not Free/Pay to Access			
41	Challenge "time management," Belief: Biggest challenge is time management	Time Management	Student Time		
42	"Don't have time or energy"	No Time or Energy			
43	"Wasting a lot of time," Hours searching, Indecisiveness if useful or not	Wasting Time			
44	"Speeding up the search," "Getting faster" at searches, Faster searching	Speeding Up Search			
45	Allotting time to process information, "having enough time," More time analyzing information, More time spent reading articles and working on assignments	Time to Process			
46	Challenge is "laziness," "just not doing it," Attitude: Biggest challenge is laziness/procrastination	Laziness	Lack of Motivation		
47	Challenge "I can't concentrate," "Can't concentrate" skim paragraphs, "I get distracted"	Can't Concentrate			
48	"I procrastinate a lot," "Prone to" giving up when frustrated	Procrastination			
49	"Depending on how interested I am," Good researcher when interested, Student researches what interests them	How Interested I Am			

Figure 4.5. *Emerging themes table in Google Sheets.*

I had peer debriefing meetings with my dissertation chair on a frequent basis to review how codes were streamlined into patterns, categories, and themes throughout the second cycle of coding. During our meeting, my dissertation chair asked questions on how I developed my patterns, categories, and themes, and offered constructive feedback to help improve my thought process. An example of this concerned two initial categories I formulated from patterns – *New to Research* and *Unaware of Resources* – to describe the student participants' background. My dissertation chair suggested that the pattern codes subsuming those two categories were more relevant to another one – *Lack of Training*. Thus, my dissertation chair suggested combining those pattern codes to form a more robust category – *Lack of Training*. Another example of this was when I created a category *Offered Additional Instruction Outside of Class Time* composed of two patterns (*Used for Review* and *Examples for Clarification*). After discussion with my dissertation

chair, it was determined that the category was too narrow, and the patterns better aligned with the pattern *Useful Scaffolding* under the category *Positive Experience with Instruction*.

Member checking. Member checking is a process that asks participants directly involved in the study to review the accuracy of the research (Candela, 2019; Mertler, 2019a). After analysis of the qualitative data, I individually emailed all student participants who volunteered for the interviews with the preliminary findings that contained a list of the themes. Participants were asked to respond with any comments or recommend any changes to the findings. Participants were also encouraged to provide any feedback on the overall experience of the information literacy instruction. Out of 14 student participants contacted for member checking, only one student responded. The student agreed with the findings and offered no further comments or suggestions.

Peer debriefing. Peer debriefing meetings were held frequently with my dissertation chair to discuss my thoughts and rationale on how I formed codes, patterns, categories, and themes. Peer debriefing meetings offered an opportunity for my dissertation chair to review decisions about the research and ask questions I had not considered about my study (Creswell, 2014). My dissertation chair asked meaningful questions and offered constructive feedback to help me to think beyond my initial thought process of my study, especially in the analysis phase. My dissertation chair noted that qualitative data analysis is subjective and encouraged me to back up my codes if I felt strongly about them. The peer debriefing meetings prompted me to talk through my thought process out loud, which was helpful for the analysis phase.

Qualitative Themes

Four themes were generated from the qualitative data. Table 4.9 presents each theme along with the categories and examples of the patterns and first cycle codes associated with it. For example, first cycle codes *"Free on OneSearch*," *Resources Not Free*, and *Pay to Access from Internet* were combined to create the pattern code *Costs*, which describes the challenge that students need to purchase access to resources for their assignments. This pattern code was combined with another pattern code, *Time*, to form the category *Extrinsic*. This category describes extrinsic challenges that students face while developing information literacy skills. Then during the second round of pattern coding, the categories were synthesized into the theme, "Students have both intrinsic and extrinsic challenges developing information literacy skills." The following section describes the themes and categories in more detail. All student participants' names appear as pseudonyms. Quotes from interviews with student participants are used to provide examples and support the descriptions of themes and categories. Direct quotes from student participants are used verbatim and appear in quotation marks.

Table 4.9. *Themes That Emerged from Qualitative Data*

Themes	Categories	Pattern Codes	First-Cycle Codes
Two-year college students lack access to information literacy practices except for course assignments.	Information literacy practices	Seeking Information	"actively seeking information you don't already know," "to find more information"
		Expanding Understanding	"A deep dive into a specific topic," Expanding understanding
		Involves Credible Sources	Research involves "credible materials," Belief: Research is finding out facts through credible places

	Demand of research training	Course Assignments	“Argumentable essay,” Requirement “peer-reviewed or professional”
		Lack of Training	“Never used library search engine,” Unaware of peer-review definition
Students have both intrinsic and extrinsic challenges with developing information literacy skills.	Intrinsic	Lack of Motivation	“Just not doing it,” Not 100% effort
		Subject Interest	“I dread writing English papers,” “Depending on how interested I am”
	Extrinsic	Costs	"Free on OneSearch," Pay to access from internet
		Time	“Don’t have time or energy,” “Wasting a lot of time”
Students developed information literacy skills through attending instruction.	Increase awareness of resources	Using OneSearch	"One source from the library," "I'll try to use OneSearch"
		Using Databases	"Using the databases," “Directly going to database”
		Using Library Resources	Library "first place I go instead of Google," Using library as primary source and internet as secondary source
	Identify effective search strategy	Using Keywords	Use "specific words," "Using more keywords”
		Narrowing Search/Using Limiters	"Narrow it down," "Pinpointed" information
		Examining Multiple Sources	"Not limited" to internet, "Read more articles"
	Develop awareness of	Reviewing Credibility	Looking at author credentials, Examining

	“trustworthy” information		internet domain for credibility
		Reviewing Reliability	"Make sure it's true," "It's actually happened”
	Increased confidence in search process	Have More Confidence	"Very confident in searching and research," "Have more confidence" with research
		Feeling Able	"I am able to get what I need," "Not perfect but can do it again"
In addition to positive experience, students offered suggestions for improvement.	Positive experience with instruction	Helpful	"Very helpful, very useful," "Thought it was helpful"
		Useful scaffolding	Scaffolding "very helpful," Examples provided "clarity"
		Easy to Understand	"Easy enough for me to understand," "I could follow along really easily"
		Enjoyable	"I really enjoyed it," "Really fun"
	Needed improvement	Provide more information literacy instruction	"Do it more," Preferred more library instruction
		Start Earlier	Improve by "starting it early," "Within the first week"
		More Hands-On Practice	"Habit of doing it," Needed more practice time with library resources
		Trouble Navigating	Trouble navigating tutorials, Didn't know where tutorials were

Theme 1: Two-year college students lack access to information literacy practices except for course assignments.

This theme describes how student participants lack access to information literacy practices except when included in their course assignments. When student participants described their information literacy practices, they were very similar in context. Students' perceptions of information literacy only partially aligned with the American Library Association's (2021) definition of information literacy. This may be attributed to students being new to research and requiring research training. This theme has been supported in literature where it has been addressed as community college students often being academically underprepared for college and most likely new to research (Contrada, 2019). This theme consists of two categories: (a) information literacy practices, and (b) demand for research training.

Information literacy practices. This category is defined as the perceptions of what students believe information literacy practices are. The American Library Association (2021) defines information literacy as a set of skills to recognize an information need as well as locate, evaluate, and effectively use information. The definition of an information literate person is based on a set of skills or abilities and being able to perform all of those skills or abilities (Addison & Meyers, 2013; American Library Association, 2019; Sample, 2020). Qualitative analysis revealed that student participants recognized information literacy practices to involve seeking information, expanding understanding, and using credible sources.

Seeking information. The first information literacy practice student participants identified is seeking information. All of the student participants recognized information

literacy as involving some form of seeking or finding information. Simply stated, student Odell phrased her definition of research as, “Looking things up. Getting information.” Other students shared similar definitions, such as student Wesley who expressed, “Gathering information. Gathering information, I guess. That’s my thought of research. Gathering information.” Finally, the student Leon elaborated more about seeking information to fulfill his information need by affirming, “I guess trying to look up, looking at something up on either something normal, like a question I get asked, or something that’s going on right now, like news, or anything of that sort.” *Seeking Information* pattern emerged as multiple student participants expressed information literacy involving some form of seeking or finding information as criteria.

Expanding understanding. The second information literacy practice student participants identified was expanding understanding. Many student participants recognized that information literacy helped to fulfill an information void they may have by increasing their knowledge about a subject or answering a question. An example of this is student Jasper’s response, “...it’s actively searching for information you don’t already know.” Another example of expanding understanding is through a response student Greta shared:

> My definition of research is you’re looking for something that you have no knowledge of up and you’re learning about it. You’re learning new things, learning stuff that you never knew had happened and kind of, like, I guess he would say writing a report about it or like, you know, writing down notes that you think would benefit your paper.

Students had the perception that information literacy helped to expand their understanding of a subject by gaining knowledge from information they did not already know.

Using credible sources. The third information literacy practice student participants identified is using credible sources. Some student participants associated information literacy with using credible sources. As student Kelly stated, "Finding out facts through credible places, but also to me research is really fun." Student Yuri elaborated more about what he viewed as credible sources, "Well, it's sifting through a lot of, I say, primarily written material broadly known it's credible. Credible material about to do with whatever subject it is I'm trying to learn more about." *Using Credible Sources* pattern developed as some student participants expressed concern about using credible sources in their research and other information literacy practices.

Demand for research training. This category is defined by recognizing the need for research training, especially for two-year college students. Students enrolled in college will, at some point, have to take required courses for their program of study, such as ENG 101, that have research requirements that they will have to fulfill to complete course assignments. Community college students may have insufficiencies in their research skills due to lack of prior information literacy experience in academic libraries or completing research projects (Head, 2013; Hincliffe et al., 2018). Qualitative analysis revealed that there was a demand for research training due to student participants having to complete course assignments with research requirements and a lack of research training before entering their ENG 101 course.

Course assignments. For the ENG 101 course, students had to complete assignments that have some research requirements. Urban Community College in the Southeast's course description describes ENG 101 as a composition course with a standard use of research and basic research techniques. From analysis of the qualitative

data, students communicated their ENG 101 assignments as having various research requirements that included using a minimum number of resources, using credible resources, or using specific resources. An example of the research requirements of the ENG 101 assignment was described by student Jasper:

> Through this current paper that we're writing right now in English, we have to use one peer-reviewed source, which was easy to find. I just looked up journals. We also need a minimum of five sources and they all have to either be peer-reviewed or…uh…professional.

Students were notified of research requirements in the instructions for each of the ENG 101 assignments and had to fulfill these research requirements in order to successfully complete their course assignments.

Lack of research training. Hinchliffe, Rand, and Collier (2018) showed that community college students lack prior information literacy experience in academic libraries or completing research projects. In the qualitative interviews, many of the student participants described their research experience as having "no knowledge of," "I didn't know before," or "new thing for me," which implies they are new to research. The majority of the student participants did not know how to use the library's resources for research, including databases and peer-reviewed journals. An example is student Connor's description of his high school experience versus his college experience with research:

> I'm still learning everything, still… everything is kind of foreign to me. I, you know, when you're in high school is kind of like, you can kind of just, you know, look up whatever. And it's not, you know, not look up whatever but it's easier college is a lot more tedious details. So, I'm kind of just going with that. I'm trying to still learn that. And not... This is my first year at college, so I'm still… everything is still kind of foreign to me a little bit.

Other students had similar research experiences to Connor where they felt they were still in the learning phase of research because they were not instructed on how to perform research before college. Another example would be Gianna as she described her frustration with the search process:

> I guess really learning how to research, I guess. I've never had anyone show me how to do it properly. It's just been, kind of, sink or swim. Figure it out for yourself. So, it was really helpful, just to see how to do it, how to make it easier instead of, like, pulling out my hair, trying to figure out, where do I go?

Due to the lack of research training, students were conducting searches that were not as effective in finding the resources that were necessary to fulfill the research requirements for their college-level assignments. A final example would be Greta, who was searching for articles but did not know what peer-reviewed articles were: "I didn't know that peer-review meant that it's a scholarly article so I just kept looking for articles that were scholarly and finding relevant articles on different websites, not like on OneSearch, but on my LibGuide." The lack of research training varied by student depending on their previous academic experiences (i.e. attended previous college, requirements of previous assignments, student motivation to seek additional help with assignments, etc.).

Summary. Students' perceptions of information literacy do not fully align with the American Library Association's definition of information literacy, which is a widely accepted definition in academic environments. At the time of the study, students appeared to not have a full understanding of what information literacy is. This may be due to students' lack of exposure to research assignments and lack of research training.

Theme 2: Students have both intrinsic and extrinsic challenges with developing information literacy skills.

This theme describes different challenges community college students may experience when developing their information literacy skills. Literature supports the idea that community college students tend to face different challenges than four-year college students (Contrada, 2019). Some of the challenges community college students face include different educational backgrounds and levels of college readiness (Nelson, 2017). Information literacy can be related to college readiness in terms of having the skills or abilities needed to complete research for college-level coursework. All student participants described some kind of challenge they had related to information literacy or research. Both intrinsic and extrinsic challenges were expressed by student participants. This theme consists of two categories: (a) intrinsic and (b) extrinsic.

Intrinsic. This category is defined as challenges students face from within themselves in dealing with developing information literacy skills. Taking from the definition of intrinsic motivation, intrinsic is defined as something that "arises from within" (Wallace, 2015, p. 193). Intrinsic challenges, such as student attitudes, can be seen as dispositional barriers (Seifi et al., 2020). Two intrinsic challenges with developing information literacy skills that students expressed were lack of motivation and subject interest.

Lack of motivation. Some students described actions that fit into the lack of motivation pattern. There was a range of responses that belonged to this pattern. Student Yuri described his challenge as "laziness" or "just not doing it." Other students had trouble concentrating, such as student Kennedy who "can't concentrate," while student

Gianna will "get distracted" while performing searches. Another factor in this challenge was student interest in the topic, as student Kelly described herself as a good researcher "depending on how interested I am." Some students just did not like the subject of English, as they described it as "quite boring" or "not my favorite subject." There were different factors expressed by student participants that played a role in their motivation.

Subject interest. Some students described having a preference for specific subjects or courses. Some student participants felt that English was "boring" or "quite boring" because they were limited in the topic that they had to write their research assignment on compared to other courses, like Public Speaking, where they had more freedom of choice. Student Kennedy's sentiment reflects many students' feelings as she lamented, "I dread writing English papers." Students' perception of specific subjects seems to reflect their interest in the coursework as well. Student Odell described, "…when I'm interested in something, I really like to know everything about it. So, I get the reading on everything. I like to know everything. Investigator." Student participant responses that expressed preferences for specific courses and how subject interests influence their motivation helped to form the pattern *Subject Interest*.

Extrinsic. This category is defined as challenges students face outside themselves in dealing with developing information literacy skills. Extrinsic is defined as something "exerted upon the learner from the outside" (Wallace, 2015, p. 194). These are challenges that are influenced by factors that are outside of oneself, and an individual may not have any control over these factors. Extrinsic challenges may also be considered situational

barriers (Seifi et al., 2020). Two extrinsic challenges with developing information literacy skills that students expressed were costs and time.

Costs. Costs refers to students paying for access to resources. Some student participants stated in their interviews that paying for access to resources hindered their information literacy practices. An example of the challenge of paying for resource access was described by student Gianna, “Just all those different things is just very hard to get access to them because you usually have to pay and I'm very cheap.” Students mentioned that there was a benefit to free access to resources from the library. Gianna added, “So I didn't have to pay for the online library and there's access to a lot of stuff.” Student Greta also described the benefit of free access through the library, “Usually you would have to pay for some of the articles that you're searching up or using and I don't think for like, you know, subscriptions and stuff like that when it can come for free on OneSearch.” Student Yuri described access to better quality free resources from the library, “I found obviously more access to, like, academic research papers beyond just abstracts, which I found before searching through Google, but I never really dug deeper because often they are not, they're not free.” *Costs* category emerged as multiple student participants expressed the cost of accessing resources influenced whether or not they used the resources in their search process. *Costs* category is devised of two patterns – *Free Access* and *Not Free/Pay to Access*.

Time. Time management was a significant challenge for student participants. Students felt they were spending too much time looking for resources to use. An example of this came from student Jasper when he stated, “I feel like I end up wasting a lot of time looking at information that I don't need and it takes longer than it probably should for me

to decide whether it's useful or not." Another important point to take into account is that many community college students have other obligations outside of college, such as working full-time (Ma & Baum, 2016). Students may not have as much time to spend on completing assignments. Student Kennedy described her struggle with time, "I usually just skim or just, like, leave the article because I don't have the time or energy to do, like, go out the extra mile." From qualitative analysis, information literacy instruction has made a positive impact on students' time management. Many student participants felt that their searching was faster, and they were able to spend more time working on the actual assignment. Jasper further described the benefit of faster searching:

> It's just going to make them much faster. I spend…I'll spend less time looking out and spend more time actually reading the information and using it. It will cut my research time probably more than half. I mean I used to spend hours just staring at the database and looking up things. Now, I'm reading the articles and I can get to writing the paper.

From the literature, a benefit of learning how to use library resources in information literacy instruction is that students felt they would save time and worry less about assignments in the future (McCartin et al., 2019).

Summary. As supported in the literature, community college students are more apt to have academic challenges when entering college. Each individual student has different challenges with developing information literacy skills. These challenges can be intrinsic or extrinsic in nature.

Theme 3: Students developed information literacy skills through attending instruction.

This theme describes some of the information literacy skills that students developed from attending information literacy instruction. As shown through numerous

studies, information literacy skills can be taught by librarian/instructor to learners/users (Aleman & Porter, 2016; Blummer & Kenton, 2014; Homol, 2018: Moorefield-Lang, 2019; Rapchak, 2017; Saunders, 2018; Stadler et al., 2021; Stiwinter, 2013; Weeks & Putnam Davis, 2017). Students were more receptive to information literacy instruction when they found out how the instruction benefits them immediately in their coursework (Gonzales, 2014). This theme consists of four categories: (a) increase awareness of resources, (b) identify effective search strategy, (c) develop awareness of "trustworthy" information, and (d) increase confidence in search process.

Increase awareness of resources. This category is defined by the level of awareness of resources by students. Upon qualitative analysis, the awareness of resources increased in student participants who completed the information literacy instruction. When student participants described their search process before information literacy instruction, there was a limited number of resources identified mainly from the internet. Students definitely described more of a "Google-centric" mindset (Hottinger, et al., 2015, p. 470). When student participants described their search process after information literacy instruction, there was an increase in identifying specific resources available from the library.

Using OneSearch. OneSearch is an aggregate search engine that searches almost all of the resources Urban Community College in the Southeast Library has to offer. Students could access OneSearch directly from the UCCS Library website. Upon qualitative analysis, all student participants increased their usage of OneSearch for researching. Student participants felt that OneSearch saved a lot of work for them, offered better results, and was more accurate than general internet searching. Student

Vanessa described how OneSearch saved her time by not having to search individual databases:

> Like I was going around before last class, our last two classes. The two I was looking in every database for what topic I needed. But in the last class you used OneSearch and it came up with the sources it's in, like it's this particular article in *CINAHL* and *Academic Premier*. You can use whatever you want. Before, I was going to *Academic Premier* and *Opposing Views* and all of that separately and I was doing it so this saved a lot of work.

Student Jasper felt that OneSearch was "a lot better than just using random search engines." This sentiment was expressed by student Kelly as well, "And it's [library search engine] honestly a lot easier than just looking it up on, like Cozer or Google." Some of OneSearch features that made it easy to use were limiters, citation tools, and icons that labeled special characteristics of an article (i.e. peer-reviewed or open access). The ease of use of these types of features in OneSearch helped convert students' "Google-centric" mindset (Hottinger, et al., 2015, p. 470).

Using databases. Student participants have access to individual databases through Urban Community College in the Southeast Library's website, which they can access using their MyUCCS credentials. Student participants named individual databases in their interviews, such as *Academic Search Premier*, *CINAHL*, or *Opposing Viewpoints*. Student participants had similar views about databases and OneSearch in that they were "extremely helpful" and "more accurate" than internet searches. A benefit of using a database was the limiter or filter feature to narrow down results, as described by student Stephanie:

> Now, I would go on EBSCO and look up information through there because it's… well, more accurate more than that time. And that it has like the narrowing down of the search bar so you can find specific, like, if you want to be from an educational source, a government source, if you wanted some specifically, the

> information be specifically from the United States, for example, like that kind of thing.

Students were able to find scholarly or peer-reviewed articles more quickly and easily in the databases by selecting the peer-reviewed limiter, which is a common feature on a majority of databases.

Using library resources. Student participants have access to library resources through the physical library locations as well as electronic access online. Student participants identified other library resources in their interviews besides OneSearch and databases. Student participants also identified academic journals, books, news articles, LibGuides, and librarians. Upon qualitative analysis, student participants expressed they would use library resources more after the information literacy instruction. When asked about what he learned from information literacy instruction, student Connor replied:

> I'll try to result back to the OneSearch once I can. Like, I say it's try to stay away from Wikipedia and all that good stuff. Get as much help because I can from the library. Just stuff like that.

Student participants expressed more awareness of resources in the library and more willingness to use library resources after learning that they exist, how to access them, or who to ask for help in accessing them.

Identify effective search strategy. This category is defined as search strategies used by student participants that made their searches more effective. Efficacy is defined as "power or capacity to produce effects" (Oxford Dictionary Online, 2021, para. 1). These search strategies (using keywords, using limiters, and examining multiple sources) had an effect on student time searching and quality of selected sources.

Using keywords. Multiple student participants described a pre-instruction search strategy as searching entire sentences. An example was given by Connor, "I would kind

of, like, take I would take something like a sentence and I would kind of like shorten it or make it to where I could put it into the search engine." Information literacy instruction taught students how to select essential key words of their research question to apply to their searches. Leon described the change in his search strategy, "And so just again, instead of writing full on sentences. Using more keywords and using the, if needed, advanced search." After the information literacy intervention, many students described using keywords as part of their search process instead of full sentences or questions, which helped develop the pattern *Using Keywords*.

Narrowing search/using limiters. Limiters or filters are standard features for databases, and they can help users narrow their search to specific results. Student Dylan described limiters in helping him narrow his search, "It definitely taught me how to narrow the search so I'm not getting a lot of different results. Taught me how to narrow it down to where what I'm looking for." Information literacy instruction demonstrated how to use limiters, and students learned to apply this search strategy to their own searches. This was especially useful for finding peer-reviewed or scholarly articles as students could select the peer-reviewed limiter that narrowed the results only to peer-reviewed sources. Student Connor described his experience with limiters: "It kind of just generated what I was exactly looking for. It pinpointed what I was looking for." Student participants really enjoyed the use of limiters as Kelly expressed, "The filtering out of the peer-review. I'm not gonna lie. That's honestly my favorite thing. I just go [makes clicking noise with tongue] and it's there." *Narrowing Search/Using Limiters* was another significant pattern that developed from student participant responses as they described their search process after attending/using information literacy intervention.

Examining multiple sources. Multiple student participants described their pre-instruction search strategy as "click first article." Student Dylan elaborated on the process, "I would normally just go to Google and find the first thing I found and I would call it a day and I know it was not reliable." Information literacy instruction has introduced students to different types of resources and taught them to be more discerning when selecting sources. Students were not aware of resources available and often reverted to sources with which they were familiar (i.e. internet). Student Benjamin described how he was unaware of resources, "I learned to figure out what kind of source it is like the scholarly articles, like all the different types, I guess. I didn't know before. I wasn't aware." Student participants made an effort to use a variety of resources. As summed up by student Leon, "to make sure that I'm not limited to just the internet, the internet search." Many student participants described their pre-instruction search process as a "click first article" strategy where they would use the first source that returned in their search. After information literacy intervention, many student participants described examining multiple sources in their search process before making a final selection to use in their assignments; thus, the *Examining Multiple Sources* pattern emerged.

Develop awareness of "trustworthy" information. This category is defined as students' perception of what they consider a "trustworthy" source. Student participants made more of an effort to find and use sources that they thought were trustworthy for their course assignments. Student participants looked for qualities, such credibility and reliability, when looking for trustworthy sources.

Reviewing credibility. Credibility is defined as "the accuracy or trustworthiness of a source" (D'Angelo et al., 2017, p. 85). In determining if a source was trustworthy, student participants would often review the credibility of the author of the source. They examined the author's credentials, affiliations, and body of work to determine if the author had expertise or was highly knowledgeable in their field. As student Odell described, "You have to back it up, make sure it's true by doing more research on the author." Student Vanessa added, "Definitely look for the credibility. Look if the person who wrote it is an expert or a scholar or somebody that is even around in that particular topic or the time that we're looking at." Students applied information literacy skills to internet searches as well. Student Greta stated:

> But now, when I look at the websites outside of the schools recommended page I make sure that I look at the about page. I'm sure to look at what they've accomplished so far with their research and even with helping others because some websites are organizations that give you data and, like, ways to you know help people and I just look at that and look that up as well to make sure it's actually happened.

Reviewing for credibility was stressed in the information literacy instruction as it was a simple technique that allowed students to examine the trustworthiness of a source author before becoming too involved in the source content.

Reviewing reliability. Reliability is defined as "a measure of consistency" (Oakleaf, 2009, p. 970). Students often assumed that authors told the truth. Student Kennedy stated, "Yes, never looked into that. I just assume that they're telling the truth." After completing information literacy instruction, students applied more skepticism when selecting sources. An example of reviewing for reliability was described by student Greta:

> So, making sure that what they're saying is actually true. And that the people are who they say they are because again you can be fooled and they can be lying to you because it's easy to make a website and then just put whatever they want on there and making it seem like what they're doing is, you know, true.

Reviewing for reliability was another technique where students were encouraged to verify the information from sources was true by examining the credibility of the author, exploring why the information was published, checking multiple sources to ensure that the information presented was consistent with the sources, and conducting additional background searches about the information presented.

Increased confidence in search process. This category is defined as the students' level of confidence in their ability to perform the search process. Confidence can be considered a student's belief in their ability to independently perform a task without supervision or oversight. Student participants expressed having more confidence in the search process and feeling able to complete information literacy practices.

Have more confidence. Upon qualitative analysis, the level of student participants' confidence in the search process varied. Table 4.10 presents different levels of student confidence in the search process and examples of student perceptions. Overall, the majority of the student participants had increased confidence in their search process after information literacy instruction. There were student participants who had high, mid-range, and lower confidence levels. The student participants with lower confidence levels appeared to have that perception more out of trepidation over the idea of searching than their actual ability to perform the search.

Table 4.10. *Examples of Student Confidence Levels with Search Process*

Confidence Level	Student	Student Perception
High	Wesley	"I'm very confident in searching and research. Very, very confident."
Medium	Dylan	"I say I am fairly confident in my searching in the topics and getting proper information that is reliable and can be used, yes."
Low	Leon	"I wouldn't say I'm confident, but I could probably help someone who isn't 100% sure how to use it."

Feeling able. This pattern stems from the *Having More Confidence* pattern. Student participants described feeling able to complete information literacy practices, such as performing effective searches, accessing information they needed, and using appropriate resources. Student Vanessa described herself as a good researcher "because I am able to get what I need." Student Gianna recognized that she is still a new researcher but felt able to perform a search when she stated, "So not perfect, but I can do it again." Student participants felt they had the ability to complete information literacy practices but were willing to recognize that they were still in a learning phase.

Summary. Student participants developed information literacy skills through information literacy instruction. These information literacy skills include awareness of resources available through the library, awareness of trustworthy information, and how to use search techniques and strategies. Overall, student participants increased confidence in their search process and felt they were able to complete information literacy practices.

Theme 4: In addition to positive experience, students offered suggestions for improvement.

During the qualitative interviews, student participants described their experiences with the information literacy instruction. Overall, student participants expressed a positive experience with the entire information literacy instruction experience. Student participants gave feedback on how the information literacy instruction could be improved. This theme consists of two categories: (a) positive experience with instruction, and (b) needed improvement.

Positive experience with instruction. This category is defined as the students' experience with information literacy instruction. Students' experiences with information literacy instruction were overall positive, as student participants described the instruction as helpful, easy to understand, having useful scaffolding, and enjoyable.

Helpful. The majority of student participants viewed the information literacy instruction to be helpful. McCartin, Evers, and Markowski (2019) state that a benefit of information literacy instruction is that students feel that they would be able to apply knowledge learned from the instruction to future assignments. This was the case for some students in the ENG 101 course, as they were able to find resources for their assignments. Student Gianna expressed, "So being able to use that to find exactly what I want to talk about, or what wants to read about is really, really helpful." Student Connor had the similar sentiment, "It helped a lot. It was easier to find what I was looking for. And all that good stuff. Was very helpful, very useful." The information literacy instruction was the most help some students received in research. Student Sierra stated, "It's been extremely helpful, if not the most help I've ever had writing a research paper I would

say." A significant pattern that developed of out student participant responses was *Helpful* as students perceived that the information literacy instruction was helpful in their research, allowing them to find relevant sources for their ENG 101 coursework.

Useful scaffolding. Student participants found the scaffolding within the in-person sessions and online tutorials useful. Student participants especially liked expert modeling as it gave step-by-step instructions on how to complete tasks related to assignments. Student Dylan described this as, "I found beneficial the kind of step-by-step, you know, guide you through in the views that most people see, so that was the most helpful lot in my opinion." Expert modeling helped visual learners as they were able to watch examples of tasks being demonstrated, making them easier to comprehend. Student Vanessa liked the expert modeling in class because it clarified tasks through demonstration:

> I think when you used to go to our example, the topics that we want to look at and you do it in our class so that we know what you're doing, like, selecting the categories, like peer-reviewed, news magazines, or articles which you want to use. It gave us more clear clarity about what conditions you need to put in to get what you need, what kind you're looking for.

Out of the scaffolding strategies used in the study, expert modeling was definitely the most popular strategy among students. Student participants did mention other scaffolding strategies, such as providing feedback or giving hints, but not as frequently.

Easy to understand. Student participants expressed that the information literacy instruction was easy to understand, and the librarian offered thorough explanations by "going into details." Student Gianna stated, "It was a… put very simply, I guess. It was easy enough for me to understand." Student Kelly shared a similar sentiment about the information literacy instruction, "Um, I wasn't really confused or anything actually. I

could follow along really easily." Student Odell elaborated more about the interaction within the instruction:

> Coming, coming to the class and you talking to us and helping us in person is more than just reading the instructions. You going over the material and breaking it down and talking to us and coming to the class and us getting ask you questions and you pointing the things out is it was more helpful besides us just her just putting it on news and y'all reading it and there you go.

By offering detailed explanations and clarifying any student concerns, the librarian was able to help students better understand the information presented in the information literacy intervention and be able to apply that knowledge to their course assignments.

Enjoyable. Student participants thought the information literacy instruction and interaction with the librarian were enjoyable. Student Greta described the experience as "it was fun." Student Gianna added that "it was really good and really helpful, like I really enjoyed it." Student participants liked having a secondary instructor in the course to ask questions and have additional instruction. As student Yuri expressed, "I think it's great. I think that there should be more classes. All classes should have that person that pops up every now and again. Keep it fresh." An observation was that students enjoyed interacting with the librarian as they viewed the role more for assistance and help rather than critique or judgement as an instructor would be when assigning grades. Having a supporting role in the classroom placed the librarian in a favorable light in the students' view.

Needed improvement. This category is defined on how student participants felt that information literacy instruction can be improved. Student feedback is important in understanding the student perspective of the instruction and can help to improve future

instructions. All of the suggestions for improvement were taken into consideration, but some suggestions were not in the librarian's control.

Provide more information literacy instruction. Over the course of a semester for the study, there were six in-person class sessions and twelve Zoom office hour sessions outside of class time. Upon qualitative analysis, student participants still wanted more information literacy instruction. Simply stated by student Kennedy, "I think I should have liked how to do it more." There were students who still needed research help after the final information literacy in-person session on March 29. Student Jasper expressed, "We still have kids in my class who asking questions that you could answer." Though student participants expressed wanting more information literacy instruction, only one student attended office hours the entire semester.

Start earlier. This information literacy study started the first week of class in the semester and students were assigned the tutorial #1 the same week (January 18). A follow-up in-person session was in the second week of classes (January 23) to discuss the tutorial content and answer any questions students may have had about the tutorial. Student participants still expressed that they wanted the information literacy instruction sooner in the semester. As described by student Jasper:

> The only thing I can say that we're probably [improving] is starting it early, like maybe even within the first week of just getting us into the library and starting it because there's at no point during this semester it wouldn't have helped.

A conclusion drawn from student feedback is that they would like the more advanced information literacy instruction (i.e. how to use databases or search strategies) sooner in the semester. The course instructor and librarian planned the instructions to coincide

when specific assignments were due, although students did not prefer this schedule of information literacy instruction.

More hands-on practice. Three out of the six in-person information literacy sessions were conducted in the library computer lab. Each student had access to desktop computers to use as information literacy instruction was being conducted and was encouraged to follow along in the examples. Twenty to thirty minutes of class time were allotted at the end of each session to allow students to practice information literacy skills as the instructor and librarian walked around to answer questions. Student participants expressed wanting to have more hands-on practice. Student Jasper explained it was easier to comprehend searching when students could attempt it themselves:

> Also, I think that we should probably spend maybe one more class in the library, and the reason is, is because in the classroom when you're talking about the topic, it's easier if you're hands on and you can do it with you, right? Like if we're talking about going to a database if I can type it with you then I'm getting into the habit of doing it. If we're just sitting in the classroom talking about it I can't make that image.

Jasper also stated that it would be beneficial for students to have more one-on-one time with the librarian to answer any questions and explain information literacy concepts.

> I wish there was a way that we could sit down had more time individually to go over the different articles. But I mean there's a lot of people who would all need help. That's a lot of time. It's great finding it in the database. It's another thing actually being able to use it.

Student Wesley suggested adding a library lab for more in-depth information literacy instruction:

> Maybe have and maybe not incorporate the library into the English 101 class, but incorporate a library lab with the English 101 class so that you would have specific dates that you would go to the library that wasn't interfering with the class itself. And that way, the class itself would be able to incorporate more on the topics more discussion of that. Maybe more time for the professor to go around to each one of their students to see whether or not they are getting the ideas. And I

> don't know if that would be beneficial or not, or how the parameters that would work, but I think maybe having a library lab.

Student participants enjoyed the information literacy instruction sessions with hands-on practice and better processed the instruction presented by being to apply those skills themselves. Hands-on practice is not always feasible depending on the classroom.

Trouble navigating. A small group of student participants had trouble navigating the tutorials. Upon further analysis of the qualitative data, the issue students had was more in locating the tutorials within their LMS course than actually using the tutorials. Some students in the course did not watch the tutorials because they did not know where to find them. Student Kennedy stated, "I just didn't know where it is" and continued later with "D2L was very confusing to me." She did not have any further suggestions for improvement of the tutorials, as she stated, "I don't know since I didn't watch any of the tutorials." Student participants did not express any difficulty locating the tutorials during the semester. It was not until student interviews were conducted at the end of the semester that the librarian was aware of any issues.

Chapter Summary

This mixed-methods study utilized quantitative and qualitative data to identify student perceptions on information literacy instruction and instructional scaffolding. Quantitative data collected from student participants through pretest, posttest, and student perception survey. A total of 18 student participants completed both the pretest and posttest and 15 student participants completed the student perception survey. Analysis of the OTIL revealed that there was no significant difference between the students' pretest score and posttest score. Analysis of PILS survey revealed that students identified themselves as emerging information users. Qualitative data was collected from 14

students through semi-structured interviews. Data analysis revealed four themes: (a) two-year college students lacked access to information literacy practices except for course assignments, (b) students had both intrinsic and extrinsic challenges with developing information literacy skills, (c) students developed information literacy skills through attending instruction, and (d) in addition to positive experience, students offered suggestions for improvement. Quantitative and qualitative findings were integrated to provide a complete understanding of student perceptions on information literacy instruction and instructional scaffolding. Findings from this study and their implications are discussed in the following section.

CHAPTER 5

DISCUSSION, IMPLICATIONS, AND LIMITATIONS

The purpose of this action research was to describe the perceptions and experiences of students after information literacy instruction with instructional scaffolding in an ENG 101 course. Quantitative findings were from the analysis of student responses from the pretest, posttest, and student perception survey. Eighteen student participants completed both the pretest and posttest. Fifteen student participants completed the student perception survey. Qualitative data was collected from 14 students through semi-structured interviews. Pretest responses, posttest responses, survey responses, interviews, and field observations were analyzed to answer the following research questions: (1) How can instructional scaffolding affect community college students' information literacy skills at Urban Community College in the Southeast?, (2) What are community college students' perceptions towards information literacy after attending an information literacy instruction with instructional scaffolding?, and (3) How do community college students describe their experience with the instructional scaffolding on information literacy? This chapter combines the findings of this research with previous research through the following sections: (a) discussion, (b) implications, and (c) limitations.

Discussion

Integrated quantitative and qualitative research findings were used to answer the research questions of this action research study. Having an understanding of information

literacy and instructional scaffolding was an integral part of this study. It was also important to understand challenges community college students may have in developing their information literacy skills. The definition of information literacy by the American Library Association (ALA) and the Association of College and Research Libraries' (ACRL) Framework for Information Literacy for Higher Education served as the framework for understanding the knowledge and skills needed to be an information literate individual. The discussion of findings is organized by the three research questions of this study.

Research Question 1: How can instructional scaffolding affect community college students' information literacy skills at Urban Community College in the Southeast?

In this study, information literacy is defined as a set of skills to recognize an information need as well as locate, evaluate, and effectively use information (American Library Association, 2021). Being an information literate person is based on a set of abilities or skills (Addison & Meyers, 2013; American Library Association, 2019; Sample, 2020). Instructional scaffolding was presented to students through the delivery methods of in-person class sessions and online tutorials. Quantitative and qualitative findings of this study provided evidence about the effect of instructional scaffolding on community college students' information literacy skills. This section is divided into three parts: (a) community college students' information literacy practices, (b) demand for research training, and (c) challenges with students developing information literacy skills.

Community college students' information literacy practices. Student participants were given the higher education version of Open Test for Information Literacy (OTIL) created by Hollis, Rachitskiy, and Van der Leer (2019a) as both the pretest and posttest. OTIL was given to students as a pretest the first week of class before

any intervention, and again later in the semester as a posttest after all of the intervention was completed. While there was no significant difference between the mean score of student participant responses from OTIL pretest (M = 6.44, SD = 1.98) to OTIL posttest (M = 6.61, SD = 1.91), student participants expressed in their qualitative interviews a difference in their information literacy practices and higher confidence in their research abilities after attending information literacy intervention. Analysis of individual subscales of OTIL also revealed there was an increase in mean score from pretest (M = 0.53, SD = 0.51) to posttest (M = 0.67, SD = 0.49) in Understanding Ethical Issues Surrounding Information. This could be due to information literacy intervention stressing the importance of credibility and reliability of resources.

From a librarian standpoint, there were noticeable differences in students' information literacy practices from before and after information literacy intervention. Before any information literacy intervention, many students described their search process in a "Google-centric" kind of way (Hottinger, et al., 2015, p. 470) where they were overly dependent on Internet search engines for their information needs (Bury, 2016; Detlor et al., 2012; Head, 2013; Refaei et al., 2015). Students viewed Internet searching as convenient, easy to access, and easy to use (Van Scoyoc & Cason, 2006). After information literacy instruction, many student participants showed greater awareness of available resources accessible through the library by being able to identify specific resources by name. Student participants expressed that they would use these resources in their future research and assignments. Student participants also articulated that they would examine resources more thoroughly before use and be more discerning in the selection of information to include in their assignments.

Contrada (2019) describes community college students as highly likely to be new to research. That was the case for the majority of student participants in this study, as revealed in the qualitative data. Many student participants described themselves as still in the learning phase of information literacy and that information literacy is a new concept to them that they were still exploring. Student participants recognized information literacy practices to involve seeking information, expanding understanding, and using credible sources. These recognitions only partially align with the American Library Association's definition of information literacy. There are many factors that contribute to the inference that students do not have a full grasp of information literacy.

A factor observed through field observations revealed that student participants seemed to put minimal effort in achieving high scores in OTIL since it did not count as part of their grade. Another factor is that educational outcomes are dependent on the instructor knowledge base where students learn more from instructors with stronger knowledge bases (Askell-Williams et al., 2012). The information literacy intervention offered may not have focused enough on ALA's definition of information literacy and ACRL standards. A disadvantage of instructional scaffolding is that the results are hard to measure in that the instructor would have to observe the learners' functions over time to know if they truly gained from the instruction (Humphries & Clark, 2021; van de Pol et al., 2010). The ideal for this study would be to observe the same group of student participants onto the ENG 102 course so that the traits of scaffolding (contingency, fading, and transfer of responsibility) have more time to develop. A definitive conclusion on whether instructional scaffolding made an effect on students' information literacy skills cannot be determined at this time.

Demand for research training. In the qualitative interviews, the majority of the student participants described themselves as first year college students. All student participants had to complete assignments for their ENG 101 course that have research requirements, such as using a minimum number of sources, using credible sources, or using specific sources. Many of the student participants expressed having minimal to no prior research experience as, "I didn't know before," "no knowledge of," or "I didn't know what I was doing." Underdeveloped information literacy skills are one of the possible factors preventing community college students from being ready for college-level coursework. Significant contributors to this are their lack of prior information literacy experience in academic libraries and lack of completing assignments that have research requirements (Head, 2013; Hincliffe et al., 2018).

Some student participants described not having anyone teach them information literacy skills prior to the ENG 101 class. Qualitative findings concluded that students need to fulfill research requirements for their ENG 101 assignments, but many were new to research or lacked prior guidance in the resources available. For these particular sections of the ENG 101 course, students had access to a librarian and tutorials embedded for the entirety of the course that provided information literacy help as needed. Additional information literacy instruction resources were added to these courses, but were not implemented in all UCCS ENG 101 sections outside of the study.

Offering information literacy instruction through online tutorials with instructional scaffolding could reach a broader audience. Instructional scaffolding in online tutorials, like the ones used in this action research study, may offer some foundation of information literacy instruction and teach students skills they can use in

research. Online tutorials can have hard scaffolds that are static and planned ahead of time where a librarian anticipates the students' needs (Saye & Brush, 2002; Sharma & Hannafin, 2007). Hard scaffolds can be used to support the general needs of the learner and can be embedded in learning environments (Saye & Brush, 2002; Simons & Klein, 2007). Online tutorials with instructional scaffolding can offer support to many students in developing basic information literacy skills no matter the course in which they are enrolled. This could especially benefit community college students, as they have competing demands on their time and they could use tutorials in a time and place that is convenient for them.

Challenges with students developing information literacy skills. Qualitative findings revealed that student participants had both intrinsic and extrinsic challenges with developing information literacy skills. Intrinsic challenges are issues that students face internally. Qualitative findings revealed two of the main intrinsic challenges students face in developing information literacy skills were lack of motivation and subject preference. Student participants expressed "laziness," procrastination, or "just not doing it" as reasons for neglecting research. Some student participants claimed that they had trouble concentrating or were easily distracted while performing research.

Lack of motivation may be a byproduct of a student's preference for the subject. Subject preference is another intrinsic challenge students described having with developing information literacy skills. Student participants expressed that English was "not [their] favorite subject" and that they considered it "quite boring." Some student participants held the sentiment that the English subject was not their favorite class and that they dreaded writing English papers. Despite their subject preference, many students

have to take ENG 101 at UCCS due to the number of programs that require it. Student interest can highly influence the amount of effort they put forth in their research.

Students face extrinsic challenges outside of themselves and often have little control over them. Qualitative findings revealed that two of the main extrinsic challenges were costs and time. From the Urban Community College in the Southeast 2020-21 president's report, eight out of ten UCCS students relied on financial aid to attend college. Student participants expressed that the cost to access resources influenced their search habits and that they saw value in the library for offering "free" access to resources. When asked about the search process, many students mentioned costs in their responses, such as "I never really dug deeper because often they're not free," "very hard to get access to them because you usually have to pay and I'm very cheap," and "usually you would have to pay for some of the articles that you're searching up." Cost was a real and noticeable barrier that inhibited what kinds of resources students could use for their research.

Another extrinsic challenge that student participants identified was time management. Qualitative findings revealed that student participants spent too much time trying to find resources. A student participant described that they "used to spend hours just staring at the database and looking things up." Time is essential to community college students as many of them have other obligations outside of school, such as working full time (Ma & Baum, 2016). Learning information literacy skills can help students speed up the process of searching. Student participants shared the benefit of faster searching in terms of spending less time searching for resources and more time

actually processing the information of the resources. Information literacy skills helped expedite students' research time.

A case can be made that instructional scaffolding helped students save time. Qualitative findings also revealed that instructional scaffolding, especially expert modeling, to be useful. Students were able to watch the librarian demonstrate information literacy tasks and query searches in a way that was easy to comprehend. Expert modeling was also used in the online tutorials through of embedded screencast videos that were less than five minutes in length. Being able to teach students information literacy skills more efficiently gave students more time to "really process and digest and get as much out of them as I can" before using the information in their assignments.

Summary. There was a demand for research training because there are research requirements for ENG 101 course assignments and students lack research training to complete these assignments. Students experienced both intrinsic and extrinsic challenges in developing their information literacy skills. Study findings revealed that even after the intervention, student understanding of information literacy did not fully align with the American Library Association standards at the time. Student participants viewed instructional scaffolding used in instruction to be useful, especially expert modeling for visual demonstrations.

Research Question 2: What are community college students' perceptions towards information literacy after attending an information literacy instruction with instructional scaffolding?

One of the main focuses of this action research study is student perception of information literacy instruction and instructional scaffolding. Oxford Dictionary defines *perception* as "the way in which something is regarded, understood, or interpreted"

(Stevenson, 2010, para. 2). So, for this study, there was an examination of how the student interprets information literacy and information literacy instruction with instructional scaffolding. Both quantitative and qualitative findings of this study were used to gain a better understanding of student perceptions. Research question two discussion is divided into two sections: (a) student perceptions of information literacy, and (b) students have more confidence in the search process.

Student perceptions of information literacy. Perceptions of Information Literacy Skills (PILS) Survey created by Yukhymenko, Foster, and Doyle (2018) was used for this action research study. PILS survey was conducted to have a better understanding of student perceptions of concepts based on the Association of College and Research Libraries' (ACRL) Framework for Information Literacy for Higher Education (Yukhymenko et al., 2018). On a 7-point Likert scale that ranged from (1) *Novice* to (7) *Expert*, mean average of all student participants for the PILS survey was 4.90, which leaned more towards *5 = Developing*. Student participants felt they had a moderately developed perception of their information literacy skills such that they felt comfortable using these skills with frequency, were able to use search tools to narrow or expand their searches, used information ethically, and synthesized multiple sources into a new information product (Yukhymenko et al., 2018). A score of *Developing* perception of information literacy could be due to their increased confidence in the search process that will be discussed more in the next section.

A note to be made is that students may have inflated views of their research skills (Hinchliffe et al., 2018). As mentioned in Research Question 1, more time would be

needed for this study so that students can have more time to apply their newly learned information literacy skills and for observation from the librarian.

Students have more confidence in the search process. Confidence can be considered a student's belief in their ability to independently perform a task without supervision or oversight. Confidence can be associated with the constructivist theory where learners actively construct knowledge (Comstock, 2013; Kamii, 2016). The search process very much relates to the definition of constructivism where individuals build from the knowledge within, create knowledge by connecting new information with previous knowledge, actively restructure one's frame of thinking to learn, and use personal experiences to create new knowledge (Pelech & Pieper, 2010). Each information query is unique and each search will be different, so information searching requires active thinking to develop search strategies and search terms. In other words, it is not enough to simply have rote memorization of a search strategy to fulfill all information queries. A constructionist approach allows learners to engage with the information to solve a problem and engage in the understanding rather than memorize information (Lau, 2006). An able student must exercise some measure of confidence during the search process on their own.

Qualitative findings revealed that all student participants had increased confidence in their search process. The level of increased confidence varied by student, ranging from high, mid-level, or low confidence. Instructional scaffolding may have played a role in student confidence, as the additional support provides the basis for future independent learning (Holton & Clarke, 2006). By learning information literacy skills, student participants felt they were able to perform the search again independently.

Summary. Quantitative findings of the PILS survey revealed that students had a *Developing* perception of the ACRL Framework concepts. Qualitative findings supported this, as students described having higher confidence in their search process and felt able to perform searches independently.

Research Question 3: How do community college students describe their experience with the instructional scaffolding on information literacy?

The experience with instructional scaffolding was of mixed experiences among student participants. Overall, the information literacy instruction was a positive experience and student participants viewed instructional scaffolding as useful. Student participants did offer feedback on improvement of the instruction. Qualitative findings of this study provided insight in the college student experience with instructional scaffolding in the information literacy instruction. Research question three discussion is divided into two sections: (a) student perceptions of information literacy instruction, (b) student perceptions on instructional scaffolding, and (c) suggestions for improvement.

Student perceptions of information literacy instruction. Qualitative findings revealed that student participants found the overall information literacy instruction to be helpful, easy to understand, and enjoyed interaction with the librarian.

Helpful. Qualitative findings revealed that students perceived the information literacy instruction as helpful. Student participants described how the information literacy instruction was helpful, useful, and made searching easier. Some student participants described not having support in learning information literacy skills prior to ENG 101 and information literacy instruction as helpful in demonstrating research examples, making searching easier for students to visualize. Student participants described how information literacy instruction helped them have a better understanding of the resources available.

And finally, some students expressed that the information literacy instruction was the most help they had received in writing a research paper to date.

Easy to understand. Qualitative findings revealed that student participants consider the librarian to be thorough and the information literacy instruction to be easy to understand. Information literacy instruction for this action research study was broken down into chunks and spread over a semester's worth of time as opposed to the traditional one-shot information literacy instruction offered in a single course session (Gil, 2017). Breaking the instruction into chunks is a form of microlearning that allowed for relevant information to be presented to students at the point when they needed to perform (Torgerson & Iannone, 2020). Student participants described the simplicity of the information presented in the information literacy instruction and that "it was easy enough for me to understand." Student participants expressed that they did not have any confusion with the information literacy instruction and could follow along really easily. Some student participants also felt the information literacy instruction helped make their understanding of the English subject easier.

Enjoyed interaction with librarian. Qualitative findings revealed that students enjoyed the information literacy instruction and interaction with the librarian. Some of the student participants described the information literacy instruction as "fun." Students enjoyed having a secondary instructor in class with whom they could interact and ask questions. Students viewed the librarian as "someone else to talk to us who isn't within our primary instructor is always just nice and refreshing." An observation could be made that the students felt less pressure interacting with the librarian, as the librarian served a support role in the course whose main goal was to help as opposed to the course

instructor who had to assign grades. Overall, student participants described the information literacy instruction experience in a positive manner, using terms such as "really good," "really helpful," and "enjoyed it."

Student perceptions on instructional scaffolding. Scaffolding is a process that enables a novice to solve a problem or complete a task beyond their abilities unassisted (Wood et al., 1976). In this study, the librarian served as the expert role by adapting activities to the learners' level, asking learners questions, demonstrating to learners how to complete the task, providing tools or guidelines on how to complete the task, and providing feedback to learners about the task (Ramani & Eason, 2014). Four different types of instructional scaffolding (expert modeling, questioning, providing feedback, and giving hints) were used in this action research study and were delivered through in-person class sessions and online tutorials. The goal of scaffolding for this study was to support immediate knowledge construction of the learner and provide the basis for future independent learning (Holton & Clarke, 2006).

Qualitative findings revealed that student participants viewed instructional scaffolding as useful, especially expert modeling. Expert modeling can help learners see why the content is important, and when and how it is used (Brophy, 1999). For part of the instruction, expert modeling was used as a computer-based conceptual scaffolding mechanism where an expert explained specific aspects of a problem they are trying to address (Li & Lim, 2008; Pedersen & Liu, 2002). From the interviews, it appeared student participants are more visual learners and preferred being shown how to complete tasks related to information literacy and their assignments. An example of how visual

elements in instruction helped students is described as “you didn't just tell us you showed us the different databases so visually I know what I'm looking for.”

Both hard and soft scaffolds were used in the study. Hard scaffolds used were screencasts of demonstrations, such as how to search databases and use limiters, which were implemented in the online tutorials. The librarian planned ahead of time, anticipating where students would have difficulty with a specific task (Sharma & Hannafin, 2007). Soft scaffolds that were customized and created later in the semester to address additional student concerns were shorter screencasts of demonstrations uploaded to the course LMS. The hard scaffolds supported common learning needs and the soft scaffolds provided “on-demand” support (Sharma & Hannafin, 2007, p. 30).

Suggestions for improvement. Though the overall experience with information literacy instruction was positive, student participants offered feedback on how to better improve the information literacy instruction experience, including offering more information literacy instruction, offering information literacy instruction sooner, more hands-on practice, and offering easier navigation of the tutorials.

Offer more information literacy instruction. Qualitative findings revealed that student participants wanted more information literacy instruction and that they “should have liked how to do it more.” For the intervention, a total of six in-person class sessions and 12 office hours sessions via Zoom were offered. Students described wanting more information literacy instruction, but field notes revealed that only one student came to one of the Zoom office hours the entire semester. A disadvantage of instructional scaffolding is that it is typically a one-on-one interaction between the instructor and learner (Wood et al., 1976), so working with large groups of learners does not allow the

instructor to tailor the supports to each individual learner (Puntambekar & Hubscher, 2005). A large group has multiple zones of proximal development and students who need additional help will not seek it (Hogan & Pressley, 1997). Students did not utilize Zoom office hours that would have given the students more one-on-one interaction with the librarian.

It is assumed that students wanted more information literacy instruction during scheduled class time. Students typically did not seek out information literacy instruction on their own and described limited interaction with the library in general. A student expressed that "this is the first university I've been to where I actually spoke to our librarian." Additional information literacy instruction during class time may not be a feasible option for many reasons. As Ma and Baum (2016) have stated, community college students have other obligations outside of school, making student time very limited. Another obstacle is instructor cooperation. For this action research study, the librarian needed to find an instructor who was willing to work with them and allow the librarian to instruct during multiple class sessions.

Offer information literacy instruction sooner. Qualitative findings revealed that student participants wanted information literacy instruction to be offered sooner in the semester. Students described the instruction as "all crammed in" a short amount of time and only offered at a point of necessity - "they gotta use the One Source [OneSearch] now so we have to teach it now. But if we had got it week one, we already been used to it by the time we needed." This information literacy study started the first week of class in the semester and students were assigned the tutorial #1 the same week (January 18). A follow-up in-person session was in the second week of classes (January 23) to discuss the

tutorial content and answer any questions students may have had about the tutorial. It can be inferred that student participants wanted the more advanced information literacy instruction (i.e. how to use databases or search strategies) sooner in the semester.

Offer more hands-on practice. Field notes revealed that three out of the six in-person class sessions were held in the library computer lab where each individual student had access to a desktop computer with internet access. Students were encouraged to follow along on the desktop computers in the expert-modeled demonstrations. For these information literacy instruction class sessions held in the library computer lab, 20-30 minutes were reserved at the end of each session for students to practice on their own. The course instructor and librarian were available to answer any questions students may have and provide additional instruction as needed. Student participants described the importance of hands-on practice in that they were "getting into the habit of doing it" and if only a lecture was given they "can't make that image." Hands-on practice allowed students to better comprehend information literacy concepts by being able to try them on their own and learn from their own mistakes and experiences.

Make tutorial navigation easier. Qualitative findings revealed a few of the student participants had trouble finding the online tutorials on the course LMS. The students who were not able to find the online tutorial did not ask the librarian or course instructor for additional clarification on where to locate them during the semester. Some student participants experienced remorse for not being able to access the online tutorials with instructional scaffolding by expressing, "I feel bad because I keep forgetting to." These students who were not able to find the online tutorials were not able to complete the tutorials or use any of the instructional scaffolding embedded within them.

Notably, they did not ask for help or notify the instructor or librarian about difficulty in locating the tutorials during the course.

Implications

The findings of this action research study have implications on many levels (personal, professional, and research). Before this action research study, I never conducted in-depth research before. On a personal level, I learned how to conduct action research and learned more about educational theories and practices. On a professional level, performing action research allowed me to examine my own practice and better understand how to improve the quality and effectiveness of the information literacy instruction (Mertler, 2019a). On a research level, this action research study expanded my perspective on issues in academic librarianship and compelled me to examine further issues in this field. This discussion of implications is divided into the following sections: (a) personal implications, (b) implications for librarians, and (c) implications for future research.

Personal Implications

Implications related to action research. In interacting with the students of my action research study, many of them described themselves as being new to research and I find myself in the same boat but on a different scale. I could very much relate to student participants when they described their research experiences that were "kind of foreign to me." Before this action research study, I had never conducted in-depth research before and it was an enlightening learning experience. I learned that action research studies the teacher's own practice as they examine their own classroom. Action research also focuses on the immediate population they interact with to better improve quality and

effectiveness of instruction (Mertler, 2019a). Action research is a cyclical process that constantly goes through the steps of planning, acting, developing, and reflecting (Duesbery & Twyman, 2020; Mertler, 2019a). This action research study encouraged me to continue examining issues in the academic librarianship field and trying to figure out methods for improvement. This process is particularly important for information literacy in the community college environment since there is lack of research in this area.

Implications related to mixed methods. For this action research study, I planned to use a triangulation of mixed methods design where I collect both quantitative and qualitative data at about the same time from the same study participants and give equal emphasis to both sets of data (Mertler, 2019a). This design did not go as planned, as low student class attendance affected the type of data I was able to collect. This entire action research experience was a constructivist a-ha moment for myself. Chapman and Macht (2020) state that individuals learn by forming knowledge based on their own prior knowledge and experiences. From my personal experience with action research, I have learned that research design does not always go as planned and it is important to remain flexible in one's approach. As Pultz (2018) suggests, unexpected events can help guide data collecting that can improve findings to be more empirically sensitive. I had to shift the focus of my action research from a mixed methods design to more qualitative data collection. I felt this helped strengthen the study overall as I was able to include more of the study participants' voice in the findings.

Implications related to qualitative analysis. At one point in the book, Tracy (2020) compares qualitative analysis to cooking or playing an instrument – there is only so much an individual can learn by reading, and to really learn how to do something is by

doing. I learned a lot about qualitative analysis by actually doing it, and there are certainly things I would change about my process. Many scholars suggest that beginning researchers code by hand using physical materials or hard copies of the data as it is easier to work with (Cope, 2020; Saldaña, 2021; Tracy 2020), which is the method I performed for this action research study. I realized qualitative data can become unruly really quickly. Dealing with the organization of a larger than expected qualitative data set opened my eyes to the consideration of a computer-assisted qualitative data analysis software (CAQDAS), such as Delve. Even simpler tasks, such as tallying the number of specific codes, would have been easier with the aid of a CAQDAS.

Information applicable to my work. From study findings, student participants highly preferred the instructional scaffolding mechanism of expert modeling where an expert (i.e. librarian) demonstrates how they would approach a problem (Belland, 2013) or perform a given task (Pedersen and & Liu, 2002). Student participants especially enjoyed expert modeling in the in-person class sessions, as they explained that they liked visual representation of instructions. Expert modeling made it easier for them to comprehend research-related tasks, and they could follow along to replicate those tasks that needed to be performed for their course. In online versions, student participants preferred expert modeling videos that were succinct and covered one specific task (i.e. how to access the mental health LibGuide) instead of general instruction videos covering broad topics (i.e. what are the different types of library resources), which can be seen as student preference to microlearning. It is also important to consider designing with purpose in microlearning in terms of not only breaking up instruction into chunks but taking into consideration the audience (Lohman, 2024). Overall, more visual elements,

such as videos, graphics, or animations, need to be included in information literacy instruction that shows information in a dynamic and demonstrative manner.

To pair with expert modeling, student participants wanted more hands-on practice opportunities to apply what they have learned. Student participants felt they understood more of the instruction through application than just passively listening. Information literacy instruction offered in the library computer lab was an appropriate setting for this type of learning arrangement, as students were able to watch the librarian conduct research or information-searching tasks, and students had the opportunity to replicate the tasks on their own desktop computer with the availability of the librarian or instructor to answer any additional questions that may arise.

Implications for Librarians

Increased technology use for information literacy instruction. For the literature review of this action research study, I noticed an increase of inclusion of technology in information literacy instruction as it has become more prevalent over the years. Some examples of how technology is being used in information literacy instruction include screenshots/screen captures (Blummer & Kenton, 2015; Rapchak, 2017), GIF images (Aleman & Porter, 2016), YouTube videos (Moorefield-Lang, 2019), screencast videos (Blummer & Kenton, 2015; Rapchak, 2017), online tutorials (Stiwinter, 2013), and virtual reality library tours (Sample, 2020). Technology-based information literacy instruction has helped alleviate some issues with information literacy instruction itself, such as lack of librarians available to lead instructions (Blummer & Kenton, 2015; Hartman & Fial, 2015; Held & Gil-Trejo, 2016; Johnston, 2010; Stiwinter, 2013).

Importance of student interaction. Gall (2014) asserts that regardless of format, information literacy instruction has a positive effect on students' information literacy skills and knowledge. For this action research study, student participants indicated in their qualitative interviews that they preferred in-person instruction and enjoyed interaction with a librarian. Student Yuri described how he views the value of librarian interactions, "So, it's a good practice for me because I needed to ask questions of people and not just of computers. So always appreciate that human connection." It is important to remember that technology-based instruction is not a replacement for librarians. Information literacy instruction offers a solid foundation in community college students' academic careers in that they become more aware of library resources and research but will also build a relationship with the library for future help.

Instruction focused more on discovery tools than ACRL standards. Discovery tools available through many libraries and mentioned frequently in this action research study (OneSearch) are typically used by librarians for their broad search functions (Nichols et al., 2017; Tonyan & Piper, 2019). As such, the transition to information literacy instruction by librarians focuses more on discovery tools rather than ACRL standards. There is lack of research on how to address discovery tools and their alignment with information literacy standards (Tonyan & Piper, 2019). The findings of this study revealed that student participants' information literacy practices did not fully align with ALA's definition of information literacy, and their perceptions of the ACRL framework was described as *Developing*. In reflection of my own practice and the instruction offered to the ENG 101 students, the study findings made me self-aware that I also fell into this paradigm.

Implication for scaffolding. Scaffolding is offering support to learners where they may not be able to complete a task on their own efforts (Wood et al., 1976). In this action research study, instructional scaffolding support was offered to students through the online tutorials and in-person class sessions by expert modeling, questioning, providing feedback, and giving hints. Out of the instructional scaffolding mechanisms offered, student participants definitely had a preference for expert modeling during the in-person class sessions, as they found watching demonstrations by the librarian to be "very helpful" with their research and ENG 101 coursework. More expert modeling mechanisms should be applied in future information literacy instruction. Some of the student participants did not use the instructional scaffolding in the online tutorials for different reasons. Some student participants were not able to find the tutorials in the ENG 101 course LMS. The tutorials did not count as part of the students' grades, as they were optional. In future information literacy instructions or research studies, more direction needs to be provided to students so they know the location of the tutorials with instructional scaffolding, and completion of tutorials should be incorporated into an assignment or participation grade.

Implications for Future Research

Lack of research about information literacy at community colleges. It was difficult to write a literature review specifically about information literacy instruction in community colleges, as there is lack of research in this area. Even in meeting one-on-one with my university's librarian, whose specialization is libraries and information science, there was not much to be found in terms of statistical data about community colleges, as research focus is aimed more towards four-year institutions. What is known about

community colleges is that they are one of the highest sectors of undergraduate enrollment increase, with 118,000 students (+2.6%) for Fall 2023 semester (National Student Clearinghouse, 2024). Though an increasing number of students are enrolling in community college, there is a lack of research about community college groups (McFadden, 2016; Nelson, 2017; Terrile, 2021). McFadden (2016) states that, of the literature published about higher education between 1990 and 2003, only 8% of the literature mentioned community colleges. This trend is especially true for lack of research about information literacy at the community college level (Latham et al., 2022). There are not concrete statistics about information literacy instruction at the community college level, and there is much need for research in this area.

Lack of support for research at community colleges. The purpose of community colleges is to help fulfill the educational and training needs of local communities and work forces (Cejda & Hensel, 2009). The emphasis of community college faculty is mainly teaching and not research, where they have some of the highest teaching loads of all of higher education (Cejda & Hensel, 2009). As such, community college faculty do not have as much time or resources to complete research. The lack of resources hinders community college faculty in conducting background groundwork and literature reviews necessary for research. To compare two higher education institutions and their access to resources via institutional logins, Urban Community College in the Southeast has access to 167 databases compared to 541 databases at University of South Carolina. For this action research study, I would not have been able to complete such a robust literature review based on my home institution's resources, as I did not have access to specialized databases, such as *Library Literature & Information Science Full*

Text or *Library, Information Science & Technology Abstracts with Full Text*. There is even a considerable gap in the amount of access to information between a community college and four-year institution using the same databases. Both Urban Community College in the Southeast and University of South Carolina have access to *Academic Search* database but different tier levels. Urban Community College in the Southeast has access to *Academic Search Premier*, compared to University of South Carolina, who has access to *Academic Search Complete*. *Academic Search Premiere* contains 2,594 full-text, peer-reviewed journals while *Academic Search Complete* contains 5,205 full-text, peer-reviewed journals (EBSCO, 2024).

Limitations

As with any study, there were limitations. Some of the limitations were known before the study and some limitations were experienced during the study. In this section, further discussion about limitations are presented on these topics: (a) student participation, (b) time restraints, (c) methodology, and (d) research subjectivities.

Student participation. The largest limitation of this study was student participation and it presented itself two-fold through class attendance and tutorial usage. Data was gathered for this study on a volunteer basis via students enrolled in the ENG 101 course. In the planning stage of this study, the ENG 101 instructor informed me that the college did not have an attendance policy due to Covid-19 at that current time, so there was no regulation on the amount of absences a student was allowed to have. The instructor stated student attrition from previous semesters was very high for this course and was concerned that I may not be able to collect enough data for the study due to low class attendance. A possible solution to this issue discussed in my dissertation proposal

defense was to add another section of ENG 101. Therefore, instead of focusing on one section of ENG 101, I conducted the study with two sections of ENG 101.

This solution did not work. At the beginning of the Spring 2023 semester, there were 40 students enrolled for both sections of ENG 101 (20 students per section). By the end of the Spring 2023 semester, there were only 27 students enrolled for both sections of ENG 101 (section one had 15 students and section two had 12 students). Of the 27 students that completed the course and received a grade, the attendance average was 57% for the semester of 28 class meetings. As the semester progressed, low class attendance highly influenced the type of data collected. From both sections of ENG 101, 33 students completed the pretest, 23 students completed the posttest, and 14 completed the student perception survey. After discussion with my advisor, I had to shift the focus more to collection of qualitative data through the student interviews. I conducted over double the number of student interviews than I initially planned.

Another part of the limitation related to student participation was tutorial usage. Half of the delivery method of the instructional scaffolding was through online tutorials located within the LMS course. The tutorials were created to align with specific assignments throughout the semester and students were notified when to use the tutorials to help with their assignments. It was apparent in student interviews that not all of the students watched the tutorials. A belief for this is that the tutorials were optional and did not have immediate influence on student grades. In the future, I may discuss with the course instructor to make viewing the tutorials as part of the assignments and assigning points to encourage more students to complete the tutorials.

Time restraints. Another significant category of limitation was time restraints that influenced the delivery method of the information literacy instruction. This was another known limitation before the study began, as time restraints are a major issue with all information literacy instructions. Typically, information literacy instructions are offered as a one-shot instruction in a 50 to 75-minute time frame (Gil, 2017) leading to students having information overload (Blummer & Kenton, 2014; Rapchak, 2017). In designing this study, my hope was that offering tutorials as part of the instruction would have allowed me to break up the information literacy instruction into chunks and better utilize limited class time to address students' specific concerns. But the class time that was allotted was still not enough for student preference, as stated in multiple student interviews. A revision of future studies of this nature would be necessary to collaborate more with the course instructor for additional class time for information literacy instruction and to consider a different delivery method that focused more on in-person interaction with the student participants.

Methodology. For this action research study, I conducted a convergent mixed methods design where I collected both qualitative and quantitative data. I analyzed each of the types of data separately and then compared the findings of the results (Creswell & Creswell, 2018). After data analysis to ensure trustworthiness of the data, a round of member checking was conducted to allow study participants an opportunity to review the data for accuracy and provide feedback (Candela, 2019; Creswell, 2014). The planned timeline for the study did not allow adequate time needed to analyze all the data, especially after the shift to focus more on qualitative data. By the end of data analysis, it was believed many student participants had moved on from the college (i.e. transferred to

four-year schools or entered workforce), which led to little response in member checking. Out of 14 student participants contacted for member checking, only one student replied. For future studies, it will be imperative to collect contact information outside of school emails for participants.

Researcher subjectivities. Because the researcher is the qualitative research instrument for the study, it is important for the researcher to examine one's own personality, demographic background, traits, and preferences (Tracy, 2020). As such, subjectivities of the researcher can translate to bias in analyzing qualitative data. For this action research study, I tried to recognize my own subjectivities so I would keep an open mind in conducting the study.

REFERENCES

Adams, K. A., & Lawrence, E. K. (2019). *Research methods, statistics, and applications* (2nd ed.) Los Angeles, CA: SAGE Publications, Inc.

Addison, C., & Meyers, E. (2013). Perspectives on information literacy: A framework for conceptual understanding. *Information Research*. Retrieved July 20, 2022 from https://eric.ed.gov/?id=EJ1044643

Aleman, K., & Porter, T. D. (2016). 10-second demos: Boiling asynchronous online instruction down to the essentials with GIF graphics. *Journal of Library & Information Services in Distance Learning*, 10(3-4), 64–78. https://doi.org/10.1080/1533290X.2016.1193414

The American Heritage dictionary of the English language. (4th ed.). (2000). Houghton Mifflin.

American Library Association. (1989). *Presidential committee on information literacy. Final report*. American Library Association. Accessed July 20, 2022, from: https://www.ala.org/acrl/publications/whitepapers/presidential

American Library Association (2019). *Evaluating information: Information literacy*. American Library Association. https://libguides.ala.org/InformationEvaluation/Infolit

American Library Association. (2020). *Framework for information literacy for higher education*. Guidelines, Standards, and Framework. http://www.ala.org/acrl/standards/ilframework

American Library Association. (2021). *Information Literacy*. Welcome to ALA's Literacy Clearinghouse. https://literacy.ala.org/information-literacy/

Askell-Williams, H., Lawson, M. J., & Skrzypiec, G. (2012). Scaffolding cognitive and metacognitive strategy instruction in regular class lessons. *Instructional Science*, 40(2), 413–443. https://doi.org/10.1007/s11251-011-9182-5

Association of College and Research Libraries. (2000). *ACRL standards: Information literacy competency standards for higher education*. Association of College and Research Libraries. https://crln.acrl.org/index.php/crlnews/article/view/19242/2239

Association of College and Research Libraries. (2001). *Objectives for information literacy instruction: A model statement for academic librarians*. Association of College and Research Libraries. https://www.ala.org/acrl/standards/objectivesinformation

Belland, B. (2013). Scaffolding: Definition, Current Debates, and Future Directions. In *Handbook of Research on Educational Communications and Technology* (pp. 505–518). Springer New York. https://doi.org/10.1007/978-1-4614-3185-5_39

Belland, B., Kim, C., & Hannafin, M. J. (2013). A Framework for Designing Scaffolds That Improve Motivation and Cognition. *Educational Psychologist*, 48(4), 243–270. https://doi.org/10.1080/00461520.2013.838920

Belland, B. (2017). *Instructional Scaffolding in STEM Education: Strategies and Efficacy Evidence*. Springer International Publishing. https://doi.org/10.1007/978-3-319-02565-0

Bergstrom-Lynch, Y. (2019). LibGuides by design: Using instructional design principles and user-centered studies to develop best practices. *Public Services Quarterly*, 15(3), 205–223. https://doi.org/10.1080/15228959.2019.1632245

Blakeslee, S (2004). "The CRAAP Test," *LOEX Quarterly*: Vol. 31: No. 3, Article 4. https://commons.emich.edu/loexquarterly/vol31/iss3/4

Blankstein, M., Wolff-Eisenberg, C., & Braddlee. (2019). *Student needs are academic needs: Community college libraries and academic support for student success*. Ithaka S+R. https://doi.org/10.18665/sr.311913

Blummer, B., & M. Kenton, J. (2014). Reducing patron information overload in academic libraries. *College & Undergraduate Libraries*, 21(2), 115–135. https://doi.org/10.1080/10691316.2014.906786

Blummer, B., & Kenton, J. M. (2015). Utilizing web 2.0 technologies for library web tutorials: An examination of instruction on community college libraries' websites serving large student bodies. *Community & Junior College Libraries*, 21(3/4), 101–124. https://doi-org.pallas2.tcl.sc.edu/10.1080/02763915.2016.1190994

Brophy, J. E. (1999). Toward a model of the value aspects of motivation in education: Developing appreciation for. *Educational Psychologist*, 34(2), 75–85. https://doi.org/10.1207/s15326985ep3402_1

Bury, S. (2016). Learning from faculty voices on information literacy: Opportunities and challenges for undergraduate information literacy education. *Reference Services Review*, 44(3), 237–252. https://doi.org/10.1108/RSR-11-2015-0047

Calkins, S., & Kelley, M. (2007). Evaluating internet and scholarly sources across the disciplines: two case studies. *College Teaching*, 55(4), 151–156. https://doi.org/10.3200/CTCH.55.4.151-156

Candela, A. (2019). Exploring the function of member checking. *Qualitative Report*, 24(3), 619–628. https://doi.org/10.46743/2160-3715/2019.3726

Carcary, M. (2020). The research audit trail: Methodological guidance for application in practice. *Electronic Journal of Business Research Methods*, 18(2), 166–177. https://doi.org/10.34190/JBRM.18.2.008

Cejda, B. D. & Hensel, N. (2009). *Undergraduate research at community colleges*. The Council of Undergraduate Research. Retrieved February 3, 2024, from https://www.cur.org/wp-content/uploads/2023/08/Undergraduate_Research_at_Community_Colleges_-_Full_Text_-_Final.pdf

Chang, K. E., Sung, Y. T., & Chen, S. F. (2001). Learning through computer-based concept mapping with scaffolding aid. *Journal of Computer Assisted Learning*, 17, 21–33. https://doi.org/10.1111/j.1365-2729.2001.00156.x

Chapman, G., & Macht, S. (2020). Learning theories. In M. David, & M. Amey (Eds.), *The SAGE encyclopedia of higher education* (Vol. 1, p. 972-975). SAGE Publications, Inc., https://dx.doi.org/10.4135/9781529714395.n358

Chen, J. & Roys, T., (2010). Motivations behind the use of web-based tutorials. http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.1083.6987&rep=rep1&type=pdf

Chen, X. & Simone, S. (2016). *Remedial Coursetaking at U.S. Public 2- and 4-Year Institutions: Scope, Experience, and Outcomes – Statistical Analysis Report*. [Data set]. National Center for Education Statistics. https://nces.ed.gov/pubs2016/2016405.pdf

Chen, G. (2021, July 31). *What is a community college?* Community College Review. http://www.communitycollegereview.com/articles/1

Chi, M. T. H. (1996). Constructing self-explanations and scaffolded explanations in tutoring. *Applied Cognitive Psychology*, 10(7), 33–49.

Cojean, S., & Jamet, E. (2017). Facilitating information-seeking activity in instructional videos: The combined effects of micro- and macroscaffolding. *Computers in Human Behavior*, 74, 294–302. https://doi.org/10.1016/j.chb.2017.04.052

Comstock, E. (2013). Constructivism. In J. Ainsworth (Ed.), *Sociology of education: An a-to-z guide* (Vol. 1, p. 151-152). SAGE Publications, Inc., https://dx.doi.org/10.4135/9781452276151.n87

Contrada, C. (2019). Reference and information literacy in the community college library. *Reference & User Services Quarterly*, 59(1), 12–16.

Contrino, J. L. (2016). Instructional learning objects in the digital classroom: Effectively measuring impact on student success. *Journal of Library & Information Services in Distance Learning*, 10(3-4), 186–198. https://doi.org/10.1080/1533290X.2016.1206786

Cope, M. (2020). Transcribing, coding, and analyzing qualitative data. In *Encyclopedia of Human Geography* (Second Edition, pp. 357–362). Elsevier Ltd. https://doi.org/10.1016/B978-0-08-102295-5.10875-3

Creswell, J. W. (2014). *Research design: Qualitative, quantitative, and mixed methods approaches* (4th ed.). SAGE Publications, Inc.

Creswell, J. W., & Creswell, J.D. (2018). *Research design: Qualitative, quantitative, and mixed methods approaches* (5th ed.). Thousand Oaks, CA: Sage.

Creswell, J. W., and Miller, D. (2000). *Determining validity in qualitative inquiry*. Theory Into Practice, 39(3), 124–130.

Culbreath, M. [Lele4700]. (2016, November 15). *Positionality in qual research* [Video]. YouTube. https://www.youtube.com/watch?v=C9wVgU9Ppk8

D'Angelo, B. J., Jamieson, S., Maid, B. M., & Walker, J. R. (Eds.). (2017). *Information literacy: research and collaboration across disciplines*. The WAC Clearinghouse.

Davis, E.A., & Linn, M. C. (2000). Scaffolding students' knowledge integration: prompts for reflection in KIE. *International Journal of Science Education*, 22(8), 819–837. https://doi.org/10.1080/095006900412293

Davis, P. M., & Cohen, S. A. (2001). *The effect of the Web on undergraduate citation behavior 1996-1999*. Journal of the American Society for Information Science and Technology, 52(4), 309–314.

Delen, E., Liew, J., & Willson, V. (2014). Effects of interactivity and instructional scaffolding on learning: Self-regulation in online video-based environments. *Computers and Education*, 78, 312–320. https://doi.org/10.1016/j.compedu.2014.06.018

Detlor, B., Booker, L., Serenko, A., & Julien, H. (2012). Student perceptions of information literacy instruction: The importance of active learning. *Education for Information*, 29(2), 147–161. https://doi.org/10.3233/EFI-2012-0924

Doyle, M., Foster, B., & Yukhymenko-Lescroart, M. (2019). Initial development of the Perception of Information Literacy Scale (PILS). *Communications in Information Literacy*, 13(2), 205–227. https://doi.org/10.15760/comminfolit.2019.13.2.5

Duesbery, L., & Twyman, T. (2020). *100 questions (and answers) about action research*. SAGE Publications, Inc.

EBSCO. (2024). Full-text database Academic Search Complete. EBSCO. https://www.ebsco.com/products/research-databases/academic-search-complete

Edmonds, W. A., & Kennedy, T. D. (2017). *An applied guide to research designs: quantitative, qualitative, and mixed methods (2nd edition.)*. SAGE Publications, Inc.

Efron, S. E., & Ravid, R. (2020). *Action research in education: a practical guide (Second edition.)*. The Guilford Press.

Elliott, E. S., & Dweck, C. S. (1988). Goals: An approach to motivation and achievement. *Journal of Personality and Social Psychology*, 54(5).

Freeman, S. Pape-Lindstrom, P., Casper, A., & Eddy, S. (2020). Community college students rise to the challenge--meeting the time demands of highly structured courses. *Journal of College Science Teaching*, 49(5), 7–16.

Forster, M. (2015). Refining the definition of information literacy: the experience of contextual knowledge creation. *Journal of Information Literacy*, 9(1), 62–. https://doi.org/10.11645/9.1.1981

Gall, D. (2014). Facing off: Comparing an in-person library orientation lecture with an asynchronous online library orientation. *Journal of Library & Information Services in Distance Learning*, 8(3-4), 275–287. https://doi.org/10.1080/1533290X.2014.945873

Ge, X., Planas, L. G., & Er, N. (2010). A cognitive support system to scaffold students' problem-based learning in a web-based learning environment. *Interdisciplinary Journal of Problem-Based Learning*, 4(1), 30–56. https://doi.org/10.7771/1541-5015.1093

Geisler, C, & Swarts, J. (2019). *Coding Streams of Language*. The WAC Clearinghouse; University Press of Colorado. https://doi.org/10.37514/PRA-B.2019.0230

Gelmon, S. B., Jordan, C. M., Seifer, S. D. (2013). Rethinking peer review: Expanding the boundaries for community-engaged scholarship. *The International Journal of Research on Service-Learning and Community Engagement*. Retrieved November 9, 2022, from https://journals.sfu.ca/iarslce/index.php/journal/article/view/42

Gibbs, G. (2018). Thematic coding and categorizing. In *Analyzing Qualitative Data* (Second ed., pp. 53-74). SAGE Publications Ltd, https://doi.org/10.4135/9781526441867

Gil, E. L. (2017). Maximizing and assessing a one-shot information literacy session: A case study. *Journal of Business & Finance Librarianship*, 22(2), 97–110. https://doi.org/10.1080/08963568.2017.1285748

Goldstein, S. (2020). *Informed societies: why information literacy matters for citizenship, participation and democracy* (Goldstein, Ed.). Facet.

Gonzales, B. (2014). Online tutorials and effective information literacy instruction for distance learners. *Journal of Library & Information Services in Distance Learning*, 8(1-2), 45–55. https://doi.org/10.1080/1533290X.2014.898011

Goodsett, M. (2020). Best practices for teaching and assessing critical thinking in information literacy online learning objects. *The Journal of Academic Librarianship*, 46(5), 102163–. https://doi.org/10.1016/j.acalib.2020.102163

Grassian, E. S., & Kaplowitz, J. R., (2010). Information literacy instruction. In M. Bates, & M. Maack (Eds.), *Encyclopedia of library and information sciences* (p. 2429-2444). CRC Press

Guttman, N., Lev, E., Segev, E., Ayecheh, S., Ziv, L., Gadamo, F., Dayan, N., & Yavetz, G. (2018). "I never thought I could get health information from the Internet!": Unexpected uses of an Internet website designed to enable Ethiopian immigrants with low/no literacy skills to browse health information. *New Media & Society*, 20(7), 2272–2295. https://doi.org/10.1177/1461444817712937

Hannafin, M., Land, S., & Oliver, K. (1999). Open learning environments: Foundations, methods, and models. In C. M. Reigeluth (Ed.), *Instructional-design theories and models* (Vol. 2, p. 115-140). Lawrence Erlbaum Associates.

Hartman, T., & Fial, A. V. (2015). Creating interactive online instruction: The McGoogan Library experience. *Medical Reference Services Quarterly*, 34(4), 407–417. https://doi.org/10.1080/02763869.2015.1082373

Hagstrom, F. (2019). Zone of proximal development. In J. Damico, & M. Ball (Eds.), *The SAGE encyclopedia of human communication sciences and disorders* (Vol. 1, p. 2133-2134). SAGE Publications, Inc., https://dx.doi.org/10.4135/9781483380810.n693

Head, A. J. (2013). Project Information Literacy: What can be learned about the information-seeking behavior of today's college students? *Association of College and Research Libraries*. https://projectinfolit.org/pil-public-v1/wp-content/uploads/2020/08/pil-summary-of-research-findings.pdf

Head, A. & Eisenberg, M. B. (2010). Truth be told: How college students evaluate and use information in the digital age. *SSRN Electronic Journal*. DOI:10.2139/ssrn.2281485

Held, T., & Gil-Trejo, L. (2016). Students Weigh In: Usability Test of Online Library Tutorials. *Internet Reference Services Quarterly*, 21(1-2), 1–21. https://doi.org/10.1080/10875301.2016.1164786

Henry, J., Glauner, D., & Lefoe, G. (2015). A double shot of information literacy instruction at a community college. *Community & Junior College Libraries*, 21(1-2), 27–36. https://doi.org/10.1080/02763915.2015.1120623

Herr, K. & Anderson, G.L. (2005). *The action research dissertation*. Thousand Oaks, CA: Sage.

Herrington, J. & Oliver, R. (2000). An instructional design framework for authentic learning environments. *Educational Technology Research and Development*, 48(3), 23–48. https://doi.org/10.1007/BF02319856

Hill, J. R. & Hannafin, M. J. (2001). Teaching and Learning in Digital Environments: The Resurgence of Resource-Based Learning. *Educational Technology Research and Development*, 49(3), 37–52. https://doi.org/10.1007/BF02504914

Hinchliffe, L. J., Rand, A., & Collier, J. (2018). Predictable information literacy misconceptions of first-year college students. *Communications in Information Literacy*, 12(1), 4–18. https://doi.org/10.15760/comminfolit.2018.12.1.2

Hogan, K. & Pressley, M. (1997). *Scaffolding student learning: instructional approaches and issues*. Brookline Books.

Hollister, C. V. & Coe, J. (2004). Current trends vs. traditional models: Librarians' views on the methods of library instruction. *College & Undergraduate Libraries*, 10(2), 49–63. https://doi.org/10.1300/J106v10n02_05

Hollis, H., Rachitskiy, M., & Van der Leer, L. (2019a). Replication data for: The open test of information literacy (OTIL) with HE add-on subscale. *Harvard Dataverse*, V1, https://doi.org/10.7910/DVN/ZWOGMR

Hollis, H., Rachitskiy, M., & Van der Leer, L. (2019b). The development and face validity testing of the Open Test of Information Literacy with context-specific add-ons: OTIL. *LIBER Quarterly*, 29(1), 1–21. https://doi.org/10.18352/lq.10264

Holloway, I. (1997). *Basic concepts for qualitative research*. London: Blackwell Science.

Holton, D., & Clarke, D. (2006). Scaffolding and metacognition. *International Journal of Mathematical Education in Science and Technology*, 37(2), 127–143. https://doi.org/10.1080/00207390500285818

Homol, L. (2018). Two thousand students, one librarian: Balancing depth and breadth of library instruction for online graduate students. *Journal of Library & Information Services in Distance Learning*, 12(3-4), 250–258. https://doi.org/10.1080/1533290X.2018.1498637

Hottinger, P., Zagami-Lopez, N. M., & Bryndzia, A. S. (2015). FYI for FYE: 20-minute instruction for library orientation. *Reference Services Review*, 43(3), 468–479. https://doi.org/10.1108/RSR-03-2015-0018

Hrycaj, P. (2005). Elements of active learning in the online tutorials of ARL members. *Reference Services Review*, 33(2), 210–218. https://doi.org/10.1108/00907320510597417

Huertas-Bustos, A., López-Vargas, O., & Sanabria-Rodríguez, L. (2018). Effect of a metacognitive scaffolding on information web search. *Electronic Journal of e-Learning*, 16(2), 91–106.

Humphries, B., & Clark, D. (2021). An examination of student preference for traditional didactic or chunking teaching strategies in an online learning environment. I, 29, 1–12. https://doi.org/10.25304/rlt.v29.2405

Ifenthaler, D. (2012). Determining the effectiveness of prompts for self-regulated learning in problem-solving scenarios. *Journal of Educational Technology & Society*, 15(1), 38–52.

Illeris, K. (2012). Learning and Cognitivism. In P. Jarvis & M. Watts (Eds.), *The Routledge International Handbook of Learning* (p. 354–361). Routledge. https://doi.org/10.4324/9780203357385-47

Irving, C. (2020). Critical information literacy. Adult learning and community perspectives. *European Journal for Research on the Education and Learning of Adults*, 11(1), 65–76. https://doi.org/10.3384/rela.2000-7426.rela9146

Jacklin, M., & Robinson, K. (2013). Evolution of various library instruction strategies: Using student feedback to create and enhance online active learning assignments. *Partnership*, 8(1). https://doi.org/10.21083/partnership.v8i1.2499

Johnson, A. P. (2002). *A short guide to action research*. Allyn and Bacon.

Johnston, N. (2010). Is an online learning module an effective way to develop information literacy skills? *Australian Academic and Research Libraries*, 41(3), 207–218. https://doi.org/10.1080/00048623.2010.10721464

Kamii, C. (2016). Constructivism. In D. Couchenour, & J. Chrisman (Eds.), *The SAGE encyclopedia of contemporary early childhood education* (p. 327-330). SAGE Publications, Inc., https://dx.doi.org/10.4135/9781483340333.n87

Kim, M. & Hannafin, M. J. (2011). Scaffolding problem solving in technology-enhanced learning environments (TELEs): Bridging research and theory with practice. *Computers and Education*, 56(2), 403–417. https://doi.org/10.1016/j.compedu.2010.08.024

Kim, M. & Dolan, M. (2015). "Excuse me, but what is a research paper?": Embedded librarian program and information literacy skills of community college students. *Community & Junior College Libraries*, 21(1-2), 53–70. https://doi.org/10.1080/02763915.2016.1149001

Kim, N. J., Belland, B. R., & Walker, A. E. (2018). Effectiveness of computer-based scaffolding in the context of problem-based learning for stem education: Bayesian meta-analysis. *Educational Psychology Review*, 30(2), 397–429. https://doi.org/10.1007/s10648-017-9419-1

Kim, J. Y., & Lim, K. Y. (2019). Promoting learning in online, ill-structured problem solving: The effects of scaffolding type and metacognition level. *Computers and Education*, 138, 116–129. https://doi.org/10.1016/j.compedu.2019.05.001

Kurbanoğlu, S., Spiranec, S., Ünal, Y., Boustany, J., & Kos, D. (2022). *Information Literacy in a Post-Truth Era: 7th European Conference on Information Literacy, ECIL 2021, Virtual Event, September 20-23, 2021, Revised Selected Papers*. Springer International Publishing AG.

Latham, D., Gross, M., Julien, H., Warren, F., & Moses, L. (2022). Community college students' perceptions of their information literacy needs. *College & Research Libraries*, 83(4), 593. doi:https://doi.org/10.5860/crl.83.4.593

Lau, J. (2006). Guidelines on information literacy for lifelong learning. *International Federation of Library Associations and Institutes*. Retrieved July 20, 2022, from: https://www.ifla.org/publications/guidelines-on-information-literacy-for-lifelong-learning

Lee, C. Y., & Chen, M. P. (2009). A computer game as a context for non-routine mathematical problem solving: the effects of type of question prompt and level of

prior knowledge. *Computers & Education*, 52(3), 530–542. doi:10.1016/j.compedu.2008.10.008.

Li, D. D. & Lim, C. P. (2008). Scaffolding online historical inquiry tasks: A case study of two secondary school classrooms. *Computers and Education*, 50(4), 1394–1410. https://doi.org/10.1016/j.compedu.2006.12.013

Library Journal (2017). *First year experience survey: Information literacy in higher education*. Library Journal. https://s3.amazonaws.com/WebVault/research/LJ_FirstYearExperienceSurvey_Mar2017.pdf

Lloyd, A. & Talja, S. (2010). Challenges for future research on learning, literacies and information practices. *Practising Information Literacy*. 357-364. DOI:10.1016/B978-1-876938-79-6.50020-0

Lohman, L. (2024). How can you deliver microlearning when learners don't want it? Designing microlearning for socially oriented learners. *Educational Technology & Society*, 27(1), 147–165. https://doi.org/10.30191/ETS.202401_27(1).SP03

Ma, J. & Baum, S. (2016). *Trends in community colleges: Enrollment, prices, student debt, and completion*. College Board Research. https://research.collegeboard.org/pdf/trends-community-colleges-research-brief.pdf

McCartin, L.F., Evers, S., & Markowski, B. (2019). Student perceptions of information literacy skills and curriculum before and after completing a research assignment. *The Journal of Academic Librarianship*, 45(3), 262–267. https://doi.org/10.1016/j.acalib.2019.03.009

McFadden, D. (2016). Health and academic success: A look at the challenges of first-generation community college students. *Journal of the American Association of Nurse Practitioners*, 28(4), 227–232. https://doi.org/10.1002/2327-6924.12345

McPherson, M. P. & Arbelo Marrero, F. (2021). Latinx community college students on academic probation: Struggles and success. *NACADA Journal*, 41(1), 33–46. https://doi.org/10.12930/NACADA-20-15

Melero, J., Hernández-Leo, D., & Blat, J. (2011). A review of scaffolding approaches in game-based learning environments. *Proceedings of the European Conference on Games Based Learning*, (717–724).

Merriam-Webster Dictionary Online. (2021). *Efficacy*. Merriam-Webster. https://www.merriam-webster.com/dictionary/efficacy

Mertler, C. (2019a). *Action research: Improving schools and empowering educators* (6th Ed.). Thousand Oaks, CA: Sage Publications.

Mertler, C. (2019b). *The Wiley Handbook of Action Research in Education*. John Wiley & Sons, Incorporated.

Mery, Y., Newby, J., & Peng, K. (2012). Performance-based Assessment in an Online Course: Comparing Different Types of Information Literacy Instruction. *Portal* (Baltimore, Md.), 12(3), 283–298. https://doi.org/10.1353/pla.2012.0029

Metzger, M., Flanagin, A., & Zwarun, L. (2003). College student Web use, perceptions of information credibility, and verification behavior. *Computers and Education*, 41(3), 271–290. https://doi.org/10.1016/S0360-1315(03)00049-6

Mikkelsen, S. & McMunn-Tetangco, E. (2014). Guide on the side: Testing the tool and the tutorials. *Internet Reference Services Quarterly*, 19(3-4), 271–282. https://doi.org/10.1080/10875301.2014.948252

Millar, R., Sahoo, S., Yamashita, T., & Cummins, P. A. (2020). Literacy skills, language use, and online health information seeking among Hispanic adults in the United States. *Patient Education and Counseling*, 103(8), 1595–1600. https://doi.org/10.1016/j.pec.2020.02.030

Mojarrabi Tabrizi, Behnam, B., & Saeidi, M. (2019). The effect of soft vs. hard scaffolding on reading comprehension skill of EFL learners in different experimental conditions. *Cogent Education*, 6(1), 1631562–. https://doi.org/10.1080/2331186X.2019.1631562

Moorefield-Lang, H. (2019). Taking your library instruction to YouTube. *Library Technology Reports*, 55(5), 17–.

Mowbray, J. A. & Hall, H. (2021). Using social media during job search: The case of 16–24 year olds in Scotland. *Journal of Information Science*, 47(5), 535–550. https://doi.org/10.1177/0165551520927657

Murray, A. (2015). Academic libraries and high-impact practices for student retention: Library deans' perspectives. *Portal* (Baltimore, Md.), 15(3), 471–487. https://doi.org/10.1353/pla.2015.0027

Murray, A., Ireland, A., & Hackathorn, J. (2016). The value of academic libraries: Library services as a predictor of student retention. *College & Research Libraries*, 77(5), 631–642. https://doi.org/10.5860/crl.77.5.631

Muszkiewicz, R. (2017). Get to know your librarian: How a simple orientation program helped alleviate library anxiety. *Public Services Quarterly*, 13(4), 223–240. https://doi.org/10.1080/15228959.2017.1319780

National Student Clearinghouse. (2024, January 24). *Current term enrollment estimates: Fall 2023*. National Student Clearinghouse Research Center. https://nscresearchcenter.org/current-term-enrollment-estimates/

Nelson, E. (2017). Information literacy needs of community college students in transition: a literature review. *Reference Services Review*, 45(2), 278–285. https://doi.org/10.1108/RSR-11-2016-0078

Ngwe, D., Ferreira, K. J., & Teixeira, T. (2019). The impact of increasing search frictions on online shopping behavior: Evidence from a field experiment. *Journal of Marketing Research*, 56(6), 944–959. https://doi.org/10.1177/0022243719865516

Nichols, L., Hanan, J., & Ranasinghe, M. (2013). Transforming the social practices of learning with representations: a study of disciplinary discourse. *Research in Science Education* (Australasian Science Education Research Association), 43(1), 179–208. https://doi.org/10.1007/s11165-011-9263-0

Nichols, A. F., Crist, E., Sherriff, G., & Allison, M. (2017). What does it take to make discovery a success?: A survey of discovery tool adoption, instruction, and evaluation among academic libraries. *Journal of Web Librarianship*, 11(2), 85–104. doi:10.1080/19322909.2017.1284632

Nichols Hess, A., Greer, K., Lombardo, S. V., & Lim, A. (2015). Books, bytes, and buildings: The academic library's unique role in improving student success. *Journal of Library Administration*, 55(8), 622–638. https://doi.org/10.1080/01930826.2015.1085241

Nichols Hess, A. & Greer, K. (2016). Designing for engagement: Using the ADDIE model to integrate high-impact practices into an online information literacy course. *Communications in Information Literacy*, 10(2), 264–282. https://doi.org/10.15760/comminfolit.2016.10.2.27

Oakleaf, M. (2009). Using rubrics to assess information literacy: An examination of methodology and interrater reliability. *Journal of the American Society for Information Science and Technology*, 60(5), 969–983. https://doi.org/10.1002/asi.21030

O'Connor, L. (2009). Information literacy as professional legitimation: A critical analysis. *Journal of Education for Library and Information Science*, 50(2), 79–89.

Oxford University Press Online. (2021). *Efficacy*. Oxford English Dictionary. https://www.oed.com/view/Entry/59736?redirectedFrom=efficacy#eid

Pass, S. (2004). *Parallel paths to constructivism Jean Piaget and Lev Vygotsky*. Information Age Publications.

Peach, H. [Howard Peach] (2014, June 30). *Coding text using Microsoft Word* [Video]. YouTube. https://www.youtube.com/watch?v=TbjfpEe4j5Y

Pedersen, S. & Liu, M. (2002). The transfer of problem-solving skills from a problem-based learning environment: The effect of modeling an expert's cognitive processes. *Journal of Research on Technology in Education*, 35(2), 303–320. https://doi.org/10.1080/15391523.2002.10782388

Pelech, J., & Pieper, G. (2010). *The comprehensive handbook of constructivist teaching: From theory to practice*. Information Age Publications.

Powell, C. B., & Mason, D. S. (2013). Effectiveness of podcasts delivered on mobile devices as a support for student learning during general chemistry laboratories. *Journal of Science Education and Technology*, 22, 148–170.doi:10.1007/s10956-012-9383-y

Pultz, S., (2018). Flexibility in research design: How unexpected events can improve learning and research. In *Sage Research Methods Cases Part 2*. SAGE Publications, Ltd., https://doi.org/10.4135/9781526435217

Puntambekar, S. & Hubscher, R. (2005). Tools for scaffolding students in a complex learning environment: What have we gained and what have we missed? *Educational Psychologist*, 40(1), 1–12. https://doi.org/10.1207/s15326985ep4001_1

Rademaker, L. L., & Polush, E. Y. (2022). *Evaluation and action research: an integrated framework to promote data literacy and ethical practices*. Oxford University Press.

Radom, R., & Gammons, R. W. (2014). Teaching information evaluation with the five Ws: An elementary method, an instructional scaffold, and the effect on student recall and application. *Reference and User Services Quarterly*, 53(4), 334–347.

Raish, V., & Behler, A. (2019). Library connection: An interactive, personalized orientation for online students. *Journal of Library & Information Services in Distance Learning*, 13(1-2), 129–149. https://doi.org/10.1080/1533290X.2018.1499247

Ramani, G., & Eason, S. (2014). Zone of proximal development. In W. Scarlett (Ed.), *The SAGE encyclopedia of classroom management* (Vol. 2, p. 885-886). SAGE Publications Inc., https://dx.doi.org/10.4135/9781483346243.n374

Rapchak, M. E. (2017). Is your tutorial pretty or pretty useless? Creating effective tutorials with the principles of multimedia learning, *Journal of Library &*

Information Services in Distance Learning, 11:1-2, 68-76, https://doi.org/10.1080/1533290X.2016.1226579

Ream, T., & Parker-Kelly, D. (2016). Expanding library services and instruction through LibGuides. *Medical Reference Services Quarterly*, 35(3), 342–349. https://doi.org/10.1080/02763869.2016.1189790

Reed, K. (2015). Square peg in a round hole? The framework for information literacy in the community college environment. *Journal of Library Administration*, 55(3), 235–248. https://doi.org/10.1080/01930826.2015.1034052

Refaei, B., Kumar, R., & Harmony, S. (2015). Working collaboratively to improve students' application of critical thinking to information literacy skills. *Writing & Pedagogy*, 7(1), 117–137. https://doi.org/10.1558/wap.v7i1.17232

Reynolds, D., & Daniel, S. (2018). Toward contingency in scaffolding reading comprehension: Next steps for research. *Reading Research Quarterly*, 53(3), 367–373. https://doi.org/10.1002/rrq.200

Richardson, J., Caskurlu, S., Castellanos-Reyes, D., Duan, S., Duha, M. S. U., Fiock, H., & Long, Y. (2022). Instructors' conceptualization and implementation of scaffolding in online higher education courses. *Journal of Computing in Higher Education*, 34(1), 242–279. https://doi.org/10.1007/s12528-021-09300-3

Rosenshine, B., & Meister, C. (1992). The use of scaffolds for teaching higher-level cognitive strategies. *Educational Leadership*, 49(7), 26-). Association for Supervision and Curriculum Development.

Rosser, C. & Willis, T. (2016). Flip over research instruction: Delivery, assessment, and feedback strategies for "flipped" library. *Theological Librarianship*, 9(1), 22–27. https://doi.org/10.31046/tl.v9i1.413

Rossman, G., & Rallis, S. (2017). Analyzing and interpreting data. In *An Introduction to Qualitative Research: Learning in the Field* (Fourth ed., pp. 227-263). SAGE Publications, Inc, https://doi.org/10.4135/9781071802694

Rovegno, I., & Dolly, J. (2006). Constructivist perspectives on learning. In D. Kirk, D. Macdonald, & M. O'Sullivan (Eds.), *Handbook of physical education* (p. 242-261). SAGE Publications Ltd, https://dx.doi.org/10.4135/9781848608009.n14

Saldaña, J. (2021). *The coding manual for qualitative researchers* (4E [Fourth edition].). SAGE.

Sample, A. (2020). Historical development of definitions of information literacy: A literature review of selected resources. *The Journal of Academic Librarianship*, 46(2), 102116–. https://doi.org/10.1016/j.acalib.2020.102116

Saunders, L. (2018). Information literacy in practice: Content and delivery of library instruction tutorials. *The Journal of Academic Librarianship*, 44(2), 269–278. https://doi.org/10.1016/j.acalib.2017.12.022

Saye, J. W., & Brush, T. (2002). Scaffolding critical reasoning about history and social issues in multimedia-supported learning environments. *Educational Technology Research and Development*, 50(3), 77–96. https://doi.org/10.1007/BF02505026

Schwandt, T. A. (2001). *Dictionary of qualitative inquiry* (2nd ed.). Thousand Oaks, CA: Sage.

Secovnie, K. O., & Glisson, L. (2019). Scaffolding a librarian into your course: An assessment of a research-based model for online instruction. *Teaching English in the Two-Year College*, 47(2), 119–148.

Seifi, L., Habibi, M., & Ayati, M. (2020). The effect of information literacy instruction on lifelong learning readiness. *IFLA Journal*, 46(3), 259–270. https://doi.org/10.1177/0340035220931879

Sharma, P. & Hannafin, M. J. (2007). Scaffolding in technology-enhanced learning environments. *Interactive Learning Environments*, 15(1), 27–46. https://doi.org/10.1080/10494820600996972

Sherriff, G. (2017). Guide on the Side and LibWizard tutorials side-by-side: How do the two platforms for split-screen online tutorials compare? *Journal of Web Librarianship*, 11(2), 124–142. https://doi.org/10.1080/19322909.2017.1295821

Shin, S. Brush, T. A., & Glazewski, K. D. (2017). Designing and implementing web-based scaffolding tools for technology-enhanced socioscientific inquiry. *Educational Technology & Society*, 20(1), 1–12.

Shin, Y., Kim, D., & Song, D. (2020). Types and timing of scaffolding to promote meaningful peer interaction and increase learning performance in computer-supported collaborative learning environments. *Journal of Educational Computing Research*, 58(3), 640–661. https://doi.org/10.1177/0735633119877134

Shute, V. J. (2008). Focus on formative feedback. *Review of Educational Research*, 78(1), 153–189. https://doi.org/10.3102/0034654307313795

Shvarts, A., & Bakker, A. (2019). The early history of the scaffolding metaphor: Bernstein, Luria, Vygotsky, and before. *Mind, Culture and Activity*, 26(1), 4–23. https://doi.org/10.1080/10749039.2019.1574306

Simons, K. D. & Klein, J. D. (2007). The impact of scaffolding and student achievement levels in a problem-based learning environment. *Instructional Science*, 35(1), 41–72. https://doi.org/10.1007/s11251-006-9002-5

Smit, A. A., van Eerde, H., & Bakker, A. (2013). A conceptualisation of whole-class scaffolding. *British Educational Research Journal*, 39(5), 817–834. https://doi.org/10.1002/berj.3007

Southern Association of Colleges and Schools Commission on Colleges. (2019). *Quality enhancement plans: Lists and summaries since 2007*. SACSCOC. https://sacscoc.org/quality-enhancement-plans/

Stadler, D., Rojas, A., Perrenod, W., & Keyes, C. (2021). Using a scaffolding approach to integrate the information cycle into a library instruction course: A review and small case study. *Journal of Education for Library and Information Science*, 62(2), 119–136. https://doi.org/10.3138/jelis.62.2-2020-0011

Stapleton, L., & Stefaniak, J. (2018). Cognitive constructivism: Revisiting Jerome Bruner's influence on instructional design practices. *TechTrends*, 63(1), 4–5. https://doi.org/10.1007/s11528-018-0356-8

Stavredes, T. (2011). *Effective online teaching: Foundations and strategies for student success*. John Wiley & Sons.

Stavredes, T. M., & Herder, T. M. (2015). Engaging students in an online environment. *Student engagement in higher education: Theoretical perspectives and practical approaches for diverse populations*, 257-269.

Stemmer, J. & Mahan, D. M. (2016). Investigating the relationship of library usage to student outcomes. *College & Research Libraries*, 77(3), 359–375. https://doi.org/10.5860/crl.77.3.359

Stephen, C. (2012). Learning in early childhood. In P. Jarvis & M. Watts (Eds.), *The Routledge International Handbook of Learning* (p. 354–361). Routledge. https://doi.org/10.4324/9780203357385-47

Stevenson, Angus. (2010). *Oxford dictionary of English* (3rd edition). Oxford University Press.

Stiwinter, K. (2013). Using an interactive online tutorial to expand library instruction. *Internet Reference Services Quarterly*, 18(1), 15–41. https://doi.org/10.1080/10875301.2013.777010

Strauss, A. L. (1987). *Qualitative analysis for social scientists*. Cambridge, UK: Cambridge University Press.

Sullivan, L. E. (2009). Scaffolding. In *The SAGE glossary of the social and behavioral sciences* (Vol. 1, pp. 460-460). SAGE Publications, Inc., https://dx.doi.org/10.4135/9781412972024.n2246

Sundin, O., & Johannisson, J. (2005). Pragmatism, neo-pragmatism and sociocultural theory: Communicative participation as a perspective in LIS. *Journal of Documentation*, 61(1), 23–43. https://doi.org/10.1108/00220410510577998

Taber, K. S. (2018). The use of Cronbach's alpha when developing and reporting research instruments in science education. *Research in Science Education (Australasian Science Education Research Association)*, 48(6), 1273–1296. https://doi.org/10.1007/s11165-016-9602-2

Tardiff, A. (2022). Have a CCOW: A CRAAP alternative for the internet age. *Journal of Information Literacy*, 16(1), 119–. https://doi.org/10.11645/16.1.3092

Terrile, V. C., (2021). Finding the answers: Community college students' non-academic information behaviors. *Community College Journal of Research and Practice*, ahead-of-print (ahead-of-print), 1–18. https://doi.org/10.1080/10668926.2021.1985014

Titmus, C. (1989). *Lifelong education for adults: an international handbook* (Titmus, Ed.; First edition.). Pergamon Press.

Tonyan, J., & Piper, C. (2019). Discovery tools in the classroom: A usability study and implications for information literacy instruction. *Journal of Web Librarianship*, 13(1), 1–19. https://doi.org/10.1080/19322909.2018.1530161

Torgerson, C., & Iannone, S. (2020). *Designing microlearning*. Association for Talent Development.

Tracy, S. (2020). *Qualitative research methods: Collecting evidence, crafting analysis, communicating impact* (2nd ed.). Hoboken, NJ: Wiley-Blackwell.

Urquhart, C. (2013). Grounded theory method (gtm). In *Grounded Theory for Qualitative Research: A Practical Guide* (pp. 14-34). SAGE Publications, Ltd, https://doi.org/10.4135/9781526402196

U.S. Department of Education. (2017). *Community college facts at a glance*. U.S. Department of Education. https://www2.ed.gov/about/offices/list/ovae/pi/cclo/ccfacts.html

U.S. Department of Education. (2021). *Beginning postsecondary students (BPS)*. IES – NCES: National Center for Education Statistics. https://nces.ed.gov/surveys/bps/

van de Pol, J., Volman, M., & Beishuizen, J. (2010). Scaffolding in teacher-student interaction: A decade of research. *Educational Psychology Review*, 22(3), 271–296. https://doi.org/10.1007/s10648-010-9127-6

van der Meij, H., & van der Meij, J. (2014). A comparison of paper-based and video tutorials for software learning. *Computers and Education*, 78, 150–159. https://doi.org/10.1016/j.compedu.2014.06.003

Van Epps, A. & Sapp Nelson, M. (2013). One-shot or embedded? Assessing different delivery timing for information resources relevant to assignments. *Evidence Based Library and Information Practice*, 8(1), 4–18. https://doi.org/10.18438/B8S319

van Rooyen, S. (2001). The evaluation of peer-review quality. *Learned Publishing*, 14(2), 85-91. https://doi.org/10.1087/095315101300059413

Van Scoyoc, A. (2003). Reducing library anxiety in first-year students: The impact of computer-assisted instruction and bibliographic instruction. *Reference and User Services Quarterly*, 42(4), 329–341.

Van Scoyoc, A. & Cason, C. (2006). The electronic academic library: Undergraduate research behavior in a library without books. *Portal* (Baltimore, Md.), 6(1), 47–58. https://doi.org/10.1353/pla.2006.0012

Vetter, T. (2017). Descriptive statistics: Reporting the answers to the 5 basic questions of who, what, why, when, where, and a sixth, so what? *Anesthesia and Analgesia*, 125(5), 1797–1802. https://doi.org/10.1213/ANE.0000000000002471

Vygotsky, L. & Cole, M. (1978). *Mind in society: the development of higher psychological processes*. Harvard University Press.

Wallace, S. (2015). *A dictionary of education* (Second edition.). Oxford University Press.

Wang, L., Bruce, C., & Hughes, H. (2011). Sociocultural theories and their application in information literacy research and education. *Australian Academic and Research Libraries*, 42(4), 296–308. https://doi.org/10.1080/00048623.2011.10722242

Wang, R. (2016). Assessment for one-shot library instruction: A conceptual approach. *Portal* (Baltimore, Md.), 16(3), 619–648. https://doi.org/10.1353/pla.2016.0042

Weeks, T. & Putnam Davis, J. (2017). Evaluating best practices for video tutorials: A case study. *Journal of Library & Information Services in Distance Learning*, 11(1-2), 183–195. https://doi.org/10.1080/1533290X.2016.1232048

Willits, F. K., Theodori, G. L., & Luloff, A. (2016). Another look at Likert scales. *Journal of Rural Social Sciences*, 31(3), 126–.

Woitte, M. (2019). How cyclical assessment can guide information literacy instruction to best serve first-year students. *The Journal of Academic Librarianship*, 45(3), 315–317. https://doi.org/10.1016/j.acalib.2019.01.006

Wood, D., Bruner, J. S., & Ross, G. (1976). The role of tutoring in problem solving. *Journal of Child Psychology and Psychiatry*, 17(2), 89–100. https://doi.org/10.1111/j.1469-7610.1976.tb00381.x

Wright, L. (2021). Assessing library instruction: A study of the relationship between attendance, retention, and student success. *The Journal of Academic Librarianship*, 47(5), 102431–. https://doi.org/10.1016/j.acalib.2021.102431

Yelland, N., & Masters, J. (2007). Rethinking scaffolding in the information age. *Computers and Education*, 48(3), 362–382. https://doi.org/10.1016/j.compedu.2005.01.010

Yukhymenko, M., Foster, B., and Doyle, M. (2018). Student perceptions of information literacy skills (PILS) using the ACRL's framework for information literacy for Higher Education. Retrieved November 9, 2022, from https://repository.library.fresnostate.edu/bitstream/handle/10211.3/201211/_Perception%20of%20Information%20Literacy%20Skills%20%28PILS%29.pdf?sequence=1

Zeni, J. (1998). A guide to ethical issues and action research. *Educational Action Research*, 6(1), 9-19. http://dx.doi.org/10.1080/09650799800200053

Zhou, M., & Lam, K. K. L. (2019). Metacognitive scaffolding for online information search in K-12 and higher education settings: a systematic review. *Educational Technology Research and Development*, 67(6), 1353–1384. https://doi.org/10.1007/s11423-019-09646-7

APPENDIX A

INSTITUTIONAL REVIEW BOARD APPROVAL LETTER

To: **Huyen Maluck**

From: **[Provost's name], Provost**

Subject: **IRB approval for doctoral research on information literacy instruction with activities involving instructional scaffolding**

Date: **December 7, 2022**

As you know, Urban Community College in the Southeast does not have a formal Institutional Review Board. However, [President's name], President of Urban Community College in the Southeast and I have reviewed your proposal and approve the protocol that you referenced in your request beginning Spring 2023. We understand that the data collection includes student pre- and post-tests, student surveys, and student interviews. We expect that all identifiable student information will be kept confidential. Please report any necessary changes to the requested protocol to my office.

Your research is of special interest to our college and our students and we look forward to your analysis. Good luck!

Sincerely,

[Provost's signature]

[Provost's name], Ed.D.

Provost

Urban Community College in the Southeast

APPENDIX B

OPEN TEST OF INFORMATION LITERACY (OTIL) QUESTIONS

Ability to discover and access information

HD1. You have read this article and you found it extremely useful:

Smith, P. (2017). The effects of cute kitten imagery on chocolate purchasing. *The Journal of Consumer Behavior*, 5(1), pp. 24-31.

Which of the following would NOT be a good strategy to find more similar articles?

a) Look at the reference list, and try to find some of the articles cited.
b) Search for Smith as an author in the library catalogue.
c) Search in other issues of *The Journal of Consumer Behavior*.
d) I do not know.

HD2. Which of the following options lists the sources from least specialized to the most specialized:

a) Wikipedia entry on Economics / *The Economist* Newspaper / Economics Textbook / *The Journal of Political Economy*.
b) Wikipedia entry on Economics / *The Journal of Political Economy* / *The Economist* Newspaper / Economics Textbook.
c) *The Economist* Newspaper / Wikipedia entry on Economics / *The Journal of Political Economy* / Economics Textbook.

d) I do not know.

Critical thinking ability

HC1. Why can we NOT find everything we need for research by using Google?

a) It does not have a very good search engine and not everything on the web is searchable.
b) Not everything on the web is searchable and it does not always bring back reliable material.
c) It does not have a very good search engine and it does not always bring back reliable material.
d) I do not know.

HC2. You are searching for information on mobile technology and learning for a research paper. Which of the following sources below is a peer-reviewed, scholarly source?

a) An article from *Journal of Educational Technology*.
b) An article from *Harvard Magazine*.
c) A book review from the *Journal of Aesthetic Education*.
d) I do not know.

Ability to use and create information

HU1. Which of the following sources would produce a more accurate insight into the behavior of a potential audience?

a) Survey questionnaires and interviews.
b) Catalogues and magazines.
c) Textbooks.
d) I do not know.

HU2. You are asked to write an essay on the abortion debate. What information would you include in your paper?

a) Research on the scientific advancements in abortion technology.
b) Research on the benefits of abortion and why the 'pro-choice' campaign should be supported.
c) Research on the benefits and detriments of abortion and directions for future research.
d) I do not know.

Ability to share and communicate information

HS1. What is the correct sequence of the elements in a research article?

a) Abstract / Bibliography / Introduction / Material and Methods / Results / Discussion / Conclusions.
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.

HS2. An abstract is which of the following?

a) A list of all the sources cited in an article.
b) A list of acknowledgements of funding sources.
c) A summary of an article.
d) I do not know.

Understanding ethical issues surrounding information

HE1. You read an article on your topic for a research paper. In which of the following instances are you NOT required to cite the material in your paper?

a) When you include a whole paragraph from the article in your paper.
b) When you re-write the information in the article in your own words.
c) When you read the information and decided it was not relevant to your research paper.
d) I do not know.

HE2. 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 encyclopedia 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 don't know

APPENDIX C

PERCEPTIONS OF INFORMATION LITERACY SKILLS (PILS) SURVEY QUESTIONS

Information Use Scale

On the following page are six ways of thinking about information, or information "frames." Please rate your experience and your perception of your skills, understanding, and feelings about these information "frames" using the scale and definitions below. If you would like to refer to the definitions while completing the survey, you may open these definitions in another window using this link: https://goo.gl/AFYlFv

(1) Novice: A novice information user is:

- Beginning to understand search
- Relying on general search tools (such as Google)
- Somewhat comfortable with basic search techniques (keyword searching)
- Unsure how to expand or refine results
- A passive member of their discipline
- Unfamiliar with the citation style of the discipline
- Unsure how to use existing information to create new information

(2) Advanced Novice

(3) Emerging: An emerging information user is:

- Beginning to understand the power of information as a tool and a commodity

- Using the basic functions of discipline-specific information retrieval tools, without or only a little understanding of the concepts that these tools are built on
- A passive member of the scholarly conversation of their field, but are interested in become an active member
- Using information legally and ethically, but occasionally plagiarizes unintentionally because of poor citation or paraphrasing skills
- Experiencing some anxiety around citations and using the ideas of others to build their own argument
- Using information without context and considering overall value-added

(4) Advanced Emerging

(5) Developing: A developing information user is:

- Using information skills comfortably and with frequency
- Using a range of tools to search out information, though they may be less likely to seek out new tools
- Expanding and narrowing their search results using an understanding of search tool concepts
- An active creator of information and contributor to their field, but may feel some anxiety or discomfort as they grow in this role
- Able to use information ethically and legally
- Developing the ability to synthesize multiple sources and perspectives into a new information product

(6) Advanced Developing

(7) Expert: An expert information user is:

- An experienced and confident researcher
- Using the advanced functions of discipline-specific, multidisciplinary, and interdisciplinary tools to find information
- Using a strong understanding of the concepts that search tools are built on
- A contributor to the scholarly conversation of their field
- An ethical and legal information user
- Managing their rights as information creators
- Evaluating information within its context and in its relationship with other information resources

Authority Is Constructed and Contextual

Please rate your experience and your perception of your skills, understanding, and feelings about the following:

	(1) Novice	(2) Advanced Novice	(3) Emerging	(4) Advanced Emerging	(5) Developed	(6) Advanced Developed	(7) Expert
I understand how to select and evaluate authoritative sources to develop credibility for their arguments.							
I evaluate research ideas and practices to identify potential biases.							
I feel comfortable with conflicting opinions in research and evaluating the evidence that supports differing perspectives.							
I recognize that there are many ways to define authority on a topic or in a discipline.							
I feel comfortable calling myself a researcher, and am confident as an authority on my topic.							
I value diversity of worldviews and opinions within my discipline.							

Information Creation as a Process

Please rate your experience and your perception of your skills, understanding, and feelings about the following:

	(1) Novice	(2) Advanced Novice	(3) Emerging	(4) Advanced Emerging	(5) Developed	(6) Advanced Developed	(7) Expert
I understand how to choose and appropriate format (like a graph, image, text, or video) for communicating information.							
I know how to use different types of information formats to communicate the same message in different ways.							
I understand that different information tools (like a research paper, a poster, or a presentation) have their own benefits and limitations.							
I understand that different types of information have different values or uses, depending on the situation.							
I enjoy discovering and using new tools for communicating and creating information.							

Information has Value

Please rate your experience and your perception of your skills, understanding, and feelings about the following:

	(1) Novice	(2) Advanced Novice	(3) Emerging	(4) Advanced Emerging	(5) Developed	(6) Advanced Developed	(7) Expert
I know how to use the work of others to support my ideas by using proper citation techniques.							
I can define and know how to use intellectual property laws and copyright.							
I can define and know how to use fair use and open access resources.							
I understand that my personal information has value online, and make informed choices to manage my preferences for how this information is used.							
I value the information of others and respect the time and energy it takes to create it.							
I feel comfortable as an active creator in the information economy, rather than as a passive consumer.							

Research as Inquiry

Please rate your experience and your perception of your skills, understanding, and feelings about the following:

	(1) Novice	(2) Advanced Novice	(3) Emerging	(4) Advanced Emerging	(5) Developed	(6) Advanced Developed	(7) Expert
I can determine the appropriate extent of assigned research projects.							
I can organize and combine the information I locate into a coherent conclusion.							
I can develop simple research questions.							
I can develop critical research questions.							
I am persistent when seeking information.							
I curious when seeking information.							

Scholarship as Conversation

Please rate your experience and your perception of your skills, understanding, and feelings about the following:

	(1) Novice	(2) Advanced Novice	(3) Emerging	(4) Advanced Emerging	(5) Developed	(6) Advanced Developed	(7) Expert
I understand why I am responsible for citing information I use.							
I understand when to cite information.							
I understand how to cite information.							
I seek out multiple perspectives when developing an understanding of a topic.							
I critically evaluate the perspectives that I use to develop an understanding of my topic.							
I recognize my work is a contribution to the body of research surrounding my topic.							
I present my work as a contribution to the body of research around my topic.							

Searching as Strategic Exploration

Please rate your experience and your perception of your skills, understanding, and feelings about the following:

	(1) Novice	(2) Advanced Novice	(3) Emerging	(4) Advanced Emerging	(5) Developed	(6) Advanced Developed	(7) Expert
I can define the scope of an assignment.							
I can create search strategies to locate and collect the information I need.							
I can identify potential kinds of sources (newspaper article, laws, policies, statistical data) when searching for information.							
I can identify the appropriate search tool (search engine, library catalog, or database) to use when searching for information.							
I recognize the ways in which search tools organize information.							
I can refine the results of a search by using different search terms.							
I understand that the first search may not always produce the desired result.							
I recognize that not all information sources are going to be relevant.							
I understand that at times I may need to seek assistance when searching for information.							
I remain persistent when faced with a challenging search.							
I keep an open mind when searching for resources.							

APPENDIX D

INTERVIEW PROTOCOL

Interview Protocol Form

Student Interview Protocol

Institutions: _____

Interviewee (Name): _____

Interviewer: _____

Other Topics Discussed: _____

_____

Documents Obtained: _____

_____

_____

Post Interview Comments or Leads:

_____

Information Literacy Interviews

Introductory Protocol

To facilitate my note-taking, I would like to record our conversation today. Please sign the release form. For your information, only I will be privy to the recording which will be eventually destroyed after it is transcribed. In addition, you must sign a form devised to

meet our human subject requirements. Essentially, this document states that: (1) all information will be held confidential, (2) your participation is voluntary and you may stop at any time if you feel uncomfortable, and (3) I do not intend to inflict any harm. Thank you for agreeing to participate.

I have planned this interview to last no longer than one hour. During this time, I have several questions that I would like to cover. If time begins to run short, it may be necessary to interrupt you in order to push ahead and complete this line of questioning.

Introduction

You have volunteered to speak with me today because you have participated in the information literacy intervention for the ENG 101 course. My research project as a whole focuses on the improvement of information literacy instruction, with particular interest in understanding how students are engaged in this activity, how they find information, and how they use resources. My study does not aim to evaluate your techniques or experiences. Rather, I am trying to learn more about students' information literacy skills that will help improve student learning on campus.

A. Interviewee Background

How long have you been …

_____ a college student?

_____ at this institution?

Interesting background information on interviewee:

What is your field of study? _____

What is the degree you wish to seek?

_____

Q1. Tell me a little about the research assignments you have done in the last year.

Q2. How did your information searching process change after attending the instructions?

Q3. Let's talk about research for course assignments—the kinds of assignments that require you to find outside sources. What do you consider about a source when you are deciding to use it, how do you know if the information is "good" to use, or not, whatever that may mean to you?

Q4. What is your definition of “research?”

Q5. Describe your information searching process. Where do you begin when searching for information?

Q6. What did you think about the search process?

Q7. Concerning your ability to discover and access information, are you a good information searcher? Why or why not? Can you describe your biggest challenges or difficulties in finding and accessing information?

Q8. Which aspects of the information literacy intervention did you find most beneficial?

Q9. Which tutorial content did you perceive to be especially important and useful?

Q10. What would you say is the most difficult part of the course-related research? Did the instructional scaffolding make any difference with your challenges?

Q11. How will you apply what you learned during information literacy intervention to your future research?

Q12. Did you have difficulties in navigating through the tutorials?

Q13. What questions or concerns, if any, do you still have about finding sources for the ENG 101 paper?

Q14. Provide any other feedback or suggestions for improving the ENG 101 information literacy intervention.

APPENDIX E

RESEARCH STUDY CONSENT FORM

UNIVERSITY OF SOUTH CAROLINA

CONSENT TO BE A RESEARCH SUBJECT

ACTION RESEARCH ON INSTRUCTIONAL SCAFFOLDING IN INFORMATION LITERACY INSTRUCTION FOR COMMUNITY COLLEGE STUDENTS

KEY INFORMATION ABOUT THIS RESEARCH STUDY:
You are invited to take part in a research study being done by Huyen Maluck. I am a doctoral candidate in the Department of Education, at the University of South Carolina. The University of South Carolina, Department of Education is sponsoring this research study. The purpose of this study is to evaluate the effect of scaffolded instruction on students' information literacy skills. You are being asked to take part in this study because you are enrolled in the ENG 101 course. This study is being done at Urban Community College in the Southeast and will have 20 subjects.

Below is a short summary of this study to help you decide if you want to be in this study. More details about this study are listed later in this form.

- *The expected duration of the subject participation is one semester (Spring 2023). The procedures of the research are as followed: pretest, intervention (i.e. tutorials and class discussions), posttest, surveys, and interview.*
- *There are no foreseeable risks or discomforts;*
- *There is not monetary benefit, but subjects may benefit in learning information literacy skills.*

PROCEDURES:
If you agree to be in this study, you will:

1. Take a brief pretest.
2. Participate in intervention activities throughout the semester (i.e. tutorials and class discussions).
3. Take a brief posttest.
4. Complete surveys/interview about your perceptions of information literacy.
5. Have your interview recorded to be sure the study team has correct notes about the details you provide.

DURATION:
Being in the study involves 4 visits over 14 weeks. Each study visit will last about 20 minutes.

RISKS/DISCOMFORTS:
Focus Groups: Others in the group will hear what you say and could tell others. The study team cannot promise what you say will be kept private, but they will ask that you, and all other group members, keep what is shared private.

Loss of Confidentiality: There is the risk that what you share or your name will not remain private. The study team will take many steps to keep what you share and your name private. Details about those steps are given later in this consent form.

BENEFITS:
You may benefit from taking part in this study by learning information literacy skills.

COSTS:
There will be no costs to you for being in this study other than any costs related to getting to and from the research site (i.e. your classroom).

PAYMENT TO PARTICIPANTS:
You will not be paid for being in this study.

COLLECTION OF IDENTIFIABLE PRIVATE INFORMATION:
Information about you may be used for future research studies or may be shared with other researchers; however, this only will be done after identifiers linking the information to you are removed. This will be done without further consent from you.

USC STUDENT PARTICIPATION:
Participation in this study is voluntary. You are free not to participate, or to stop participating at any time. Your participation, non-participation, and/or withdrawal will not affect your grades or your relationship with your professors, college(s), or the University of South Carolina.

If research credit is required for successful course completion, other alternative means for obtaining credit are available and you may discuss these options with your course instructor.

CONFIDENTIALITY OF RECORDS:
Information obtained about you during this research may be published, but you will not be identified. Information that is obtained concerning this research that can be identified with you will remain confidential to the extent possible within State and Federal law. All records in South Carolina are subject to subpoena by a court of law. The investigators associated with this study, the sponsor, and the Institutional Review Board will have access to identifying information. Study information will be securely stored in locked files and on password-protected computers.

VOLUNTARY PARTICIPATION:
Taking part in this research study is voluntary. You are free not to take part, or to stop taking part at any time. If you withdraw from this study, the information you already have given to the study team will be kept private. If you wish to withdraw from the study, please call or email the main researcher who is listed on this form.

Concerns about your rights as a research subject are to be directed to, Lisa Johnson, Associate Director, Office of Research Compliance, University of South Carolina, 1600 Hampton Street, Suite 414D, Columbia, SC 29208, phone: (803) 777-6670 or email: LisaJ@mailbox.sc.edu.

I have been given a chance to ask questions about this research study and my questions have been answered. If I have any more questions about my taking part in this study, or a study related injury, I am to contact Huyen Maluck at (803) 738-7812 or email dieph@email.sc.edu.

I agree to take part in this study. I have been given a copy of this form for my own records.

If you wish to be in the study, you should sign below.

_____ _____

Signature of Subject / Participant Date

_____ _____

Signature of Qualified Person Obtaining Consent Date