Student Engagement in One-Shot Library Instruction

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A R T I C L E   I N F O

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A B S T R A C T

As technology has increased students’ access to both high and low quality information, the need for effective information literacy instruction has become more apparent. However, many librarians still struggle to solidify their place, and their value, in the instructional landscape of their parent institution. This struggle persists while library instruction for students remains limited to one 50–75 min session (one-shot instruction). Indeed, the notion that information literacy can be taught in one session is preposterous for most librarians. Nevertheless, as this constraint persists, librarians must work to improve the results students achieve within the one-shot model. This research explores ways in which one-shot library instruction might be bolstered through the promotion of higher levels of student engagement. This research utilizes a pre and post-test analytical model to compare an experimental, learner-centered approach to library instruction, supplemented with clickers, to a more traditional pedagogical approach. Statistical analyses show that while both the experimental and control groups witnessed significant improvement from pre to post-test, there was no statistically significant difference between these two approaches. These findings elicit further, perhaps more troubling, questions regarding the level of engagement possible in one-shot library instruction.

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INTRODUCTION

For several decades now, librarians have pointed to the proliferation of information technology as both the answer to their information prayers and the bane of their instructional existence. Library users have access to a seemingly endless supply of digital information via the internet, which is great for academic research. However, as the maze of information grows the best path for any given academic need becomes more complex and equally less apparent. Users are no longer confined to their library's local collections. Traditional publishing companies are no longer the only entities publishing. This all further solidifies the user’s need for an evaluative skill set that helps them to determine: (a) what information resources exist, (b) where these resources are located, and (c) which of these sources are authoritative and most relevant to their topic of research. At a glance, this seems simple enough, but still librarians struggle to reach their students — undergraduates especially.

Research has identified several factors that influence student success in the realm of higher education. Unfortunately for colleges and universities many of these factors exist outside their effective scope of influence. Of course, this fact does not let them off the hook in relation to appeasing the requirements of accrediting agencies or the public at large who has grown increasingly more sensitive to the return on investment (ROI) and overall value of higher education. For these reasons it is important to identify and actively support those factors that buttress student success and exist within an institution’s effective scope of influence. For Kuh, Kinzie, Buckley, Bridges, and Hayek (2006) and Kuh, Kinzie, Schuh, and Whitt (2005), the key is engagement. The concept of engagement encompasses several organizational and environmental factors that have been linked to student success. Additionally, engagement is an element of the collegiate environment on which institutions can exert significant influence.

As is the case with their parent institutions, academic libraries are constantly under pressure to exhibit greater value to their users. One way in particular that libraries have chosen to exhibit such value is through library-based instructional efforts aimed at increasing both the visibility of library offerings as well as the information literacy of users (Kuh & Gonyea, 2003). This being the case, it makes sense for librarians to focus on engagement in ways similar to traditional teaching faculty (Kuh & Gonyea, 2003).

This research investigated the comparative impact of two separate instructional approaches on engagement and student success among students who received library instruction. The first approach took the form of a traditional, teaching-centered, lecture-based model. The second approach was a learner-centered approach fashioned using the research of the foremost scholars in the areas of student engagement and success. Classes of students enrolled in a required first-year writing course were randomly selected for exposure to one of the pedagogical
approaches outlined above. Using a pre/post-test method of assessment, data pertaining to student success as defined by their mastery of important information literacy concepts, as well as student engagement and general library usage, were collected and compared across classes (at both the micro and macro levels). In the end, this research was geared toward answering the question of whether or not a clicker-augmented, learner-centered approach to one-shot library instruction is more effective than a more traditional lecture-based, teacher-centered approach.

**LITERATURE REVIEW**

Libraries are service organizations. Their service consists of, at the most foundational level, putting people in contact with information. The more effective they are in accomplishing this mission, the greater value they are able to show. Moreover, in this age of increased scrutiny and oversight, coupled with strained budgets, being able to show value is the key to organizational support and longevity.

With regard to the academic library, there are several perspectives one might employ when attempting to exhibit such value. One might point to collections, and more specifically the depth and breadth of said collections. *Do these collections support the university’s missions of teaching, learning, and research?* One might also point to the access that a library provides to its collections. Further, tied in with access is both technology and service. The technology must be user-friendly, but there must also be a layer of user support that is provided by library personnel.

Over the past 20 years, the traditional approach to library service provision, which consisted mainly of point-of-need service, was expanded to include what has become known as *information literacy training, bibliographic instruction,* or simply *library instruction.* This introductory-level instruction is meant to augment the point-of-need services provided by libraries through basic training in resource usage and digital information retrieval and evaluation techniques (Massis, 2011). With this expansion of library service, librarians have yet another means of exhibiting library value to stakeholders, specifically with regard to their impact on student success (Massis, 2011).

**DEFINING STUDENT SUCCESS**

The concept of student success is relatively simple at its core. Students attend schools, so their success is dependent upon their academic performance during that matriculation. Indeed, student success has often been linked to measures of individual academic achievement, as well as institutional achievement (Kuh et al., 2006). Standardized test scores, grade point average (GPA), and earned credit hours have become standard measures of student success at the individual level, while measures such as retention, persistence, graduation rates, and the number of degrees awarded over time have helped to define student success at the institutional level (Christenson, Reschly, & Wylie, 2012; Kuh et al., 2005, 2006; Mullin, 2012).

However, as the pressure on colleges and universities to show value has increased, so too has the complexity of measuring student success (e.g., Habley, Bloom, & Robbins, 2012; Kuh et al., 2006). More than any single metric, research points to several personal, social, and environmental factors that shape student success (e.g., Habley, Bloom, & Robbins, 2012; Kuh et al., 2006). For example, research is expanding our understanding of how *pre-college experiences,* as well as the unique perspectives of social subgroups, affect students’ educational experiences. The traditional, or what might be called average, student of the past is no longer the sole focus of most systems of education. In addition to the rudimentary student divisions, such as undergraduate, graduate, and distance learners, educators are now also concerned with low-achieving students, at-risk students, non-traditional (adult) students, and English as second language (ESL) students (just to name a few).

In light of these shifts in perspective, traditional measures of student success, such as GPA and graduation rates, have been expanded to highlight those skills that students should gain or improve through their studies, such as: “writing, speaking, critical thinking, scientific literacy, and quantitative skills and more highly developed levels of personal functioning represented by self-awareness, confidence, self-worth, social competence, and sense of purpose” (Kuh et al., 2006, p. 6). Of course, knowing the outcome of educational practices is meaningless without understanding how to influence such outcomes. Moreover, the factors that potentially influence student success seem innumerable. One must consider, for example, pedagogical approach (Hall, Wilson, & Sanger, 2012; Horpspool & Lange, 2012); instructional support (Cho & Karp, 2013); campus culture (Brown & Burdsal, 2012); student advising (Young-Jones, Burt, Dixon, & Hawthorne, 2013); and mentorship (Felder, 2010; Neuhauser & Weber, 2011). Couple this with the wide variety of student types previously mentioned and it becomes difficult to see the forest for the trees.

**THE IMPORTANCE OF ENGAGEMENT**

As previously mentioned, the work of Kuh et al. (2005, 2006) outlines a complex framework of student success within which must be recognized several personal and environmental elements that can potentially affect student success. In particular, their “What Matters to Student Success” framework depicts the journey toward student success not as a straight path, but as a complex maze of possible paths and obstacles. A student’s *pre-college experiences,* at the micro level are tinged by culture, training, economics, or any number of other social, political, or institutional influences. These pre-college experiences lead into an environment divided, perhaps unevenly, between student behaviors and institutional conditions. As one might guess, *student behaviors* can refer to: study habits, peer involvement, interaction with faculty, time on task, motivation, or several alternative possibilities. At the same time, *institutional conditions* can include: first-year experience, academic support, campus environment, peer support, pedagogical approaches, and numerous other factors.

At the nexus of student behaviors and institutional conditions one finds *engagement* (Kuh et al., 2006). The concept of *engagement* has gained considerable traction as a key factor affecting student success. Kuh et al. (2005, 2006) have noted that it makes sense for institutions to focus on engagement, as it is often the only environmental element on which they can exert direct influence. That is to say, while universities rarely have an opportunity to exert direct influence on their students during the formative years leading up to enrollment, they do have opportunities to directly affect student success by facilitating more positive contact between students and the academic environment through engagement.

Over the past twenty years scholars have identified several institutional practices that lead to higher levels of student engagement and success (e.g., Astin, 1999; Chickering & Gamson, 1991; Chickering, Gamson, & American Association for Higher Education, W., D., 1987; Kuh et al., 2005; Pace, 1984). In the preface to their volume, *Handbook of Research on Student Engagement,* Christenson et al. (2012) identified what they refer to as a “general consensus regarding a number of facets of engagement theory” (p. v). This consensus proclaims that engagement is not only about attendance, performance, or persistence in the academic setting, but also about something of a culture2 that helps to define those academic settings in which students thrive intellectually. Citing several authors,3 they surmised that: “Engagement is a

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2 Whether these elements coalesce to form a unique “culture of learning” or an “organizational culture” that is more conducive to learning than others remains to be seen. However, the consensus among scholars cited herein points to such a phenomenon, whereby seemingly independent social and organizational elements come together in a way that allows for higher levels of student achievement.
3 Appleton, Christenson, & Furlong, 2008; Newmann, Wehlage, & Lamborn, 1992.
multidimensional construct — one that requires an understanding of affective connections within the academic environment (e.g., attendance, participation, effort, pro-social behavior)” (Christenson et al., 2012). Further, they noted that engagement should not be understood as an in- nate state of a student, but rather as an “alterable state of being that is highly influenced by the capacity of school, family, and peers to provide consistent expectations and supports for learning” (Christenson et al., 2012, pp. v–vi).

CULTIVATING ENGAGEMENT IN THE CLASSROOM

As noted by Kuh et al. (2006), the literature on engagement features a strong sociocultural influence that defines its elemental aspects in cultural terms (e.g., Bean, 1980, 1983; Berger & Milem, 2000; Braxton & Lien, 2000; Braxton, Shaw Sullivan, & Johnson, 1997; Hurtado, Carter, & Spuler, 1996; Kuh & Love, 2000; Tinto, 1993). That is to say, when one discusses engagement, they are invariably discussing social con- structs, as well as the existence of, and a student’s connection to, a discipline academic culture.

In searching for ways to make the classroom experience more engaging some instructors have turned to personal response systems (or audience response systems), such as clickers or web polling applications. Many have noted that these systems promote higher levels of participation, or interaction, between instructors and their students through on-the-fly classroom polling that can facilitate discussion by identifying knowledge gaps through prompt and focused feedback on the subject matter at hand (Chan & Knight, 2010; Connor, 2011; Dallaire, 2011; Dean, 2013; Draper & Brown, 2004; Hoppenfeld, 2012; Keogh & Wang, 2010). As Dean (2013) has noted, clicker feedback is often more helpful from an instructor’s perspective because, unlike the occasion when one asks a single student to answer a question, class polling puts levels of comprehension across the entire class on display. Higher levels of attendance, as well as a more open and honest dialog between instructor and student (free from negative social influence), have also been attributed to the use of clickers in the classroom (Chan & Knight, 2010; Connor, 2011; Keogh & Wang, 2010).

Of course, there are challenges associated with clickers as well. Hoppenfeld (2012) noted that reliance on remote devices can prove challenging when technical failures occur, or students forget to bring their technology to class. For these reasons, web-based polling solutions may prove a better fit (Hoppenfeld, 2012). Chan and Knight (2010) noted that clickers may not provide an ideal platform for quizzes and tests, as the time-limits often placed on polling intervals can overwhelm some students who feel overly rushed to answer. Dallaire (2011) also found that there is such a thing as clicker overkill; using clickers too often in the classroom can leave learners annoyed. Draper and Brown (2004) identified several other potential problems, namely the amount of time involved in technology setup. The incorporation of technology into the classroom can actually distract students from what is being taught. There are also situations when the technology is integrated in ways that provide little benefit — such as taking attendance.

METHODOLOGY

While many scholars have trumpeted the value of clickers, there is not a great amount of statistically sound empirical consensus on the matter. Many articles that have been written on the matter are observational in nature, relying solely on descriptive rather than inferential statistics. While these articles do indeed provide value, their findings are not as meaningful, from a research perspective, as others that use more rigorous hypothesis testing aimed at exposing statistical significance. At the same time, the few studies that do use this more rigorous approach lend credence to the methods used in this study. In particular, the pre and post-test design of Shapiro and Gordon (2012), which utilized a t-test for comparative analysis, takes advantage of methods that produce more meaningful and conclusive results.

Bearing previous research in mind, this study aimed to answer the question: Is a clicker-augmented, learner-centered approach to one-shot library instruction more effective than traditional, lecture-based library instruction? The null hypothesis for this study simply states that there is no difference between the experimental and control methods of library instruction. Further, it is hypothesized that:

H1. Clicker-based, learner-centered library instruction will result in higher levels of engagement.

H2. Higher levels of engagement will coincide with higher degrees of information literacy skill acquisition and library usage.

To study the comparative impact of the traditional versus learner-centered instructional approaches proposed herein, a quasi-experimental, quantitative research design is used. A pre/post-test method generates comparable data at the individual level that focuses on the analytical categories of: information literacy skill acquisition, library usage, as well as classroom engagement. Paired and independent sample t-tests are utilized to determine inter and intra-group differences. More specifically, these tests can determine if statistically significant gains are made by students from pre to post-test (in both groups independently), as well as if statistically significant differences exist across the experimental (clicker) and control (non-clicker) groups.

DESIGNING USER-CENTERED INSTRUCTION

As previously mentioned, the purpose of this study was to determine the effectiveness of a more engaging, learner-centered approach to one-shot library instruction. Building off a traditional approach to one-shot library instruction that utilizes a combined lecture and practice approach, the research of Kuh et al. (2005, 2006) was used to design a learner-centered approach to library instruction. Specifically, several elements of the instructional environment became the focus of improve- ment, namely: student–faculty contact, cooperation among students, active learning, prompt feedback, time on task, high expectations, and respect for diverse talents and ways of learning (Kuh et al., 2006). The thinking here was that if these elements help to increase engagement in the traditional classroom setting, then it seems reasonable to believe that library instruction might also benefit from such conditions.

Since traditional instruction already includes practical elements, this remained the same between both the two approaches used in this study. That is to say, both instructional protocols involved students using their own computer to explore library web interfaces throughout the session. However, the learner-centered approach designed for this study was specifically meant to increase: (a) the level of interaction between instructor and learner, (b) the level of class discussion, and (c) the level of student collaboration. For the purposes of this study, radio frequency (RF) clickers were used in conjunction with proprietary software that allowed the instructor to create a custom slide show to facilitate interactive polling via the clicker technology. A series of questions, based on set of learning outcomes,4 were projected in front of the class.5 These questions were designed to be ambiguous in nature, so as to pro- mote discussion around key concepts. The idea was to promote controlled chaos that would lead to higher levels of interaction and critical thinking than is typically seen in more traditional instructional approaches.

SAMPLE POPULATION

The first-year writing program at the University of Alabama has a history of close partnership with the library. Every year librarians

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4 In the months leading up to this study, a series of learning outcomes were derived for department-wide use in formulating library instruction. These learning outcomes were based on ARL’s Information Literacy Standards, Practices, and Outcomes, a copy of which can be found in Appendix A.

5 Transcripts of these slides can be found in Appendix B.
engage in library instruction for over one hundred sections of the English 102 (EN102) course. So it made sense to solicit participation for this research through the established instructional request pathways already in place. In particular, when contacted about providing library instruction for a section of EN102, the course instructor was asked if they would like to participate in this research. Of course, the benefits of participation, namely the ability to show active assessment of student learning outcomes for accreditation purposes, were also marketed to instructors.

The subject population consists of both male and female first-year undergraduate students who were receiving library instruction as part of first-year writing requirements linked to the EN102 course (N = 1499). From this population, this research aimed to secure a targeted sample of approximately 500 students who had not previously received library instruction. However, varying levels of support from teaching faculty resulted in an initial sample comprised of only 261 students. After eliminating individual cases that provided only partial data, a final sample size of 138 students was attained. This represents 9.2% of the target population and about 28% of the target sample. Moreover, external validity becomes a concern when dealing with a potential sample size.

In addition to finding willing participants, it was also imperative to devise assessment methods that would prove precise and accurate. As the engagement literature suggests, an engaged student should: perform better academically, feel more connected to their university’s environment or culture, as well as feel more involved and interested in the instruction they are receiving. So the focus of this research was to gather and analyze data related to the analytical categories of: information literacy; library usage; and perceived classroom engagement. In other words, this study sought to first determine if students were acquiring (i.e., learning) the information literacy skills being taught. Secondly, were students using the library and its resources more as a result of the instructional session, as engagement theory would dictate (if students are engaged)? Lastly, did students experience those elements that typify the engaged, learner-centered classroom?

A pre-test and post-test method was used to gather data of interest. In looking to previous research that utilized similar methods the author noted two shortcomings that limited the reliability and accuracy in those instances. Firstly, tests used were often too simplistic in judging student learning. Many times these tests asked a maximum of 10 multiple-choice questions that one with little library experience would likely answer correctly. Further, these tests often relied solely on factual recall, rather than incorporating some critical thinking elements (via scenario-based questions). Secondly, in analyzing the data gathered, it has often been the case that only descriptive statistics were used to outline research findings. And while descriptive statistics can provide insight, such an approach cannot render conclusive results in hypothesis testing. Instead, one must utilize statistical tests that allow for more robust comparisons between study participants.

If one cannot say that a statistically significant degree of difference exists between two groups, mere descriptive differences are of little consequence. With these concerns in mind, the authors set about the creation of a challenging pre and post-test. These tests utilized 20 questions to gauge information literacy skill acquisition, 11 questions to measure library usage, and nine (9) questions to measure perceived levels of classroom engagement. It was believed that this approach to the pre and post-tests would provide a greater depth of understanding, with regard to the impact of library instruction, than the typical 10-question test one can find on many libraries’ websites.

For the purposes of this research and, specifically, the statistical methods being used, it was important to match a student’s pre and post-tests. It was also important to differentiate the experimental from the control groups, as well as identify any students who did not fit the desired profile, which in this case simply meant a respondent with the class rank of freshman who had never received library instruction. A series of five questions at the beginning of the pre and post-tests would accommodate these requirements. First, to identify the student, without overriding the anonymous nature of student participation, each student was asked to create a unique identifier using the last two letters of their first and last name with the last four digits of their Campus-Wide Identification number (CWID). Second, participants were asked to identify their course section by the day/time and instructor for a drop-down menu that listed all EN102 sections that had agreed to participate in the study. Students were also asked to identify their class rank, which helped the researchers filter out any non-freshman participants.

Multiple choice and true/false questions that focus on information recall were buttressed by information literacy scenarios that incorporate elements of critical thinking not typically seen in this type of research. Therefore recalling a simple fact from the instructional session was not enough to perform well on this study’s pre and post-tests. Instead, a student was required to consider research scenarios that featured several plausible answers, of which only one was correct. If the student had truly mastered the skills necessary to utilize library resources, the correct answer should stand out. Finally, the time table for the post-test was extended until two weeks after students had attended the instructional session. It was believed that this method would render a more accurate picture of information literacy skill acquisition than the post-test method most often used (which involves administering such tests immediately following the session).

As with any test, there may be legitimate concerns as to the content of the questions used in this research. However, the pre and post-test used in this project were designed to meet the specific needs and goals of the first-year writing program already in place, as well as more general learning objectives modeled on the ACRL information literacy standards. Working from these learning outcomes, a working group of four librarians formulated each test question with a specific instructional protocol in mind.

DATA AND ANALYSIS

Each of the thirty sessions identified for participation were randomly assigned to receive one of the two instructional approaches. To control for differences in the instructional personality and technique that one might expect to see across multiple librarian instructors, only one librarian was chosen to teach the instructional sessions involved in this research. In addition, focusing only on the EN102 first-year writing course helped to control for differences in ability and behavior patterns one might expect to see across the spectrum of class rankings, as well as among those students who had previously attended library instructional sessions.

The researchers worked very closely with English instructors to ensure the proposed research protocol was observed. Students were required to complete the pre-test as a homework assignment a week before attending library instruction. This gave the researchers time to check the number of pre-tests returned for each class before they arrived for library instruction. As previously mentioned, post-tests were administered, also as homework, two weeks after students attended library instruction. A copy of the post-test can be seen in Appendix B. Please note, the only difference between the pre and post-test is the addition of nine questions at the end of the test that measure the level of classroom engagement experienced by each respondent.

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6 It is worth noting that while a vast majority of students must take part in the first-year writing program, library instruction is not required element of said program. Instead, each English instructor made the final decision as to whether or not students received library instruction.

7 Post-test is shown in Appendix C.
A commercial, web-based survey tool was utilized to create a pre and post-test administrable via the web. This survey tool also allowed for a no-hassle means of gathering and storing research data. At the end of the semester, pre and post-test data was exported from the survey tool into a spreadsheet format for manipulation, and then transferred to SPSS for final statistical analyses. Participants in the experimental group were separated from those in the control group and each student’s pre-test was matched to their post-test using the unique identifiers mentioned earlier. A simple binary scoring system was used to score a majority of the questions. A score of one (1.0) was given for correct answers to questions for which there was only one right answer, as well as when a yes/no question was answered with a “yes” (e.g., the question about whether or not the student had ever previously received library instruction). Contrarily, a score of zero (0.0) was given to incorrect answers and to denote “no” in yes/no situations. For questions that utilized a range of possible answers (e.g., library usage and classroom engagement questions), an evenly- weighted scale was used for scoring purposes. For the section establishing library usage, a four-points scale was used that ranged from zero (0.0) to one (1.0). For the section that measured classroom engagement, a five-point scale was used that ranged from negative one (−1.0) to one (1.0). Each of the substantive sections, which include library usage, information literacy skill acquisition, and classroom engagement, were scored separately. An average score was calculated for each of these sections on both the pre and post-tests. Paired t-tests were then used to compare intragroup, individual changes in these three categories, while unpaired t-tests were used to compare outcomes between the experimental and control groups.

**FINDINGS**

From the library instructor’s point of view, the use of clickers as an engagement tool changed the classroom environment in several notable ways. Students had stronger, more audible, reactions to polling results, especially when only a low percentage of the class chose the correct answer to a question. For questions in which a majority chose the correct answer, students often nodded their heads in approval. While our data did not indicate a statistically significant engagement effect in those classes using clickers, anecdotally speaking, the clickers did create a palpable buzz in the classroom. The use of clickers also allowed the instructor to streamline concepts that normally required in-depth demonstrations using the more traditional lecture-based approach. For this reason, clicker-enhanced instructional sessions seemed more efficient when exploring concepts, leaving more time at the end of discussion for assigned tasks, student questions, and one on one research consultations.

Examining the descriptive statistics provided in Table 1 reveals a few important aspects of the sample. First, as one can see, the means for both groups (clicker and non-clicker) for each variable category are relatively indistinct. With regard to library usage, the minimum values shown in Table 1 illustrate that, at the time of both the pre-test and post-test, there are respondents who have not used the library and its services. However, as indicated by the mean of each of the library usage categories, there was indeed an increase in library usage from pre to post-test for both the clicker (45%) and non-clickers (60%).

Examining pre and post-test scores relating to respondents’ information literacy skill acquisition, one can see fairly low levels of understanding in the pre-test phase. The mean pre-test information literacy scores for both groups were below 50%, with the lowest scoring individual in the non-clicker group answering only five percent (5%) of the questions correctly. In the clicker group the lowest scoring respondent answered just 25% of the questions correctly. However, one can readily see a great deal of improvement in respondents’ understanding of information literacy concepts from pre to post-test for both groups. Low scores in this category increased by 15% for the clicker group, and by 30% for the non-clicker group. In addition, the mean scores for both of these groups increased by over 10% from pre to post-test.

In examining the data shown in Table 1, it would appear that both library usage as well as information literacy skill acquisition did increase from pre to post-test (see Usage Difference and Literacy Difference for average increases). However, comparatively speaking, the non-clicker group shows greater gains in library usage while the clicker group shows higher average gains in information literacy skill acquisition. Average library usage increased by 70% for the non-clicker group and only 60% for the clicker group. In addition, average information literacy skill acquisition increased only 22% for the clicker group, while the non-clicker group registered a 23% gain. Lastly, the non-clicker group registered classroom engagement scores over 24% higher than the clicker group.

Table 2 shows average library usage, information literacy skill acquisition, and classroom engagement as revealed by pre-test responses, and broken down into their constituent elements. Overall, the clicker group shows marginally higher levels of library usage and information literacy skill acquisition (less than 1% and 3% respectively). Surprisingly, members of non-clicker groups indicated experiencing classroom engagement at levels of nearly 7% higher than the clicker groups. In fact, the only engagement category for which the clicker group indicated higher level of engagement related to learning about library resources. Tables 3 and 4 delve deeper into the change seen from pre to post-test for each of the independent variables. In Table 3, elements of overall library usage are listed in order of average mean change (across groups) from pre to post-test. Once again, the non-clicker group shows a greater increase in overall library usage, besting the clicker group in seven usage categories. Not surprisingly, using the library to find journal articles and books are the activities that increased the most for both groups.

With regard to information literacy skill acquisition, Table 4 shows that the clicker group saw the highest rate of improvement across three of six learning outcomes, while the non-clicker group saw higher improvement in two outcomes. For both groups, the top three areas of improvement were associated with constructing search strings, locating print and e-resources, and understanding the library’s self-service tools. Interestingly, neither group experienced improvement in selecting relevant keywords.

Superficially, the gains described above would suggest that traditional library instruction produces better results than the experimental approach used in this study. However, only more rigorous statistical analyses can tell us whether: (a) gains seen from pre to post-test for each group are statistically significant, and (b) any statistically significant differences exist between the clicker and non-clicker groups. Results from a paired sample t-test speak to the first issue. As Table 5 shows, the gains seen from pre to post-test in both the library usage and information literacy skill categories are statistically significant for both the clicker and non-clicker groups. Such significance is signified by a p-value ("Sig.") of less than 0.05. This means that one can be confident that in 95% of cases, such improvement could not result from simple, random variation. In other words, one can feel confident that each approach to library instruction used in this study is having a positive effect on students in its own right.

To address the matter of statistically significant differences between clicker and non-clicker groups, an independent samples t-test is used. As Table 6 shows, no statistically significant difference existed between the clicker and non-clickers groups at the time of the pre-test. This is important because it helps to establish that indeed both groups started from the same "place," as pertaining to their library usage and understanding of information literacy concepts. Second, this t-test also shows that no statistically significant difference exists between the clicker and non-clicker groups, with regard to increases from pre to post-test in library usage, information literacy skill acquisition, or other categories.
perceived levels of classroom engagement. Therefore, the null hypothesis cannot be disproven. Nevertheless, intra-group gains suggest further study in this area is warranted.

**DISCUSSION**

To summarize, a paired sample t-test shows statistically significant intra-group gains, from pre to post-test, with regard to library usage and information literacy skill. This indicates that library instruction led to improvement in both groups from pre to post-test. However, independent samples t-tests revealed no statistically significant inter-group differences. That is to say that each approach (clicker and non-clicker) seems to be effective in its own right, but neither can be classified as a better approach than the other within the current one-shot context. Moreover, as stated above, these findings cannot disprove the null hypothesis posed herein. However, it is worth noting that these findings do provide some value. In fact, they seem to hint at another important issue that has been discussed in the literature of librarianship — the ineffectiveness of one-shot sessions in serving the information literacy needs of students (Burke, 2011; Burkhardt, 2007; Owusu-Ansah, 2001).

The fact is that, in this research, two completely different pedagogical approaches were used in the provision of library instruction to first-year students. One approach was the typical “show and tell” approach to library instruction that asks students to quietly follow along as the librarian discusses and demonstrates how to use library resources to conduct research. The second approach was fashioned by the latest research in student success and engagement. Even if the learner-centered approach was executed poorly, one would expect at the very least to see some statistically significant difference between the information literacy skill acquisition of the two groups. So why is there no difference?

There are a few plausible explanations for these findings. For example, the library instructor involved with this research had never used clickers in the classroom before, so perhaps he did not get the full benefit that might have been achieved with more experience. That being said, the clicker approach used here was just as effective as the non-clicker approach, which raises another possibility. It may be the case that there is simply no difference between the two approaches, as pertaining to educational benefit. However, considering the fact that the clicker approach was built upon pedagogical concepts for which evidentiary support is growing, it seems unlikely that this small study should disprove more extensive studies. Therefore, one might posit that differences between library instruction and the traditional classroom experience, as seen across academic departments, explains these

### Table 1
Pre and post-test — descriptive statistics.

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<th>Non-clicker</th>
<th>Clicker</th>
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<tbody>
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<td></td>
<td>n</td>
<td>Minimum</td>
</tr>
<tr>
<td>Library usage (pre-test)</td>
<td>69</td>
<td>0.00</td>
</tr>
<tr>
<td>Information literacy (pre-test)</td>
<td>69</td>
<td>0.05</td>
</tr>
<tr>
<td>Library usage (post-test)</td>
<td>69</td>
<td>0.00</td>
</tr>
<tr>
<td>Information literacy (post-test)</td>
<td>69</td>
<td>0.35</td>
</tr>
<tr>
<td>Change in library usage</td>
<td>69</td>
<td>0.00</td>
</tr>
<tr>
<td>Change in information literacy</td>
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<td>0.25</td>
</tr>
<tr>
<td>Classroom engagement</td>
<td>69</td>
<td>1.00</td>
</tr>
</tbody>
</table>

### Table 2
Library usage, information literacy, & engagement at post-test — descriptive statistics.

<table>
<thead>
<tr>
<th></th>
<th>Non-clicker</th>
<th>Clicker</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>Minimum</td>
</tr>
<tr>
<td>Library usage</td>
<td>69</td>
<td>0.00</td>
</tr>
<tr>
<td>Get coffee</td>
<td>69</td>
<td>0.00</td>
</tr>
<tr>
<td>Print paper</td>
<td>69</td>
<td>0.00</td>
</tr>
<tr>
<td>Speak with librarian</td>
<td>69</td>
<td>0.00</td>
</tr>
<tr>
<td>Access reserve item</td>
<td>69</td>
<td>0.00</td>
</tr>
<tr>
<td>Search for books</td>
<td>69</td>
<td>0.00</td>
</tr>
<tr>
<td>Search for journal articles</td>
<td>69</td>
<td>0.00</td>
</tr>
<tr>
<td>Use ILL services</td>
<td>69</td>
<td>0.00</td>
</tr>
<tr>
<td>Group project</td>
<td>69</td>
<td>0.00</td>
</tr>
<tr>
<td>Receive tutoring</td>
<td>69</td>
<td>0.00</td>
</tr>
</tbody>
</table>

### Information literacy

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>Minimum</td>
</tr>
<tr>
<td>Selecting relevant keywords</td>
<td>69</td>
<td>0.00</td>
</tr>
<tr>
<td>Constructing search strings</td>
<td>69</td>
<td>0.00</td>
</tr>
<tr>
<td>Using database features</td>
<td>69</td>
<td>0.00</td>
</tr>
<tr>
<td>Determining relevance &amp; reliability</td>
<td>69</td>
<td>0.00</td>
</tr>
<tr>
<td>Locating print &amp; E-resources</td>
<td>69</td>
<td>0.33</td>
</tr>
<tr>
<td>Understanding library's self-service tools</td>
<td>69</td>
<td>0.29</td>
</tr>
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</table>

### Engagement

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
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</tr>
<tr>
<td>Resources</td>
<td>69</td>
<td>1.00</td>
</tr>
<tr>
<td>Services</td>
<td>69</td>
<td>1.00</td>
</tr>
<tr>
<td>Interest</td>
<td>69</td>
<td>1.00</td>
</tr>
<tr>
<td>Value</td>
<td>69</td>
<td>1.00</td>
</tr>
<tr>
<td>Interaction with instructor</td>
<td>69</td>
<td>1.00</td>
</tr>
<tr>
<td>Interaction with peers</td>
<td>69</td>
<td>1.00</td>
</tr>
<tr>
<td>Feedback</td>
<td>69</td>
<td>1.00</td>
</tr>
<tr>
<td>Enjoyment</td>
<td>69</td>
<td>1.00</td>
</tr>
</tbody>
</table>
findings. Indeed, while this explanation comes without needed details, there may be more to infer.

Consider that the most apparent difference between the traditional classroom experience and library instruction is the degree of contact an instructor has with the student. The fact is that most libraries are still working within the one-shot framework. Moreover, when one considers the defining characteristics of engagement outlined in the literature—namely that engagement is a cultural phenomenon formed at the library level is the answer. Of course, as this research would suggest, a proper library as a first to final year of matriculation. Additional

CONCLUSION & NEXT STEPS

While this study was not able to show how a learner-centered approach to library instruction can prove more effective than traditional approaches, the lack of conclusive findings raises additional, important questions about the very nature of library instruction. It has been noted in the literature that one-shot instructional sessions likely do not fulfill the information literacy needs of students. Further this study lends peripheral, empirical support to such notions.

The facts are that, in this study, students did not perform at a high level even after receiving library instruction. The average post-test score hovered around 55% for both groups. Considering this performance is based on learning associated with only one 50-min instructional session, perhaps such low scores are understandable. However, if the library wants its users to get the most out of its facilities, services, and resources, a more profound impact on information literacy is needed. If changes cannot be imposed at the institutional level, such as adding information literacy course requirement for all students, then perhaps a more robust effort to promote engagement at the library level is the answer. Of course, as this research would suggest, that engagement cannot be effectively driven by one-shot library instruction alone. More likely, there must be a concerted effort to create a proper library as third place in which engagement is driven by both targeted, as well as point-of-need, instructional efforts.

Ideally, future research in this area might take the form of a more in-depth longitudinal study that can trace student progress toward information literacy from their first to final year of matriculation. Additional study is also needed to determine comparative benefits of one-shot versus multi-shot or credit-bearing information literacy courses. Further, how does the concept of engagement figure into providing more effective instructional support within such frameworks?

### Table 3
Change in library usage — descriptive statistics.

<table>
<thead>
<tr>
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<th></th>
<th>Clicker</th>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>Minimum</td>
<td>Maximum</td>
<td>Mean</td>
<td>Std. deviation</td>
<td>n</td>
<td>Minimum</td>
<td>Maximum</td>
</tr>
<tr>
<td>Search for journal articles</td>
<td>69</td>
<td>−0.33</td>
<td>1.00</td>
<td>0.261</td>
<td>0.351</td>
<td>69</td>
<td>−0.33</td>
<td>0.67</td>
</tr>
<tr>
<td>Search for books</td>
<td>69</td>
<td>−0.33</td>
<td>0.67</td>
<td>0.159</td>
<td>0.259</td>
<td>69</td>
<td>−0.33</td>
<td>0.67</td>
</tr>
<tr>
<td>Use ILL services</td>
<td>69</td>
<td>−0.67</td>
<td>1.00</td>
<td>0.164</td>
<td>0.326</td>
<td>69</td>
<td>−0.33</td>
<td>0.67</td>
</tr>
<tr>
<td>Check email</td>
<td>69</td>
<td>−0.67</td>
<td>1.00</td>
<td>0.116</td>
<td>0.351</td>
<td>69</td>
<td>−0.67</td>
<td>0.67</td>
</tr>
<tr>
<td>Speak with librarian</td>
<td>69</td>
<td>−0.67</td>
<td>0.67</td>
<td>0.082</td>
<td>0.276</td>
<td>69</td>
<td>−0.67</td>
<td>0.00</td>
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<tr>
<td>Print paper</td>
<td>69</td>
<td>−0.33</td>
<td>1.00</td>
<td>0.130</td>
<td>0.244</td>
<td>69</td>
<td>−0.33</td>
<td>1.00</td>
</tr>
<tr>
<td>Group project</td>
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<td>0.67</td>
<td>0.063</td>
<td>0.276</td>
<td>69</td>
<td>−0.33</td>
<td>0.67</td>
</tr>
<tr>
<td>Get coffee</td>
<td>69</td>
<td>−0.67</td>
<td>1.00</td>
<td>0.082</td>
<td>0.393</td>
<td>69</td>
<td>−0.67</td>
<td>0.67</td>
</tr>
<tr>
<td>Access reserve item</td>
<td>69</td>
<td>−0.67</td>
<td>0.67</td>
<td>0.092</td>
<td>0.255</td>
<td>69</td>
<td>−0.67</td>
<td>0.67</td>
</tr>
<tr>
<td>Meet friends</td>
<td>69</td>
<td>−0.67</td>
<td>1.00</td>
<td>0.097</td>
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<td>69</td>
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<td>1.00</td>
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<tr>
<td>Receive tutoring</td>
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<td>0.251</td>
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<td>−0.33</td>
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</table>

### Table 4
Achievement of learning outcomes — descriptive statistics.

<table>
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<tr>
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<th>Non-clicker</th>
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<th></th>
<th></th>
<th>Clicker</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>Min</td>
<td>Max</td>
<td>Mean</td>
<td>Std. deviation</td>
<td>n</td>
<td>Min</td>
<td>Max</td>
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<tr>
<td>Constructing search strings</td>
<td>69</td>
<td>−1.00</td>
<td>1.00</td>
<td>0.232</td>
<td>0.546</td>
<td>69</td>
<td>−1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Locating print &amp; E-resources</td>
<td>69</td>
<td>−0.50</td>
<td>0.83</td>
<td>0.189</td>
<td>0.255</td>
<td>69</td>
<td>−0.33</td>
<td>0.67</td>
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<td>Understanding library’s self-service tools</td>
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<td>−0.42</td>
<td>0.71</td>
<td>0.089</td>
<td>0.254</td>
<td>69</td>
<td>−0.43</td>
<td>0.43</td>
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<td>Using database features</td>
<td>69</td>
<td>−1.00</td>
<td>1.00</td>
<td>0.051</td>
<td>0.404</td>
<td>69</td>
<td>−0.50</td>
<td>1.00</td>
</tr>
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<td>Determining relevance &amp; reliability</td>
<td>69</td>
<td>−0.67</td>
<td>0.67</td>
<td>0.078</td>
<td>0.311</td>
<td>69</td>
<td>−0.34</td>
<td>0.67</td>
</tr>
<tr>
<td>Selecting relevant keywords</td>
<td>69</td>
<td>−0.50</td>
<td>0.50</td>
<td>0.000</td>
<td>0.321</td>
<td>69</td>
<td>−0.50</td>
<td>0.50</td>
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</table>

### Table 5
Paired-sample t-test.

<table>
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<tr>
<th></th>
<th>Mean</th>
<th>Std. deviation</th>
<th>Std. error mean</th>
<th>95% Confidence interval of the difference</th>
<th>t</th>
<th>df</th>
<th>Sig. (2-tailed)</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Lower</td>
<td>Upper</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Library usage (clicker)</td>
<td>−.068</td>
<td>.136</td>
<td>.016</td>
<td>−.101</td>
<td>−.036</td>
<td>68</td>
<td>.000</td>
</tr>
<tr>
<td>Information literacy (clicker)</td>
<td>−.121</td>
<td>.164</td>
<td>.020</td>
<td>−.160</td>
<td>−.081</td>
<td>68</td>
<td>.000</td>
</tr>
<tr>
<td>Library usage (non-clicker)</td>
<td>−.102</td>
<td>.099</td>
<td>.012</td>
<td>−.126</td>
<td>−.078</td>
<td>68</td>
<td>.000</td>
</tr>
<tr>
<td>Information literacy (non-clicker)</td>
<td>−.109</td>
<td>.135</td>
<td>.016</td>
<td>−.142</td>
<td>−.077</td>
<td>68</td>
<td>.000</td>
</tr>
</tbody>
</table>
APPENDIX A. LEARNING OUTCOMES FOR EN102

• Select relevant keywords for a research topic in order to develop a targeted search strategy.
• Construct valid search strings in order to search Scout (EDS) successfully.
• Utilize database special features in order to use Scout (EDS) flexibly and effectively.
• Distinguish between different types of resources in order to select relevant and reliable sources.
• Locate articles and books in print and electronic format in order to retrieve diverse types of resources in a variety of formats.
• Know how to use self-service tools, Ask A Librarian and the location of and services available at the Information Desk.

APPENDIX B. SLIDE TEXT

B.1. SLIDE 1

Welcome to EN102 Library Instruction.

B.2. SLIDE 2

Which word best describes this image? (Picture of the surface of Mars.)

1. Desert
2. Surreal
3. Colorful
4. Extraterrestrial

B.3. SLIDE 3

Which of the following search strings would perform the best narrow search?

1. Global warming
2. Global warming policies
3. “Global warming” AND policies
4. “Global warming”
5. What were some of the ground-breaking policies to counteract global warming suggested at the international summit in Kyoto?

B.4. SLIDE 4

Your search has returned over 400,000 results. How can you filter and improve your search?

1. Date limiter
2. Subject limiter
3. Scholarly (peer-review) limiter
4. All of the above
5. None of the above

B.5. SLIDE 5

What type of source is this? (Picture of the cover of The Journal of American History.)

1. Popular
2. Scholarly or peer-reviewed
3. Free website
4. Library database

B.6. SLIDE 6

What information do you need to locate a specific book in the library?

1. Call number, title, and location
2. Location, author, and title
3. Author, title, and call number
4. Location, title, and publication year
5. Publication year, title, and author

B.7. SLIDE 7

You’re working on a big research paper where you need 20 sources, how would you retain and manage these library articles?

1. Email them to yourself
2. Download the PDFs
3. Print them
4. Save them to your Scout account
5. Use your photographic memory

B.8. SLIDE 8

You have a research question; how can you get help with finding resources?

1. Use the Ask-A-Librarian link on the website
2. Call the library
3. Text the library
4. All of the above
5. None of the above

APPENDIX C. POST-TEST FOR LIBRARY INSTRUCTION

<table>
<thead>
<tr>
<th></th>
<th>F</th>
<th>Sig.</th>
<th>t</th>
<th>df</th>
<th>Sig. (2-tailed)</th>
<th>Mean difference</th>
<th>Std. error difference</th>
<th>95% Confidence interval of the difference</th>
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</thead>
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<tr>
<td>Levene’s test for equality of variances</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Library usage (pre-test)</td>
<td>0.624</td>
<td>0.431</td>
<td>−1.047</td>
<td>136</td>
<td>0.297</td>
<td>−0.034</td>
<td>0.032</td>
<td>−0.098 0.030</td>
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<tr>
<td>Information literacy (pre-test)</td>
<td>3.487</td>
<td>0.064</td>
<td>0.761</td>
<td>136</td>
<td>0.448</td>
<td>0.014</td>
<td>0.018</td>
<td>−0.022 0.050</td>
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<tr>
<td>Library usage (post-test)</td>
<td>0.056</td>
<td>0.813</td>
<td>−1.981</td>
<td>136</td>
<td>0.050</td>
<td>−0.073</td>
<td>0.037</td>
<td>−0.147 0.000</td>
</tr>
<tr>
<td>Information literacy (post-test)</td>
<td>3.152</td>
<td>0.078</td>
<td>0.966</td>
<td>136</td>
<td>0.336</td>
<td>0.014</td>
<td>0.015</td>
<td>−0.015 0.044</td>
</tr>
<tr>
<td>Change in library usage</td>
<td>0.987</td>
<td>0.322</td>
<td>−1.692</td>
<td>136</td>
<td>0.093</td>
<td>−0.040</td>
<td>0.023</td>
<td>−0.086 0.007</td>
</tr>
<tr>
<td>Change in information literacy</td>
<td>3.152</td>
<td>0.078</td>
<td>0.034</td>
<td>136</td>
<td>0.973</td>
<td>0.001</td>
<td>0.021</td>
<td>−0.041 0.042</td>
</tr>
</tbody>
</table>

3. How often do you visit the library to:\[\text{a. Yes}\]
\[\text{b. No}\]

4. You have a question about how to use one of the library’s databases.
   Where should you go for help?
   \[\text{a. www.ask.lib.ua.edu}\]
   \[\text{b. The Information Desk}\]
   \[\text{c. The Circulation Desk}\]
   \[\text{d. Any of the above}\]
   \[\text{e. None of the above}\]

5. You can use Bama Cash to print documents at the library:
   \[\text{a. True}\]
   \[\text{b. False}\]

6. Wikipedia should never be used during the research process:
   \[\text{a. True}\]
   \[\text{b. False}\]

7. If your professor asks you to avoid web resources and instead use scholarly journal articles, then you should not use any articles pulled from the library’s databases:
   \[\text{a. True}\]
   \[\text{b. False}\]

8. Your professor wants you to write a persuasive paper about the potential connection between childhood vaccinations and developmental disorders. You remember watching a news report by Dr. Sanjay Gupta that discussed the possible link between autism and the mercury-based preservative used in some vaccines. Which group of keywords would be best for an initial search within a library database?
   \[\text{a. Childhood, Vaccine, “Developmental Disorder”}\]
   \[\text{b. Vaccine, Autism, “Sanjay Gupta”}\]
   \[\text{c. Vaccinations, Autism, Persuasive}\]
   \[\text{d. Mercury, Vaccine, Disorder}\]
   \[\text{e. Mercury, Vaccine, Childhood}\]

9. Which of the following search strings would perform the best narrow search?
   \[\text{a. Death penalty}\]
   \[\text{b. Death penalty regulations}\]
   \[\text{c. “Death penalty” AND policies}\]
   \[\text{d. “Death penalty”}\]
   \[\text{e. The correlation between the death penalty and crime rates}\]

10. The best place to start a search for library resources is:
    \[\text{a. Catalog}\]
    \[\text{b. Scout}\]
    \[\text{c. E-journals}\]
    \[\text{d. Google Scholar}\]
    \[\text{e. 1st floor of Gorgas Library}\]

11. You’re working on a big research paper and you’re stuck. You don’t know where to look to find your last two sources. True or false: You can text a librarian for help.
    \[\text{a. True}\]
    \[\text{b. False}\]

12. You are writing a paper on how participation in organized sports affects grades. Your professor requires you to use scholarly sources. You find a great article in Sports Illustrated by a Dr. J. Williams, a top researcher in the area of educational development and sports. True or false: This is an acceptable article to use for your paper?
    \[\text{a. True}\]
    \[\text{b. False}\]

13. True or false: If an item’s record within the catalog does not have a linked PDF file, the only way to obtain a full-text copy is by requesting the item via interlibrary loan (ILL).
    \[\text{a. True}\]
    \[\text{b. False}\]

14. How can you filter and improve your search results?
    \[\text{a. Date limiter}\]
    \[\text{b. Subject limiter}\]
    \[\text{c. Scholarly (peer-review) limiter}\]
    \[\text{d. All of the above}\]
    \[\text{e. None of the above}\]

15. True or false: You can download library articles at home.
    \[\text{a. True}\]
    \[\text{b. False}\]

16. What information do you need to locate a specific book?
    \[\text{a. Call number, title, location}\]
    \[\text{b. Location, author, title}\]
    \[\text{c. Author, title, call number}\]
    \[\text{d. Location, title, publication year}\]
    \[\text{e. Publication year, title, author}\]

17. True or false: If you pick a few good keywords you should be able to find all the resources you need without performing more than your first search.
    \[\text{a. True}\]
    \[\text{b. False}\]

18. True or false: All of the library’s resources can be found through searching Scout.
    \[\text{a. True}\]
    \[\text{b. False}\]

19. True or false: Most of the library’s databases, as well as Scout, can produce works cited entries for you.
    \[\text{a. True}\]
    \[\text{b. False}\]

20. True or false: Digital copies of scholarly articles can be obtained from other universities through interlibrary loan (ILL).
    \[\text{a. True}\]
    \[\text{b. False}\]

21. You’re working on a research paper that requires 20 scholarly article sources. What’s the best way to retain and manage these items once they are found?
    \[\text{a. Email them to yourself}\]
    \[\text{b. Download the PDF file for each}\]
    \[\text{c. Print each of them}\]
    \[\text{d. Save each to your Scout account}\]
    \[\text{e. Use your photographic memory}\]

22. Your professor handed out an article in class last week, but you have lost it. The article’s title is listed in your syllabus and you want to know if any of the library’s databases have the article. Which tool/service/link on the library’s website should you use to begin your search?
    \[\text{a. E-journals}\]
    \[\text{b. Scout}\]
    \[\text{c. Classic Catalog}\]
    \[\text{d. Interlibrary Loan}\]
    \[\text{e. Digital Collections}\]

23. If you need in-depth help on how and where to find sources for a research project, your best bet is to: 
   "This question utilizes a 4-point Likert scale that included the answer options: More than once per week, A few times per semester, Maybe once per semester, and Never."
a. Ask for tutoring at the Center for Academic Excellence
b. Set up a research consultation with a librarian
c. Ask for help at the Writing Center
d. Ask your professor to change your topic
e. Lastly, tell us a little about your library instruction experience

24. How well do the following descriptions match what you experienced during your library instructional session?10
   a. I learned a lot about the library’s resources
   b. I learned a lot about the library’s services
   c. I was interested in what the library instructor had to say
   d. The instructional session relayed valuable information
   e. I interacted a great deal with the library instructor
   f. I interacted a great deal with my fellow classmates
   g. Class discussion helped to improve the quality of the instructional session
   h. Feedback given during the session helped the library instructor tailor the session to class need
   i. I enjoyed the instructional session

REFERENCES


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10 This question utilizes a 5-point Likert scale that included the answer options: Totally disagree, Disagree, Neither agree nor disagree, Agree, and Strongly agree.