GOOGLING IN THE CLASSROOM:
INTEGRATING THE HANDHELD LIBRARY INTO OUR PEDAGOGY

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This research was funded by an Instructional Innovation Grant from the J. Mack Robinson College of Business at Georgia State University.
GOOGLING IN THE CLASSROOM: INTEGRATING THE HANDHELD LIBRARY INTO OUR TEACHING

ABSTRACT

Smartphones, tables, and laptops are everywhere – but our students often lack the ability to use the knowledge they gain from these devices in an efficient and discriminating manner. To address this issue, how can we integrate information literacy skills into our classes? Do we need to adapt our discipline-specific learning objectives to accommodate the growth in these available libraries? Our disciplines are business intelligence and human resources management. We came together to create a multi-disciplinary approach to answering these questions. The exercises we developed worked to improve the information literacy of our students. We also were able to appreciate how student’s information literacy would impact the conceptualization of our learning objectives.

Keywords: Information Literacy, Pedagogy, Learning Objectives
Googling in the Classroom: Integrating the Handheld Library into our Teaching

In our day, instructors lectured and students learned. They were expected to memorize theories and facts because either the information was foundational or finding the information was time-consuming or difficult. We still have the reality that some of the content students must master is factual knowledge. We expect our doctors to know the names of all our bones, our business analysts to understand the profit model, and our human resources managers to be fluent in Title VII. While the need for foundational knowledge has not changed, the need for memorizing information because it was difficult to ascertain or time-consuming to acquire is no longer a concern. Electronic devices are ubiquitous and with that ubiquity comes the ability to access dictionaries, thesauruses, equations, regulations, encyclopedia, news reports, videos, and journal articles with the click of a button or the touch of a screen.

One effect of the availability of handheld devices is the need to improve the informational literacy of our students. While students have a plethora of resources available to them, it is our experience that many do not know when or how to use these resources. Students tend to follow the path of least effort in their on-line searches (Jansen, Spink, & Saracevic, 2000). These searches can result in frustration when students cannot easily find the information they need. They can also result in inaccuracy when students are unable to critically evaluate the credibility of the information provided, or its source.

A secondary effect is the implications of information availability on our learning objectives. Studies of the use of technology in the classroom have generally focused on student engagement or enhanced student learning. However, with the ubiquity of handheld devises, we need to change how we expect students to access information within our disciplines. They can
easily look up the 4/5 rule, how to construct a pivot table, or the largest companies based on worldwide revenue – content that we might have had students memorize in the past. If we recognize that students will have access to this technology in their workplace, what is the implication on the discipline-specific content they must master?

This paper grew out of an effort of two instructors from different business disciplines, teaching at a large, urban university in the southeastern United States. One of the authors teaches Human Resources Management (HRM); the other teaches Business Intelligence (BI). BI, a senior-level elective, is a quantitative course providing a foundation for students on how to approach business problems from an analytic perspective. HRM is a traditional survey course which introduces students to a variety of talent-related organizational systems including selection, performance management, compensation, and training and development. Our goal of combining two distinctly different disciplines was to focus on issues that cross disciplines, increasing the rigor and applicability of our results.

This research was conducted over a seven-week summer term. Classes met twice a week for 2.5 hours per session. We had three classes on which to test the effectiveness of our instruction and exercises. The undergraduate BI class had 12 students. The undergraduate HRM class had 8 students. We had a second BI class of 23 graduate students. Two of the courses occurred in an instructional lab which provided all students access to a desktop tablet.

This paper examines our efforts to integrate the knowledge available from hand-held devices into our curriculum in a thoughtful and systematic manner. We begin by discussing information literacy and describing the specific information literacy skills we seek to develop in our students. Then our paper considers how these skills affected our learning objectives and impacted the exercises and activities supporting those objectives. Instruction and exercises are
described followed by an analysis of their effectiveness. We conclude with a discussion of future research directions.

**Developing Informational Literacy**

The American Library Association (ALA) has created a definition of an information literate person. That individual is “able to recognize when information is needed and has the ability to locate, evaluate, and use the needed information effectively” ("Presidential Committee on Information Literacy. Final Report," 1989). So, while ensuring that students master the core conceptual knowledge on which our disciplines are based, our instruction should also produce students who are able to

- “Determine the extent of information needed,
- Access the needed information effectively and efficiently,
- Evaluate information and its sources critically,
- Incorporate selected information into their knowledge bases,
- Use information effectively to accomplish a specific purpose, [and]
- Understand the economic, legal, and social issues surrounding the use of information, and access and use information ethically and legally.” (Albitz, 2007 p 99)

We have chosen to focus on two specific aspects of information literacy identified by Albitz, (2007), accessing information efficiently and evaluating sources critically. While information literacy requires students to have a variety of critical thinking, analytic, and problem-solving skills, both the general search strategies individuals use as well as the criteria used in credibility evaluation are not discipline specific. For example, peer-reviewed journals are more credible than anonymous blogs across all disciplines. Using an asterisk (*) or site search limitation (site:) are general search strategies unconstrained by content area. Conversely, determining the
information one needs is necessarily tied to discipline specifics as is incorporating information into one’s knowledge base.

Because the skills we identified were focused and not discipline specific, we were able to collaborate in an interdisciplinary effort to develop broadly applicable approaches. The following section describes these skills in more detail.

**Selected Informational Literacy Skills**

*Accessing information efficiently.* The first search engine for the internet was created in 1990. Today, you would be hard pressed to find a college student that is not using a search engine daily. Forty-five percent of students use Google as their first source, only 10% use the library catalog (Griffiths & Brophy, 2005). One of those search engines, Google, has been elevated to a verb and is now listed in dictionaries, both online and hard copy. Clearly, our students are conversant with Googling and we need to let them use it. Griffiths and Brophy found that when students are looking for information, they prefer to use a search engine and Google is the search engine of choice (2005). Unfortunately, “Googling delivers data and information, not knowledge” (Adams, 2006 p 27).

With the significant use of search engines, and specifically Google, one could assume that students have all the skills needed in this area. Looking deeper, however, the lack of depth in students’ knowledge is revealed. Web searchers use approximately two terms, infrequently use Boolean operators, perform only two searchers per session, rarely go beyond the first page of search results, and view no more than ten documents (Jansen & Pooch, 2001; Van Deursen & Van Dijk, 2009).

*Evaluating sources critically.* Once students find a website, they must assess the credibility of the source and author. Based on their review of numerous studies, Griffiths and Brophy found that when students have difficulty locating information and resources, they trade
quality for effort, i.e., the more difficult the search, the more likely less credible information will be reported (2005). Cmor and Lippold found that students often gave discussion list comments the same academic weight as peer reviewed journals (2001). In another study, Van Deursen and Van Dijk found additional challenges with student’s assessment of source credibility (2009).

Few students paid attention to the source of the information found or the date on which the information was posted.

Having selected these skills, our goals are to improve students’ effectiveness and efficiency locating information through the use of google and to improve their ability to evaluate the credibility of a source. These goals required us to evaluate our learning objectives.

Reassessing our Learning Objectives

We have moved to a world in which hand-held libraries are everywhere; where, with the right search engine and appropriate query, one can find out just about anything. How does this impact our learning objectives? More importantly, how should it? We recognized that Google has changed our lives. We no longer have volumes of journals on our shelves. Instead, we use Google Scholar to find the paper we are looking for. We do not head to the library to find the latest Bureau of Labor statistics, instead we type in www.bls.gov. The variety of electronic databases to which we have access makes the standard ways we thought about problems obsolete.

Having chosen to focus on the specific information literacy skills accessing information efficiently and evaluating sources critically, in this section we present our implementation of these skills into each course, addressing the following:
• The impact of the internet as a source of information to meet discipline-specific course learning objectives,

• The learning objectives we developed for the information literacy skills on which we focused, [and]

When considering learning objectives, we chose Bloom’s taxonomy as our framework. Bloom’s taxonomy (Bloom & Krathwohl, 1956) has been utilized by instructors to thoughtfully consider the depth to which discipline knowledge must be mastered. A revision by Anderson et. al. (2001) clarified the six cognitive process dimensions. Each cognitive dimension describes what the learner is able to do with different types of knowledge. At the simplest level of cognition, students remember, they “retrieve relevant knowledge from long-term memory” (Anderson et al., 2001, p. 67). Students may not be able to describe this information or explain its relevance in a meaningful way. The focus is rote memorization. At the second level of cognition, students understand. In understanding, they are able to explain and summarize, defend and discuss. Traditionally, we have placed a high value on these lower-level cognitive results, i.e., remembering and understanding. Indeed, a quick review of our textbook’s test bank shows a strong preference for these types of questions. While some of this basic information was critical and remains so, we would argue that other information has lost its importance because it can, so easily, be found through a competent web search.

The remaining four levels of Bloom’s taxonomy require critical thinking (Bissell & Lemons, 2006; Ennis, 1993; Zoller, 1993). At the application level of cognition, students compute, demonstrate, modify, show, and use. They use the knowledge and understanding they have gained to solve a new problem. This is increasingly important since much has been written about the significance of employees being able to solve new problems (Cascio & McEvoy,
At the next level of cognition, analysis, students can break material into its constituent parts and determine how the parts relate to one another and to an overall structure. Students do this by distinguishing, organizing, or predicting. Making judgments based on criteria or standards, evaluation, is the fifth cognitive category. It includes learning that allows a student to interpret, to judge, and to justify. The final level of cognitive processes is creation where the student puts elements together to “form a coherent or functional whole [or] reorganizes elements into a new pattern or structure” (Anderson et al., 2001, p. 68). This idea of inventing new relationships, composing new ideas, or formulating new theories is the apex of cognitive processes. It is important to note that the cognitive dimensions are interrelated. For example, before a student can apply knowledge, they must have some understanding. Also, while the taxonomic levels are presented as a hierarchy, there is little research supporting it as such.

After placing each learning objective in the appropriate Bloom’s category, we considered the informational literacy learning objective with which each of the discipline-specific learning objectives needed to be paired. In Table 1, we provide examples from both courses and information literacy learning objectives we established for our courses.

As an example, in HRM, one of the learning objectives was to develop a non-smoking policy that is compliant with state lifestyle discrimination laws. To accomplish this objective, students must have conceptual knowledge of what lifestyle discrimination is. They can look up the discrimination law of a particular state to find its specific prohibitions. Students must use their conceptual knowledge of workplace policies to craft a reasonable statement. Two types of
conceptual knowledge are necessary, i.e., lifestyle discrimination and workplace policies. However, we expect students to be able to find the appropriate factual knowledge about a specific legal environment. As we assessed our learning objectives and reviewed the foundational knowledge, it became increasingly clear that students needed a deeper conceptual knowledge but could use their hand-held devices to locate relevant factual or process knowledge.

By considering the foundational knowledge which underpins our learning objectives and discerning whether it is readily available, we crafted new courses that better utilize the hand-held library. We believe that these integrated objectives more accurately reflect the world in which our students will be employed. Their ability to maneuver in this environment depends on the conceptual knowledge they possess, their critical thinking skills, and their ability to find high quality information effectively and efficiently.

When developing our classes, we considered these informational literacy skills to be critical to our student’s success. Despite our millennial students having grown up in an information-rich, technology-filled world, we quickly recognized that their information literacy, or lack thereof, would impede the success of our courses. If students did not know where to find a “good” ROI formula or a coherent explanation on pivot tables, their ability to demonstrate competency with our learning objectives was compromised. This underscores the need for informational literacy learning objectives.

Instruction and Exercises
In this section we will describe the type of instruction and activities we used to support development of the information literacy skills reflected in our learning objectives. As is typical with skill development, we start with information and then move to practice. Students are armed with knowledge that will help them conduct better searches and tools that can aid them in
evaluating credibility. After this information is provided, students are given multiple opportunities to practice and receive feedback that supports habituation of the new skills.

**Instruction.** Both of the instructors began their courses by providing examples of the importance of information literacy. We wanted students to appreciate information literacy as an acquired skill. We used examples from our own areas to ground this discussion.

In HRM, students were asked to consider how employers often need to determine whether state laws protect employees in the same manner that federal laws do. HR professionals must be able to find the relevant law and must also be able to evaluate the credibility of the source. For example, while state laws described on [www.nolo.com](http://www.nolo.com) may be easier to understand than those on the state’s official website, one must be concerned about the quality of an unknown blogger’s statement. In discussing turnover, we often ask students what a “good” turnover rate is, i.e., to what turnover percentage should a company aspire? The answer depends on many things including the current unemployment rate, industry turnover, and organizational objectives. Two of these data points are available online.

In BI, the profit model was discussed focusing on how this basic concept is linked to the health of a company. Discussion then turned to the use of Internet resources to find information from business sources to examine how the concept of a profit is used and reported.

BI students were also asked to perform a Google search for the definition of “business intelligence.” They were then to select the definitions that they would consider and eliminate those that were unusable. Students were initially confused regarding which sources to use. The top three listings were advertisements. While 50 to 75% of the graduate students found these ads unusable, the undergraduate students generally found them to be credible sources. This was
fodder for an interesting discussion on advertisements, hidden agenda, and anonymous peer review.

Having helped students understand that the course will help them identify the information they need, the next step was to equip students with tools to search and evaluate credibility. Two tools were then presented to help achieve this goal. A colleague in the University’s instructional support center developed a job aid to help students with Google search techniques with which they might not be familiar. While there are many search engines publicly available, we decided to focus on Google since it is the most commonly used (Alexa) and because its conventions have been adopted by other platforms (Kent, 2012). For the skill of assessing the credibility of sources, a handout with criteria students should consider was compiled by one of the authors. Both handouts are included in the Appendix.

**Exercises.** Merely presenting information is insufficient to develop skill so we also created exercises that were integrated into the class to practice and reinforce both searching strategies and credibility evaluation. These took two general forms; simple search with credibility evaluation, and searches with content application.

The concept behind simple search with credibility evaluation was to engage students and provide a quick practice opportunity. In BI, students were asked to collaborate in small groups to define terms from content the instructor was introducing. The groups would define the term for the class and discuss the credibility of the site at which they found the answer.

In HRM, the instructor asked the students to race to find an article published in 2013 in the Journal of Personnel Psychology on social networking websites and selection (Roulin & Bangerter, 2013). The class then talked about the search terms different students used and identified what worked best. In this case, using Google Scholar was very helpful. Students then
located consulting sites with similar content and evaluated the credibility of both the academic article as well as the consulting websites.

The search with content application exercises took the form of a search question with a follow-up application of course content. In HRM, students were asked to select a target company from the Fortune 100. Students needed to be careful with this since the list Fortune magazine creates is the “Fortune 500.” Many found the 100 “Best Companies to Work For” which, while interesting, did not satisfy the assignment. After identifying a company, students then had to find the company’s website and determine the primary role the HR function served, e.g., administrative, business partner or strategic partner (Noe, Hollenbeck, Gerhart, & Wright, 2010). This exercise provided students an opportunity to practice using quotation marks to refine their search as well as searching a specific site by putting the site name in Google.

In BI, students were asked to create a VLookup in Excel, something they had not been taught. Students had to find a tutorial and follow its directions to accomplish the goal. Most students were able to locate and use credible sources with many locating videos to help them complete this task. This task reinforced a number of things. Finding information may be easy; actually using it can be more difficult. Not all instructions were equally easy to use but videos were the preferred method.

Effectiveness of the Instruction and Exercises

Pre- and post-tests of search strategies and credibility assessments were conducted to determine whether our instruction and exercises were effective at increasing informational literacy.

Accessing information efficiently. To gauge student’s ability to access information efficiently, search skills expertise was measured. A pre-test was given to students on the first day of class. They were asked what search terms they would use to Google the answer to each of
four questions. They were allowed to enter these phrases into their devices to determine whether or not it got them to a reasonable answer. If not, they could try again for a total of three searches. Most searches involved two- to five-term phrases. The use of search techniques, like the not symbol (-), was very limited. Approximately 14% of the graduate students and 18% of the undergraduate students used quotation marks (") to search for an exact phrase. No other advanced techniques were used.

At the end of the term, students were again tested on this knowledge of searching in two ways. Nearly 100% of the students were able to answer basic questions such as “True or False: Order does not matter when entering search terms” and “Putting ____________ around a search phrase, results in searching for the exact phrase.” They also increased their knowledge of more advanced techniques with 75% knowing how to add a wildcard element to a search and how to search for pages on a particular site.

In BI, undergraduate students were asked to complete an exam task that required locating and using information from the Internet. They were also required to describe the process they went through to locate the information. Ninety one percent of undergraduate students were able to complete this assignment successfully. When describing their search terms, all used multi-term searches with most searches using more than three terms. Sixty-four percent of students used quotation marks to clarify their search. Multiple searches were used by 45% of students. Of the multiple searches, 40% were looking for additional information to improve the quality of their application. The remaining 60% had started with limited search terms and therefore needed to try multiple attempts to achieve an acceptable answer.
A similar assignment was used in the graduate class. The quality of the graduate students’ searches was better than those of the undergraduates, with 77% using quotes and only 18% performing multiple searches due to poor initial search term selection.

To better gauge skill development, we felt it was important to not use the same questions for the pre and post-tests. Though this limits direct quantitative comparisons, we feel our post-test results indicate that student’s abilities to access information effectively increased over the semester.

_Evaluating sources critically._ We used several methods to evaluate students’ ability to assess credibility. As a pre-test, we asked students to rate the credibility of several common internet sources. Table 2 presents the results across all our classes. Though there is no standard for credibility, the order of the source listed in the table generally tracks from less credible to more credible. The cells show the percentage of students selecting that credibility rating for a given source. One item of particular interest in these results is the credibility given to an opinion piece and information from a consulting firm. Both of these sources would tend to have a bias in the information presented but students seemed not to be concerned that this could make the source less credible.

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Insert Table 2 about here
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At the end of the term, students were asked to present relevant articles to the class. In presenting their article most discussed the credibility of the source and author. Table 3 presents the quality of credibility evaluation for the graduate and undergraduate class. Credibility of source evaluations were considered excellent when students discussed both the author’s and the
website’s credibility. Adequate results occurred when the student discussed only the source credibility. Poor results occurred when the student failed to provide an evaluation of the source.

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Insert Table 3 about here
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Clearly, the graduate students did superior work with 60% of their evaluations being excellent. In fact, 90% of the graduate students evaluated the credibility of the source they selected in this “search and apply” exercise. The authors found it interesting that, while this was not a part of the assignment, students applied their new-found knowledge to this task.

The results of the undergraduates were not as high with approximately 67% providing at least an adequate evaluation. This highlights the reality that a single exposure to this material, no matter how well integrated in the course, is not likely to be sufficient to cement these aspects of informational literacy.

These results do indicate that the majority of students did take the time to consider the credibility of the source of their information, which we consider a very important first step.

Summary and Future Direction
This paper explores the impact on our learning objectives and instructional methods that are created by the reality of hand-held devices everywhere. No longer are trips to the library necessary to locate basic information. This provides us several challenges. First, we must revise our discipline-based learning objectives to reflect what students are able to quickly and easily find. Second, we must develop student’s informational literacy so that when they are tasked with problems that require factual and procedural knowledge they can quickly and efficiently find a credible source for an answer.
We suspect that many instructors base their learning objectives and how they learned, what they have been successful teaching, or what the textbook suggests. The world has changed and we argue that a focused look at our learning objectives through the prism of technology is a requirement. Much of the work on technology in the classroom as been conducted for the purposes of student engagement. How can we use clickers or on-line tools to keep students interested in the material, focused on the class, or, at least, prevent them from texting their friends? So, using Google to support the class’s learning objectives will aid student participation. Engagement is laudable but is only a small part of the technological revolution. This revolution is changing much about the way business is conducted and our teaching should reflect that change.

“Google” is an integral part of the way students gather information and how they interact with the world. If we appreciate that our students will be forced to search for data using the internet, databases, and other web-supported tools, it is critical that we integrate informational literacy into our classes. Student Googling skills are at a relatively unsophisticated level. So, it is important that we include activities to improve these skills and give students opportunities to practice. As one would expect, graduate students had better performance than undergraduates, especially when it came to source credibility. To improve performance of undergraduate students, a rubric, more practice, and greater reinforcement may be helpful.

Additional types of activities should be considered. It might be possible to gamify searches and credibility assessments to exploit our student’s propensity for play. We do not know whether it is better to develop informational literacy skills within a discipline context as we did here, or whether it’s better to segregate the development of those skills into a specific course. For example, instruction related to oral and written communication is segregated into a
unique class. Opportunities for practice, feedback, and performance are integrated into discipline-specific work. Is this the model we should use for informational literacy? This is another area where additional research should be considered.

We have not explored the usefulness of various media, written or video. It may be that the type of knowledge, factual, conceptual or process, may drive that source media for which students should search. This is an open question that requires additional research.

We know that hand-held devices, and the libraries they contain, will not go away. The challenge is for us to consider how they affect the learning objectives for our classes and how to arm our students with the skills they need to successfully utilize that technology.
REFERENCES


### TABLE 1

**Learning Objectives that Exploit Handheld Technology and Supporting Activities**

<table>
<thead>
<tr>
<th>Bloom’s Taxonomic Levels</th>
<th>Course Learning Objectives</th>
<th>Information Literacy Learning Objective to support Course Learning Objective</th>
</tr>
</thead>
</table>
| **Remember**             | BI: Develop a foundation in Business Intelligence to be used in the Business Analysis curriculum. (basic term knowledge)  
HRM: Define the terms recruitment and selection. | Perform basic search to locate information |
| **Understand**           | BI: Understand what Business Intelligence represents, its importance to business and its role in the decision making process of an organization.  
HRM: Classify performance appraisal instruments as trait-, behavior-, or results-based. | Construct an efficient multi-term search to locate information.  
Construct an efficient multi-term search to locate examples. |
| **Apply**                | BI: Develop skills in the creating of Dashboards in the Microsoft Excel environment, databases in Microsoft Access and Visualizations in Tableau.  
HRM: Conduct an ROI analysis to evaluate training effectiveness. | Locate material on internet that explains how to perform a function in a specific software application.  
Find appropriate ROI formula. |
| **Analyze**             | BI: Analyze a dataset using various tools such as Excel and Tableau.  
HRM: Develop a staffing forecast. | Locate material on internet that explains how to perform a function in a specific software application.  
Find credible data on which to build forecast. |
<table>
<thead>
<tr>
<th>Bloom’s Taxonomic Levels</th>
<th>Course Learning Objectives</th>
<th>Information Literacy Learning Objective to support Course Learning Objective</th>
</tr>
</thead>
</table>
| Evaluate                 | BI: Locate new information and present to class. Information must be related to course materials and from a credible source.  
HRM: Discern whether a staffing plan will meet a new business’s objectives. | Consider multiple sources and evaluate the credibility of an internet source  
Find business and industry data for environmental scan. |
| Create                   | BI: Based on specific requirements design a Dashboard and Visualizations with data from several sources to meet business objectives.  
HRM: Create a non-smoking policy that is compliant with state lifestyle discrimination laws | Locate additional data on internet to supplement design. Validate data.  
Find relevant lifestyle discrimination laws. |
<table>
<thead>
<tr>
<th>Source</th>
<th>Low Credibility</th>
<th>Moderate Credibility</th>
<th>High Credibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>New York Times opinion piece</td>
<td>7.41%</td>
<td>18.52%</td>
<td>29.63%</td>
</tr>
<tr>
<td>Signed blog post</td>
<td>23.08%</td>
<td>42.31%</td>
<td>11.54%</td>
</tr>
<tr>
<td>Consulting firm website</td>
<td>7.41%</td>
<td>11.11%</td>
<td>37.04%</td>
</tr>
<tr>
<td>LifeHacker blog</td>
<td>36.00%</td>
<td>48.00%</td>
<td>16.00%</td>
</tr>
<tr>
<td>National Public Radio story</td>
<td>3.85%</td>
<td>11.54%</td>
<td>23.08%</td>
</tr>
<tr>
<td>Wall Street Journal news article</td>
<td>0.00%</td>
<td>3.70%</td>
<td>7.41%</td>
</tr>
<tr>
<td>Academic article in peer-reviewed</td>
<td>0.00%</td>
<td>3.70%</td>
<td>11.11%</td>
</tr>
<tr>
<td>journal</td>
<td></td>
<td></td>
<td>29.63%</td>
</tr>
<tr>
<td>Report commissioned by US Department of Justice</td>
<td>0.00%</td>
<td>7.41%</td>
<td>7.41%</td>
</tr>
</tbody>
</table>
TABLE 3

Quality of Credibility Evaluations

<table>
<thead>
<tr>
<th>Quality</th>
<th>Grad</th>
<th>Undergrad</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excellent</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adequate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poor</td>
<td></td>
<td></td>
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</tbody>
</table>
Appendix A: Job Aids for Searching and Evaluating Credibility

Google Search Tricks
Use search modifiers and advanced techniques to find what you are looking for faster.

<table>
<thead>
<tr>
<th>Precise</th>
<th>Broad</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot; &quot;</td>
<td>OR</td>
</tr>
<tr>
<td>To return pages that include an exact phrase</td>
<td>To return pages that include either of the words</td>
</tr>
<tr>
<td>“fortune 100”</td>
<td>loan OR credit</td>
</tr>
<tr>
<td>-</td>
<td></td>
</tr>
<tr>
<td>To exclude search results with particular words</td>
<td>To add a wildcard element to your search</td>
</tr>
<tr>
<td>business - magazine</td>
<td>chief * officer</td>
</tr>
<tr>
<td>site:</td>
<td></td>
</tr>
<tr>
<td>To search only for pages on a particular site</td>
<td>To return pages containing the word or any synonym</td>
</tr>
<tr>
<td>site:www.hp.com</td>
<td>~investment</td>
</tr>
<tr>
<td>filetype:</td>
<td></td>
</tr>
<tr>
<td>To search for particular types of files (xls, doc, ppt, pdf)</td>
<td></td>
</tr>
<tr>
<td>filetype:pdf</td>
<td></td>
</tr>
</tbody>
</table>

Search Tools and Advanced Search

[Images of Google search interfaces with advanced search options highlighted]
### Top 10 Google Search Tips

**Pointers for refining and improving your Google searching**

<table>
<thead>
<tr>
<th>Tip</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1 Start simple</strong> - Input important key words and gradually add additional terms.</td>
<td>mergers and acquisitions</td>
</tr>
<tr>
<td><strong>2 Order matters</strong> - Group words in phrases &amp; place the most important words first.</td>
<td>company mergers and acquisitions versus mergers and acquisitions company</td>
</tr>
<tr>
<td><strong>3 Be selective</strong> - Avoid words that may not appear on the ideal search result.</td>
<td>what strategies should business associates use when doing mergers and acquisitions</td>
</tr>
<tr>
<td><strong>4 Use likely words</strong> - Use words likely to appear on the perfect search result.</td>
<td>strategies mergers and acquisitions valuation integration</td>
</tr>
<tr>
<td><strong>5 Combine Search Tricks</strong> - Combine tips like filetype and domain searches into a single search.</td>
<td>strategies &quot;mergers and acquisitions&quot; valuation integration filetype:pdf</td>
</tr>
<tr>
<td><strong>6 Try synonyms</strong> - Consider other words that might be used instead.</td>
<td>approach &quot;mergers and acquisitions&quot; valuation integration filetype:pdf</td>
</tr>
<tr>
<td><strong>7 Truncate words</strong> - Add a wildcard &quot;*&quot; to the end of words that could have multiple endings.</td>
<td>strategies &quot;mergers and acquisitions&quot; valu* integrat* filetype:pdf</td>
</tr>
<tr>
<td><strong>8 Review related searches</strong> - Review the related searches at the bottom of the list of search results.</td>
<td>When searching 'mergers and acquisition strategies,' Google lists eight related searches such as 'challenges of mergers and acquisitions.'</td>
</tr>
<tr>
<td><strong>9 Advanced Search</strong> - Use the Advanced Search tool for complicated and specific searches.</td>
<td>When precision searching, click the gear icon at the top right of the screen and try an Advanced Search with multiple criteria.</td>
</tr>
<tr>
<td><strong>10 Try, try, try again</strong> - If results are too broad, be persistent. Keep modifying your search criteria.</td>
<td>Go back to the drawing board and try a totally different approach. For example, try a long list of key words and phrases surrounded by quotes.</td>
</tr>
</tbody>
</table>
Web sources: things to consider:

1. There are a number of different types of web sites.

Types of Web sites:

- Blogs
- Wikis
- Question and Answer sites
- Discussion lists (or forums or groups)
- Scholarly works
- Search engines
- News/article sites
- Databases/archives
- Reference sources
- Documents
- Informational pages

Peruse Wikipedia entry entitled Websites for other formats not included on list.

Information from https://docs.google.com/document/d/1FNvqtxxxbNCoqKJAIiHlmhDbElC3sGzWy-SIWXIpm9E/edit
2. Not all sources are “good” sources. Are they reliable and accurate?

Search Topic: ___________________________ Site
Address: ________________________________

Directions: Review a site and answer these questions and prompts. You may divide this task with group members.

<table>
<thead>
<tr>
<th>Who wrote this information?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can you identify an author? A real name or an alias?</td>
</tr>
<tr>
<td>What is the author’s education, training, or experience as it relates to this content?</td>
</tr>
<tr>
<td>Does s/he have a professional title or is s/he recognized as an authority? Identify the title.</td>
</tr>
<tr>
<td>Is the author connected with an organization? If so, can you determine if it is a respected organization? Name the organization.</td>
</tr>
<tr>
<td>Can you contact the author or company? How?</td>
</tr>
<tr>
<td>If the author is unnamed, can you take extra steps to find information about this author? What steps did you take?</td>
</tr>
</tbody>
</table>

<table>
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<tr>
<th>When was the article written?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Does the author include a date for the information written? What is it?</td>
</tr>
<tr>
<td>Is it important that the information be current or are you researching a topic from long ago?</td>
</tr>
<tr>
<td>Do the links on the site work, or are they outdated?</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Can the information be verified for accuracy?</th>
</tr>
</thead>
<tbody>
<tr>
<td>What sources does the author of this information use? Name one.</td>
</tr>
<tr>
<td>Are these sources listed in the article? Linked?</td>
</tr>
<tr>
<td>Does the author include a works cited or other links to provide additional resources or original source information? Identify one.</td>
</tr>
<tr>
<td>Are there identified sources for any data or statistics in the content? Write one statistic and its source.</td>
</tr>
<tr>
<td>Can you find other sources that share the same information, or is this the only source? Name which other source you accessed.</td>
</tr>
</tbody>
</table>
How do I identify credible sources?

When collecting evidence for a research project, information report, argument paper, or similar task, it is important to use factual information. For an argument paper, it is true you want to sway your reader and will have a clear position and perspective. However, basing your evidence on facts will be more convincing to your readers. For a research project or report, you will want to include accurate and reliable facts and information. Consider the following when you collect evidence so you can use credible sources.

**Does the writing seem too good to be true?**

Sometimes content seems so amazing that it makes a reader wonder if it's true or not. Beware of this as it can indicate unreliability and inaccuracy. Ask these questions to help you determine if the writing might be largely untrue: **Does this information seem unbelievable? Does it make sense to you or others? Does what you read conflict with something you already know to be true? Does the writing seem like hyperbole where something is grossly exaggerated? Is there a way to check this information out so you know whether it is true or not?**

**Who wrote this information?**

Identifying the author can help you determine the credibility and truthfulness of your source. Consider these questions: **What is the author’s education, training, or experience as it relates to this content? Does he or she have a professional title or is he or she recognized as an authority? Is the author connected with an organization? If so, can you determine if it is a respected organization? Can you contact the author or the company? If the author is unnamed, can you take extra steps to find information about this author?**

**When was the article written?**

For certain topics, how old the information is can impact the reliability and accuracy. **Does the author include a date for the information written? Is it important that the information be current or are you researching a topic from long ago? Do the links on the site work, or are they outdated?**

**Can the information be verified?**

To check the accuracies of information, we might consider these questions: **What sources does the author of this information use? Are these sources listed in the article? Does the author include a works cited or other links to provide additional resources or original source information? Are there identified sources for any data or statistics in the content? Can you find other sources that share the same information, or is this the only source?**

**How might the tone or style of the writing reflect its credibility?**

The actual design of the website will not necessarily mean it is unreliable. What is most important is the actual writing. The way in which an article is written can reveal clues about its credibility. Consider the following: **Does the article have several grammar, spelling, punctuation, or capitalization errors? Is the writing emotional and include language that has a bitter, critical, or demanding tone? Is the writing so informal that it seems hard to trust? Does it seem unfair or extremely slanted to a point of view and biased? If it is biased, are there facts to back it up or other sites to verify what it states? Does it seem like it would anger or manipulate people?**

**Why does the author write this information?**

Sometimes people write articles for reasons that contribute to unreliability, bias, and untruths. This doesn’t mean that a company writing an article about something it is passionate about will be unreliable. Or that a person who writes a persuasive piece is completely biased. Argument papers are by nature meant to persuade a reader, so take this into account while reading. As you read sources, use your judgment and the clues about credibility to make sure you access the information you need to satisfy your task.

https://docs.google.com/document/d/1wpDm3zSQn8xgfsM4k53MKXopO9YshbFp7og9LZmDN6Y/edit#bookmark=id.jh102w892fku
3. Sources can be biased. Consider the bias of the source and how it impacts the material.

- What is the point of view, position, or claim of this source?
- Why was it produced? Who produced it?
- How does who produced it explain the bias?
- How does the purpose of the message dictate the information that is relayed in this video?
- How does the content impact viewers?
- Is the information factual? How do you know?
- Do you feel it is unfairly biased? Why or why not?
- Even if the video is biased, is it useful information?

https://docs.google.com/document/d/11eawh-joTCvNt5GffH-0WPN54we8fNChMevFvlb9nw/edit#