

ASSIGNING INQUIRY:

How Handouts for Research Assignments Guide Today's College Students



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Abstract: A report of findings from a content analysis of 191 course-related research assignment handouts distributed to undergraduates on 28 college campuses across the U.S., as part of Project Information Literacy. A majority of handouts in the sample emphasized standards about the mechanics of compiling college research papers, more so than guiding students to finding and using sources for research. Most frequently, handouts advised students to use their campus library shelves and/or online library sources when conducting research for assignments, though most handouts lacked specific details about which of the library's hundreds of databases to search. Few handouts advised students about using Internet sources, even though many of today's students almost always integrate the Web into their research activities. Very few handouts recommended consulting a librarian about research assignments. Details about evaluating information, plagiarism, and instructor availability appeared in only a minority of the handouts analyzed. The findings suggest that handouts for academic research assignments provide students with more how-to procedures and conventions for preparing a final product for submission, than guidance about conducting research and finding and using information in the digital age.

Introduction

Research assignments are a mainstay of many higher education course curricula. Although the topics vary, the assignments consistently demand inquiry, argument, and evidence. This pedagogical tradition is a time-tested process as old as the debates in the sacred olive grove of the ancient Athenian academy, and is no less relevant in the digital age.

Project Information Literacy (PIL) is a national research study based in the University of Washington's Information School. In our ongoing research, we seek to understand how college students conduct research and find information for their course work and for addressing issues in everyday life.¹ We also explore the needs of these students, and the unique approaches, strategies, and workarounds that characterize their research process.

In this 2010 mid-year progress report, we present findings from a content analysis of 191 handouts voluntarily submitted from instructors at 28 U.S. colleges and universities. The handouts in our sample were distributed in the last year to students for course-related research assignments.²

In our prior research, we found that over three-fourths of the students (76%) surveyed considered written guidelines about course-related assignments, especially which sources to use, as one of the most helpful materials an instructor can provide—second only to email exchanges with instructors about research assignments.³

In this study, we ask how instructors' assignment handouts provide instruction, guidance, and support to college students about completing the course-related research process.

Major Findings

The majority of handouts in our sample placed more attention on the mechanics of preparing a research assignment than on conveying substantive information that students also needed, such as how to define and focus a research strategy within the complex information landscape that most college students inhabit today.

¹ Project Information Literacy (PIL) is co-directed by Alison J. Head, Ph.D., Research Scientist in the Information School and Michael B. Eisenberg, Ph.D., Dean Emeritus and Professor in the Information School and is supported with contributing funds from the John D. and Catherine T. MacArthur Foundation. Communication about this progress report should be sent to Dr. Alison Head at ajhead1@uw.edu or Dr. Michael Eisenberg at mbe@uw.edu. Visit the [PIL project site](#) for an overview of PIL's ongoing research, since 2008.

² We collected handouts from the instructors teaching sophomores, juniors and seniors at 28 institutions in the U.S. The sample was made up of handouts collected from four-year colleges or universities (69%) and handouts from two-year community colleges (31%). For a full list of institutions participating in the study, see Appendix A: Methods.

³ See findings and the discussion about the "Helpfulness of Instructors" on pages 28-30 in "[Lessons Learned: How College Students Seek Information in the Digital Age.](#)" by Alison J. Head, Ph.D. and Michael B. Eisenberg, Ph.D., Project Information Literacy Progress Report, December 1, 2009. The sample comprised 2,318 students from six colleges and universities in the U.S.

Moreover, a large number of handouts in the sample provided only limited guidance about how and where to conduct research and find information. The handouts had few specific details about finding and using sources, making the guidance that was provided often vague and inapplicable.

Major findings from the study are as follows:

1. Despite the seismic changes in the way that information is now created and delivered, 83% of handouts in our sample called for the standard research paper. Few handouts asked students to present findings using other formats, including multimedia and oral presentations.
2. Six in 10 handouts recommended students consult the library shelves—a *place-based source*—more than scholarly research databases, the library catalog, the Web, or, for that matter, any other resource. Only 13% of the handouts suggested consulting a librarian for assistance with research.
3. Few of the handouts (14%) that directed students to use the library's online scholarly research databases (such as those provided by EBSCO, JSTOR, or ProQuest) specified which database to use by vendor or file name from the hundreds that tend to be available.
4. Details about plagiarism, if mentioned at all, were scant and tended to emphasize the disciplinary recourse instructors would take against students who were caught in acts of academic dishonesty.
5. Few of the handouts provided information for contacting instructors when students had questions about a research assignment, whether by email, face-to-face, the telephone, or in online forums.

Despite the seismic changes in how information is created and delivered today, 83% of the handouts analyzed called for the standard research paper.

Our analysis shows robust relationships and similarities among handouts we studied from different educational institutions in the U.S. These findings should not be viewed as comprehensive, but as another part of our ongoing research.

However, in light of these striking findings, additional research is clearly warranted in order to confirm whether our findings may be generalized to all course-related research handouts that college and university instructors may use.

In the following pages, we present detailed findings from our analysis in three parts:

- Part One: Findings about the similarities among the sample of handouts from arts and the humanities, the sciences and engineering, and social sciences, based on their shared properties.
- Part Two: Findings about the guidance that handouts provide for finding course-related research sources to fulfill assignments, including comparative follow-up analyses about four-year vs. two-year institutions and from the perspective of different disciplines.
- Part Three: Findings about how handouts direct students to evaluate the quality of the information in the resources they find and select, and their ethical use in assignments.

Approach

Our ongoing study is grounded in information-seeking behavior research. We study how college students conceptualize and operationalize course-related and everyday life research. We investigate these research processes through students' accounts, reports, experiences, and processes.

We define course-related research process in broad terms—from the moment students receive a research assignment in a college course through collecting materials until the final writing of a mid-course paper, or related assignment (e.g., multimedia presentation).

In this study, we studied one communication artifact of the course-related research process—the research assignment handout. During the fall of 2009, instructors voluntarily submitted handouts to our sample after we contacted them about study participation.⁴

We systematically coded and measured the manifest textual properties of a sample of handouts, especially as they related to addressing, steering, and/or guiding students through the research process and finding and using information and research materials. We also conducted a small set of follow-up interviews with faculty, who had submitted handouts to our sample.⁵

In particular, we asked:

1. Is there a "typical" course-related research assignment? If so, what are its characteristics?
2. Which sources are students guided to use for finding information and conducting research?
3. How are students guided to evaluate information and use it ethically?

At the outset, it should be noted that we fully acknowledge that instructors use other channels of communication with their students who are conducting research. In addition to handouts, instructors may (and most probably do) use class discussions, syllabi, ancillary handouts, course management software systems, individual or group conferences with students, classroom visits from librarians, and/or a conversation in the hallway—to teach and guide students through the research process.

These modes of communication are not the primary part of our analysis, though they were often discussed in our follow-up interviews with faculty.

⁴ See Appendix A of this report for more details about the study's research methods and for descriptive data about the sample of handouts and the instructors, who participated in the study. Also, see page 33 of this report (Appendix A) for a discussion of the sampling method and its acknowledged limitations.

⁵ We conducted 15 follow-up telephone interviews (15 – 30 minutes in length) in April and May 2010 with faculty members who had volunteered their time and submitted a handout to the study sample. The purpose of the interviews was to add supplementary details from a subset of instructors to our content analysis of handouts. The script of questions appears at the end of the methods section.

Finding Context

In our prior research, we developed a typology of certain contexts college students try to find in their research processes. Finding context, according to students we have studied, is a laborious and often frustrating, but essential part of their course-related and everyday life research process.

We have identified four contexts that students have reported needing on a frequent basis, especially in the initial stages of finding information or conducting research. Each contextual need varies in intensity, given the research tasks at hand and the level of the student's engagement and interest in the topic.

Figure 1 shows a breakdown of each research context and how frequently these contextual needs tend to arise among students.

Figure 1: Context Needs of the Undergraduate Research Process

Research Context	Associated Dimensions	Occurrence
Big Picture	<ul style="list-style-type: none"> - Finding the summary of a topic - Finding the background of a topic - 	Often
Language	<ul style="list-style-type: none"> - Defining the words or terms related to topic - Translating terms and words from one language to another - Figuring out search terms for use in further research 	Sometimes
Situational	<ul style="list-style-type: none"> - Determining how far to go with research activities, in light of meeting someone else's expectations (e.g., those of the instructor or in the case of everyday life research, a health professional) - Estimating how much time to spend on a research assignment - Figuring out how to get a "good grade" (i.e., for course-related research) - Locating sample papers from former students, provided by instructor (i.e., for course-related research) - Finding guidelines for paper submission (i.e., for course-related research) 	Sometimes
Information Gathering	<ul style="list-style-type: none"> - Learning what research has been published about topic - Locating full-text versions of potential research sources 	Often

During the development of our typology about the college student research process, additional aspects emerged from our research; these became central to this study.

We summarize these findings about the typology as follows:

1. Students reported that their search for research context does not take place in isolation—students often search for more than one kind of research context at the same time during the course-related research process.⁶
2. Written guidelines that an instructor distributes for course-related research assignments tend to play an integral role in helping his or her students define situational context—how to meet the instructor's expectations.
3. Students tend to use handouts to help them define information-gathering context—how to find and use appropriate information sources and develop a course-related research strategy.

The findings from our typology model informed this study about course-related handouts. Specifically, we have investigated how written guidelines can provide two major research contexts that students seek during their research processes: (1) the situational context or figuring out an instructor's expectations for an assignment, and (2) the information-gathering context or locating and selecting research resources.

Detailed Findings

Part One: Endless Topics, Formulaic Standards

We found a sweeping variety of research topics described in the handouts we analyzed.⁷ No two handouts were remotely similar in the topics assigned.

For example, students were instructed to research and write about public policy recommendations for reducing school violence, high treason in Renaissance England, acceptable doses of digital radiology, demographic indicators of physicians' income levels, the religious influences in Harry Potter novels, and the advantages and disadvantages of hybrid cars.

No two handouts were remotely similar in the topics assigned.

The seemingly endless number of topics led us to ask if there was anything typical, or generic, about the course-related research handouts we analyzed.

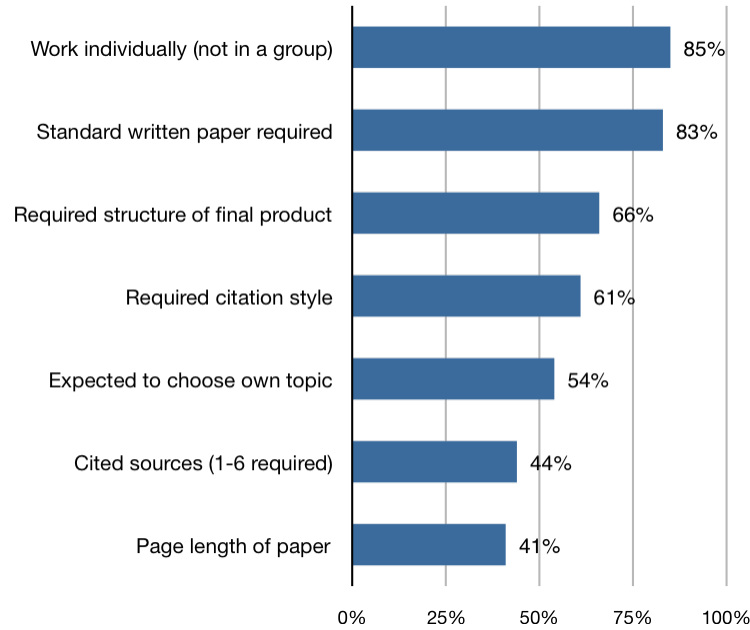
We began to ask different kinds of questions about the handouts. What, if anything, did the sample of handouts have in common?

⁶ For instance, students in our focus groups described having a combined need for background about a topic (i.e., big picture context) and an explanation of the terms related to the topic (i.e., language context). In many cases, students reported turning to Wikipedia, a source that provides both kinds of contexts in "plain English," as one student put it.

⁷ The handouts in our coding sample came from courses in the arts and humanities, social sciences, business administration, engineering, occupational training, and the sciences. We acknowledge some bias may exist since we have used a voluntary sample of handouts (i.e., handouts instructors chose to submit for purposes of the research study).

Despite the wide variety of topics, we found certain commonalities among the handouts. Most notably, the majority of the handouts issued a similar set of prescribed standards for completing assignments.⁸ Figure 2 shows the results for similar properties in the course-related research handouts we analyzed.

Figure 2: What Properties Do Handouts Have in Common?



DATA DETAILS: ASSIGNMENT CHARACTERISTICS	OCCURRENCE IN HANDOUTS
Required students to work individually, instead of collaborating with two or more other students in the class.	163 85%
Required students to write a paper that provides supportive evidence from outside sources (vs. oral, multimedia, or poster presentations)	158 83%
Required students to use a certain structure for the final product (e.g., introduction, answers to certain questions raised, a bibliography, and/or a works cited page).	126 66%
Required students to use a proper citation style (e.g., MLA, APA, or Chicago styles).	116 61%
Students expected to choose and define a topic on their own as long as it fit within a broad topic area.	103 54%
Required students to cite 1-6 research sources.	83 44%
Required students to submit a 5- to 10-page long paper.	79 41%

Reported from most frequent to least frequent standard.
n = 191

⁸ The average handout was 960 words, or 3.84 single-spaced typed pages. As a means of calculation, we counted a single-spaced page as having 250 words. See Appendix A (pp. 32-33) for the complete breakdown of the sample of handouts by length.

We summarize the key findings from our sample of handouts as follows:

1. The written "research paper" still prevails as the dominant course-related research assignment—83% of the handouts analyzed called for such standard written papers. Most papers called for individual (85%) rather than group authorship. About three-fourths of the handouts (76%) specified a certain page limit—the most frequent length was 5 to 10 pages (41%).
2. Beyond the requisite written research paper, few handouts in our sample assigned oral (7%), multimedia (2%), or poster presentations (2%), or other formats, such as project-based assignments, fieldwork, or experiments (6%).
3. Two-thirds of the handouts (66%) in the sample contained instructions for structuring and compiling the final assignment product, such as including an introduction, a summary, answers to certain questions raised, a bibliography, and/or a works cited page.
4. Over half the handouts specified the number of citations required (57%), and almost two-thirds of the handouts (61%) included details about using a proper citation style, such as MLA, APA, or Chicago styles.
5. In more than half the handouts (54%), students were expected to come up with their own research topic as long as it fell within the parameters of the course. The remaining handouts provided a list of acceptable topics for students (31%), or posed a specific question for students to answer (15%).

Professors had few, if any, assumptions about their students' ability to conduct and complete course-related research.

Taken together, these findings indicate that many handouts in our sample contained step-by-step instructions about the mechanics of compiling a research paper—regardless of the range of topics that may be assigned.

In follow-up faculty interviews, we found one plausible reason for the emphasis on standards in handouts: A large majority of instructors we interviewed reported that their students were inexperienced in completing some if not all aspects of the course-related research process.

Interviews: Few Assumptions

Instructors at all types of institutions expressed the same opinion. They had few, if any, assumptions about their students' ability to conduct and complete course-related research.

One humanities instructor said:

"I don't assume any such thing. I can tell you I've only had a handful of students who really can do all this stuff without much direction. I'd say 95% of my students really don't have much of a clue about completing research assignments."

A social sciences professor offered the following account:

"I have to make sure that I cover all parts of the assignment—finding a topic, and, well, finding articles that are related, and writing the paper, too. I take them to the library, I cover every part of the assignment in class—I have to do a lot—I assume nothing."

The sentiments were similar across all disciplines. A science professor described the gap between students' perceived research competencies and their actual skill sets.

"In one of my classes, I actually give a pre- and post-survey test to the students, who are seniors. In the pre-test—the self-assessment—I ask students to evaluate themselves on about 30 variables regarding their skills. Students typically express more confidence in their ability to do research, write papers, do analysis, present their results, than they do when I give them the post-test at the end of the class. At the end of the class when I administer the post-survey, students realized there was a lot they didn't know. I expect there's a lot of time that needs to be spent on research in other classes, so I'm surprised that I need to take a lot of time on this in my class."

We also found some instructors discussed standards as a basis to evaluate students' learning progress and grade their work, especially students' ability to fulfill certain parts of a research assignment.

In general, the instructors we interviewed talked about using standards as a matter of course, and often out of sheer necessity.

A humanities professor offered the following details:

"I require an annotated bibliography, five sources, a working outline first, and then notes on the sources before a draft is due, and the final comes in. So, it's about seven different steps of the process that I check them at, or seven different stages. I'm checking that they've completed each stage before they go on to the next."

In general, the instructors we interviewed talked about using standards as a matter of course, and often out of sheer necessity. Instructors offered a detailed and formulaic framework in the handouts because they recognized that their students came into the classroom with little knowledge of the course-related research process, especially as it applied to conducting research in individual disciplines—and their class. Economics professors, for example, define research entirely differently from civil engineering professors, anthropology professors or Shakespearean scholars.

One social science professor explained:

"I spend a lot of time reviewing what is required for this level of research. They read a lot of this kind of research, but they've never had to produce it themselves, but once they get to econometrics, I expect them to execute it on their own. So, they've never had to do this before my course."

Our entire analysis found that similar step-by-step standards—a how-to guide for preparing the research assignment end product students submitted—were an essential component of research assignment handouts in our sample. Standards helped define and clarify what was required and expected of students, and provided what we would call an ample dose of situational context.

Instructors described using formulaic standards for a variety of reasons. However, a large majority of instructors concurred that including these standards helped students learn

how to complete a research assignment—a set of competencies instructors believed most, not all, of their students sorely lacked in one way or another.

Part Two: Guidance about Finding Research Sources

We now turn our attention from similar standards to the research guidance that these handouts provided to students. We investigated how handouts instruct and guide students to using a full range of sources, often in combination, including the use of the campus library, the Internet, course readings, and primary sources—and whether the handouts offer any guidance at all.

What kind of direction do the handouts provide to students about which sources to use, under what circumstances, and where they may be found? In Figure 3, we ranked the most to least frequently mentioned information sources by use, which appeared in the sample of handouts we analyzed.⁹

Figure 3: Guidance about the Use of Information Resources

SOURCES	Required	Recommended	Discouraged	Prohibited	No Mention
Library shelves (e.g., books, reserves, videos, print journals)	67 35%	48 25%	1 1%	2 1%	73 38%
Library online sources (OPACs, online scholarly databases) ¹⁰	43 22%	40 21%	0 --	1 1%	107 56%
Course readings (i.e., not found in library reserves)	36 19%	28 15%	3 1%	2 1%	122 64%
Primary sources (e.g., experiments, interviews)	47 25%	15 8%	0 --	3 2%	126 66%
Web sites (excluding Wikipedia)	19 10%	31 16%	9 5%	6 3%	126 66%
Librarians	4 2%	20 11%	0 --	0 --	167 87%
Search engines (e.g., Google, Bing, Yahoo!)	7 4%	15 8%	7 4%	8 4%	154 81%
Wikipedia	1 1%	1 1%	2 1%	17 9%	170 89%
Blogs	1 1%	2 1%	0 --	4 2%	184 96%

Reported from most frequent to least frequent mentioned source; n = 191

⁹ Totals reported in Figure 2 may not add up to 100%, due to rounding.

¹⁰ The category for "library online sources" includes online scholarly research databases (e.g., EBSCO, JSTOR, ProQuest) and online public access catalogs (OPACs), since the two resources often appeared together in the same handout. Very few handouts (2%) recommended using OPACs, alone, without also mentioning online scholarly research databases.

We summarize the findings about locating and using sources as follows:

1. The handouts in our sample most frequently recommended students use the campus library shelves (60%) and to a lesser extent, online library sources (43%)—rather than librarians, course readings, the Web, or data collected from fieldwork.
2. Only 13% of the handouts in the sample guided students to consult a librarian during the course-related research process.
3. Few handouts guided students about the use of public Internet resources—those on the Internet and freely accessible.¹¹ Most frequently, the handouts mentioned doing research on the Web (26%); far fewer mentioned using search engines (12%), or blogs (2%).
4. Wikipedia was the most frequently mentioned Web site, though more handouts discouraged or forbade using Wikipedia (10%) than recommended using the online, peer-produced encyclopedia (2%).
5. One-third of the handouts (34%) directed students to consult course readings, not found in the library, as a source of information and research. Another third of the handouts (33%) in our sample guided students to use primary sources as a method for collecting information—many of these handouts required or recommended conducting interviews or running experiments.
6. In a follow-up analysis, we found handouts from instructors, who had taught for between 11 and 20 years, provided the most guidance to students about using library and/or Internet sources. Instructors, who were relatively new to teaching and had taught for five years or less, had handouts with the fewest references to information resources from the library or elsewhere.¹²

Few handouts guided students about the use of public Internet resources—those on the Internet and freely accessible.

Given the Web-based focus of most students, as well as the richness of online resources on the free and fee-based Web, why did so many of the handouts in our sample advise students to use the library shelves first, and online library resources second?¹³

In the follow-up faculty interviews, we asked instructors what they thought student research should entail when it came to finding acceptable materials. For the large

¹¹ Distinctions between online scholarly research databases and public Internet sources can be blurry. For purposes of our research, we define “public Internet sources” as sites and search engines with URLs ending in .com, .gov, or .org and further, that tend, for the very large part, to be “no fee” vs. “for fee.”

¹² At first, it may seem surprising that professors, who had taught for 11 to 20 years, guided students to more library and Internet sources in their handouts than their junior faculty colleagues, who may have been more accustomed to using online sources for research. We found some evidence that handouts are modified and keep growing in size and scope with each year they are put to use in the classroom; junior faculty lack the years of using their assignments with students.

¹³ In our 2009 survey, we found, on the average, students most frequently used the following three Web sources during the course-related research process: Google (96%), Wikipedia (85%), and U.S. government Web sites (76%). We also found respondents did not use library shelves (70%) nearly as much as they used these Web sources, though they did frequently use scholarly research databases (94%). See findings and the discussion about the “Resource Prioritization” on pages 14-18 in [“Lessons Learned: How College Student Seek Information in the Digital Age.”](#) by A. J. Head and M. B. Eisenberg, 2009.

majority of instructors, course-related research meant using the campus library—and the resources that the physical campus library offers.

Interviews: Libraries First

Instructors reported using different methods for integrating the library into the student research process. We found some instructors guided students to library sources in their handouts. Others discussed the use of library resources in classroom lectures and/or leveraged the expertise of librarians and the services they provide.

In a follow-up interview, an engineering professor explained:

"What I usually do is have the science librarian come in and show the subscriptions that the university has related to engineering. I really think students should have these experiences several times prior to this class, so that they know how to do qualified research. Unfortunately, I would say that even as seniors, only about 15% or 20% know what is involved for this level of research."

In other cases, instructors discussed using pathfinders—a comprehensive and customized list of recommended research resources compiled by campus librarians for courses. Pathfinders, instructors said, had the potential to engage students in the research process and in the on-site foraging in the stacks that research often requires.

According to a humanities professor:

"In larger courses I always take the special services librarian up on her offer to build a specialized Web page that kind of consolidates all the resources in the library that might be of interest to modern American historians in one page so they just go to it—it's custom-made to our class. It reminds students that they may actually have to go into the library—that not everything relevant is online. The big thing—challenge—I have in our age of abundant information is really getting students to pick themselves up and go into the library and put their nose into dusty books."

An inevitable challenge, several instructors explained, was having students go beyond Google's search engine. That is, instructors discussed a need for explaining their expectations for quality research to students, rather than relying on a cursory Google search and results from the first page of hits.

An inevitable challenge, several instructors explained, was having students go beyond Google.

Another humanities professor gave the following account:

"My students have reported that they usually begin their research by doing a Google search on a very broad topic—let's say they have chosen the feminist movement. The student will search the term 'feminist movement,' read the first few entries on the search list and feel that they have conducted adequate research. However, I require that students cite at least three different credible sources of information on paper. This disqualifies many of the sources they would find in a broad Google search, simply because the sources have questionable credibility and often did not originate on paper. At this point, students will go to the library catalog and utilize the same broad category for their search. Students will often get frustrated at this point because they 'cannot find anything on their topic.' I will then demonstrate how to do a Google Scholar search and work with the student on focusing on the parameters of their topic."

At the same time, other instructors reported they left students to their own devices and encouraged independent exploration. If a student claimed that he or she needed assistance, the instructor was available to help.

One social sciences professor described the following approach:

"I prefer students try it first on their own—they may find different information. It could be just as good, but it would be different. So, I like to see what they come up with first. It's only when they walk themselves into a hole that I like to jump in and say, 'Okay, let's try this.'"

Taken as a whole, the results of our content analysis and comments from the follow-up interviews suggest four major findings about how instructors' handouts guide students to find course-related research sources and complete the research process.

We summarize the main points of this section as follows:

1. The large majority of handouts we analyzed provided limited guidance to students about finding and using a full range of research sources. Few of the handouts provided students with direction about the information-gathering context that helps students to fulfill course-related research assignments. Most frequently, the handouts in our sample guided students to use *place-based sources* for course-related research, more so than online sources. These resources were typically found on site and on the campus library shelves.
2. In the handouts analyzed, details were sparse about where and how to use the Web for conducting what could be considered quality research or to find credible online sources. Even though instructors interviewed readily acknowledged that many of their students gravitated toward the Web when they looked for research sources, three-quarters of the handouts analyzed entirely neglected the Web's inevitable use.
3. Few handouts—only 13%—directed students to consult a librarian for help with plotting a research strategy or finding sources in order to complete an assignment. Yet, about half of the faculty we interviewed discussed their own reliance on librarians. Faculty turned to librarians for teaching students about finding information and planning a research strategy, especially choosing and using appropriate databases, and for creating custom resources, such as pathfinders, for their course.¹⁴ The finding suggests some instructors do not actively recommend librarians as a go-to student source for students to use for assistance, but the faculty does rely on librarians for their own classroom needs.
4. Research handouts were but one means of showing students how and where to find research materials. In follow-up interviews, instructors reported providing guidance about using research sources using other means (e.g., often in classroom discussions and librarian demonstrations).

Most frequently, the handouts in our sample guided students to use *place-based sources* for course-related research, more so than online sources.

¹⁴ Our faculty interview sample was made up of 15 interviewees; 40% recommended librarians in their handouts and 60% did not mention consulting with librarians in their handouts. Of those faculty interviewed who discussed relying on librarians for training and resources, 38% were the same faculty whose handouts had not recommended consulting with librarians. We expect that this trend would be more pronounced given the entire sample of handouts, where 87% of the instructors did not recommend using librarians in their handouts.

Follow-Up Analyses: Resource Guidance

We conducted a series of three follow-up analyses, which were related to research handouts that provided guidance to students.

The analyses were: (1) an investigation of brand name details within scholarly research database recommendations, (2) a comparative analysis of resource guidance in handouts at four-year and two-year institutions, and (3) a comparative analysis of resource guidance among disciplinary fields (i.e., arts and humanities vs. the sciences and engineering vs. social sciences).

Scholarly Research Databases

In our first analysis, we investigated whether the handouts in our sample that mentioned scholarly research databases provided specific guidance about which database to use.

Which online databases were recommended by name in the handouts we analyzed? The results appear in Figure 4.

Figure 4: Research Databases by Brand Name

RESEARCH DATABASES	OCCURRENCE IN HANDOUTS
JSTOR	12 6%
Academic Search Premier	8 4%
MLA	3 2%
InfoTrac	3 2%
PsycINFO	3 2%
Academic Universe	3 2%

n = 191

Overall, we found that few handouts—14%—steered students toward starting off with specific databases—out of the hundreds of database sources that are available through a typical campus library Web site.^{15, 16}

¹⁵ Note that our analysis of research databases included scholarly collections distributed by commercial and non-profit vendors (e.g., ProQuest, EBSCO, Lexis-Nexis) and by non-profit library and publisher consortiums (e.g., JSTOR and Project Muse).

¹⁶ Our analysis indicated that while there were 39 mentions of specific databases in our sample, the mentions occurred in 26 handouts in the sample; some handouts used two or more database names in their details about using scholarly research databases.

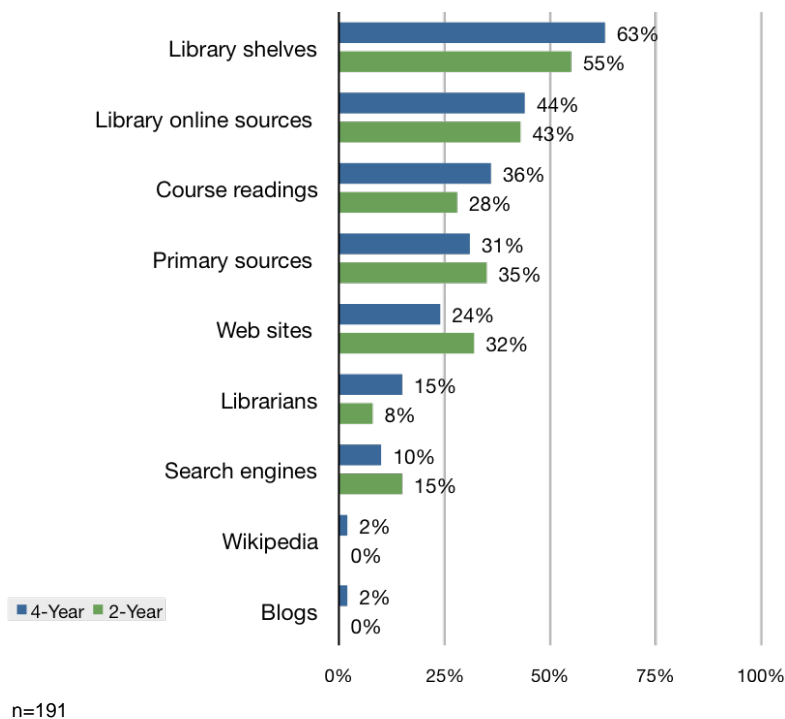
As the results indicate, JSTOR, the subscription-based academic archival service, appeared more often in handouts than any other scholarly database. At the same time, though, JSTOR only appeared 12 times in handouts in our sample, or only 6% of the time. Academic Search Premier, a subscription-based EBSCO product, was recommended, but in an even smaller number of the handouts that we studied, or only 4% of the time.

We found most handouts directed students to use “library databases” or “college databases”—a catch-all for the wide collection of databases available through library subscriptions, rather a source identified by its file or vendor name. The majority of handouts recommending databases did so in broad terms—often without the details that make these kinds of recommendations actionable and operational for most students. In such cases, handouts felt like city roadmaps with no street names included.

Four-Year vs. Two-Year Institutions

In our second follow-up analysis, we compared handouts from two- and four-year institutions and by discipline. How was each setting different in the handouts that were used and in the guidance provided about using certain resources and/or plotting a research strategy? We provide a breakdown of resource guidance by two- and four-year institutions in Figure 5.¹⁷

Figure 5: Resource Guidance by Institutional Setting



¹⁷ For purposes of this analysis, the response categories for “required” and “recommended” have been conflated into a single category in Figure 4 that indicates “use.” The total number of handouts from four-year institutions was 131 and from two-year institutions it was 60.

DATA DETAILS: SOURCES BY INSTITUTIONAL TYPE	FOUR-YEAR INSTITUTIONS	TWO-YEAR INSTITUTIONS
Library shelves (e.g., books, reserves, videos, print journals)	82 63%	33 55%
Library online sources (OPACs, scholarly research databases)	57 44%	26 43%
Course readings	47 36%	17 28%
Primary sources (e.g., experiments, interviews)	41 31%	21 35%
Web sites (e.g., Thomas, Nytimes.com)	31 24%	19 32%
Librarians	19 15%	5 8%
Search engines (e.g., Google, Bing, Yahoo!)	13 10%	9 15%
Wikipedia	2 2%	0 --
Blogs	3 2%	0 --

n = 191

On the average, we found more handouts in our sample from four-year institutions (40%) guided students to resources available than handouts (36%) from community colleges did.¹⁸ The four-year handouts noted a wider range of types of resources. This makes sense because four-year institutions purchase more resources than do community colleges, given their budget allocations.

A notable difference between institutions was the handouts' recommendations for using librarians. Almost twice as many handouts from four-year institutions (15%) guided students to consult with librarians, than from community colleges (8%).

What was perplexing to us is how few of the handouts from either type of institution mention consulting with librarians on course-related research assignments. One plausible explanation for why community colleges rarely suggested using a librarian may be that there were fewer librarians and therefore, available services, in these settings than there were at four-year institutions.

Guidance by Discipline

In our third follow-up analysis, we studied how handouts from courses in different disciplinary areas directed students to conduct research.¹⁹

¹⁸ In this "on the average" calculation, the library sources included library shelves, library online sources, and librarians as a single category.

¹⁹ For the purposes of this analysis and in order to fill the cells with comparable numbers of handouts, we have conflated individual disciplines from our sample into three areas: (1) Arts and Humanities (n=77 handouts), (2) Sciences and Engineering (n=39 handouts), and (3) Social Sciences (n=75 handouts). We have also conflated coding for "required" and "recommended" into a single variable: "guidance for use."

What were the differences in handouts from different disciplines when it came to providing guidance about finding information and/or plotting a research strategy? Figure 6 shows the results of the analysis of discipline by suggested use of sources.

Figure 6: Guidance for Use of Sources by Discipline

SOURCES	Arts & Humanities	Sciences & Engineering	Social Sciences
Library shelves (e.g., books, videos, print journals)	47 61%	23 53%	45 60%
Library online sources (OPACs, scholarly research databases)	40 52%	9 23%	34 45%
Course readings	28 36%	10 26%	14 35%
Primary sources (e.g., experiments, interviews)	34 44%	20 26%	18 24%
Web sites (e.g., Thomas, Nytimes.com)	15 31%	11 28%	15 20%
Librarians	9 12%	1 3%	14 9%
Search engines (e.g., Google, Bing, Yahoo!)	8 10%	7 18%	7 9%
Wikipedia	1 1%	0 --	1 1%
Blogs	3 4%	0 --	0 --

n = 191

Overall, we found that the handouts from arts and humanities courses were more likely than those in other either social sciences of sciences and engineering to provide direction about using the range of research sources we studied.²⁰ This makes intuitive sense—the library tends to be the “lab equivalent” for students in the humanities.

Still, only 27% of the handouts from arts and humanities courses—less than one-third—guided students to use sources from the library, course readings, primary sources, or the Internet.

²⁰ A total average percentage for mentioned use, made up of all nine resources, by each of the three disciplines was calculated with the following results: Arts and Humanities (27%), Sciences and Engineering (23%), and Social Sciences (22%).

Part Three: Evaluation and Ethical Use of Information

So far, we have presented findings about how handouts provide details about the mechanics of completing course-related research assignments and guidance for finding and evaluating information sources. In general, we have found the handouts in our sample were chock-full of details about formulaic standards for completing an assignment, such as page length, structuring of sections and requirements for and the style of citations.

Yet, we have also found something revealing about the handouts: In most handouts, there was a paucity of specific guidance about which information sources to use and where to begin finding them.

In the next part of our analysis, we turn our attention to quality control, including the evaluation and ethical use of information resources.

In most handouts, there was a paucity of guidance about which information sources to use and where to find them.

Quality Control

We used content analysis to investigate how the handouts guided students through the information evaluation process. We coded the handouts in our sample for the presence of two critical components of information quality evaluation—a source's authority and its timeliness.

In general terms, *authority* is defined as the basis for determining whether a source has reliable authorship (e.g., author's credentials). *Timeliness* is the basis for determining the currency of research material (e.g., publication date).²¹

Evaluating the quality of sources is integrally related to selecting research sources for use in an assignment—and always has been an essential step in the course-related research process.

More recently, the methods for evaluating the quality of different resources have become more complex with the proliferation of new means of information creation and delivery, especially with the Internet.

One example is Web sites. Web sites do not have the same conventions—or standards—that most printed books do. Digital media has also ushered in elements that merit separate evaluation (e.g., URLs as an indicator of publisher and footer updates as an indication of timeliness).

Figure 7 presents the results of our analysis about how handouts provided guidance about evaluating resources.

²¹ We fully acknowledge that this is a general discussion about two methods for assessing the information quality of research sources and suggest the following sites for more background information: U.C. Berkeley's Library and "[How to Critically Evaluate Information Resources](#)" from Cornell University's Library (accessed on May 21, 2010).

Figure 7: Guidance about Evaluating Information Sources

QUALITY CONTROL	OCCURRENCE IN HANDOUTS
Suggests reviewing authority	48 25%
Suggests reviewing timeliness	21 11%

n = 191

Despite these significant changes to the contours of the information landscape, only one in four of the handouts (25%) we analyzed explained how (and why) to evaluate the authority of a research source. Far fewer of the handouts (11%) in our sample provided direction about how to evaluate the currency of materials—another crucial dimension of quality control.

In the follow-up interviews, we asked instructors whether they thought students had a fairly good idea of what sources to use for course-related research, as a question related to the infrequent coverage of authority and currency in handouts.

Interviews: What's a "Good Source," again?

Instructors we interviewed discussed information evaluation in terms that were different from the properties we measured in our content analysis. When instructors discussed the concept of authority, it was within the context of determining a source's potential scholarlyness.

One science professor explained:

"I do the usual talk about Google and Wikipedia. I have to explain what constitutes scholarly journals—just because it has the word 'journal' in its title does not make it a scholarly journal—like Ladies Home Journal."

A humanities professor relayed the following account about students' general troubles with judging the quality of sources:

"They are terrible at figuring out which sources to use. They seem to have a limited idea of what makes for a good source. Sometimes in high school, I think they were cowed into thinking encyclopedias are lame, but some are a high caliber. There's one I've recommended that chronicles the Holocaust in a really insightful way, but students would dismiss it unless I explained to them why it is such a valuable source. It's something that they decide in high school and carry through their college work. They just don't seem to know what a good source is."

In another interview, a social sciences professor discussed the larger issue of integrating secondary sources with primary data collected from the field into an assignment.

"Students know, for example, how to make a bibliography; they know how to look for secondary literature—those kinds of things are easier for them and most have those kinds of experiences. It's really about how do you start with a question, and how do you collect primary data, and how do you interpret the data—how to make an argument from all that."

Taken together, the handouts we studied rarely explained how to evaluate the information quality of resources and how these resources are to be used. In the faculty follow-up interviews, we found that instructors directed students to use scholarly sources for assignments and often spent time in class reviewing what constituted scholarly materials, including the peer-review process, reliability, verifiability, and scientific data.

Plagiarism

Just as the Internet has changed the criteria for evaluating the authority and currency of sources, the Internet has increased opportunities for plagiarism—whether students plagiarize deliberately or unintentionally, due to lack of experience and depth of background about plagiarism.

Accordingly, it comes as no surprise that prior research has found that plagiarism is on the rise in the digital age in the U.S. and elsewhere.²²

The simple ability to “copy and paste” makes it easier to insert unattributed segments of text directly into an assignment, without crediting the source, than it was in the pre-Internet era where a more labor-intensive transcription from one source into another was needed. In addition, online paper mills make it possible for students to purchase a research paper at the last minute and present it in a course as their own work.

We investigated how the handouts in our sample treated the issue of academic dishonesty—the unethical use of information--in research assignments. Specifically, we asked what the handouts told students about avoiding plagiarism.

In Figure 8 we present findings about the handouts’ coverage of plagiarism. We have also included a breakdown of the number of handouts that required students to submit their finished assignments to turnitin.com—a Web-based plagiarism-detecting service.

Figure 8: Information about Plagiarism

PLAGIARISM	OCCURRENCE IN HANDOUTS
Topic of plagiarism covered	35 18%
Students asked to submit assignments to turnitin.com for plagiarism review	11 6%

n = 191

²² For a discussion of the impact of the Internet on plagiarism, see ["Student Plagiarism and Cheating in an IT Age."](#) K.O. Jones, J. M. V. Reid, and R. Bartlett, International Conference on Computer Systems and Technologies, *CompSysTech 2005*. We credit the article for details included in our discussion about reasons for the rise of plagiarism, brought on by the Internet, especially our paragraph about “copy and pasting” and “paper mills.”

Despite frequently articulated faculty concerns about plagiarism and the seeming prevalence of plagiarism among some—by no means all—college students, the findings of this analysis were striking. Only a small percentage of the handouts (18%) in our sample either defined plagiarism, discussed it as a form of academic fraud, or explained ways of avoiding it.

From a follow-up analysis, we summarize key findings about the handouts in our sample that covered the topic of plagiarism:

1. Of the handouts in our sample that did discuss plagiarism, more than three-quarters of this sub-set (86%) addressed plagiarism in a cursory fashion. In some handouts, plagiarism was defined broadly in a sentence or two with a reminder to cite sources used. In other handouts, a link to a campus's academic honor code was provided without any details. All in all, most details about plagiarism came as admonishments to students about plagiarizing materials and putting them on notice that they would fail the course if they were caught.
2. More of the handouts in our sample that mentioned preventing plagiarism were from four-year institutions (71%), than community colleges (29%).
3. Almost three-quarters of the handouts (73%) directing students to submit their assignments to turnitin.com, the Web-based plagiarism-detection service, were distributed to students in humanities courses.

Only 18% of the handouts in our sample either defined plagiarism or discussed it as a form of academic fraud.

In the follow-up interviews, we asked faculty about their assessments of students' knowledge of plagiarism. Most instructors admitted that their students had a fairly superficial understanding that they should avoid plagiarism at all costs, but they also admitted that often students were often not sure how to do this.

Interviews: Tunnel Vision

The large majority of instructors we interviewed believed that students understood that plagiarism was unethical and should not be done, but not the finer details, especially as they related to the paper they were writing as part of their course work.

Instructors interviewed reported that plagiarism was a nebulous concept for students; something that few students fully comprehended. Many students did not understand plagiarism well enough to know when they were actually plagiarizing.

In a follow-up interview, a humanities professor noted:

"Students understand plagiarism...hmm...imperfectly. Some may know that copying and pasting is wrong, but some of the nuances they just don't get—sloppy paraphrasing, crediting someone for their idea, quoting. They know the big picture but not the finer points of execution, like footnoting and endnoting."

In other cases, instructors prepared ancillary handouts, which provided directions for citing sources and the conditions under which it was necessary. Still, at other times, instructors circumvented the problem of plagiarism by designing assignments that called for an abundance of original thought and analysis, often from fieldwork.

A social science professor explained:

"My assignments are usually specific enough and original enough—I have their data—that there really isn't anyone else's work around that they can copy from. So, for the most part, students need to work independently and they need to meet with me frequently enough that it is highly unlikely that they would even have the opportunity to plagiarize. If I had assigned the same topic and the same data sets, then it may be possible to copy work from someone in the past semester—but I don't do that—that it just won't happen. I keep it specific enough and tailored to them to prevent plagiarism."

Overall, our content analysis found that plagiarism was quite underrepresented in most of the handouts we sampled—less than one in five mentioned academic dishonesty.

When plagiarism was discussed in handouts, it was cursory, and tended to focus on the penalties—failing the course. Few handouts offered substantive criteria for explaining how plagiarism occurred and how plagiarism could be avoided.

In other words, few handouts spelled out precisely what plagiarism is—from copying word-for-word, to paraphrasing and taking credit for someone else's ideas. Even more rarely discussed is why plagiarism is on the rise in a copy-and-paste, computerized world.

In the follow-up interviews, some instructors reported they presented the basics of plagiarism, such as how to use citations for acknowledging someone else's work, in a class lecture. Still, for most instructors we interviewed, plagiarism was like an unwanted guest—something that always shows up but that no one can do anything about without creating even more trouble.

Instructor Assistance

As a follow-up analysis, we investigated how the handouts in our sample detailed instructor availability for assistance with the course-related research assignments.

Figure 9, on the next page, ranks the way instructors make themselves available to students according to the handouts we coded.

When plagiarism was discussed in handouts, it was cursory, and tended to focus on penalties—failing the course.

Figure 9: Handouts and Instructor Availability

INSTRUCTOR AVAILABILITY	OCCURRENCE IN HANDOUTS
In-person meetings (e.g., asking a question in or after class)	47 25%
Available to read drafts	36 19%
Office hours for discussing the assignment	17 9%
Email inquiry about the assignment	10 5%
Online discussion forum (e.g., posting a question or issue about the assignment)	7 4%
Telephone	4 2%

n = 191

These findings indicate that few instructors in our sample included details about their availability in the handouts. If contact information did appear, these details were most often about an instructor's willingness to meet face-to-face to discuss a course-related research assignment—but such information appeared only in one in four of the handouts in our sample.

In our prior research, we found over three-fourths (82%) of the students in the survey sample reported that instructors were the most helpful when they were available over email to answer questions about a course-related research assignment.²³

Yet, in the sample of handouts we analyzed for this study, very few—only 5% of the handouts—provided students with details about the instructor being available by email.

We realize handouts are not the only source where instructors may offer assistance and availability. One plausible explanation may be that instructors assume that students already know they can contact an instructor by email. An instructor's contact information, especially an email address, may have been given to students from other course materials, such as a syllabus, a college catalog, course management software systems, a supportive Wiki or course Web site, or an instructor's jotting on the whiteboard during a lecture.

However, we would argue that handouts are often a roadmap for students to use during the course-related research process; they carry handouts with them when they complete assignments—far from a binder with a syllabus handed out two months before or their lecture notes with an email address they may have scribbled in the margin.

In a related analysis, we coded the number of handouts that provided grading criteria. Slightly more than one-third of the handouts (36%) of the handouts in our sample

²³ See page 29 in "[Lessons Learned: How College Students Seek Information in the Digital Age](#)," by A. J. Head and M. B. Eisenberg, 2009.

included a rubric of some kind for the evaluation of student's work (e.g., points and/or percentages assigned to parts of a paper).

The results of this last analysis were surprising. Findings from our most recent student survey have indicated 96% of the students we studied considered their grade on an assignment to be of sizable importance.²⁴ Yet at the same time, instructors infrequently included grading criteria, which would inform students of their grading policies well in advance of an assignment actually being submitted.

An Illustrative Model

Our findings provide a revealing picture of how a sample of handouts used on a variety of college campuses instructed, directed, guided, and advised college students through the course-related research process they were asked to complete.

Common threads ran through most of the handouts we analyzed. Whether they came from research institutions, liberal arts colleges, or community colleges, many of the handouts in our sample assigned the reliable and traditional research paper. Accordingly, many of these handouts served up brief, formulaic conventions about how students should prepare the deliverable they needed to submit.

Applying our model of the undergraduate research process to our content analysis sheds some interesting light on the implications of our findings. We mapped trends from the handout analysis as a method of exploring (not statistically determining) how written guidelines provided two major research contexts that students seek during the research process: (1) situational, and (2) information-gathering.

Mapping the Contexts

The findings indicate that the standards in handouts gave students a wide range of factors associated with situational context, such as details that help students to gauge the parameters of an assignment, determine how much time to spend on the assignment, and how best to meet instructors' expectations (i.e., individual authorship, format, structure, citations).²⁵

At the same time, situational context was not always the strong suit of the handouts we analyzed. The finer details of professors' expectations—those related to evaluating information quality (i.e., timeliness and authority), avoiding plagiarism, grading criteria and contacting an instructor—received far less coverage. Few details about plagiarism and quality control were offered.

Accordingly, the analysis indicates that when it came to providing students with situational context, the handouts in our sample had more breadth (range of expectations), than depth (details and explanation).

²⁴ Results are from our 2010 student survey of 8,300 students on 25 U.S. colleges and universities. Results will be released in the fall of 2010.

²⁵ See Figure 1 on page 5 of this report for the "Contextual Needs of the Undergraduate Research Process."

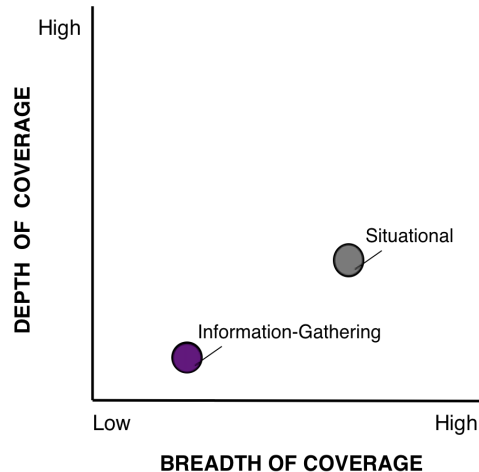
In addition, handouts provide an information-gathering context. The respondents in our prior survey reported needing this context more often than they needed situational context.

Our analysis indicates that the handouts we analyzed provided neither the breadth nor the depth about finding relevant resources.

Beyond accessing materials from the library shelves, our analysis indicated that the handouts recommended very few online scholarly databases for students to access. Equally surprising, most handouts neglected to cover whether there were any appropriate sources to cull from the vast, ubiquitous Internet.

Figure 10 shows an illustrative depiction of how the handouts rated in the situational and information-gathering context our sample. The x and y axes are used to plot the breadth (range of topics covered) and depth (details and explanation).

Figure 10: Handouts and the Contextual Research Model



As Figure 10 indicates, the handouts in our sample had a low degree of information-gathering context in both their depth and breadth. Yet, at the same time, the handouts in our sample also provided a greater breadth of coverage of situational context than information gathering context, but relatively little depth.

Recommendations

What struck us throughout this study were the paradoxical twists we encountered during analysis and the interviews. Many of the contradictions pertained to information literacy competencies and what we have learned from our ongoing research about how today's early adults conduct research and find information.²⁶

Simple fact? Most students lack a seminal understanding about what conducting research means as a form of intellectual inquiry and discovery and the large majority of handouts we analyzed did not provide much context that would help.

This leads us to end with a discussion of findings that were particularly intriguing to us as researchers. It is also the basis for our two recommendations about revisiting course-related research assignment handouts. Our hope is that the recommendations will resonate with instructors, librarians, and administrators and stimulate discussion.

Adding Situational Context

We identified the following trend from our analysis: Few handouts explained what research entails as a critical process of inquiry. Why were students being asked to engage in a pedagogical research exercise in a certain course in the first place?

In one handout we analyzed, a humanities instructor put the research process into a larger context:

"Research is meant to probe questions which interest us, to carefully study the ideas and record from those who have written before us, and add to the world's knowledge pool. Think of it as detective work, work which draws definite conclusions about a question based on already existing evidence."²⁷

Such sentiments were rarely expressed in our sample. In a follow-up analysis, we found only 16% of the handouts in our sample discussed, clarified, defined, or framed what research meant as it applied to the assignments students were given.

Few of the handouts in our sample peeled back the layers of the knowledge production process and what it meant in the academic environment, in a given discipline, in a given class, for a given group of students, who were enrolled and most likely, hoping to perform well.

Instead, many of the handouts in our sample had evolved into their own genre—a step-by-step process with standards and conventions that ended up defining research as

Most students lack a seminal understanding about what conducting research means as a form of intellectual inquiry and discovery.

²⁶ By *information literacy* we mean competencies associated with defining an information need as well as locating, selecting, evaluating, and putting information to use. For a complete list of information literacy standards, see the Association of College and Research Libraries' (ACRL's) [Information Literacy Competency Standards for Higher Education](#) (2000). Full-text reports from our ongoing research are available on the publications page of the [Project Information Literacy Web site](#).

²⁷ The passage is from a humanities instructor's handout and is used with that instructor's permission.

more of a linear checklist than an iterative process that requires critical thought, curiosity, ongoing discovery, and tenacity. From our standpoint, defining the research process could go a long way in providing situational context we believe many students lack—well beyond what we have mapped in our illustrative model.²⁸

Faculty may want to think about how much sense making is relevant to include in their handouts. Should handouts explain research as a process in explicit terms, or just in terms of the content students need to provide and steps they need to take?

We contend that students need to understand the *whys* of the research processes before they can even begin to practice them and gain traction with their information problem skills from one class to the next. If students consider instructors' written guidelines as being helpful to them now, the value of handouts is only likely to increase with the addition of situational context that also frames the *whys* of the research process.

Adding Information-Gathering Context

We were surprised by the sparse guidance handouts provided about using a fuller range of research sources students have at their disposal. Most frequently, handouts directed students to use what tend to be finite and single-copy sources—books and journals—collected from their campus library shelves—a tradition-bound approach to research.

Yet, at the same time, few of the handouts we analyzed explained how the Internet could be effectively used for conducting scholarly research. Regardless of the fact that students do rely heavily on the Web for course-related research.

We wholeheartedly agree that library bookshelves are entirely appropriate for conducting scholarly research. However, in the digital age, scholarly sources can be found in many places beyond the library stacks.

In the digital age, scholarly sources exist in many places beyond what students are likely to find in the library stacks.

Research assignments, in general, should have students learn how to derive information from multiple and diverse formats. Students need to learn how to use and evaluate specific online and print sources—from blogs to collaborative wiki entries to traditional top-flight scholarly journals to data directly collected from the field—independently and when the sources are used in combination.²⁹

The use of multiple formats causes students to go beyond thinking of research as a competency learned by rote where students use the same predictable set of resources—an approach a large majority of students reported using in our prior student survey.³⁰

²⁸ See "[Finding Context: What Today's College Student Say about Conducting Research in the Digital Age](#)", Alison J. Head and Michael B. Eisenberg, Project Information Literacy Progress Report, University of Washington's Information School, February 4, 2009 (18 pages, PDF, 864 KB).

²⁹ For example, assignments that require students find sources from a PsycINFO search, a book from a campus library, a Wikipedia entry, and a YouTube video would teach students to critically evaluate and extract information from multiple channels, in addition to working on the deliverable they will need to submit.

³⁰ See "[Lessons Learned: How College Students Seek Information in the Digital Age](#)," by A. J. Head and M. B. Eisenberg, 2009.

The approach to using multiple and diverse formats hit a pedagogical sweet spot: Students gain hands-on practice with determining the nature and extent of information they need and become proficient in processing information in all forms.³¹

Students also learn how research and writing are changing in the digital age, as they become consumers as well as creators of information.³² These competencies and experiences are what students will inevitably need to apply in the workplace after they graduate.³³

We realize the recommendations we make here may take many hours and a great deal of thought to implement, when faculty have few hours to spare. So, we offer one last suggestion. We suggest contacting a librarian and/or a Faculty Development Office for help, ideas, and inspiration.

Both are would-be partners for creating assignments that explain the underpinnings of what the research process means and how the changing parade of information sources in the digital age are found, applied, evaluated, and put into scholarly use so they engage curious minds and encourage intellectual discovery and lifelong learning.

Next Steps

This content analysis of course-related research assignments is the first part of our yearlong large-scale study about how college students conceptualize, operationalize, and experience research in the digital age.

In fall 2010, we will release findings from our large-scale student survey, conducted at 25 U.S. colleges and universities (n=8,300). The survey investigates how students evaluate, organize, and use information, once they have found it, for course-related research and for addressing information problems in their everyday lives.

³¹ For an interesting discussion, see [Project Information Literacy Smart Talk, no. 2 with Andrea A. Lunsford, "Writing and the Profound Revolution in Access."](#) July 12, 2010. Lunsford, the Director of Stanford's Program on Writing and Research discusses how writing and research have changed in the digital age, noting "changes in audience and audience awareness (the whole world can now be your audience, introducing a huge set of problems in trying to find effective ways of addressing an audience); the increasingly collaborative and participatory nature of writing (Google.docs and Google.wave, to mention only two), allow groups of writers to work together in real time to create documents of all kinds. Students today are much more accustomed to producing and disseminating knowledge rather than simply consuming it."

³² For further discussion, see [Project Information Literacy Smart Talk, no. 2 with Andrea A. Lunsford, "Writing and the Profound Revolution in Access."](#) July 12, 2010. Lunsford, the Director of Stanford's Program on Writing and Rhetoric discusses how writing and research have changed in the digital age, noting "changes in audience and audience awareness (the whole world can now be your audience, introducing a huge set of problems in trying to find effective ways of addressing an audience); the increasingly collaborative and participatory nature of writing (Google.docs and Google.wave, to mention only two), allow groups of writers to work together in real time to create documents of all kinds. Students today are much more accustomed to producing and disseminating knowledge rather than simply consuming it."

Appendix A: Methods

From October 1, 2009 through December 17, 2009, the Project Information Literacy (PIL) Team conducted a quantitative content analysis of 191 course-related research handouts. Instructors who taught undergraduates at 28 U.S. colleges and universities, voluntarily submitted the handouts.

The goal of the content analysis was to find out what types of guidance and support instructors provide to undergraduate students for completing a course-related research assignment.

This content analysis study is part of PIL's ongoing research about how college students conceptualize and operationalize course-related and everyday life research. In light of PIL's previous research findings, we were interested about learning more about the coaching role instructors may play in the student research process and specifically, in providing students with *situational* and *information-gathering contexts*.³⁴

Our unit of analysis was the course-related research handout. We used instructors' handouts as one of the communication artifacts that instructors use to convey information about course-related research. In our prior research, students have reported written guidelines as being useful to them in completing their research assignment.

For the purposes of the study, we defined a *course-related research handout* as an explanatory handout about a research assignment, prepared and distributed by a college instructor in the previous year.

The handout may have been distributed to students in class or through other methods (e.g., posted on a Blackboard site). A course-related assignment could result in a research paper or another deliverable (e.g., multimedia presentation). In either case, the assignment requires students to conduct some "outside research" and collect substantiating information from existing primary and secondary sources.

Research Liaisons

At each institution, we enlisted research liaisons, often librarians, who worked on campus and facilitated PIL's instructor recruitment process. Each liaison submitted instructor names and emails (approximately 15 faculty names per institution). PIL, in turn, emailed each instructor with study details. In exchange for their time and participation, instructors who submitted handouts were entered in a PIL drawing for a \$100 bookstore gift card.

To mitigate any "pro-library" bias, we asked liaisons to collect the names from sources other than themselves. That is, liaisons collected instructor names by asking a dean or department head on their campus to recommend an instructor for the study, instead of relying on their own contacts through, perhaps, library support and consultation. Appendix Figure 1 shows baseline information about each institution where handouts were collected.

³⁴ See page 5 of this report for a discussion of how PIL defines situational context, in light of PIL's typology of research contexts early adults seek when conducting course-related and everyday life research.

Appendix Figure 1: Institutions Participating in the Content Analysis Study

Four-Year Colleges and Universities				
Institution	Type	Full-time Undergraduate Enrollment	Research Liaison	Handouts Submitted from Faculty
Cal Maritime (California State University System)	Public	850	Michele Van Hoeck, Information Fluency Librarian	4 handouts
City University of Seattle	Private	5,400	Mary Mara, Director of Library Services	3 handouts
Colby College	Private	1,850	Sara Prah, Reference and Instruction Librarian	10 handouts
Corban College	Private	697	Garrett Trott, Reference and Instruction Librarian	6 handouts
College at Brockport	Public	6,294	Mary Jo Orzech, Director, Drake Library	8 handouts
Dartmouth College	Private	4,100	Laura Barrett, Director of Education and Outreach	13 handouts
Eastern Michigan University	Public	16,885	Suzanne Gray, Assistant Professor/Information Literacy Librarian	8 handouts
Gustavus Adolphus College	Private	2,500	Barbara Fister, Academic Librarian/Department Chair	8 handouts
Harvard College	Private	7,000	Sue Gilroy, Librarian for Undergraduate Programs for Writing, Lamont and Widener Libraries	5 handouts
Holy Names University	Private	1,000	Karen G. Schneider, Library Director	3 handouts
Northern Kentucky University	Public	9,534	Stephanie Henderson, Instructional Services Librarian	5 handouts
Ohio State University	Public	37,864	Nancy O'Hanlon, Coordinator for Teaching and Learning; Professor	5 handouts
San Francisco State University (California State University System)	Public	30,014	Ned Fielden, Librarian	5 handouts

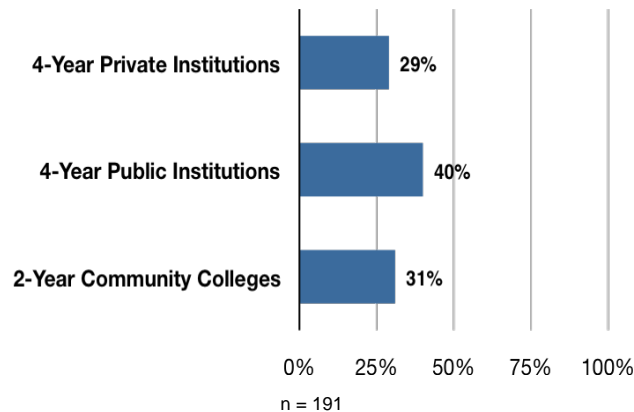
Institution	Type	Full-time Undergraduate Enrollment	Research Liaison	Handouts Submitted from Faculty
University at Albany (SUNY)	Public	13,250	Trudi Jacobson, Head of User Education Programs	5 handouts
University of Arkansas-Fayetteville	Public	19,849	Necia Parker-Gibson, Social Sciences/Agriculture Librarian	2 handouts
University of California, Irvine	Public	28,000	Cathy Palmer, Head, Education and Outreach	6 handouts
University of Illinois, Urbana-Champaign	Public	40,000	Lisa Hinchliffe, Coordinator for Information Literacy Services and Instruction	6 handouts
University of Kansas	Public	21,000	Erin Ellis, Head of Libraries Instructional Services	3 handouts
University of Minnesota	Public	27,040	Kate Peterson, Information Literacy Librarian	5 handouts
University of Washington	Public	47,848	Deb Raftus, Romance Languages and Literatures Librarian	9 handouts
Wake Forest University	Private	5,000	Rosalind Tedford, Assistant Director for Research and Instruction	10 handouts
Two-Year Community Colleges				
Butler Community College	Public	4,200	Dr. Gene George, Executive Director, Research and Institutional Effectiveness	4 handouts
Chaffey College	Public	6,195	Marie Boyd, Curriculum Chair and SLO Co-Coordinator	16 handouts
Fulton-Montgomery Community College	Public	1,743	Michael V. Daly, Instruction and Public Services Librarian	8 handouts
Santa Barbara City College	Public	7,795	Kenley Neufeld, Library Director	13 handouts
State College of Florida Manatee-Sarasota	Public	8,500	Mark Marino, Information Literacy Librarian	6 handouts
Volunteer State Community College	Public	7,241	Jane McGuire, VP of Institutional Effectiveness	4 handouts
West Valley College	Public	8,508	Maryanne Mills, Department Chair, Library	8 handouts

Institutional Sample

Of the 28 institutions participating in the content analysis, 7 were community colleges (25%), 13 were four-year public colleges and universities (46%), and 8 were four-year private colleges and universities (29%).

From each institution we received the following number of handouts: 77 handouts from four-year public institutions (40%), 54 handouts from four-year private institutions (29%), and 60 handouts from community colleges (31%). Appendix Figure 2 on the next page shows a breakdown of the type of institutions.

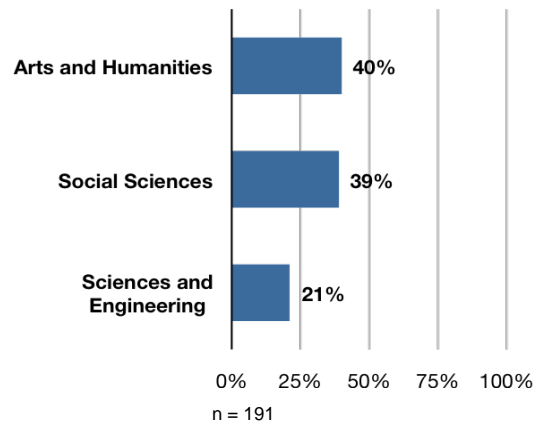
Appendix Figure 2: Handouts Submitted by Institutional Type



Description of Instructors who Submitted Handouts

We collected handouts from instructors who taught sophomores, juniors, and seniors and came from a range of broad disciplines (e.g., humanities and arts, social sciences, sciences, architecture and engineering). During our analysis, individual disciplines were collapsed into these broad disciplinary categories so that we could fill cells for more meaningful comparisons. Appendix Figure 3 shows a breakdown of the handouts we received by discipline.

Appendix Figure 3: Handouts by Discipline

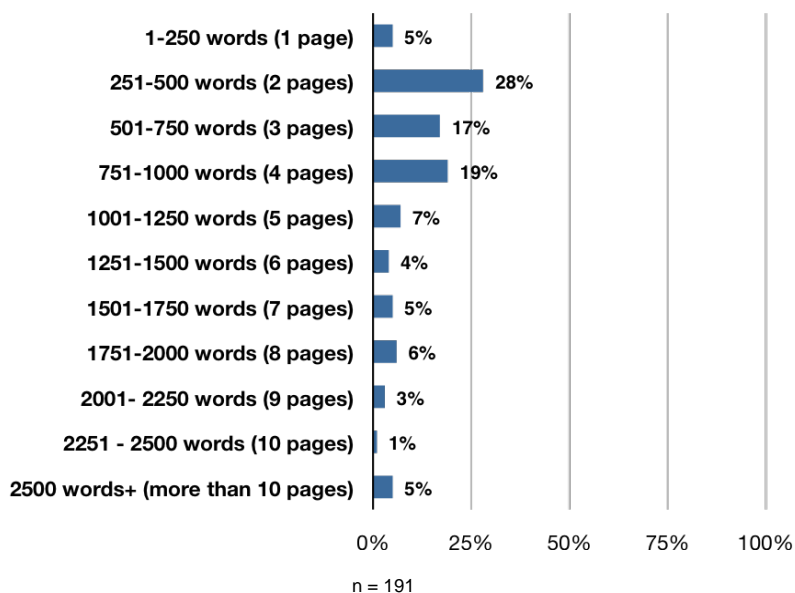


The handouts in the PIL sample had been distributed to students within the last three semesters. Our sample did not include courses where the majority of the curriculum was focused on how to conduct library research. We also excluded syllabi from the sample.

Our sample of handouts is a "voluntary sample." We fully recognize that voluntary samples are always somewhat biased, since they are limited to people (and handouts) that are self-selected. Subsequently, inferences from a voluntary sample are not as reliable as those from a random sample of an entire population, which was not a realistic option, given our study design.

The handouts in the sample varied in length. On the average, handouts were 960 words, or nearly four-single spaced pages each. Appendix Figure 4 shows a breakdown of the handouts analyzed by word length.

Appendix Figure 4: Length of Handouts

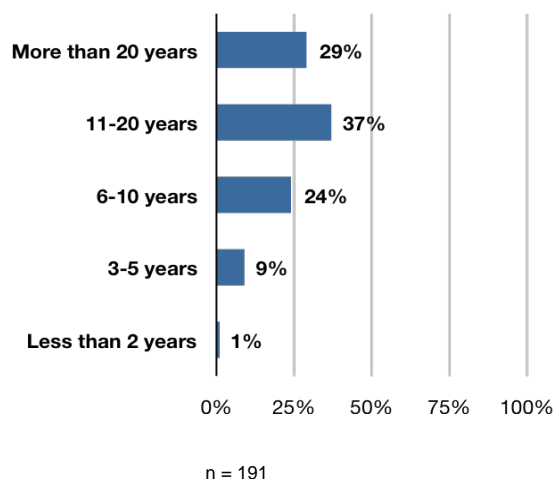


In addition to collecting the handouts from instructors, we asked participants to voluntarily provide demographic information about the highest degree that they held.

The majority of the instructors who participated in the study had PhDs (79%) with fewer having Masters (20%) or JDs (1%) as their highest degree.

We collected data from instructors about how many years they had been teaching. The mode for teaching experience was 11-20 years with 37% of the sample falling into this category. Appendix Figure 5 shows a breakdown of instructors' experience with college teaching.

Appendix Figure 5: Instructors and Years of Teaching Experience



Human Subjects Review and Confidentiality

The Human Subjects Division at University of Washington (UW) approved our research protocol on July 31, 2009 (Certification #36818). UW is the sponsoring institution for PIL's ongoing research study, which is based in the Information School.

UW's Human Subjects' reviewers certified PIL's survey project as "exempt." The exempt status was due to the no-risk nature of the methodologies used to collect data and to guarantee confidentiality. Our research protocol was also submitted and approved at each of the 28 institutions where data was collected from instructors.

All measures were used to protect any identifiable data about instructors who submitted handouts (e.g., each participant was assigned an identification code; all responses and code keys were stored separately in locked files or on secured computers). No participants or individual institutions were identified in this report.

Handout Coding Procedures

The content analysis coders were three working librarians, who generously donated their time. The coders were Sue Gilroy (Harvard), Sara PrahI (Colby College), and Sarah Vital (St. Mary's College of California). Coders who worked at institutions also in the handout sample, were not allowed to code any of the "home base" handouts from faculty.

Before the official coding process began, Sarah Vital, the Lead Coder, conducted a training session with coders Sue Gilroy and Sara PrahI. The codebook was also pilot tested with a sample of three handouts from St. Mary's College of California, a campus not in the sample.

Handouts were coded for 28 individual properties (the coding form used during the analysis is included in Appendix B). During the coding phase, the three coders systematically identified 26 *manifest properties* of wording and phrasing that appeared in the 191 handouts. When coding is conducted during content analyses, manifest describes what an author or speaker (or in our case, an instructor) has definitely written right into the text. Manifest coding is different from latent coding, since latent coding

requires the coder to make a qualitative and critical interpretation of inferred meanings in a text.

The PIL Team used only latent coding for coding two properties—guidelines provided to students for evaluating the *currency* and *authority* of resources. Since *currency* and *authority* are terms used in library and information science for characterizing resources, we had to infer how instructors who had not been trained in library and information science may have described the similar concepts.

Intercoder Reliability

In order to measure intercoder reliability, we had each coder read the same 19 handouts in the sample. Krippendorff's alpha was used to measure the variations among the three coders' individual coding decisions.

The current version of PASW Statistics 17 (formerly SPSS) was used to test intercoder reliability and to measure the degree of variation among the three coders' decisions. Krippendorff's alpha is the most rigorous means of testing intercoder reliability. The statistic takes into account chance agreement among content analysis coders and adjusts for nominal, ordinal, interval, and ratio variables.

Although there is no universally accepted standard for interceder reliability, communication research scholars have argued that a coefficient of .90 is "highly acceptable" and that .80 is "acceptable."³⁵ Overall, the intercoder reliability among the individual decisions was .80 and therefore within the "acceptable" range. This means that there was an 80% degree of reliability in the PIL Team's coding among the three coders' individual decisions.

Follow-Up Interviews with Instructors

Many of the results from our analyses provided some answers about the kinds of guidelines instructors provided to students in course-related research handouts. At the same time, the analysis raised new questions. In the hope of answering some of these questions and providing supplementary qualitative details to our content analysis, we conducted 15 follow-up interviews with instructors who had submitted handouts to our sample and from the 174 instructors (91%) who agreed to be contacted.

The sample was segmented along three lines: (1) by respondents from community college vs. those from four-year institutions, (2) disciplinary area of expertise, including a balance of humanities, social science, sciences, and business administration, and (3) instructors whose handouts recommended using library resources and services and those who handouts did not.

Fourteen of the interviews were conducted by telephone and lasted for 15-30 minutes. One interviewee responded by email to the list of questions. A script with six open-ended questions was employed. The same interviewer was used throughout for consistency.³⁶

³⁵ K. A. Neuendorf (2002). *The content analysis guidebook*. Thousand Oaks, CA: Sage.

³⁶ John Marino, a doctoral student in the University of Washington's Information School and a member of the PIL Research Team, conducted the interviews in April and May, 2010.

The questions were as follows:

Q1a. Do you assign many course-related research assignments to students?

Q1b. What would you say the "research part" of the research assignments actually entails for students? What are your expectations of students for course work that involves researching a topic or issue?

Q2. When you ask students to complete a course-related research assignment, we know that you often distribute a handout of some sort that explains the assignment (that's how you ended up in our study, since you submitted a handout to us last fall). Would you say in the handout (or in class or one-on-one, e.g., face to face or via email) that you spend a lot of time discussing assignment particulars with students or do you assume students know what course-related research involves by the time they enroll in your course?

Q3. From your experience, how much skill would you say students bring to the course-related research process? Are most students, in your experience, well prepared to conduct the level of research you expect of them? Would you say students are better at certain things than others when completing course-related research assignments? Please describe.

Q4. Do you tend to recommend other people on campus whom students may consult for help with finding information and conducting research? If so, who? Why? How about librarians? Do you recommend that students use librarians, or do you assume students already know about consulting with librarians? Why or why not?

Q5a. There are so many online sources available to students for conducting course-related research, as we both know. Do you ever make suggestions to students about what sources to use (or not to use) for course-related research? Why or why not? What sources are you likely to recommend or discourage? Do you find students have a fairly good idea of what sources to use?

Q5b. Would you say you, yourself, are up-to-date about the different research sources—online and in print—which students might use for one of your course-related research assignments?

Q6. Lastly, let's talk about plagiarism and course-related research assignments. By the time you have students enrolled in one of your classes, would you say students know what plagiarism is and what constitutes an act of plagiarism? How much is plagiarism a problem and what forms does it seem to take?

Appendix B: Coding Form

Content Analysis Coding Form, Project Information Literacy, Fall 2009

PART 1: DESCRIPTIVE INFORMATION ABOUT SAMPLE

1. Unique ID Number of handout?

2. HIGHEST Degree of the faculty member who is teaching course

- PhD
- JD
- Masters
- Other:

3. YEARS teaching at college level?

- Less than two years
- 3 to 5 years
- 6 - 10 years
- 11 - 20 years
- More than 20 years
- Other:

4. Available for follow-up interview?

5. NAME of institution where handout originated?

Butler CC
Cal Maritime (CSU)
Chaffey CC
City University of Seattle
Colby College
College of Brockport
Corban College
Dartmouth
Eastern Michigan University
Fulton Montgomery CC
Gustavus Adolphus
Harvard
Holy Names University
Northern Kentucky University
Ohio State University
San Francisco State University
Santa Barbara CC
State College of Florida Manatee-Sarasota
State University New York at Albany (SUNY)
University of Arkansas, Fayetteville
University of California, Irvine
University of Illinois, Urbana-Champaign
University of Kansas
University of Minnesota
University of Washington
Volunteer State CC
Wake Forest University
West Valley CC

6. What TYPE of institution is this? (e.g., public, private, CC)

- Four-year PUBLIC institution
- Four-year PRIVATE institution
- Two-year institution (i.e., community college)

7. What DISCIPLINARY category does the handout fall into?**(That is, what type of class was handout used in)?**

- Architecture and Engineering
- Art and Humanities
- Business Administration
- General Education
- Occupational Training
- Sciences
- Social Sciences
- Other:

PART 2: ANALYSIS OF HANDOUTS**CODER'S NAME**

- Sarah Vital
- Sue Gilroy
- Sara Prahl

I. ASSIGNMENT TYPE**(Defines a certain kind/type of research paper)**

- Argument paper about an issue or subject (1)
- Historical paper about a certain period or event (2)
- "Close reading," interpretative paper about a work of art or written work (e.g., novel, poem, film)(3)
- Case study analysis (4)
- Literature review (5)
- Biographical sketch (6)
- Theoretical paper, which applies a theory covered in a class (7)
- Multimedia product that requires research (8) (i.e., Web site, movie)
- Poster presentation that integrates research (9)
- Oral presentation that integrates research (10)
- Other:

II. TOPIC DEFINITION**(The topic of the paper is...)****The topic of the paper can be either one that was assigned by the professor or chosen by the student**

- Defined by professor (1): The handout must answer one or more specific questions.
- Chosen by student from multiple professor-defined topics (2): The handout must have a list of eligible topics.
- Defined by student (3): The handout will indicate that the student is expected to choose and define the topic within the parameters of the course (e.g. pertaining to women in the Civil War).
- Other:

III. DEGREE OF COLLABORATION**(Assignment requires student to work in groups or individually)**

For INDIVIDUAL (1) to be assigned, the handout must indicate the assignment is to be completed by only one student.

A handout indicating that one assignment is to be completed by two or more students is coded as GROUP (2).

Other:

IV. ARRANGEMENT**(Provides structure of paper)**

For a YES (1) to be assigned, the handout must include instructions on how to arrange the final product (e.g., Introduction, specific questions to answer, Summary/Conclusion, Reference page). If arrangement instructions are not given, assign a NO (2).

Other:

V. REQUIRES CITATIONS**(Requires a set number of citations; click associated multiple choice button on online form)**

- 1-3 citations required
- 4-6 citations required
- 7-10 citations required
- 11-15 citations required
- 16-20 citations required
- More than 20 citations required
- Citations required, but set number of citations not specified.
- No citations required

VI. REQUIRES- PAGES**(Requires a set number of pages) (Note: pages are figured at 250 words per page)**

- 1-4 page paper (250-1,000 words)
- 5-10 page paper (1,001 - 2,500 words)
- 11 - 20 page paper (2,501 - 5,000 words)
- 21-40 page paper (5,001 - 10,000 words)
- 40+ paper (over 10,000 words)
- No page number of paper specified
- Not a paper (e.g., multimedia project)
- Other:

VI. CONTEXT**(Provides explanation of how the assignment is related to course material)**

For a YES (1) to be assigned, the handout is to include discussion on the purpose of the assignment to the overall objectives of the course (e.g., cites a class reading or lecture discussion, or asks student to draw a relationship).

If a relation to course objectives is not discussed, assign a NO (2).

Other:

VIII. GRADING (includes grading criteria)

For a YES (1) to be assigned, the handout must include an explanation or method for tallying evaluation of work (e.g., points/percentages assigned to parts of the paper).

If grading criteria is not mentioned, assign a NO (2).

Other:

IX. SPECIFIC RESEARCH RESOURCES TO CONSULT

For the code to be assigned, the following words need to be present in the description of the assignment. Makes suggestion regarding the use of the following research resources.

Coding categories for the "suggestion" of resource use are as follows:

Required (1): must

Recommended (2): should, might, may, can

Discourages (3): (e.g. can be used, but not advocated as appropriate)

Prohibits (4): not (such as must not, do not, not acceptable)

No mention (5): topic is not mentioned at all

Resources:

- Librarians for consultation or assistance with assignment (e.g., reference, or otherwise)
- Online library resources (includes OPACS and/or scholarly research databases, ProQuest, JSTOR, etc.)
- Library resources available from library that are not in online format (e.g., books, print journals, videos, reserves—i.e., place-based sources available on site from the library)
- Internet search engines (e.g., Google, Google scholar, Yahoo!, Ask.com, Bing, etc.)
- Wikipedia (that is, wikipedia.org—only)
- Internet/Web "public sources" (e.g., .com, .org, .gov sites—any sites, except for Wikipedia.com)
- Course readings (i.e., assigned for the course, e.g., articles, texts)
- Primary sources (e.g., interviews with people, fieldwork, lab experiments)
- Blogs

X. What kind of ASSIGNMENT ASSISTANCE is offered to students?

For a YES (1) to be assigned, the handout must explicitly state that each method of assistance is available for help on the assignment, itself (an email listed with no explanation of using it for assignment help DOES NOT make it a yes). If the method for offering assistance is not mentioned, assign a NO (2).

- Office hours available for discussing the assignment
- Instructor is available via email for discussing assignment
- Instructor will review drafts of students' papers
- Instructor sets up a special online forum discussion group for student-to-student discussion or instructor-to- student
- Instructor is available by telephone for discussing assignment
- Instructor suggests, "just ask me" (implying face-to-face informal discussion after class or on a drop in basis in office/hallway)

XI. QUALITY CONTROL

Use the following coding: YES (1), NO (2).

- Includes information on plagiarism (e.g., defines plagiarism, cites honor code, defines penalties for plagiarism)
- Includes proper citation style (e.g., MLA, APA, Chicago, or any style as long as consistent and formulaic)
- Suggests reviewing currency of materials used (includes information about reviewing the currency of materials used, that is checking what date the materials were published, and/or what is acceptable)
- Suggests reviewing authority of materials used (includes information about reviewing the authority of materials used, that is the source of authorship and the publication are provided)
- Makes recommendation to spell-check final product (the handout must recommend spell-checking final

Acknowledgements

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