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Web-based research guides are a major service provided by academic libraries, which require a significant investment of staff time to create and maintain. These guides, however, are not heavily used. Librarians need to understand the factors influencing the use a guide receives in order to make improvements that will increase usage. The literature suggests many design standards for guides to follow, but no quantitative assessment has been undertaken to determine whether good design really does increase research guide use.

In a case study of LibGuides at Kennesaw State University, use of guides is regressed against a specific list of design and usability standards based on the library science and web design literature. The results demonstrate the effect each variable has on use and how well design predicts use overall. A list of standard design recommendations is presented, and other factors influencing guide use are also considered.

Headings:

Academic libraries

Computer assisted instruction

Library resources -- Computer network resources

DESIGN STANDARDS FOR LIBGUIDES: DOES BETTER DESIGN LEAD TO GREATER USE?

by
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Introduction

Online research guides are a standard service in academic libraries, as well as some school, public, and special libraries. These guides are created by librarians to help patrons locate reliable resources in a given subject area. Research guides require a good deal of time to create and maintain; however, the library science literature reveals that they tend to not be heavily used. Students still turn in droves to the familiarity of Google to complete their research assignments, either unaware or unwilling to use the library guides. Librarians need to understand the factors that influence the use of these guides in order to adapt them to better serve the needs of their patrons.

To analyze whether adherence to design and usability standards increases the use of online research guides, I propose a case study of online research guides at the Horace W. Sturgis Library at Kennesaw State University, a public university of over 23,000 students located in the northwest suburbs of Atlanta. The results of the Sturgis Library's 2010 LibQUAL survey revealed that undergraduates, graduate students, faculty, staff, and even library staff desire improved online resources to help them find information on their own. For all five groups, the "perceived" level of service was less than the "desired" level for three topics relevant to this study: "A library Web site enabling me to locate information on my own," "Easy-to-use access tools that allow me to find information on my own," and "Making information easily accessible for independent use" (Association of Research Libraries, 2011, p. 46, 59, 72, 81, 90). Improving KSU's LibGuides is a great opportunity to meet the specific needs of their users. LibGuides are

a great tool for librarians serving patrons who are increasingly self-sufficient and "have grown to expect Google's immediacy and accessibility" (Anello & Bonfield, 2007, p. 32).

In July 2010, KSU's Sturgis Library implemented LibGuides, a content-management system for research guides that has taken the academic library world by storm. KSU currently has 62 published LibGuides, which received a total of 44,578 hits from January 2011 through December 2012. Librarians have steadily added to KSU's LibGuides collection, with guides for general subjects, individual courses, and library research skills. Data also reveal that the guides have received continually increasing use since implementation and that visits have increased 39 percent from 2011 to 2012. While this data is positive and demonstrates a good deal of use, visits to LibGuides still make up only a small percentage of traffic to the library's website. There is still room to greatly increase use of KSU's LibGuides.

This paper includes three parts. First, a literature review of previous library studies and recommendations from web usability experts is presented. Second, a regression analysis is conducted to determine the effect of selected design variables on use. Third, a set of recommended design guidelines is proposed to target some fundamental areas of need in standardizing and improving LibGuides both at KSU and other institutions.

The hypothesis of this study is that adherence to a specific set of design standards, based on a literature review from the library science and web design fields, will have a positive effect on the use an online research guide receives, as measured by average page hits per month per page on that guide.

Literature review

Need for standardization

The need for standardization of the look and feel of LibGuides is well-covered in the literature (Jackson & Pellack, 2004, p. 320, 324) (Hintz et al., 2010, p. 42). Having a standard appearance and format across all guides helps users "begin to recognize them as a library product" (Adebojono, 2010, p. 404). Furthermore, studies have found that a consistent format is a key usability desire for students, who prefer sites like Wikipedia, because "their goals are speed and simplicity" and "they know what to expect of the Wikipedia format and know how to navigate quickly" (Strutin, 2008, para. 24). Consistent layout between guides seems to be a key issue. A LibGuides usability study at the University of Washington found that "inconsistent layouts confused the users" and "made it hard for them to find resources" (Hungerford et al, 2010, p. 6).

Need for assessment

The creation and maintenance of LibGuides represent a significant time commitment by librarians, and therefore "justifying the time and creative investment…is important for buy-in and for the overall success of a comprehensive and ongoing guide project" (Gonzalez & Westbrock, 2010, p. 653) and "usage data needs to be consulted when this much time is put into creating resources" (Jackson & Pellack, 2004, p. 325). Also, usage data is a key resource in securing and maintaining funding for a commercial product (Gonzalez & Westbrock, 2010, p. 651). However, "the data indicates that students do not relate well to subject guides. Yet, librarians continue to produce and rely

on them as tools for introducing students to library materials" (Reeb & Gibbons, 2004, p. 123).

Specific design and usability recommendations

A review of previous library studies, as well as guidelines from web usability experts, suggests several topics that are key for creating the most efficient and beneficial LibGuides.

Clean Design

Numerous studies have found that ease of use, simplicity, and clarity are among users' top usability concerns with LibGuides (Ouellette, 2011, p. 436, 444) (Hintz et al., 2010, p. 45). Researchers have found that "the most consistently noted problem with subject guides is that users are overwhelmed by clutter" (Ouellette, 2011, p. 444). Users desire a clean layout, clear navigation, simple and concise wording, and brevity (Hintz et al., 2010, p. 47) (Springshare, 2013). Hintz et al. found that "while content and comprehension are important, visual appeal can be a deciding factor in determining which guides students would most likely use" (2010, p. 45).

Avoid Clutter

Previous studies have emphasized that with the vast amount of information available via the Web and electronic resources, "comprehensiveness is neither possible nor desirable" (Gilmour, 2010, p. 350). Students have expressed a preference for more careful selection of databases and other resources, with a short list of quality resources rather than a list of everything available related to the subject (Ouellette, 2011, p. 445-446) (Adebojono, 2010, p. 401-403) (Hintz et al., 2010, p. 47) (Jackson & Pellack, 2004, p. 323). Aiming for volume rather than quality of sources results in "a hodgepodge of cluttered pages" (Jackson & Pellack, 2004, p. 325). If guides are still too busy even when

only a few quality resources are highlighted, another option to create easier navigation is to split them into separate guides based on more narrow sub-topics (Gilmour, 2010, p. 357)(Ouellette, 2011, p. 445)(Staley, 2007, p. 130). Studies have even found that the presence of white space increases comprehension and improves users' satisfaction (Fadeyev, 2009).

Authority and Professional Appearance

Librarians have an opportunity to reinforce their credibility with quality LibGuides, as students approach them seeking "authoritative information from accepted experts" (Hintz et al., 2010, p. 47). Since the guides are a part of the library website, they should be current, free of typos, and have active hyperlinks (Judd & Montgomery, 2009, p. 17). Jackson and Pellack explain that "it seems irresponsible of libraries to offer their users outdated or inaccurate guides" and "if librarians want their users to look to their guides as a more authoritative alterative to search engines, then offering poor guides is contradictory to that goal" (2004, p. 325).

Studies have indicated that users judge a website's credibility in part based on its design, including layout, consistency, typography, color, style, errors, update rate, and ease of use (Fadeyev, 2009). Springshare (2013) also reminds guide creators that a professional, easily-read font should be defined system-wide, and certainly should not be customized within boxes. Furthermore, they advise authors to use bold, italics, and color sparingly, and to avoid underlining unless the item is a hyperlink.

Front-Load Content

Web usability guidelines, including those published by Springshare (2013), emphasize the importance of "front-loading" websites, or placing the most important information front and center. Jakob Nielsen (2006) states that the first two paragraphs

should include the most important information and that users will "probably read more of the first paragraph than the second." There is substantial evidence that users are willing to scroll down a page, despite the traditional belief that scrolling is not preferred (Tarquini, 2007) (Fadeyev, 2009). However, users will only scroll down the page if the content appears worthwhile – "if it is compelling, users will follow where it leads" (Tarquini, 2007). It is key to make clear to users up front what content is included, because "if they have to scroll to even discover what the site is, its success is unlikely" (Tarquini, 2007).

Research has definitively shown that students use subject guides primarily to access databases, because their goal is to find articles to complete their assignments quickly (Ouellette, 2011, p. 443-444). Given these findings, databases should be clearly highlighted in research guides among the most important information. Ouellette suggests possible solutions as placing the top three databases on the guide's homepage or making the databases tab the default (2011, p. 445, 448).

Provide Alternate Navigation

It is important to include a brief list up front that highlights the material covered in subsequent pages of the guide, as usability studies have shown that many users do not initially recognize the tab navigation (Pittsley & Memmott, 2012, p. 53) (Hungerford et al, 2010, p. 6, 10). It has even been recommended to include a box on the home page with links to each of the subsequent tabs, as alternate navigation (Pittsley & Memmott, 2012, p. 54-55). Springshare (2013) warns against wordy "welcome" messages, though, and instead encourages a brief bulleted list of the purpose and contents of the guide.

Organizational Structure

Librarians must decide on a consistent organization scheme for each guide, either by type of resource or subdivisions within a subject area, but not both (Ouellette, 2011, p. 446) (Jackson & Pellack, 2004, p. 326) (Nielsen, 2007). One study pointed out that organization by sub-disciplines has "the advantage of following the way that practitioners think about their discipline rather than the way librarians think about it" (Gilmour, 2010, p. 351) and that students "do not approach research by format" but rather by topic or task and are only interested in format organization *within* sub-topics (Sinkinson et al, 2012, p. 79). Librarians must also consider the organization of materials *within* tabs, because "having a random arrangement can stymie patrons looking for a specific link" (Jackson & Pellack, 2004, p. 322). Gilmour explains that users who are accustomed to Google assume the most relevant results come first and "will focus on the first few links and give decreasing attention to those farther down the page" (2010, p. 357). Web usability expert Jakob Nielsen emphasizes that the most important information needs to be above the "page fold," or the area initially viewable when a page is opened, since this is where users spend 80 percent of their time (2010). Library patrons, like other computer users, have a general aversion to scrolling down a page (Hintz et al., 2010, p. 45).

Tabs

Previous studies have found that users overwhelmingly prefer fewer tabs on LibGuides (Ouellette, 2011, p. 444) (Strutin, 2008, para. 40) (Hungerford et al, 2010, p. 8). Furthermore, numerous web usability experts urge authors to stick to one row of tabs as a basic usability principle to enable easier navigation (Mifsud, 2011) (Gube, 2009) (Nielsen, 2007) (Springshare, 2012) (Conradie, 2008, p. 7). Multiple rows of tabs "destroy spatial memory" (Nielsen, 2007) and confuse users by implying a hierarchical

relationship between the top row and those below (Gube, 2009) (Conradie, 2008, p. 7). Tabs should appear in a logical order (Mifsud, 2011) and group information "so users can easily predict what they'll find when they select a given tab" (Nielsen, 2007). Finally, tabs should function like file folder tabs in the real world – they should organize information within the page and never link to a new webpage (Nielsen, 2007) (Mifsud, 2011) (Pittsley and Memmott, 2012, p. 55).

Labeling

Labels within the guides must be carefully chosen and then standardized across guides, as users prefer short, jargon-free labels and descriptions (Hintz et al., 2010, p. 45) (Springshare, 2013). Experts recommend that labels consist of one to three words, and some even say two is the maximum (Mifsud, 2011) (Nielsen, 2007) (Springshare, 2013) (Gube, 2009) (Conradie, 2008, p. 8). Jakob Nielsen asserts that when reading on the web, users only see about the first two words of any list item, or maybe three if the words are very short, for a total of about eleven characters (Nielsen, 2009). LibGuides usability testing has confirmed this finding as students tend to miss the last words in long tab names, even if they contain key information about the content (Hungerford et al, 2010, p. 19.) Librarians should consider how easily a new student could understand their terminology (Ouellette, 2011, p. 446-447) (Center for Plain Language, 2013). Students have complained that it is consistently difficult to locate databases across guides, because "tab labels are often unclear, inconsistent, or confusing" (Ouellette, 2011, p. 446). Clear tab labels make it easier for users to predict what content each tab contains (Mifsud, 2011).

Annotations

Students do not simply want to be pointed to resources – they want help learning how to use them (Sinkinson et al, 2012, p. 76). Students have consistently expressed a preference for annotations of resources – and even LibGuides in general – including why the resource is useful, authorship information, searching tips, and any limitations or restrictions (Gilmour, 2010, p. 357) (Jackson & Pellack, 2004, p. 322) (Courtois, Higgins, & Kapur, 2005, p. 195) (Little, 2010, p. 62) (Hungerford et al, 2010, p. 11-12). Hintz et al. explain that students "[do] not want to simply be pointed to a resource; they wanted to be told how best to make use of it" (2010, p. 46). However, these annotations need to be short, preferably not more than a sentence or two (Hintz et al., 2010, p. 46). Annotations are especially crucial when resource names are acronyms or otherwise do not make clear their scope and purpose (Hungerford et al, 2010, p. 9). Furthermore, usability testing has indicated that students prefer static resource annotations over the rollover or hover display options (Hungerford et al, 2010, p. 10).

Librarian Profile

Even with the best-designed guides, many students still want to interact with a librarian (Foster, Wilson, Allensworth, & Sands, 2010, p. 613) (Hintz et al., 2010, p. 46) (Freeman, 2004, p. 44). Therefore, contact information for the librarian who authored a guide should be readily available. Furthermore, a recognizable photo is preferred as it "gives students a person with whom they can connect when they need more help" (Adebojono, 2010, p. 406) and "add[s] a human element" (Little, 2010, p. 62), and one study found that "students [request] subject librarians by name and appear more comfortable approaching librarians they recognize from the photos" (Reeb & Gibbons, 2004, p. 127).

Links

Guide authors must choose the appropriate level of link specificity. Some websites, such as those of government agencies, are so vast that a link to the homepage may not be helpful to students. Gilmour recommends that librarians "should provide some tips on how the visitor should proceed" or "better yet, link directly to pages of interest" (2010, p. 351). Links must also be current and active, which should be simple with the integrated "Link Checker" tool provided as part of the LibGuides platform. Studies have suggested checking links at least twice per semester (Courtois, Higgins, & Kapur, 2005, p. 195) (Jackson & Pellack, 2004, p. 324). The guides administrator must decide whether they, the individual authors, or student assistants will be responsible for checking links. This is an essential upkeep for the guides, as "links that go nowhere destroy the credibility of the library faculty" (Adebojono, 2010, p. 400).

Weeding

Weeding is an essential part of a LibGuides collection. Pages with little use should either be improved or removed (Jackson & Pellack, 2004, p. 326). The presence of outdated or irrelevant guides threatens the credibility of the entire collection with students. Guides cannot be created and forgotten; they must be constantly reviewed and updated to ensure not only that the information is still accurate, but also to regularly look for new authoritative material to add (Adebojono, 2010, p. 403) (Casey & Savastinuk, 2006, p. 42).

Also, guides should list resources with a direct purpose for your target audience, not everything related to a topic (Gilmour, 2010, p. 351). Guide authors should review material to determine not only if it is still relevant, but if it is still the best (Gilmour, 2010, p. 357). Springshare (2013) recommends that guides be regularly reviewed for

outdated information and to find new information. Furthermore, Springshare recommends unpublishing or deleting guides for courses not offered in the current semester and for past events. At one university, a list was kept to categorize guides as temporary or permanent, which simplifies the weeding process at the end of the semester (Gonzalez & Westbrock, 2010, p. 654).

Web 2.0 Features

"Web 2.0" options are a highly-promoted feature of the LibGuides platform, allowing an increasingly interactive and social experience for users. These features have largely been viewed as a positive by librarians (Hintz et al., 2010, p. 42). However, research has shown that students largely "appeared skeptical about rating systems, discussion forums, student recommendations, and they showed little interest in personalization features" and even "found these features confusing" (Hintz et al., 2010, p. 46-47). One study found that students go to LibGuides seeking "authoritative information from accepted experts" rather than to interact with peers and generate knowledge socially (Hintz et al., 2010, p. 47).

Other Factors Influencing Use Besides Design

Course Guides vs. Subject Guides

The literature overwhelmingly suggests that students are more inclined to use course-specific guides over subject guides, and that course guides more specifically meet student needs (Kerico & Hudson, 2008, p. 40) (Ouellette, 2011, p. 436, 438-439) (Adebojono, 2010, p. 409) (Gonzalez & Westbrock, 2010, p. 648, 653) (Little, 2010, p. 61). Furthermore, many libraries are focusing on course guides created with input from professors and tailored to the level of specific assignments, which require a large time commitment from librarians, but show the greatest use (Adebojono, 2010, p. 401, 405,

409) (Gonzalez & Westbrock, 2010, p. 649) (Strutin, 2008, para. 8) (Staley, 2007, p. 132). Course guides are more useful to today's students, who approach library research in terms of coursework rather than disciplines, and usability studies have found that they have difficulty matching their information needs with a disciplinary subject guide (Reeb & Gibbons, 2004, p. 124-128). Furthermore, subjects are becoming increasingly interdisciplinary, and the "blending of disciplines is not usually reflected in the categorization of subject guides, only adding to students' confusion about how to address their information needs within the context of discipline-based subject guides" (Reeb & Gibbons, 2004, p. 125) (Strutin, 2008, para. 9).

These guides customized to the level of specific courses, assignments, or instruction sessions match the "world of customization and personalization" that college students have grown accustomed to and meet them at the point of need (Reeb & Gibbons, 2004, p. 125) (Ouellette, 2011, p. 448) (Strutin, 2008, para. 16). Furthermore, students view these guides as "current and relevant" and then have the opportunity to hone their skills using the most appropriate and relevant resources for their current coursework, rather than muddling through the huge collection of available material on a given subject (Gonzalez & Westbrock, 2010, p. 649).

Access Point

Studies have shown that a major factor influencing use and usability of LibGuides is their access point from the library homepage (Jackson & Pellack, 2004, p. 321) (Gonzalez & Westbrock, 2010, p. 646) (Strutin, 2008, para. 25, 32) (Ghaphery & White, 2012, p. 22). Research has emphasized that no matter the amount of time invested in creating guides, if users cannot find them they will not be used. Therefore, they should be featured prominently on the library homepage (Judd & Montgomery, 2009, p. 14)

(Jackson & Pellack, 2004, p. 326). One study recommends that for quicker navigation, there should be a dropdown menu on the main page with subdivisions for subject guides and course guides (Strutin, 2008, para. 11). Furthermore, previous studies have recommended having multiple access points to the research guides, from several strategic locations where students most frequently look for information (Lindsay, Cummings, Johnson, & Scales, 2006, p. 444). In addition to the homepage, these include the databases page (Adebojono, 2010, p. 399) (Courtois, Higgins, & Kapur, 2005, p. 190) (Reeb & Gibbons, 2004, p. 127) and the electronic course reserves page (Reeb & Gibbons, 2004, p. 128).

Marketing

Whether or not guides are marketed also plays a role in the use they receive. This marketing can be approached in a variety of ways.

In Instruction and Reference Sessions

One effective way to market the library's guides collection is to use and recommend them in instruction sessions and one-on-one reference interactions (Ouellette, 2011, p. 447). One study found after reviewing their statistics that "in-person instruction at our institution is the direct cause of most visits to guides" (Foster, Wilson, Allensworth, & Sands, 2010, p. 613). Furthermore, when a guide is customized to the course level and introduced during an instruction session, "students are introduced to the guides in context, and the guides are seen as relevant and helpful" (Gonzalez & Westbrock, 2010, p. 652). Students also become familiar and comfortable with the guides as a portal to the library's resources, with some students "expecting to see a picture of their library liaison because their librarian used a guide as part of in-class

instruction" when they open the library's website (Foster, Wilson, Allensworth, & Sands, 2010, p. 613).

With Faculty

Another highly effective marketing opportunity is to promote the guides with faculty, who are in a unique position of influence with students. If faculty recommend that their students use a resource, it is likely the students will do so (Ouellette, 2011, p. 443). Also, outreach to faculty members opens the door to a new network, as instructors who have positive experience with library subject or course guides are likely to recommend these resources to other faculty in their departments and across campus and to request additional guides for other courses they teach (Adebojono, 2010, p. 411) (Gonzalez & Westbrock, 2010, p. 649). Direct marketing emails to department faculty are one way of promotion (Foster, Wilson, Allensworth, & Sands, 2010, p. 608, 610). Course guides provide a unique marketing opportunity, as they are immediately relevant to students, faculty can become involved in their creation, and they reinforce librarians' value in the research process and status as research partners (Gonzalez & Westbrock, 2010, p. 649) (Kerico & Hudson, 2008, p. 40).

In the Library

Finally, the guides should also be marketed within the library, including on the library website and around the physical building with posters and fliers. Lack of marketing is one of the main reasons for low guide use overall (Ouellette, 2011, p. 442). It is not clear, however, which method is most effective. A marketing experiment was conducted at San Francisco State University to determine the effectiveness of different techniques. They found no or minimal success with featuring selected guides on the library homepage, publicizing on Twitter and Facebook, and promotion through blog

posts. The greatest success they found was with direct emails to faculty members (Foster, Wilson, Allensworth, & Sands, 2010). Another marketing technique of note is to promote the time-saving benefit of helping users efficiently select the best resources without the trial-and-error approach (Lindsay, Cummings, Johnson, & Scales, 2006, p. 444).

A review of the literature on library research guides reveals that there has not yet been a quantitative study on whether good design increases the use of online research guides, although a similar study has been recommended (Ouellette, 2011, p. 449). This study will be the first of its kind and will attempt to fill a gap in the research in this area.

Methodology

To determine the impact of design on the use a guide receives, a linear regression will be conducted. Nine design variables have been determined, based on the literature review and available data for KSU's LibGuides. Two other variables will also be included: First, the number of students enrolled in the departments or classes a guide is associated with should be taken into account, as some guides may be heavily used by a small department or lightly used by a large department. Second, whether or not a guide is used in instruction sessions is accounted for, as the literature suggests that guides promoted in instruction receive more use.

Data gathering

I collected the data from KSU's 62 LibGuides. The usage statistics were collected for the last two full years, from January 1, 2011 through December 31, 2012. The guides were split into 3 sub-collections of Subject Guides, Course Guides, and Library Guides. Subject Guides cover introductory material for a broad academic discipline. Course Guides are focused for the assignments of a specific class. Library Guides are general introductions to using the library and technical support issues. These guides have such distinct purposes that it can be assumed they may behave differently. The literature suggests that Course Guides receive greater use than Subject Guides, and the Library Guides can also be expected to behave differently than the other two as they target the most general skills and the broadest audience of all 3 groups. Therefore, the groups will be regressed separately.

I omitted eight guides from this study, because they were not actually created in the LibGuides platform. Clicking the link for the guide automatically redirects to KSU's institutional repository, DigitalCommons@Kennesaw State University, where these materials are stored. As this is a study of design within the LibGuides platform, these materials are irrelevant.

Regression model

In this study, I will conduct a linear multiple regression to determine the impact of several design factors on the use an individual LibGuide receives. The models differ slightly between Subject and Course Guides and Library Guides. For Subject and Course Guides, I will control for the number of students in the program or class. This is not necessary for Library Guides, as the audience can be assumed to be the total student population. For Library Guides, I will control for whether or not the guide is used in instruction sessions. This is not necessary for the other categories, as no Subject Guides are used in instruction, and all Course Guides are. The regression models are as follows:

Subject Guides and Course Guides:

$$USE_i = \beta_0 + \beta_1 STUDENTS_i + \beta_2 ONEROW_i + \beta_3 PAGES_i + \beta_4 JARGON_i + \beta_5 WORDS_i + \beta_6 LINKS_i + \beta_7 PROFILE_i + \beta_8 ORG_i + \beta_9 LABELS_i + \beta_{10} ANNOTATE_i + \beta_{11} \epsilon_i$$

Library Guides:

$$USE_i = \beta_0 + \beta_1 INSTR_i + \beta_2 ONEROW_i + \beta_3 PAGES_i + \beta_4 JARGON_i + \beta_5 WORDS_i + \beta_6 LINKS_i + \beta_7 PROFILE_i + \beta_8 ORG_i + \beta_9 LABELS_i + \beta_{10} ANNOTATE_i + \beta_{11} \epsilon_i$$

Where, for the *i*th guide:

USE_i = the average number of hits per page per month on a guide

$STUDENTS_i$ = the number of students enrolled in the programs or class with which a guide is associated

$INSTR_i$ = a binary variable indicating whether a guide is used in instruction sessions (as determined by KSU's Assistant Director for Library Instructional Services)

$ONEROW_i$ = a binary variable indicating whether all of the main navigation tabs fit on one row (not including drop-downs)

$PAGES_i$ = the total number of pages (tabs) on a guide (proxy for clutter)

$JARGON_i$ = the Flesch-Kincaid Reading Ease score for the homepage (well-known readability score, measured by an online tool, proxy for jargon)

$WORDS_i$ = the word count for the homepage (measured by an online tool, proxy for clutter)

$LINKS_i$ = the link count for the homepage (measured by an online tool, proxy for clutter)

$PROFILE_i$ = a binary variable indicating whether a librarian profile box with a recognizable photo is included on the homepage

ORG_i = a binary variable indicating whether a guide is organized consistently by subject or format

$LABELS_i$ = a binary variable indicating whether main tab labels are all 1-2 words

$ANNOTATE_i$ = a binary variable indicating whether annotations are provided for key resources

ϵ_i = classical stochastic error term (to account for all variation in USE that cannot be explained by the independent variables)

Expected Coefficient Signs

I expect STUDENTS to have a positive coefficient, as more students in a discipline should result in more guide hits. INSTR should have a positive coefficient, as the literature indicates guides promoted in instruction receive greater use. ONEROW should be positive, as this is a common design recommendation. PAGES is being used here as a proxy for clutter (i.e. too many tabs), so I expect a negative coefficient. JARGON is measured here by the Flesch-Kincaid Reading Ease score. The score ranges from 0 to 100, with 0 being difficult to read and 100 being easy. Therefore, the higher the score, the more use should be expected. Therefore JARGON should have a positive coefficient. The coefficient for WORDS is ambiguous. It is being used here as a proxy for clutter, and thus should have a negative coefficient. However, a page could have a high word count and be filled with well-organized, useful information. On the whole, though, I will associate more words with a busier interface that necessitates scrolling and could overwhelm the user. LINKS is a proxy for clutter as well, and therefore is predicted to have a negative coefficient. The remaining four binary variables – PROFILE, ORG, LABELS, and ANNOTATE – are design recommendations that should positively impact use, and therefore a positive coefficient is expected.

My null hypothesis for STUDENTS, INSTR, ONEROW, JARGON, PROFILE, ORG, LABELS, and ANNOTATE is that the coefficient is less than or equal to zero:

$$H_0: \beta_1 \leq 0$$

$$H_A: \beta_1 > 0$$

My null hypothesis for PAGES, WORDS, and LINKS is that the coefficient is greater than or equal to zero:

$$H_0: \beta_1 \geq 0$$

$$H_A: \beta_1 < 0$$

Other Important Statistics

I will look for whether any of these variables have a statistically significant relationship with USE at the 5% level, determined by a p-value of less than .05. I will also be interested in the Adjusted R^2 for the model as a whole, which will tell how well the independent variables together explain the variation in USE. This will give some idea as to how complete the model is. The overall F-statistic will give the significance of the model as a whole. If $|F| \leq .05$, then the model is considered significant.

Limitations of this study

There are several limitations with the model and the variables. First, it is difficult to determine what USE is actually measuring. I am considering more hits to indicate that someone arrived at a guide, found it useful, and continued using it or returned later. However, hits on a guide could simply be many people visiting the homepage of the guide, finding nothing useful, and leaving for another website. It could also be one frustrated user who is having difficulty finding helpful material on the guide but is clicking several pages nonetheless. These statistics may also include librarians refreshing their guide to preview changes they've made and use by librarians in instruction or reference interactions. Good design is not recognized until a user arrives at a page, so there is an inherit flaw in measuring good design by page hits, although other options are limited by the data available. The real interest is in continued use once a user arrives at the page. However, a previous study assessing website "quality" by usage statistics

found that "the average number of visits per day…represents, in part, user satisfaction and, therefore, the quality of web sites perceived by users" (Yeh et al., 2008, p. 586).

Another limitation is that the data was collected after the end of the time period being analyzed. Therefore, the usage statistics reflect the two years being studied, but the design measurements are current. A librarian could have easily have improved the guide's design during that time or even after.

Perhaps the main limitation of this study is the small sample size. With only 62 observations total, and even fewer when the guides are split into the 3 categories, it is difficult to gain statistical significance. Other complications also arise, such as unreliable coefficients. Furthermore, some of the design variables do not apply to every guide in a category (for example, a guide with no tabs cannot be evaluated for having short tab labels). These guides must be omitted from certain regressions, further reducing the already small sample size. This is further complicated by the fact that the regression models have ten independent variables, which is rather large especially given the sample size.

Some of the proxy variables used are questionable substitutes for what they are trying to get at. JARGON uses the Flesch-Kincaid Reading Ease score to determine the readability of the page, which is used as a proxy for the presence of library jargon. This test was selected from many readability scores as perhaps the best-known. However, much of "library jargon" is not made up of fundamentally difficult words, and therefore may not be picked up on by this test. For example, the word "database" is not in itself long or difficult, but it is still confusing when students are looking for "articles" or "journals" and do not know the meaning of "database" in library terms. Of the clutter

proxies, word count (WORDS) and link count (LINKS) have been suggested as important measures by past studies correlating web page design with use (Ivory et al., 2001, p. 4) (Yeh et al., 2008, p. 589-590), although the impact of these variables on use has not been clearly determined. Yeh et al. describe this complexity regarding word count: "The total word count on a web page may represent or contribute to the richness of the information on the page. However, too many words result in a cognitive burden on users" (2008, p. 590).

Finally, the ANNOTATIONS variable is the least precise of the group. I did not account for the length of annotations, even though one to two sentences is recommended in the literature. I only required that annotations be present for "key resources," in order to avoid penalizing a guide that has excellent annotations for all of the databases in the discipline and most other resources, only to lack an annotation on a link to a website of secondary importance. I interpreted "key resources" to mean mainly the databases, as well as any other link whose purpose is not clear from the title (for example, an agency that goes by an acronym, or a very general title). This variable is somewhat subjective.

Data Summary and Analysis

Subject Guides

The results of the Subject Guides regression including all variables, in Table 1, reveal a few interesting points. Several variables have the expected coefficient signs. ONEROW, JARGON, and PROFILE are all positive, and PAGES and WORDS are both negative. I can reject the H_0 for these variables.

The only statistically significant variable is LINKS, although ORG is very close. The Adjusted R^2 for the overall model is 0.0993, meaning that almost ten percent of the variation in USE can be explained by the independent variables in the model.

Table 1
Subject Guides Regression Results (All Design Variables)

```
2 . regress USE STUDENTS ONEROW PAGES JARGON WORDS LINKS PROFILE ORG LABELS ANNOT
  > ATE
```

Source	SS	df	MS		
Model	303.734481	10	30.3734481	Number of obs =	37
Residual	565.408643	26	21.7464863	F(10, 26) =	1.40
				Prob > F =	0.2363
				R-squared =	0.3495
				Adj R-squared =	0.0993
Total	869.143125	36	24.1428646	Root MSE =	4.6633

USE	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
STUDENTS	-.0003439	.0008082	-0.43	0.674	-.0020051	.0013173
ONEROW	2.140635	3.213517	0.67	0.511	-4.464843	8.746113
PAGES	-.3488934	.2583721	-1.35	0.189	-.8799848	.182198
JARGON	.0051319	.0697116	0.07	0.942	-.1381624	.1484263
WORDS	-.0091657	.0079093	-1.16	0.257	-.0254235	.007092
LINKS	.234857	.0867367	2.71	0.012	.0565671	.413147
PROFILE	2.378828	2.657081	0.90	0.379	-3.082879	7.840536
ORG	-1.928404	1.948926	-0.99	0.332	-5.934478	2.077671
LABELS	-3.722494	2.043327	-1.82	0.080	-7.922613	.4776256
ANNOTATE	-.0306129	1.77076	-0.02	0.986	-3.670463	3.609237
_cons	-1.97519	7.6257	-0.26	0.798	-17.65004	13.69966

The regression was also run with USE, STUDENTS, and each of the nine design variables independently. The results, however, did not provide significant additional explanation and are thus included in Appendix A.

It is interesting to note that the correlation between the number of students enrolled in a discipline and the use the corresponding guides receive is quite low, as seen in Table 2. Correlations can range from -1 (perfect negative correlation) to 1 (perfect positive correlation), with 0 meaning no correlation at all. Therefore, .16 is not a very significant observation and is lower than expected.

Table 2
Subject Guides Corrleation between USE and STUDENTS

```
1 . correlate USE STUDENTS
  (obs=40)

             |      USE STUDENTS
-------------+------------------
         USE |   1.0000
    STUDENTS |   0.1614   1.0000
```

This appears to be due to the small sample size, as a few outliers are heavily impacting the results. The scatterplot in Figure 1 shows that there are some smaller programs with very heavy use and some large programs with very low use. Overall, there seems to be a trend of data points extending from the lower left to the upper right, meaning the more students are in a discipline, the more use those disciplinary guides receive. This trend may be clearer with a larger sample size.

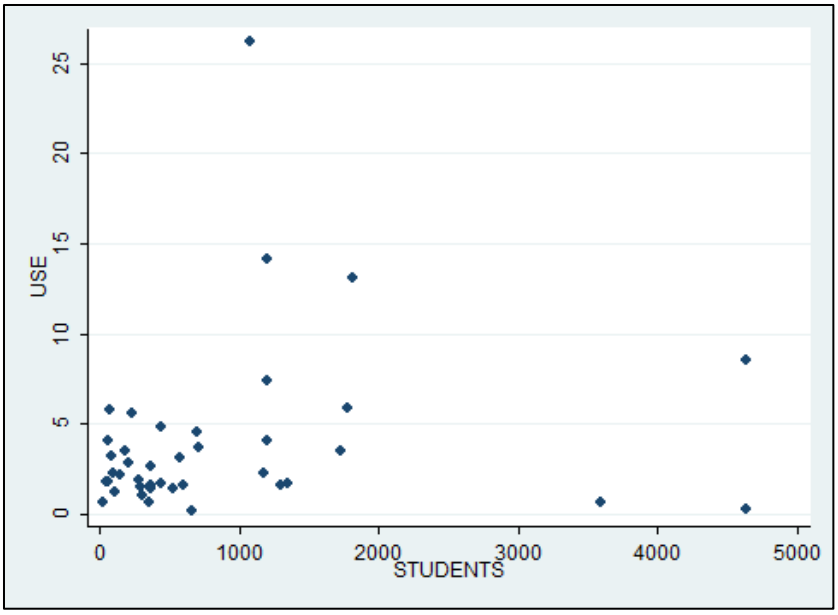

Figure 1. Subject Guides Correlation between USE and STUDENTS

Course Guides

The results of the Course Guides regressions are not as informative, due to an extremely small sample size. The regression of USE with all of the independent variables is not useful, because Stata omits several of the binary variables as having high multicollinearity. Logically, none of the variables should be highly correlated with one another. This is likely the result of chance with such a small sample for the Course Guides (only six). This prevents us from calculating the Adjusted R^2 to determine the predicting power of the model overall.

The regression was then run with USE, STUDENTS, and each of the design variables independently to determine the effect of each design variable on use. The variables that had the expected coefficients include STUDENTS, ORG, and ANNOTATE (all positive), and PAGES, WORDS, and LINKS (all negative). I can reject the H_0 for these variables.

There are no statistically significant variables. Most of the models have a negative Adjusted R^2, which is a common occurrence with a small sample size, and actually means that variables are included which have no predictive power over the dependent variable. Two variables, however, have a fairly high Adjusted R^2: PROFILE (0.3534) and ORG (0.1217). It seems most likely that this, too, is the result of chance from the small sample, especially given the insignificant results for all other variables. The regression results for the Course Guides can be found in Appendix B.

Finally, it is interesting to note that the correlation between USE and STUDENTS is slightly higher for the Course Pages – around 21 percent, as seen in Table 3. This is still in the range with the observation from the Subject Guides and still a relatively low correlation overall, though.

Table 3
Course Guides Correlation between USE and STUDENTS

```
1 . correlate USE STUDENTS
  (obs=8)

             |      USE STUDENTS
-------------+------------------
         USE |   1.0000
    STUDENTS |   0.2081   1.0000
```

Library Guides

The results of the regression for the Library Guides involving all of the independent variables were in many ways similar to the Course Guides, due to a similarly small sample (eight observations). These regression results are presented in Appendix C. Again, several binary variables were automatically omitted due to multicollinearity, which is likely a chance occurrence from the small sample, as the variables are not

logically correlated with one another. This again prevents us from obtaining the Adjusted R^2 for the model as a whole.

The regression was then run with USE, INSTR, and each of the design variables independently to determine the effect of each design variable on use. The variables that had the expected coefficients include ONEROW, ORG, LABELS, and ANNOTATE (all positive) and WORDS (negative). I can reject the H_0 for these variables. INSTR alternates between a positive and negative sign in the individual regressions, so its sign is inconclusive without the overall regression.

There are no statistically significant variables. Similar to the Course Guides, most of the models have a negative Adjusted R^2. Two variables have interesting Adjusted R^2 values, compared with the other variables. PROFILE is again much higher than its peers (0.0819) and fairly strong for one variable. ANNOTATE, however, stands out with the highest Adjusted R^2 by far, 0.2096. Again it seems most likely that these high values can be attributed to the effects of a small sample size.

Finally, it is interesting to note that the correlation between USE and INSTR (see Table 4) is quite low, only around five percent. This is surprising, given that the literature says guides promoted during instruction sessions receive greater use. This finding, though, should be taken keeping in mind the extremely small sample size and the likelihood that other factors are influencing use.

Table 4

Library Guides Correlation between USE and INSTR

```
2 . correlate USE INSTR
  (obs=14)

             |      USE    INSTR
-------------+------------------
         USE |   1.0000
       INSTR |   0.0494   1.0000
```

Discussion

The regression results indicate that several of the design variables have the predicted outcome on the use a guide receives, indicating that adherence to design standards does increase guide usage. The only variable with the expected sign for all 3 groups is WORDS. This indicates that more words generally leads to less use, as patrons most likely become overwhelmed by trying to locate relevant information amid large amounts of text. Variables with the expected signs for two groups include ONEROW, ORG, ANNOTATE, and PAGES. In other words, having all tabs fit on a single row, consistently organizing pages in a guide by either subject or format, and providing annotations for key resources all positively impact guide usage. Having more pages on a guide generally decreases use, as patrons may be overwhelmed by the amount of information presented. These five characteristics may be design variables to focus on as a priority.

The only set of guides for which a model Adjusted R^2 was generated is the Subject Guides. This value showed that controlling for the nine design variables and the number of students in each discipline only accounts for about ten percent of the variation in use. Clearly other factors are at work as well. As discussed in the literature review, other factors that likely impact guide usage include marketing, the access point for the guides on the library homepage and from class websites, and the difference between course guides and subject guides. Some of these factors may have an even greater ability to impact use than improving design. For example, a large-scale marketing campaign

with faculty, within the library, and in instruction classes would likely significantly increase guide usage.

Specific Design Recommendations

Based on the literature review, there are some clear, concrete standards that are a good foundation for any library starting to implement a set of institutional LibGuides design standards. This list is by no means comprehensive, but it includes some fundamental design issues that are also fairly straightforward to implement. In addition to the standards below, guide authors should keep in mind some less measurable but highly important factors to users, such as keeping the webpage clean, clutter-free, and easy to navigate. Remember, students often judge the authority and reliability of the content – and whether they will pursue using it – based on its presentation. The goal is to create a set of resources with a standard appearance and format, so that students will become comfortable with the interface and know where to find the resources they need.

1. **All tabs should fit on one row**, so that they function like real-world file folder tabs. If there is too much content to achieve this, consider breaking the material up into more narrowly-focused guides.
2. **Keep tab labels short**. They should be one to two words that clearly reflect the content in that page.
3. **Avoid library jargon**. The language on your guide should be easily understood by a first-time user of the library.
4. **Include a librarian profile with contact information**. This should at least appear on the homepage of the guide. Furthermore, students prefer a

recognizable photo, as it makes them feel more comfortable asking the librarian for help.

5. **Keep the tab organization consistent**. Material should be organized either by subject or format, but not a mixture. If there are tabs within a History guide for both "Colonial History" and "Articles," students will not know where to look for an article on colonial history. Furthermore, **students prefer organization by subject**, as this is how they approach their coursework.
6. **Put the most important information up front**. Students are used to the most relevant results displaying at the top of the page. Students primarily use LibGuides to access the key databases for their subject. Consider a "key resources" section featured prominently on the homepage or as a tab on the guide.
7. **Provide alternative navigation to the tabs**. Many users do not immediately recognize the tab navigation. Include a box on the homepage that functions as a table of contents and links to each of the pages in the guide while providing a brief description of the contents of each page.
8. **Tabs should never redirect to a new webpage.** Tabs are a metaphor for real world file folders; therefore, they should organize material within the page only.
9. **Provide annotations for resources**. Students do not only want to be told that resources exist – they want to know what information they provide, how and when they might use them, and their strengths and weaknesses.
10. **Font and formatting should be professional in appearance**. A professional and easy-to-read font should be defined at the system level and not customized

within boxes. Colors, bold, and italics should be used sparingly. Underlining is limited to hyperlinks.

11. **Link to specific pages when appropriate**. For large websites, such as government agencies, a link to specific pages of interest will better serve users than a link to the agency's homepage.
12. **Keep your guides collection current**. Just like a print collection, guides must be reviewed to add new material and weeded to remove what is outdated. Ideally this should be done on a regular schedule. This applies to both material within guides and to whole guides themselves. For example, course guides for classes not currently being taught should be unpublished.
13. **Avoid Web 2.0 features.** Students have largely responded negatively to features such as ratings, student recommendations, and discussion forums. They use these guides to receive research guidance from people they view as experts, not from their peers. Students do not view guides as a social destination.

Further Research

This study provides an interesting look into the effects of design on research guide use. There is room, however, for more in-depth analysis in several areas. This study was limited to the internal statistics collected by LibGuides. Having a tool like Google Analytics running on the site could provide useful data like referring URLs, unique users, and date and time stamps for hits. This data may give insight into such factors as the effect of linking to guides from class websites or different locations on the library website and whether the guides are being used heavily by a few users or lightly by many.

Even within the LibGuides statistics provided, a closer analysis could be performed. For example it would be interesting to measure the proportion of hits on secondary pages rather than average hits per page, to capture users coming to a guide and staying to look around, as suggested by Pittsley and Memmott (2012, p. 53). It may also be useful to analyze which links are accessed most frequently within guides, to help librarians prioritize and organize the resources.

There are also other quantitative measures of design, such as font count, color count, graphics count, and body versus header text that are used more traditionally in the web design field and would require specialized tools to measure. However, these variables may provide insight on the importance of the professional, standard font recommended by Springshare or may provide a recommended ratio of words to images to maximize usage. It would also be insightful to do a more focused quantitative study on the impact of some of the other variables discussed on use, for example the impact of marketing or the impact of the access points for the guides.

This study has assessed use of KSU's LibGuides. To assess usability or usefulness, a survey or user study is in order. As recommended by Ouellette (2011, p. 436), "librarians should consult with students and faculty to assess their needs and wants to create guides that are more useful, and more used" (Ouellette, 2011, p. 436). Quantitative studies are useful and can be persuasive, but sometimes in order to determine the needs and preferences of users, you must ask them directly.

Conclusion

Good design is difficult to quantify. It often falls under the category of "you know it when you see it." This study has demonstrated some positive correlation between quantifiable measures of design and the use a research guide receives. The results also indicate that there are many other factors than design contributing to guide use. Whether or not they are backed by statistical evidence, design standards still hold a great deal of value as they are solidly backed by the literature and by usability studies.

Implementing the design standards recommended here, which were compiled from previous library science and web design studies, should have a positive impact on the use of LibGuides at Kennesaw State University. This will help librarians there meet the requests of their users for better online resources to help them find information on their own.

While creating and implementing a set of institutional standards requires an investment of time up front, it will pay off with time-saving in the long run. Having standards in place will eliminate some decision-making for librarians about formatting and layout and will prevent them from having to constantly go back and improve poorly-designed guides. Standards also save time for students, who have indicated that the variables mentioned here are important to them in making the guides easier to navigate and more useful. Ultimately, design standards are a win-win situation for guide creators and users.

References

Anello, K., & Bonfield, B. (2007). Providing reference service in our sleep: Using a FAQ database to guide users to the right sources. Reference & User Services Quarterly, 46 (3), 28-33.

Association of Research Libraries. (2011). LibQUAL+® 2011 survey results – Horace W. Sturgis Library, Kennesaw State University. Retrieved from http://kennesaw.edu/library/surveyresults/surveyfull.pdf

Adebojono, L.G. (2010). LibGuides: Customizing subject guides for individual courses. *College & Undergraduate Libraries, 17* (4), 398-412.

Casey, M.E. & Savastinuk, L.C. (2006). Library 2.0: Service for the next-generation library. *Library Journal, 131* (14), 40-42.

Center for Plain Language. (2013). Plain language checklist. Retrieved from http://centerforplainlanguage.org/about-plain-language/checklist/

Child, D. (2013). Readability-Score.com. Retrieved from http://www.readability-score.com/

Conradie, P. (2008, January 21). *Introduction to good usability: An e-book by peterpixel*. Retrieved from http://www.peterpixel.nl/writings/introduction-to-good-usability/

Courtois, M.P., Higgins, M.E., & Kapur, A. (2005). Was this guide helpful? User's perceptions of subject guides. *Reference Services Review, 33* (2), 188-196.

Fadeyev, D. (2009, September 24). 10 Useful usability findings and guidelines. Retrieved from http://uxdesign.smashingmagazine.com/2009/09/24/10-useful-usability-findings-and-guidelines/

Foster, M., Wilson, H., Allensworth, N., & Sands, D.T. (2010). Marketing research guides: An online experiment with LibGuides. *Journal of Library Administration, 50* (5-6), 602-616.

Freeman, C.A. (2004). The relationship of undergraduate students' self-assessment of library skills to their opinion of library instruction: A self-reporting survey. *Southeastern Librarian, 52* (3), 39-46.

Ghaphery, J. & White, E. (2012). Library use of web-based research guides. *Information Technology and Libraries, 31* (1), 21-31.

Gilmour, R. (2010). Old wine in new skins: Thoughts on academic library Web guides. *College & Research Libraries News, 71* (7), 350-373.

Gonzalez, A.C. & Westbrock, T. (2010). Reaching out with LibGuides: Establishing a working set of best practices. *Journal of Library Administration, 50* (5-6), 638-656.

Gube, J. (2009, June 24). Module tabs in web design: Best practices and solutions. Retrieved from http://www.smashingmagazine.com/2009/06/24/module-tabs-in-web-design-best-practices-and-solutions/

Hintz, K., Farrar, P., Eshghi, S., Sobol, B., Naslund, J., Lee, T., Stephens, T., & McCauley, A. (2010). Letting students take the lead: A user-centered approach to evaluating subject guides. *Evidence Based Library and Information Practice, 5* (4), 39-52.

Hungerford, R., Ray, L., & Tawatao, J. W. (2010). LibGuides Usability Testing: Customizing a Product to Work for Your Users. *University of Washington Libraries Research Works Archive*. Retrieved from https://digital.lib.washington.edu/dspace/handle/1773/17101

Ivory, M. Y., Sinha, R. R., & Hearst, M. A. (2001). Empirically Validated Web Page Design Metrics. *CHI '01: Proceedings of the SIGCHI conference on human factors in computing systems*, 53-60. New York, NY: ACM. Retrieved from http://webtango.berkeley.edu/papers/chi2001/chi2001.pdf

Jackson, R. & Pellack, L.J. (2004). Internet subject guides in academic libraries: An analysis of contents, practices, and opinions. *Reference & User Services Quarterly, 43* (4), 319-327.

Judd, C. & Montgomery, N.M. (2009). LibGuides and librarians: Connecting content and community. *Kentucky Libraries, 73* (3), 14-17.

Kerico, J., & Hudson, D. (2008). Using LibGuides for outreach to the disciplines. *Indiana Libraries, 27* (2), 40-42.

Lindsay, E.B., Cummings, L., Johnson, C.M., & Scales, B.J. (2006). If you build it, will they learn? Assessing online information literacy tutorials. College & Research Libraries, 67 (5), 429-445.

Little, J. J. (2010). Cognitive load theory and library research guides. *Internet Reference Services Quarterly, 15* (1), 53-63.

Mifsud, J. (2011, October 17). 14 Guidelines for web site tabs usability. Retrieved from http://usabilitygeek.com/14-guidelines-for-web-site-tabs-usability/

Nielsen, J. (2010, March 22). Scrolling and attention. *Jakob Nielsen's Alertbox.* Retrieved from www.useit.com/alertbox/scrolling-attention.html

Nielsen, J. (2009, April 6). First 2 words: A signal for the scanning eye. *Jakob Nielsen's Alertbox*. Retrieved from http://www.nngroup.com/articles/first-2-words-a-signal-for-scanning/

Nielsen, J. (2007, September 17). Tabs, used right. *Jakob Nielsen's Alertbox.* Retrieved from http://www.nngroup.com/articles/tabs-used-right/

Nielsen, J. (2006, April 17). F-shaped pattern for reading web content. *Jakob Nielsen's Alertbox*. Retrieved from http://www.nngroup.com/articles/f-shaped-pattern-reading-web-content/

Ouellette, D. (2011). Subject guides in academic libraries: A user-centered study of uses and perceptions. *The Canadian Journal of Information and Library Science, 35* (4), 436-451.

Pittsley, K. A. & Memmott, S. (2012). Improving independent student navigation of complex educational web sites: An analysis of two navigation design changes in LibGuides. *Information Technology and Libraries, 31* (3), 52-64.

Reeb, B. & Gibbons, S. (2004). Students, librarians, and subject guides: Improving a poor rate of return. *Libraries and the Academy, 1* (4), 123-130.

Sinkinson, C., Alexander, S., Hicks, A., & Kahn, M. (2012). Guiding design: Exposing librarian and student mental models of research guides. *Libraries and the Academy, 12* (1), 63-84.

Springshare. (2013). *Best practices for building guides*. Retrieved from http://help.springshare.com/guidebestpractices

Springshare. (2013). *Statistics in LibGuides & LibGuides CMS*. Retrieved from http://help.springshare.com/content.php?pid=162075

Staley, S.M. (2007). Academic subject guides: A case study of use at San José State University. *College & Research Libraries, 68* (2), 119-140.

Strutin, M. (2008). Making research guides more useful and more well used. *Issues in Science and Technology Librarianship*, (no. 55). Retrieved from http://www.istl.org/08-fall/article5.html

Studenmund, A. H. (2006). *Using econometrics: A practical guide* (5th ed.). Boston, MA: Pearson Education, Inc.

Submit Express. (2013). Link counter tool. Retrieved from http://linkcounter.submitexpress.com/

Tarquini, M. (2007, July 24). Blasting the myth of the fold. Retrieved from http://boxesandarrows.com/blasting-the-myth-of-the-fold/

Yeh, D., Tsai, R., Sun, P. C., & Lee, J. W. (2008). Linear regression models for assessing the ranking of web sites based on average number of visits. *Journal of Information Science and Engineering*, *24*, 585-599.

Appendix A: Subject Guides Regression Results

Table A1

Regression Output for ONEROW

```
2 . regress USE STUDENTS ONEROW
```

Source	SS	df	MS	Number of obs =	38
				F(2, 35) =	0.49
Model	23.9277033	2	11.9638517	Prob > F =	0.6153
Residual	850.446945	35	24.2984841	R-squared =	0.0274
				Adj R-squared =	-0.0282
Total	874.374648	37	23.6317472	Root MSE =	4.9293

USE	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
STUDENTS	.0007032	.0007102	0.99	0.329	-.0007386	.0021449
ONEROW	.0547202	1.721353	0.03	0.975	-3.439811	3.549252
_cons	3.210974	1.543791	2.08	0.045	.0769128	6.345036

Table A2

Regression Output for PAGES

```
4 . regress USE STUDENTS PAGES
```

Source	SS	df	MS	Number of obs =	40
				F(2, 37) =	0.50
Model	23.1525375	2	11.5762688	Prob > F =	0.6102
Residual	855.685594	37	23.1266377	R-squared =	0.0263
				Adj R-squared =	-0.0263
Total	878.838132	39	22.5343111	Root MSE =	4.809

USE	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
STUDENTS	.0007009	.0007058	0.99	0.327	-.0007291	.0021309
PAGES	-.0139456	.1311456	-0.11	0.916	-.2796719	.2517806
_cons	3.428437	1.558313	2.20	0.034	.270995	6.585879

Table A3

Regression Output for JARGON

```
6 . regress USE STUDENTS JARGON
```

Source	SS	df	MS	Number of obs =	40
				F(2, 37) =	1.40
Model	61.6227409	2	30.8113704	Prob > F =	0.2606
Residual	817.215391	37	22.0869025	R-squared =	0.0701
				Adj R-squared =	0.0199
Total	878.838132	39	22.5343111	Root MSE =	4.6997

USE	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
STUDENTS	.0004247	.0006997	0.61	0.548	-.0009932	.0018425
JARGON	-.0651969	.0492335	-1.32	0.194	-.1649535	.0345597
_cons	6.234393	2.410289	2.59	0.014	1.350684	11.1181

Table A4

Regression Output for WORDS

```
8 . regress USE STUDENTS WORDS
```

Source	SS	df	MS	Number of obs =	40
				F(2, 37) =	0.51
Model	23.5962982	2	11.7981491	Prob > F =	0.6044
Residual	855.241833	37	23.1146441	R-squared =	0.0268
				Adj R-squared =	-0.0258
Total	878.838132	39	22.5343111	Root MSE =	4.8078

USE	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
STUDENTS	.0006795	.0006877	0.99	0.330	-.0007139	.0020729
WORDS	.0008521	.0048782	0.17	0.862	-.0090321	.0107363
_cons	3.010334	1.912761	1.57	0.124	-.8652884	6.885956

Table A5

Regression Output for LINKS

```
10 . regress USE STUDENTS LINKS
```

Source	SS	df	MS	Number of obs =	40
				F(2, 37) =	1.91
Model	82.0709052	2	41.0354526	Prob > F =	0.1630
Residual	796.767226	37	21.5342494	R-squared =	0.0934
				Adj R-squared =	0.0444
Total	878.838132	39	22.5343111	Root MSE =	4.6405

USE	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
STUDENTS	.0004269	.0006812	0.63	0.535	-.0009534	.0018072
LINKS	.0710838	.0428794	1.66	0.106	-.0157981	.1579658
_cons	-.0727086	2.237777	-0.03	0.974	-4.606875	4.461457

Table A6

Regression Output for PROFILE

```
12 . regress USE STUDENTS PROFILE
```

Source	SS	df	MS	Number of obs =	40
				F(2, 37) =	1.06
Model	47.7735195	2	23.8867597	Prob > F =	0.3556
Residual	831.064612	37	22.4612057	R-squared =	0.0544
				Adj R-squared =	0.0032
Total	878.838132	39	22.5343111	Root MSE =	4.7393

USE	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
STUDENTS	.000645	.0006785	0.95	0.348	-.0007297	.0020197
PROFILE	2.212114	2.101731	1.05	0.299	-2.046397	6.470624
_cons	1.452141	1.99676	0.73	0.472	-2.593679	5.497962

Table A7

Regression Output for ORG

```
14 . regress USE STUDENTS ORG
```

Source	SS	df	MS	Number of obs =	38
				F(2, 35) =	0.57
Model	27.6053984	2	13.8026992	Prob > F =	0.5704
Residual	846.76925	35	24.1934071	R-squared =	0.0316
				Adj R-squared =	-0.0238
Total	874.374648	37	23.6317472	Root MSE =	4.9187

USE	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
STUDENTS	.0006688	.0007139	0.94	0.355	-.0007805	.002118
ORG	-.6327901	1.617616	-0.39	0.698	-3.916725	2.651144
_cons	3.629079	1.412198	2.57	0.015	.7621653	6.495994

Table A8

Regression Output for LABELS

```
16 . regress USE STUDENTS LABELS
```

Source	SS	df	MS	Number of obs =	38
				F(2, 35) =	1.16
Model	54.4741671	2	27.2370835	Prob > F =	0.3244
Residual	819.900481	35	23.425728	R-squared =	0.0623
				Adj R-squared =	0.0087
Total	874.374648	37	23.6317472	Root MSE =	4.84

USE	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
STUDENTS	.0004958	.0007203	0.69	0.496	-.0009666	.0019581
LABELS	-1.877758	1.643733	-1.14	0.261	-5.214714	1.459197
_cons	4.225914	1.320588	3.20	0.003	1.544978	6.90685

Table A9

Regression Output for ANNOTATE

```
18 . regress USE STUDENTS ANNOTATE
```

Source	SS	df	MS	Number of obs =	39
				F(2, 36) =	0.53
Model	24.8574429	2	12.4287214	Prob > F =	0.5947
Residual	848.699813	36	23.5749948	R-squared =	0.0285
				Adj R-squared =	-0.0255
Total	873.557256	38	22.9883488	Root MSE =	4.8554

USE	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
STUDENTS	.0007092	.0006956	1.02	0.315	-.0007015	.0021198
ANNOTATE	.2337986	1.598562	0.15	0.885	-3.008236	3.475833
_cons	3.198584	1.399265	2.29	0.028	.3607432	6.036424

Appendix B: Course Guides Regression Results

Table B1

Regression Output for All Variables

```
2 . regress USE STUDENTS ONEROW PAGES JARGON WORDS LINKS PROFILE ORG LABELS ANNOTATE
  note: ONEROW omitted because of collinearity
  note: PAGES omitted because of collinearity
  note: PROFILE omitted because of collinearity
  note: ORG omitted because of collinearity
  note: ANNOTATE omitted because of collinearity

      Source |       SS       df       MS              Number of obs =           6
-------------+------------------------------           F(  5,     0) =           .
       Model |  76.6065053     5  15.3213011            Prob > F      =           .
    Residual |            0     0            .         R-squared     =      1.0000
-------------+------------------------------           Adj R-squared =           .
       Total |  76.6065053     5  15.3213011            Root MSE      =           0

------------------------------------------------------------------------------
         USE |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
    STUDENTS |    .001097          .        .       .            .           .
     ONEROW |           0  (omitted)
      PAGES |           0  (omitted)
     JARGON |    .2325998          .        .       .            .           .
      WORDS |   -.0074802          .        .       .            .           .
      LINKS |     .058081          .        .       .            .           .
    PROFILE |           0  (omitted)
        ORG |           0  (omitted)
     LABELS |   -3.275299          .        .       .            .           .
   ANNOTATE |           0  (omitted)
      _cons |   -3.998688          .        .       .            .           .
------------------------------------------------------------------------------
```

Table B2

Regression Output for ONEROW

```
4 . regress USE STUDENTS ONEROW

      Source |       SS       df       MS              Number of obs =           8
-------------+------------------------------           F(  2,     5) =        0.36
       Model |  28.1478104     2  14.0739052            Prob > F      =      0.7175
    Residual |  198.168522     5  39.6337044            R-squared     =      0.1244
-------------+------------------------------           Adj R-squared =     -0.2259
       Total |  226.316332     7  32.3309046            Root MSE      =      6.2955

------------------------------------------------------------------------------
         USE |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
    STUDENTS |   .0007005   .0038332     0.18   0.862    -.0091531    .010554
     ONEROW |  -3.306055   4.859646    -0.68   0.527    -15.79817    9.186062
      _cons |   7.640812   3.859273     1.98   0.105    -2.279764    17.56139
------------------------------------------------------------------------------
```

Table B3

Regression Output for PAGES

```
6 . regress USE STUDENTS PAGES
```

Source	SS	df	MS	Number of obs =	8
				F(2, 5) =	0.49
Model	36.9327643	2	18.4663821	Prob > F =	0.6406
Residual	189.383568	5	37.8767136	R-squared =	0.1632
				Adj R-squared =	-0.1715
Total	226.316332	7	32.3309046	Root MSE =	6.1544

USE	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
STUDENTS	.0035414	.004035	0.88	0.420	-.006831	.0139138
PAGES	-.568768	.6720646	-0.85	0.436	-2.296365	1.158829
_cons	9.960871	5.658421	1.76	0.139	-4.584563	24.50631

Table B4

Regression Output for JARGON

```
8 . regress USE STUDENTS JARGON
```

Source	SS	df	MS	Number of obs =	8
				F(2, 5) =	0.12
Model	10.6069656	2	5.3034828	Prob > F =	0.8869
Residual	215.709367	5	43.1418733	R-squared =	0.0469
				Adj R-squared =	-0.3344
Total	226.316332	7	32.3309046	Root MSE =	6.5682

USE	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
STUDENTS	.0017638	.0036657	0.48	0.651	-.0076591	.0111867
JARGON	-.0271521	.1990969	-0.14	0.897	-.538947	.4846429
_cons	6.795765	8.837971	0.77	0.477	-15.92296	29.51449

Table B5

Regression Output for WORDS

```
10 . regress USE STUDENTS WORDS
```

Source	SS	df	MS	Number of obs =	8
				F(2, 5) =	0.81
Model	55.27138	2	27.63569	Prob > F =	0.4966
Residual	171.044952	5	34.2089905	R-squared =	0.2442
				Adj R-squared =	-0.0581
Total	226.316332	7	32.3309046	Root MSE =	5.8488

USE	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
STUDENTS	.0019857	.0032688	0.61	0.570	-.006417	.0103884
WORDS	-.0085825	.0074445	-1.15	0.301	-.0277192	.0105543
_cons	8.49577	3.397024	2.50	0.054	-.2365583	17.2281

Table B6

Regression Output for LINKS

```
12 . regress USE STUDENTS LINKS
```

Source	SS	df	MS	Number of obs =	8
				F(2, 5) =	0.88
Model	59.1359846	2	29.5679923	Prob > F =	0.4690
Residual	167.180348	5	33.4360695	R-squared =	0.2613
				Adj R-squared =	-0.0342
Total	226.316332	7	32.3309046	Root MSE =	5.7824

USE	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
STUDENTS	.0045591	.0039704	1.15	0.303	-.005647	.0147653
LINKS	-.1947161	.1603053	-1.21	0.279	-.606794	.2173617
_cons	12.77756	6.307679	2.03	0.099	-3.436844	28.99197

Table B7

Regression Output for PROFILE

```
14 . regress USE STUDENTS PROFILE
```

Source	SS	df	MS	Number of obs =	8
				F(2, 5) =	2.91
Model	121.790046	2	60.8950232	Prob > F =	0.1450
Residual	104.526286	5	20.9052572	R-squared =	0.5381
				Adj R-squared =	0.3534
Total	226.316332	7	32.3309046	Root MSE =	4.5722

USE	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
STUDENTS	.0037122	.0026879	1.38	0.226	-.0031972	.0106216
PROFILE	-8.14557	3.519398	-2.31	0.069	-17.19247	.9013316
_cons	10.09018	2.64641	3.81	0.012	3.287364	16.89299

Table B8

Regression Output for ORG

```
16 . regress USE STUDENTS ORG
```

Source	SS	df	MS	Number of obs =	8
				F(2, 5) =	1.48
Model	84.3356184	2	42.1678092	Prob > F =	0.3117
Residual	141.980714	5	28.3961428	R-squared =	0.3726
				Adj R-squared =	0.1217
Total	226.316332	7	32.3309046	Root MSE =	5.3288

USE	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
STUDENTS	.0004009	.003086	0.13	0.902	-.007532	.0083337
ORG	6.546302	4.040705	1.62	0.166	-3.840661	16.93326
_cons	1.994704	3.094586	0.64	0.548	-5.960183	9.949591

Table B9

Regression Output for LABELS

```
18 . regress USE STUDENTS LABELS
```

Source	SS	df	MS	Number of obs =	8
				F(2, 5) =	0.80
Model	54.9975341	2	27.4987671	Prob > F =	0.4986
Residual	171.318798	5	34.2637596	R-squared =	0.2430
				Adj R-squared =	-0.0598
Total	226.316332	7	32.3309046	Root MSE =	5.8535

USE	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
STUDENTS	.0008724	.0033523	0.26	0.805	-.0077451	.0094899
LABELS	-5.636111	4.907516	-1.15	0.303	-18.25128	6.979061
_cons	7.340379	2.759	2.66	0.045	.2481442	14.43261

Table B10

Regression Output for ANNOTATE

```
20 . regress USE STUDENTS ANNOTATE
```

Source	SS	df	MS	Number of obs =	6
				F(2, 3) =	0.57
Model	21.2242972	2	10.6121486	Prob > F =	0.6147
Residual	55.3822082	3	18.4607361	R-squared =	0.2771
				Adj R-squared =	-0.2049
Total	76.6065053	5	15.3213011	Root MSE =	4.2966

USE	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
STUDENTS	.0022472	.0025722	0.87	0.447	-.0059386	.0104329
ANNOTATE	1.854856	4.863711	0.38	0.728	-13.62364	17.33336
_cons	2.901335	4.297289	0.68	0.548	-10.77456	16.57723

Appendix C: Library Guides Regression Results

Table C1

Regression Output for All Variables

```
2 . regress USE INSTR ONEROW PAGES JARGON WORDS LINKS PROFILE ORG LABELS ANNOTATE
  note: ONEROW omitted because of collinearity
  note: LABELS omitted because of collinearity
  note: ANNOTATE omitted because of collinearity
```

Source	SS	df	MS	Number of obs =	8
				F(7, 0) =	.
Model	125.60175	7	17.9431071	Prob > F =	.
Residual	0	0	.	R-squared =	1.0000
				Adj R-squared =	.
Total	125.60175	7	17.9431071	Root MSE =	0

USE	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
INSTR	-1.571066	.	.	.	.	.
ONEROW	0	(omitted)				
PAGES	.7792255	.	.	.	.	.
JARGON	.2647296	.	.	.	.	.
WORDS	-.0053558	.	.	.	.	.
LINKS	-.3588853	.	.	.	.	.
PROFILE	3.101745	.	.	.	.	.
ORG	-7.755734	.	.	.	.	.
LABELS	0	(omitted)				
ANNOTATE	0	(omitted)				
_cons	9.889999	.	.	.	.	.

Table C2

Regression Output for ONEROW

```
4 . regress USE INSTR ONEROW
```

Source	SS	df	MS	Number of obs =	12
				F(2, 9) =	0.10
Model	10.0614923	2	5.03074617	Prob > F =	0.9074
Residual	460.740624	9	51.1934026	R-squared =	0.0214
				Adj R-squared =	-0.1961
Total	470.802116	11	42.8001924	Root MSE =	7.155

USE	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
INSTR	.9321096	5.986266	0.16	0.880	-12.60977	14.47398
ONEROW	2.005313	4.525192	0.44	0.668	-8.231382	12.24201
_cons	6.83196	3.199794	2.14	0.062	-.4064768	14.0704

Table C3

Regression Output for PAGES

```
6 . regress USE INSTR PAGES
```

Source	SS	df	MS	Number of obs =	14
				F(2, 11) =	0.02
Model	2.01734253	2	1.00867127	Prob > F =	0.9792
Residual	525.658472	11	47.7871338	R-squared =	0.0038
				Adj R-squared =	-0.1773
Total	527.675815	13	40.5904473	Root MSE =	6.9128

USE	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
INSTR	.5641657	5.81695	0.10	0.924	-12.23885	13.36719
PAGES	.0549108	.4439148	0.12	0.904	-.9221391	1.031961
_cons	6.56843	3.328128	1.97	0.074	-.7567298	13.89359

Table C4

Regression Output for JARGON

```
8 . regress USE INSTR JARGON
```

Source	SS	df	MS	Number of obs =	14
				F(2, 11) =	0.15
Model	14.0940003	2	7.04700017	Prob > F =	0.8617
Residual	513.581814	11	46.6892558	R-squared =	0.0267
				Adj R-squared =	-0.1503
Total	527.675815	13	40.5904473	Root MSE =	6.833

USE	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
INSTR	1.071975	5.233526	0.20	0.841	-10.44694	12.59089
JARGON	-.0728494	.1390903	-0.52	0.611	-.3789851	.2332862
_cons	10.11238	6.446544	1.57	0.145	-4.076373	24.30112

Table C5

Regression Output for WORDS

```
10 . regress USE INSTR WORDS
```

Source	SS	df	MS	Number of obs =	14
				F(2, 11) =	0.69
Model	59.0160278	2	29.5080139	Prob > F =	0.5208
Residual	468.659787	11	42.6054352	R-squared =	0.1118
				Adj R-squared =	-0.0496
Total	527.675815	13	40.5904473	Root MSE =	6.5273

USE	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
INSTR	-.418102	5.105921	-0.08	0.936	-11.65616	10.81995
WORDS	-.0019008	.0016329	-1.16	0.269	-.0054947	.0016932
_cons	8.585131	2.377269	3.61	0.004	3.352798	13.81746

Table C6

Regression Output for LINKS

```
12 . regress USE INSTR LINKS
```

Source	SS	df	MS	Number of obs =	14
				F(2, 11) =	0.04
Model	4.03699164	2	2.01849582	Prob > F =	0.9586
Residual	523.638823	11	47.6035294	R-squared =	0.0077
				Adj R-squared =	-0.1728
Total	527.675815	13	40.5904473	Root MSE =	6.8995

USE	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
INSTR	.397977	5.618022	0.07	0.945	-11.96721	12.76316
LINKS	.0312132	.1298451	0.24	0.814	-.254574	.3170004
_cons	5.758613	5.140853	1.12	0.287	-5.55633	17.07355

Table C7

Regression Output for PROFILE

```
14 . regress USE INSTR PROFILE
```

Source	SS	df	MS	Number of obs =	14
				F(2, 11) =	1.58
Model	117.764624	2	58.8823122	Prob > F =	0.2493
Residual	409.91119	11	37.2646537	R-squared =	0.2232
				Adj R-squared =	0.0819
Total	527.675815	13	40.5904473	Root MSE =	6.1045

USE	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
INSTR	.3796106	4.670488	0.08	0.937	-9.900064	10.65928
PROFILE	-5.838772	3.302534	-1.77	0.105	-13.1076	1.430055
_cons	10.30384	2.610882	3.95	0.002	4.557332	16.05036

Table C8

Regression Output for ORG

```
16 . regress USE INSTR ORG
```

Source	SS	df	MS	Number of obs =	12
				F(2, 9) =	0.01
Model	1.31173384	2	.655866922	Prob > F =	0.9875
Residual	469.490382	9	52.165598	R-squared =	0.0028
				Adj R-squared =	-0.2188
Total	470.802116	11	42.8001924	Root MSE =	7.2226

USE	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
INSTR	.165804	5.790944	0.03	0.978	-12.93422	13.26583
ORG	.7878358	4.984051	0.16	0.878	-10.48687	12.06254
_cons	7.204347	4.595068	1.57	0.151	-3.190418	17.59911

Table C9

Regression Output for LABELS

```
18 . regress USE INSTR LABELS
```

Source	SS	df	MS	Number of obs =	12
				F(2, 9) =	0.08
Model	8.18650055	2	4.09325028	Prob > F =	0.9241
Residual	462.615616	9	51.4017351	R-squared =	0.0174
				Adj R-squared =	-0.2010
Total	470.802116	11	42.8001924	Root MSE =	7.1695

USE	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
INSTR	.230898	5.604656	0.04	0.968	-12.44772	12.90951
LABELS	3.014448	7.557317	0.40	0.699	-14.08139	20.11029
_cons	7.533171	2.389833	3.15	0.012	2.126992	12.93935

Table C10

Regression Output for ANNOTATE

```
20 . regress USE INSTR ANNOTATE
```

Source	SS	df	MS	Number of obs =	10
				F(2, 7) =	2.19
Model	56.0520181	2	28.026009	Prob > F =	0.1822
Residual	89.4593725	7	12.7799104	R-squared =	0.3852
				Adj R-squared =	0.2096
Total	145.511391	9	16.1679323	Root MSE =	3.5749

USE	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
INSTR	2.075919	2.990976	0.69	0.510	-4.996615	9.148453
ANNOTATE	4.281287	2.610738	1.64	0.145	-1.892127	10.4547
_cons	1.406863	2.06397	0.68	0.517	-3.47365	6.287375