Tracy M Jackson. I Want To See It: A Usability Study of Digital Content Integrated into Finding Aids. A Master's Paper for the M.S. in L.S degree. July, 2011. 102 pages. Advisor: Jacqueline Dean.

This paper presents the findings of a usability study conducted on finding aids from the North Carolina Collection Photographic Archives at UNC-Chapel Hill. The study focused on digital content from archival collections that is made available through these finding aids using CONTENTdm; sought to explore how users accessed and understood this digital content; and followed up on several aspects of a similar usability study conducted at the Southern Historical Collection in 2009. Findings indicated that the digital content integrated into finding aids was largely intuitive but that it could be made more consistently usable; advanced users and users with archival experience found the finding aids easy to use; novice users may need additional assistance to understand the finding aid and would prefer to access digital content through the CONTENTdm interface; and the search capabilities in CONTENTdm are very important to users but could be improved for usability.

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I WANT TO SEE IT: A USABILITY STUDY OF DIGITAL CONTENT INTEGRATED INTO FINDING AIDS.

by
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Introduction

Users of primary source materials are increasingly expecting that such materials are available or at least findable on the web. Many internet users, regardless of situation or intent, subscribe to the axiom that "if it's not online, it doesn't exist." As part of the archival response to the technological changes that have both caused and accompanied these changing expectations, institutions are digitizing materials and collections as well as making finding aids available online. By presenting digitized content and descriptions of archival collections on the internet, archives and special collections institutions seek to connect users or potential users with relevant holdings, making archival materials more accessible.

At the same time that institutions are being pushed to present more material more accessibly, most need to operate with limited resources of staff, technology, and budget. While projects that highlighted specific collections with special digital exhibits were a way for many repositories to begin digitization practices, these projects do not scale well and require more time and money than would be feasible for digitization of large amounts of materials. Thus, many archives and special collections have begun to explore how digital content might be made available online in ways that are efficient, effective, and reasonably priced. Several writers have proposed using the finding aid as the most logical vehicle for presenting digitized content (Evans, Greene), and some archival institutions are following suit. At the University of North Carolina at Chapel Hill, Wilson Library

Special Collections have been presenting digital content linked directly from the finding aid since January of 2010.

The traditional finding aid was a printed document available in the archive that described a particular set of materials, including topical and physical descriptions, and was made available to researchers in some fashion so that they could make sense of a collection or find relevant material. As finding aids have moved online, they have undergone various levels of conversion from paper to electronic format, from static reproduction of a scanned print document to marked-up text on websites with commenting features, and everything in between. In recent years, a shift in focus within the archival profession from the materials themselves to what the user wants and what the user finds has become paramount to the continued progress of the archive. Usability studies, in particular, have allowed archivists to determine what users think of the way both description and content are presented. Recent usability studies of online finding aids and digital collections have brought to light both user and professional concerns with the utility of both the traditional method of description (using archival language and organizing materials according to their physical status) and the newer model of representation (a static HTML or even PDF format). The finding aid, a formerly specialized document that may have required the assistance of an archivist or the experience of many years to interpret, is now available to large numbers of users, having various levels of familiarity with archives, without the assistance of an archivist. Studies of this unmediated interaction tend to raise several issues time and again: unfamiliar terminology, too much unnecessary information, too little pertinent information, confusion over what information is where in the document, and a desire to see the contents of a collection right away. Many users express frustration

and a lack of desire to use the finding aid or the archive. Similarly, usability studies of digital collections have indicated that users have difficulty navigating to and within collections as well as searching for materials, but are appreciative of the accessibility of digital content as well as information on background and usage. These studies suggest that users are interested in immediate access and intuitive tools to get it.

The Southern Historical Collection and Digital Content at UNC-CH

Special Collections at the University of North Carolina at Chapel Hill (UNC-CH) are housed in Wilson Library. The Southern Historical Collection is the largest archival collection at UNC, including over 4,600 individual collections. The North Carolina Collection Photographic Archives, University Archives, and Southern Folklife Collection are also housed in Wilson Library and contain hundreds of additional collections described by finding aids or collection guides.

In 2007 the Southern Historical Collection (SHC) was awarded a Mellon Foundation grant to explore options for the large-scale digitization of its many collections. According to Laura Clark Brown, Coordinator of the Digital SHC, the goal was to implement programmatic procedures flexible enough to expand or narrow as resources allowed (Brown interview). SHC staff talked to scholars and colleagues, investigating options for delivery of digital materials being developed and utilized at other archival institutions and taking into account current professional thinking about how best to make materials available to researchers. Numerous considerations such as technical, financial, legal, privacy, processing, and conservation concerns were taken into account during the process. Ultimately, the SHC sought to make large amounts of digitized material available online in a way that would mirror the researcher experience in the reading room and be both cost-effective and efficient. It was decided that delivery through the finding aid would be the best method for making digital content available; in this way, contextual

and hierarchical information would be available to the researcher without requiring extra metadata input or additional curation (SHC pg. 4-5).

In 2008, the SHC also began a project to redesign its finding aid template. The redesign was intended to improve usability, with goals "to improve display, add useful navigation features, lower terminology barriers, and include new help features for both novice and advanced users" (Chapman pg. 13). An additional benefit to the new design was that it allowed other special collections housed in Wilson Library to later adopt a standardized finding aid template with a uniform look and brand (Brown interview). While there was no usability test conducted on the finding aids before the redesign, a study conducted post-redesign indicated that the new design rated as highly useable compared to the results of published studies from other institutions (Chapman pg. 57-61). As a result of this study, the finding aid template was modified slightly to include language advising users to use the browser's Ctrl+F search feature within the finding aid to assist in searching for specific elements, a brief explanation of the purpose and function of subject headings, and additional small changes to terminology and help features (Chapman interview).

These two separate projects, the finding aid redesign and exploration of mass digitization, began to overlap in early 2009. Library systems staff, in collaboration with the team redesigning the finding aids, began developing methods to present digitized content within the new finding aid template (Shearer interview). In early 2010, as part of their 80th anniversary celebration, the SHC debuted the first finding aids that incorporated links to digitized content. Other special collections in Wilson Library, particularly the North Carolina Collection Photographic Archives (NCCPA), soon followed suit. The

unique needs of the NCCPA and its multiple special format materials led to further development of and revision of the procedures that allow digital content to be linked to the finding aid (Shearer interview). Since the NCCPA has been scanning images for a variety of purposes over the last ten years, the adoption of the standardized finding aid template and digital collection functionality established by the SHC has allowed a great deal of digitized content to become available through the finding aids.

The basic process that allows a user to look at a finding aid and get to digitized content starts with EAD-tagged[1] finding aids written in XML[2], then transformed into HTML[3] files with an XSLT[4] stylesheet before being uploaded to the web. As part of this transformation, a javascript function is included in the final HTML version of the finding aid that will perform a search for digital content each time the finding aid is loaded. Each collection has a unique identifier, and smaller divisions of materials, such as a folder or box of manuscripts, a roll of film, or an entire subseries, are also given unique identifiers. Digitized items are given filenames corresponding to these identifiers. For example, a digital scan of a color slide from the Frank Clodfelter Collection (P0032) that is listed in the finding aid as P0032/2_0004 will have a filename beginning with P0032_2_0004 (Figures 1 and 2).

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[1] Encoded Archival Description (EAD). More information on EAD can be found on the EAD Library of Congress website, http://www.loc.gov/ead/

[2] eXtensible Markup Language (XML). More information on XML can be found on the World Wide Web Consortium website, http://www.w3.org/XML/

[3] HyperText Markup Language (HTML). More information on HTML can be found on the World Wide Web Consortium website, http://www.w3.org/html/

[4] eXtensible Stylesheet Language Transformations (XSLT). More information on XSLT can be found on the World Wide Web Consortium website, http://www.w3.org/TR/xslt

Figure 1: Record in Finding Aid

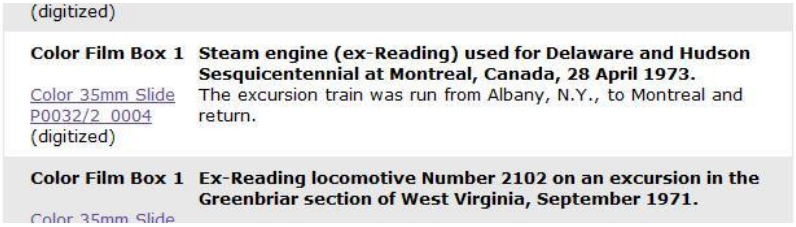
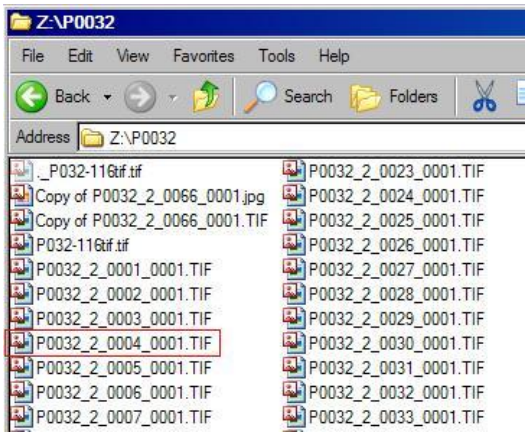
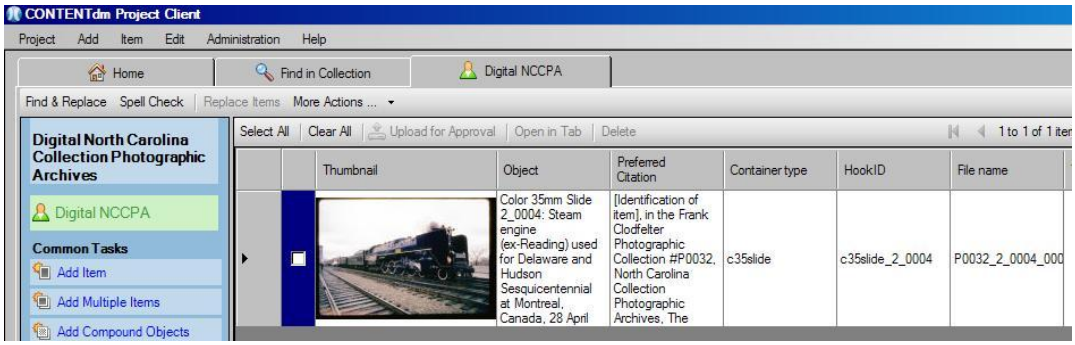


Figure 2: Filename of Digitized Content



Digital items are uploaded to CONTENTdm (Figure 3) along with metadata that has been taken directly from the finding aid via a process using another XSLT transformation developed by library systems and special collection staff.

Figure 3: Image in CONTENTdm Client



When the finding aid page is loaded, the script present in the HTML begins searching for digital content in the CONTENTdm collection. If digital content is present for that

collection (identified by the unique collection number), CONTENTdm returns the names of the digital files, which the script then uses to create links within the finding aid directly to that content (Shearer interview).The stylesheet used for the finding aids renders these links purple and adds the text "(digitized)" to the identifier, as shown in Figure 1. A purple box is also added just below the collection number and title at the top of the finding aid, indicating that the collection includes digitized content. The box at the top of the page, as shown in Figure 4, contains a link which takes the user to all of the digitized content available for that collection in the CONTENTdm interface (Figure 5), while the link created for each item or container with digital content will take the user to just that digitized content (Figure 6).

Figure 4: A Finding Aid with Purple Box for Digitized Content

Figure 5: CONTENTdm page with all digitized content for collection P0032

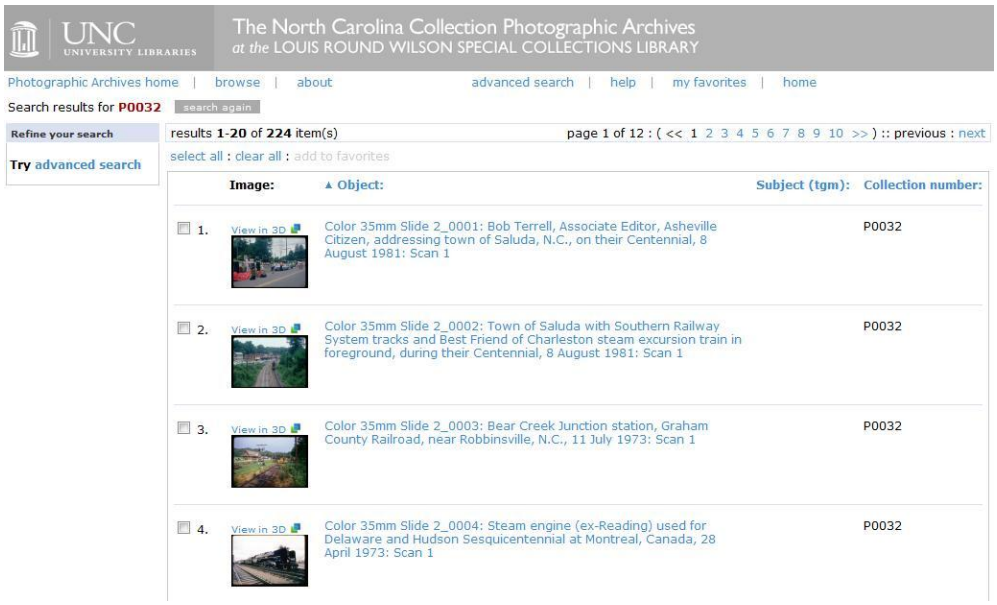
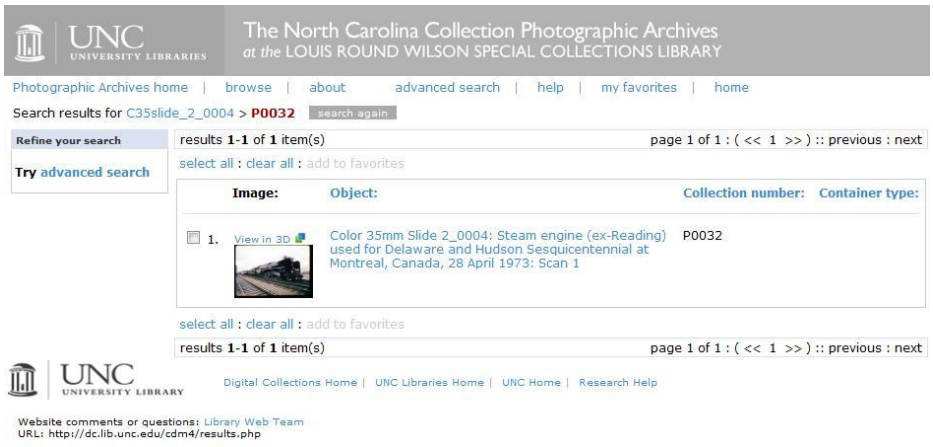


Figure 6: CONTENTdm page with digitized content for one record



This process allows newly digitized content to be automatically linked to the finding aid without processors needing to change the finding aid each time. The redesigned finding aid template and XSLT transformation process mean that every single finding aid can include this function regardless of its level of processing, and the XSLT generation of metadata is a workflow that can be used by all processing archivists and graduate students to get digitized materials into the CONTENTdm collection. No separate sites of

digital content need to be maintained, and all online digital items can be managed within CONTENTdm.

About 18 months after the digitized content finding aid first debuted at the Southern Historical Collection, there has yet to be a formal evaluation of user reaction to or satisfaction with this functionality or interface. Anecdotal evidence from Wilson Special Collections Research and Instruction staff suggest that some users are thrilled to discover easily available content, some users have difficulty finding digitized content even when it is available through the finding aid, and some users may be disappointed that content is not fully transcribed or downloadable; general unsolicited feedback has been positive overall (Brown interview). However, a formal evaluation of user interaction with the finding aids, including observation of users performing tasks and asking targeted questions about design, function, and satisfaction is clearly needed to inform future development of this aspect of the archival institution's online presence.

Literature Review

In recent years, the increasing number of usability studies of online archival finding aids has reflected the growing interest of many archivists and archival institutions in making their materials, including collections and collection guides, as accessible as possible to as many users as possible. This interest is certainly not limited to finding aids; it has been demonstrated and debated in articles on methods of processing, user studies, analyses of digital collections, and the evolving theoretical discussion on the role and impact of the archivist on collections and the historical record. While the number of usability studies has grown, the authors of these studies generally lament that the total number is still small, and the problems found are still persistent. Many of the usability studies of online finding aids, as well as the design and usability literature they cite, point to what seem to be fundamental difficulties between archivists and users as successive falters on the path to the truly accessible archive. Nevertheless, finding aids and the opportunities they give for greater access to materials continue to evolve apace with the professional desire to connect with users, and a new segment of the literature is emerging to describe the integration of digital content with the descriptive information traditionally given in finding aids.

Kathleen Roe, in the manual *Arranging and Describing Archives and Manuscripts* put forth by the Society of American Archivists, describes the archival finding aid as an access tool and a method of representation, a way of "establishing administrative or intellectual control over archival material" (Roe, pg. 86). At its most basic, a finding aid

is an inventory that may be expanded upon "depending on the intended audience, the nature of the records, or the institutional goals" (Roe, pg. 86). It includes such essential information about a group of records as collection or grouping title, the name of the holding repository, biographical or historical information about the creation of the records, a description of the materials, information on accessing the records, a container or folder list, the name of the person who created the finding aid, and the date the finding aid was created (Roe, pg. 87).

In the past 20 years, finding aids have gone online in increasing numbers and in a variety of forms. As early as 1997, institutions and archivists were beginning to question the effectiveness of simply uploading traditional finding aids to the internet. Dennis Meissner's article "First Things First: Reengineering Finding Aids for the Implementation of EAD" addresses the realization that traditional finding aids required extensive mediation by archival staff and a fundamental re-thinking of the structure, order, and presentation of information could vastly improve use.

In 2004, Christina Hostetter conducted a survey of university archives and archivists, and found that most had 10% or less of their finding aids online. Practices varied widely and there were problematic perceptions of the utility and function of online finding aids. While all surveyed agreed that online finding aids were valuable, some thought they were no more valuable than paper and that they may even be "a luxury [that] should not take away from the importance of paper finding aids" (Hostetter, pg. 135). The majority of respondents, however, agreed "that access was the key function of finding aids on the web" (Hostetter, pg. 135). Some archivists were even more clear-eyed than this about the trend towards greater online access and that users will only expect more of it as time goes

on. One respondent suggested that "an institution's web interface and the absence of jargon were determining factors in evaluating its usefulness" (Hostetter, pg. 137). Given this comment and another respondent's recognition that "the generation of online finding aids has removed archivists as mediators, so we need to remain cognizant of that fact and ensure that our description can stand for itself" (Hostetter, pg. 139), it is clear that many archivists value the construction of online finding aids as the access points by which our users will learn about, use, and evaluate both our resources and our institutions.

These attitudes and practices, among other issues, are addressed by Richard Cox in his 2008 article, "Revisiting the Archival Finding Aid." Cox had a number of critiques for current thinking and practice surrounding the generation of finding aids, mainly centering around the lack of focus on and understanding of the actual needs of researchers. He maintains that "archivists need to muse about whether the language of finding aids is the same as the language of most of the web browsers and potential audience for, and users of, archival records […] wondering if a finding aid as traditionally conceived of (from inventories and registers to EAD documents) is anything like what someone on the web might be expecting." (Cox, pg. 17).

As the presence of online finding aids began to be perceived as the norm for archivists and users alike, a shift in focus within the archival profession, from the materials themselves to the users and the uses that make them valuable, produced a core group of usability studies. A review of these studies reveals that most have compared finding aids across institutions, and very few have compared designs within one institution; only one study conducted iterative testing, and a content analysis of the existing literature in 2010 found some inconsistencies in this group of studies as a whole. Many of the studies,

particularly the earliest ones, emphasize user disappointment, confusion, and unmet expectations, particularly with the nature of the materials and the lack of immediate access to them. However, some later studies that have included extensive user analysis or close attention to design guidelines have had more positive user feedback.

The first major finding aid study to appear was conducted by Wendy Duff and Penka Stoyanova, published as "Transforming the Crazy Quilt" in 1998. Done in the very early days of online finding aids, this study used mock-ups of potential finding aid designs to get feedback from users. Technically a study using focus groups rather than a usability study, this article is nevertheless the first acknowledged instance of archival focus on user feedback for finding aids, and it presents quantitative and qualitative results. The researchers had small groups of archival users examine several different display mock-ups of finding aids, then engage in a structured group discussion as well as answer an individual questionnaire and rank elements in order of importance. Important findings of the study included user complaints of too much information presented, hindering use of the finding aid (Duff and Stoyanova, pg. 52); difficulties with labels and terminology (pg. 52); user preference for "an archival display created according to design guidelines" over traditional presentation (pg. 61); and finally, recommendations for "a short narrative overview accompanied by a list of series" (pg. 65).

Burt Altman and John R. Nemmers produced the next major study of user feedback regarding online finding aids, "The Usability of On-line Archival Resources: The Polaris Project Finding Aid," in 2001. A case study of one set of finding aids assessed after they were first placed online, this study was a combination of email communication, a self-paced survey, and informal in-person feedback for users of one particular institution; the

article does not present any statistics or systematic analysis. Users, who were likely to be experienced users of this archive in particular, were generally positive about online finding aids, but made a number of suggestions about the importance of understanding the hierarchy of a collection and the ability to get assistance while viewing an online finding aid.

In 2004 two major studies were published that conducted quantitative analysis of finding aid usability. The first, performed by Christopher Prom and published as "User Interactions with Electronic Finding Aids in a Controlled Setting," compared finding aids across eight institutions. The research involved a preliminary survey to gather demographic information and user performance of eight controlled tasks; task completion and correctness, time taken, and some qualitative feedback were measured. Users included archival experts, computer experts, and novices, with some overlap between the first two groups. The results of this study directly relate to the design of the finding aids involved, and Prom is able to make a number of concrete recommendations on design. Users had difficulties with extraneous information or search options, archival terminology, and overall design of the sites, prompting the researcher to advise that "self-apparent layout and visual clues are as important as using simple terminology" (Prom, pg. 262) and "interfaces should not wittingly or unwittingly undermine context" (pg. 261).

The second study from 2004 is Elizabeth Yakel's "Encoded Archival Description: Are Finding Aids Boundary Spanners of Barriers for Users?" Similar to Prom's study, Yakel's involved a preliminary information-gathering survey and a test with a series of tasks to be performed on a set of finding aids, in a controlled setting. In this case,

however, Yakel conducted an exit interview specifically addressing the interface used, and the finding aids included were from one institution and utilized one design. The study participants were graduate students of information and library science assumed to have high computer and search expertise, but were screened to eliminate those with high archival expertise. The primary difficulties users identified in this study were with "archival jargon" and differentiating between "contextual information" and "content information" (Yakel, pg. 74). Yakel is also the first to suggest the use of expanding information, as "something between the full text and outline view" such as a drop-down or explode-able view of finding aid contents (pg. 75).

In 2006, Wendy Schier published "First Entry: Report on a Qualitative Exploratory Study of Novice User Experience with Online Finding Aids." The first study to focus specifically on novice users, who are likely to have more difficulty using finding aids than archival experts, Scheir explicitly stated her goal of examining terminology, navigation, display, and structure (Scheir, pg. 52). Similar to Prom's study, task completion, correctness and time were measured, qualitative feedback invited, and finding aids from a variety of institutions were used. In this case, participants were remote and self-paced, contributing to the study via email and entirely self-reporting. The interesting results of this study included the "desire among participants to obtain immediate answers, with little patience" for either hierarchical/contextual information or "dense blocks of text" (pg. 60) and the intermingling of navigation, display, and structure feedback, all having to do with the design of the site. Users here, as in other studies, had difficulty with archival terminology, and this study also suggests the importance of simple design with "drill down" capabilities (pg. 75). Perhaps the most important finding

of this study was that "two users of equally minimal experience with archives, with equivalent educational backgrounds and facility with computers, had very different experiences with the same site" (pg. 76), echoing the subjectivity of assessment found in the design literature.

Another study published in 2008 performed similar analyses. A UNC-Chapel Hill SILS master's paper by Rita D. Johnston entitled "A Qualitative Study of the Experiences of Novice Undergraduate Students with Online Finding Aids," is very similar to Scheir's study in structure and results, building upon the previous study to further emphasize novice users' difficulties with archival terminology and confusingly dense finding aid displays. Johnston's study differs from Scheir's in that participants performed the study in a controlled setting, allowing for more structured analysis of user processes, but she only briefly addressed design issues with finding aids at various institutions, emphasizing again user dissatisfaction with "dense paragraphs of text" (Johnston, pg. 41).

Finally, these finding aid usability studies are summarized and analyzed, along with several others, in Emily Walters' UNC-CH SILS master's paper "Usability Studies of Finding Aids: A Content Analysis of the Literature 1998-2008." Walters' major finding was persistent inconsistencies in both methods and reporting of usability tests within the archival literature. She found common themes among the usability studies examined, primarily user difficulties with display, terminology, and search capabilities of online finding aids (Walters, pg. 37). While she is reluctant to draw any broad conclusions about usability testing of finding aids due to the inconsistencies mentioned, her observations regarding findings of these studies are worth noting as a general summary of online finding aids. Walters points out that many of these studies reveal users performing what

appear to be site workarounds (such as using browser search functions rather than site search functions) to complete the tasks of the studies, which seems to indicate problems with the presentation of finding aid contents. Two other interesting themes Walters mentions are that users learn throughout study participation and archival expertise and computer expertise may actually indicate search expertise, which "relieves some of the onus on online finding aid creators and instead places that burden on users of the system" (pg. 35). Ultimately, she suggests that in every case, "subjects are able to succeed despite poorly designed systems" (pg. 34).

While this last conclusion may seem like censure of the finding aid's inability to become a completely intuitive web interface for representing archival materials, it could also point to the success of the online finding aid in proving itself useful to participants in spite of its complex nature, large amounts of contextual information, and relative newness to many study participants. Literature on user-centered design emphasizes design principles and how they are used to make a system that is efficient, effective, and satisfactory, but it also emphasizes that usability is "context dependent" (Hornbaek, pg. 79). While it is easy to fixate on the frustrations and failures of online finding aids, it is useful to keep in mind some issues of system design and evaluation when assessing the purpose of the online finding aid and how this purpose is realized.

Concerns about the structure, display, and perception of the finding aid are related to concerns of all creators of web content regarding the design of pages. Alison J. Head, in her text *Design Wise*, describes web pages as interfaces, or visible pieces of a system, that users come into contact with when completing a task. The design of the interface matters "because it plays a large role in determining whether we can get our work done. A well-

designed tool is one that is easy to interpret and satisfying to use" (Head, pg. 4). Head asserts that all users of a system "bring certain expectations" and "[w]hen those expectations are not met, then the design begins to fail" (Head, pg. 6). The concept of design language, as Head explains it, "describes how interfaces communicate what objects are to users, what they might do, and how they should be used," based on three components: elements, organizing principles, and qualifying principles (Head, pg. 7).

According to the text *Interaction Design*, usability testing is an evaluation of the site rather than the user, conducted in a controlled environment with the goal of deciding "whether the product being developed is usable by the intended user population to achieve the tasks for which it was designed" (Sharp et.al., pg. 646). A plethora of guides on conducting usability testing echo what Steve Krug sums up eloquently in *Don't Make Me Think*: "if you want to know whether your […] web site […] is easy enough to use, watch some people while they try to use it and note where they run into trouble" (Krug, pg. 135). The scale for usability testing can vary widely, but current thinking suggests that even small, informal tests with as few as five people of any level of domain experience are valuable for informing design decisions (Sharp et. al., Krug, Head). As Krug asserts, "the point of testing is not to prove or disprove something. It's to inform your judgment" (Krug, pg. 135).

However, scholarly research into usability testing suggests that problems exist with many usability studies, calling into question the applicability of some testing measures. Kasper Hornbaek, in his article "Current practice in measuring usability: Challenges to usability studies and research," reviewed a large number of usability studies and found multiple common problems, primarily concerned with weak correlations between measures,

confusion between subjective and objective assessments, and inconsistent use of standardized and expert assessment allowing for research to build upon itself (Hornbaek, pg. 97). He gives structured suggestions for incorporating subjective and objective evaluation, both essential for obtaining a complete picture of usability and of the three central usability measures of effectiveness, efficiency, and satisfaction (Hornbaek, pg. 96). Alshamari and Mayhew discuss a number of issues in the usability testing literature, including questions about the validity of using a small number of participants and limitations of controlled testing to assess web sites (Alshamari and Mayhew, pg. 403-405). Thus, while any amount of usability testing may be useful in informing design decisions, attempts must be made to ensure the validity of results for the specific user community.

This concentration on the user and how they might best be served is reflected in the archival literature by a number of studies focusing on particular groups, including Helen Tibbo's "Primarily History: Historians and the Search for Primary Materials," Ian Anderson's British counterpart study "Are You Being Served? Historians and the Search for Primary Sources," two articles by Wendy Duff entitled "Where Is the List with All the Names? Information-Seeking Behavior of Genealogists" and "Archival Orientation for Undergraduate Students: An Exploratory Study of Impact," and Elizabeth Yakel's "AI: Archival Intelligence and User Expertise." These studies examine a particular subset of users, their characteristics, expectations, expertise, and search habits, and taken together, they reveal that archives and finding aids are not understood or accessed in a universal way. As addressed in the design literature and in Wendy Scheir's 2006 study, no two users (much less two groups of users) will react to or search a finding aid in the

same way, and what's more, the very process of research into archival materials makes the intuitiveness so highly sought in usability studies incredibly elusive.

In spite of this, at least two recent usability studies of finding aids have found positive reactions to some problem areas specified in previous studies. These studies address the design process and user input, as well as hinting at future possibilities addressed in successor articles on digital content and streamlined processes for making materials available.

A 2008 article by Cory Nimer and J. Gordon Daines called "What Do You Mean It Doesn't Make Sense? Redesigning Finding Aids from the User's Perspective" is the first usability study discussed here to display some form of iterative testing. As part of a project to redesign finding aids at a single institution, the authors engaged in a multi-step process of attempting to analyze user needs through the creation of user profiles, analysis of other institutions' finding aids, gathering user preferences through usability testing of other institutions' finding aids, and through usability testing of a design informed by the first three stages. While this process appears to conform well to guidelines on usability testing and on the recommendations of archival literature to take the needs of an institution's users into account when testing finding aids, the results of these tests are not completely conveyed in this article and the project discussed was still in process. However, initial tests indicated that users appreciated a display that indicated location in a collection's hierarchy and that both more experienced and less experienced users were able to understand terminology used (Nimer & Daines, pg. 229). In addition, the authors were excited to address the possibility of incorporating Web 2.0 technologies such as

commenting and RSS feeds, based on positive feedback from users questioned (Nimer & Daines, pg. 229).

The second study was conducted at the University of North Carolina at Chapel Hill's Southern Historical Collection by a master's student at the School of Information and Library Science (SILS), Joyce Chapman, who in 2009 presented the results in her master's paper "What Would Users Do? An Empirical Analysis of User Interaction with Online Finding Aids." Chapman's study tested a new design of the SHC's finding aid display, a design that was created with specific goals "to improve display, add useful navigation features, lower terminology barriers, and include new help features for both novice and advanced users" (pg. 13). The new features included hyperlinks to different parts of the finding aid, expandable/collapsible sections, a FAQs page, and hover captions to inform a user of their location in the collection hierarchy (pg. 13). Participants of the study included novice and advanced users, who were asked to locate materials and navigate the finding aids through a series of eight tasks; time taken, ability to locate items, search strategies, and qualitative feedback were measured. Results indicate that novice users were able to self-educate, and users as a whole reported much less confusion and frustration with location and understanding than in previous studies. Chapman discovered, as in previous studies, the tendency of advanced searchers to utilize browser functions for keyword searching, which led to greater rates of success in study tasks for those users who were aware of this possible avenue of search. Interestingly, in a post-test questionnaire intended to gauge interest in further development of the finding aids, participants in this study revealed a distinct lack of desire for Web 2.0 technologies such

as commenting or tagging, although there was some interest in the ability to share or bookmark finding aids.

These studies are just a small part of a rising tide of publications describing innovative uses of the finding aid, theoretical and practical. Michelle Light and Tom Hyry stirred a vibrant discussion of post-modernism in archival description as a whole with their 2002 article "Colophons and Annotations: New Directions for the Finding Aid," while the effective use of Web 2.0 features to add value to a finding aid was explored in Yakel et. al.'s article on the Polar Bear Expedition Digital Collection, "Creating the Next Generation of Archival Finding Aids." The former suggested additions to the finding aid that describe the subjective impact and perspective of the processing archivist, while the latter invited the addition of information to the finding aid from an interested community of users through commenting, collaborative filtering, and bookmarking. While these innovations would add value to finding aids by adding greater detail, another discussion centers around streamlining arrangement and description, best embodied in the pivotal 2005 article by Mark Greene and Dennis Meissner, "More Product, Less Process."

The need for archivists to restructure their processing to incorporate more collections and a broader range of activities has been more recently, and for the purpose of this paper more pointedly, addressed in Max Evans' 2007 article "Archives of the People, by the People, for the People." Evans, in his excellent discussion of inventive ways archivists can strive to meet the "growing public expectation that every page in every document is online and indexed" (pg. 387), was one of the first to suggest that the finding aid be used to provide access to digitized items. He was particularly addressing this need as the result of movements towards mass digitization, motivated by user demand. He envisions that "a

finding aid entry for a file unit will open a virtual folder, beginning with the first page of the first item. Navigation buttons and menus allow movement among pages and items. There is no description of each item; like researching among the originals in the reading room, what you see, in the context of the whole, is what you get" (Evans, pg. 391). Mark Greene similarly proposes mimicking the physical context of materials in the digital world in his discussion of applying MPLP to mass digitization. Greene argues that although many institutions may be reluctant to rush headlong into making every collection digital, "we must acknowledge that these expectations will be an increasing reality" (Greene, pg. 194) and suggests that the most direct way to organize digital content is "by linking folders of material to their place in online finding aids; [which] provides the most and best context for the material" (pg. 194).

Several institutions are exploring this method of making digital content accessible, but as yet there is little published material detailing the experiences of incorporating or linking digital or digitized material to online finding aids.

A study called "Finding Aid as Interface?" was conducted in 2003 by researchers at UCLA, testing elementary and high school students' ability to retrieve images from both a finding aid-based interface and a "prototype user-centered" interface (Besser et. al., pg 511). These researchers found that students were more successful at retrieving items from the prototype interface, but found it lacking in context (pg. 512). This early study establishes what some later studies have since found, but presented little data for comparison.

Brian Dietz and Jason Ronallo describe a new workflow designed for preparing large-scale digitized content for finding aid integration at North Carolina State University in the article "Automating a Digital Special Collections Workflow Through Iterative Development." Although NCSU does not yet display digitized content via finding aid links, Dietz and Ronallo precisely articulate the convergent forces driving the need for such an approach. They describe past "tools and workflows that were created to facilitate an 'exhibit' approach to digital projects" that needed to be replaced due to a new "focus on getting materials online in the aggregate" (Dietz and Ronallo, pg. 44). In order to accommodate large-scale digitization of materials as both a better method of researcher access and as called for by professional ideas about efficiency (pg. 44), Dietz and Ronallo describe a method of harvesting the existing description and organization present in finding aids and re-purposing it for digital objects in preparation for display (pg. 47-49).

In 2009 the Northwest Digital Archives conducted a user study of a variety of user groups aimed at answering the question "Why digitize, and for whom?" (Allison-Bunnell et. al., pg. 2). The study conducted interviews with nineteen users of archival materials (including digitized) and came to several interesting conclusions. On the whole, users "vastly preferred keywords as a search entry method over browsing" and "wanted contextual material for digitized objects and collections and expressed some preference for the type of information presented in finding aids over that presented in digital asset management systems even though they disliked the presentation of finding aids" (pgs. 2-3).

A 2011 article by Jody L. DeRidder in the Journal of Library Innovation fully illustrates efforts at the University of Alabama Libraries to link digital material to finding aids.

"Leveraging EAD for Low-Cost Access to Digitized Content" describes a National Historical Publications and Records' grant-funded project to devise the technologies and workflow capable of "recreat[ing] the patron experience in the reading room via the Web" (pg. 45). DeRidder outlines the methods, including file-naming conventions and software applications, by which the UA Libraries began integrating digitized content to their finding aids, starting with one particular collection and moving to include all collections with digital content.

A usability study of the new finding aid interface with digital content was conducted and Jody DeRidder kindly forwarded a copy of the article describing the results prior to its publication in the *American Archivist*. The study used 20 participants and had them perform eight known-item searches, half on a finding aid incorporating digital content and the other half using a digital collection interface with item-level description and searchability.

This study uncovered some fascinating differences between use of the finding aid to discover digital content and use of the searchable "item-level described collection" (DeRidder et. al., pg. 15). Generally, the study concluded, participants found the item-interface more efficient in performing known-item searches and were also more satisfied with that than with the finding aid interface. Users with greater levels of special collections experience performed significantly better on the finding aid interface than other participants, and novice users with no experience in either special collections or digital library interfaces also performed slightly better on the finding aid interface than did users who primarily had digital library interface experience. These results led the authors to suggest that the finding aid "method of web delivery may currently be more

suitable for scholars than for students" (pg. 19). However, in their conclusion the authors make some extremely salient points about the advisability of continuing to pursue the finding aid as the primary delivery method for digitized content. They point out that this method "is extremely cost-effective" and "provides a solution to digitization of large manuscript collections that may never otherwise see the light of day online" (DeRidder et. al., pgs. 18-19). Their concluding paragraph on page 19 eloquently sums up this entire approach:

> "Although it is apparent that it takes more time and steps to use the finding aid interface, this must be weighed against savings in cost. Does more time and effort necessarily hamper usability? The finding aid provides much more context, which requires time to peruse. For this reason, perhaps interface efficiency is not a useful comparison. By increasing the ease of use and verifying the learnability of the finding aid interface, we will be better positioned to leverage this low-cost digitization method to provide online access to large manuscript collections."

Methodology

This study sought to explore how users of archives navigate finding aids that have links to digitized content, how users access that content, and how satisfied users are with the experience of using a finding aid to locate and view archival content, analog and digital. The study examined the finding aid design currently in use by the University of North Carolina at Chapel Hill's Wilson Library Special Collections, which includes links to any content that may be digitized and uploaded into the archival digital collection. This was designed as a usability study to provide quantitative data on participants' ability to use and satisfaction with the finding aids, and qualitative data on user perception of and satisfaction with the finding aids.

Study participants, or users, were solicited via email. Several potential study participants were identified by staff members of the Southern Historical Collection's Research and Instructional Services and received an email describing the study and requesting their participation. An email was also sent to graduate and undergraduate students in the history department over their departmental listserv. Two additional participants were invited to participate in the study through their association with the School of Information and Library Science (one current student and one recent graduate). Participants were offered monetary compensation (ten dollars in cash) for their participation in the study. Eight participants were originally sought, and nine people ultimately participated in the study.

The study was conducted on the UNC-CH campus, in Davis Library. Seven sessions were conducted in a computer lab on a desktop computer equipped with Morae screen-capture software[5]. The other two sessions were conducted in a conference room on a laptop computer also equipped with Morae. The primary researcher attended all nine sessions, observing the study and conducting the post-test interview; for two of the sessions, faculty advisor Jackie Dean was also present and participated in the post-test interview.

Users were first given a short questionnaire (Appendix A) to determine their age, gender, level of education, affiliation with the University, experience with archives and finding aids, experience with using the internet, and experience specifically using finding aids and archival materials from Wilson Library Special Collections. After completing this questionnaire, users' answers to questions about archival finding aid experience at Wilson Library were used to determine their status as novice or advanced users. Users who indicated they had used these finding aids more than five times were classified as advanced users and instructed to skip the first task. Otherwise, regardless of their response as to their level of experience with archives, users were instructed to begin with the first task. This was intended to find out how users acclimated to this finding aid design.

The written part of the study (Appendix B) included eight tasks, some of which had several sub-tasks, that participants were asked to perform on finding aids from the North Carolina Collection Photographic Archives. The computer being used for the study had

[5] Morae is usability software including screen-capture and audio and video recordings. More information about this software can be found on their website, http://www.techsmith.com/morae.asp

the web browser Mozilla Firefox open to a page with the list of NCCPA finding aids listed in order by collection number; task questions then directed users to a specific collection finding aid or asked them to choose one they had previously used during the study. Study tasks presented participants with a general scenario and asked them to answer questions about a collection or find a group of items or a specific item. Participants were given space on the study paper to write answers such as what they found, where, and why they have answered as they have. Participants were encouraged at the beginning of the study to think aloud and indicate verbally when they were beginning a new task, so that researchers could calculate the time taken for each task. Six of the participants spoke their thought processes to some extent.

After completing these tasks, users were asked to fill out a post-test questionnaire (Appendix C) asking them about their experience and perception of the finding aids and digital content pages. These questions used Likert scales to determine each user's level of satisfaction with aspects of the finding aid and digital content design, as well as their overall experience. Participants were also asked if they would be interested in the availability of some Web 2.0 features on finding aids, in order to compare current results to these answers with results Joyce Chapman found in her 2009 study. After completing this questionnaire, users were verbally asked several questions (Appendix D) about their experience using the finding aids, and these conversations were recorded as part of the study session. The total time required for the study varied from 40 minutes to just over an hour.

Results

The study pointed to three different groups of users instead of the anticipated two groups, and indicated that some aspects of the digital content inclusion in the finding aid were intuitive, while others were not. Novice users of archives and finding aids demonstrated some confusion over the nature of the finding aid and the difference between it and the digital content interface, although they were able to complete the tasks of the study. Interestingly, users who claimed familiarity with archives and finding aids fell into two distinct groups in their search behaviors, and this depended on their level of familiarity with using online finding aids in general and using this institution's finding aids in particular. Those users who were nominally familiar with online finding aids clearly preferred to use the digital interface to find items and had some difficulties navigating the finding aid, although they showed more willingness to use the finding aid page to search for items and a greater understanding of its nature than the novice users. Users who indicated advanced experience with finding aids in general and UNC-CH's Wilson Special Collections (WSC) finding aids in particular navigated the finding aid pages quickly using the Control Find (Ctrl+F) function, but also relied on the search box function in the CONTENTdm interface from time to time.

One study participant was never able to access the digital content due to technical difficulties, which were not fully realized until partway through the study. The researcher decided to have this user go ahead and finish the study, and her feedback on the finding

aid design and navigability is included, but this session was excluded from the discussion of the integration of digital content and the CONTENTdm interface.

Usability results showed that many people did not find the purple box at the top of the page, indicating that a finding aid included digital content, unless they knew about it or specifically looked for it. Many people did not see or notice the purple box even after it appeared; others noticed it but did not think it was important. All participants noticed the links at the container level, however, and used them with no hesitation. All users noticed the red text describing access and use restrictions and indicated understanding of what these restrictions meant. Overall reaction to the finding aid design was positive, while reaction to the digital content display was mixed. Most participants mentioned that the order of information in the finding aid was good, giving them necessary information for using the finding aid and materials at the top of the page. Novice participants reacted to the CONTENTdm interface more positively than advanced archival users, with the intermediate archival user group demonstrating mixed reactions. All users who were able to access the digital content tried the "advanced search" feature in CONTENTdm and most users expressed some dissatisfaction with it. This dissatisfaction primarily related to the list of collections available for search, which confused users by not listing all collections used in this study by name and will be discussed in greater depth below.

This study also brought to light some probable differences between research in photographic collections and research in manuscript collections. Researchers were intrigued by questions raised in this study about conceptualizations of the finding aid and archival collections, as well as the responsibility of the finding aid to educate users about itself. These issues and questions will also be discussed further below.

Participant Characteristics

Participants in this study were mostly students at UNC-CH. Two were undergraduate students (22%), six were graduate students (67%), and one was a recent graduate of a master's program (11%). Five participants (56%) listed History as their main area of study, with an additional person indicating a History minor. Other areas of study were American Studies, Latin American Studies, and Information Science. The recent graduate listed his area of work as Education. The average age of participants was 31, and all participant responses to the demographics questionnaire (reproduced in Appendix A) can be seen in Figure 7 below.

Four people (44%) described their level of archival experience as Advanced, three History majors and one American Studies major. Three of these people also indicated that they had used online finding aids from Wilson Special Collections many times, with responses ranging from 25 to 1001. The fourth had used WSC finding aids three to four times before. Two more people described their level of archival experience as Intermediate (22%), one History major and one History minor. One of these people described using WSC finding aids 3-8 times, while the other had never used WSC finding aids. The last History major described her level of archival experience as Beginner, although she indicated previous use of online finding aids. The Information Science student also indicated his level of archival experience as Beginner, with no experience using online finding aids, and the recent graduate checked None as his experience level and indicated he wasn't sure if he had used online finding aids. A total of seven people (78%) indicated previous use of online finding aids, including five people who had used

WSC finding aids (56% of total, 71% of those who had used online finding aids), while two people indicated no previous experience with finding aids.

All participants rated themselves either Intermediate or Advanced on experience using computers and the internet. Five people (56%) rated themselves Intermediate and four people (44%) rated themselves Advanced. Two of the self-described Advanced computer/internet users indicated they spent more than ten hours per week on the internet (50%), while the other half indicated six to ten hours per week on the internet. Of the self-described Intermediate computer/internet users, three indicated more than ten hours per week on the internet (60%), one indicated six to ten hours per week (20%), and one indicated three to five hours per week (20%).

Figure 7: Participant Demographic Responses

ID	Age	Sex	Field	Archival Experience	Internet Experience	Internet hrs/wk	Online Finding Aids	WSC Finding Aids
1	28	M	GS, History	Advanced	Intermediate	11+	Yes	1001
2	19	F	UG, American Studies	Advanced	Intermediate	3-6	Yes	50
3	22	F	UG, Latin American Studies	Intermediate	Advanced	6-10	Yes	3-8
4	54	F	GS, History	Advanced	Intermediate	11+	Yes	3-4
5	34	M	GS, Information Science	Beginner	Advanced	11+	No	0
6	26	F	GS, History	Intermediate	Intermediate	6-10	Yes	0
7	29	M	GS, History	Beginner	Advanced	6-10	Yes	0
8	36	M	GP, Education	None	Intermediate	11+	Don't know	0
9	33	F	GS, History	Advanced	Advanced	11+	Yes	25

Observation led the researcher to conclude that these characteristics provided incomplete predictors of how participants used the finding aid pages. The three participants (33% of total) who described themselves as Advanced users of archival materials *and* indicated

extensive use of WSC finding aids demonstrated the greatest ease with and understanding of the finding aid overall. They relied on that page as their main source of information, used Ctrl+F to search within the page for different combinations of keywords, and demonstrated an understanding of the distinction between the finding aid as a description of the entire collection, and the CONTENTdm interface as a way to view the digitized portions of the collections. The researcher, therefore, describes just this group as the advanced archival users. The two people who had never used online finding aids before demonstrated some confusion over the nature of the finding aids, as well as the reasons for the differences between the finding aid pages and the CONTENTdm interface. These users displayed a distinct preference for the CONTENTdm interface and the ability to use a search box; they also displayed a general lack of interest in using the finding aid page. The researcher describes this group as the novice archival users.

The four people who did not clearly fall into either of these groups represent a portion of users who have some understanding of and experience with archives and finding aids, but display a wide range of preferences and search patterns. Their self-identification regarding level of archival experience did not reflect their apparent comfort with using these finding aids or digital content, and their search techniques varied widely. Three of these people were apparently unaware of the Ctrl+F function, as they never used it during their sessions, relying instead on scrolling or advanced search (all other participants used Ctrl+F at some point during the study). The researcher grouped these users together as intermediate users of archives for this study.

Tasks

Task 1

This task was specifically for novice users and was intended to check understanding of the purpose and function of the finding aid as a description of and guide to archival materials. Participants were directed to the Portrait Collection finding aid and asked what kind of materials they thought the page described, where the materials were physically located, how they could view the materials in person, and if they could view any of the materials online. This question was largely the same as in Chapman's study, with slight changes to reflect focus on users' understanding of the inclusion of digital content. Participants were directed to complete this task if they indicated that they had used online finding aids from Wilson Special Collections less than five times, regardless of how often they had used finding aids from other institutions.

Five participants completed this task, two who had never used archival finding aids before and three who had used finding aids at other institutions. Average time to complete this task was 5:23 minutes, with times ranging from 2:24 to 8:04 minutes. All participants gave essentially the same answers for the first three parts of this task, indicating a fairly good understanding of the collection, its physical location, and how to physically access it. Users appeared to find the information for this task from the Abstract and the Information for Users sections, although two people also spent some time in the CONTENTdm interface before answering. One user, who had never previously used finding aids, spent extensive time navigating around the CONTENTdm site trying to find out how he would view the materials in person, before having to "go all the way back to the beginning" by returning to the finding aid page to answer. Both novice users spent

more than five minutes on this task, searching in multiple places for answers and expressing some frustration at what they perceived as a lack of clear explanation of the nature of this page. No user ever gave any indication that they read the small print under the collection number and title that describes the nature of the page, although one user clicked on the FAQs link without reading the text surrounding it.

The fourth part of this task asked users if they could view any of the materials described online. Three users gave the correct answer that they could, one by using the purple box at the top and the other two by using links to digitized content in the Contents List. One of the two people who decided that they could not view material online was experiencing the technical difficulties mentioned previously and never saw the links to the digitized material. The other person who answered negatively to this question later found and used the purple box, but apparently did not see it at this time.

These results differ somewhat from Chapman's results in 2009, which can be attributed to two main differences: the significant change in size of the explanatory statement at the top of the page and the addition of the purple box and red restriction text. Changing the size of the text explaining the nature of the page clearly made it much less likely that users would read it, and adding two additional colored features just above it seems to have distracted users. In addition, novice users in both studies clicked on the FAQs or How to View Materials links at some point in the study, but participants in Chapman's study who used these tabs were taken to different explanatory pages (specifically for the Southern Historical Collection) than users in this study (pages describing the North Carolina Collection Photographic Archives). The NCCPA's help pages are different in

appearance and content than the SHC's, and users who clicked on these pages expressed a lack of interest in reading the "dense blocks of text."

Task 2

This task was intended to see how users would begin to navigate a finding aid page, as well as how well they understand cues regarding digital content. Participants were asked to use the Portrait Collection (P0002) to see if someone named Thomas Wilson was included in the collection and if they could see a picture of him.

All users answered this question correctly, finding at least one Thomas Wilson. Average time to complete this task was 1:52 minutes, with times ranging from 0:55 to 2:38 minutes. The three advanced users plus one of the intermediate users found the answer by searching for the name using Ctrl+F within the finding aid, usually trying "Thomas Wilson" before realizing that folders were listed by surname and correcting to "Wilson, Thomas." Four users found the answer by scrolling down the page to the name listed alphabetically, which usually took much less time than using Ctrl+F. One of the novice participants spent considerable time at first looking around the site for a search function, eventually asking "Where's the search box?" in surprise before deciding "Well, I'll search the hard way." One user found the answer from the CONTENTdm interface, where he had gone early in Task 1 and where he spent the most time during the study. He used the CONTENTdm advanced search function and was at first frustrated by the size of the result list, but found the two digitized images by narrowing his search to the Digital North Carolina Collection Photographic Archives (more on this method will discussed below). Four users also noticed that there was a Thomas Wilson, Jr. listed in the finding aid and included him in their answer.

Six users correctly answered the second part of this task by seeing and clicking on the link to the digitized content in the entry for Thomas Wilson, as shown in Figure 8.

Figure 8: Link to Digital Content

One user apparently did not see this link (although she saw others throughout the study), one user did not see the link because it never appeared, and one user found the digital content directly without using the finding aid. Three of the people who found the digital content via the finding aid (two advanced and one novice user) noticed aloud that only two of the six images listed in the finding aid were available online.

Task 3

This task sought to test how users find basic information about what is included in a collection by asking users to look for picture formats and subject matter included. Participants were directed to the Frank Clodfelter Photographic Collection (P0032) and asked what picture formats were in the collection, how many there were of each, where they found this information, and the collection included images of steam engines.

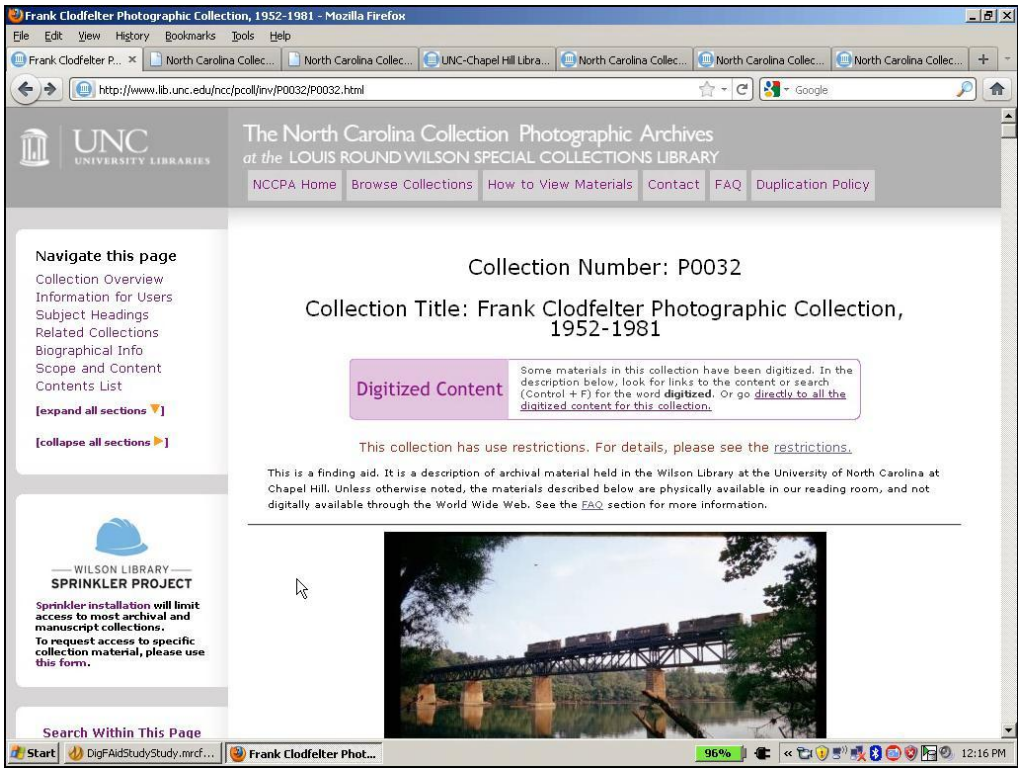
All participants correctly described the two photographic formats in the collection, with two users also indicating the presence of manuscript materials. Seven participants (78%) indicated that they found the answer to this question in the Abstract alone (five users, 56% of total) or the Abstract and another place (Scope and Content or Series Quick

Links). The other two users (22%) indicated the Scope and Content as their primary source of this information, with one also citing the Series Quick Links.

Participants all found steam engines within the collection, although search methods varied. All of the advanced users immediately used Ctrl+F within the finding aid to answer this question. Three of the intermediate users found the answer by scrolling through the finding aid and scanning scope and content notes and item descriptions, spotting the words "steam engine" near the top of both series' contents lists. The other intermediate user and one of the novice users navigated to the entire digital portion of the collection by going directly to the CONTENTdm interface via the purple box at the top of the finding aid. Both of these participants then saw the words "steam engine" in item titles in the result list and based their answers on this.

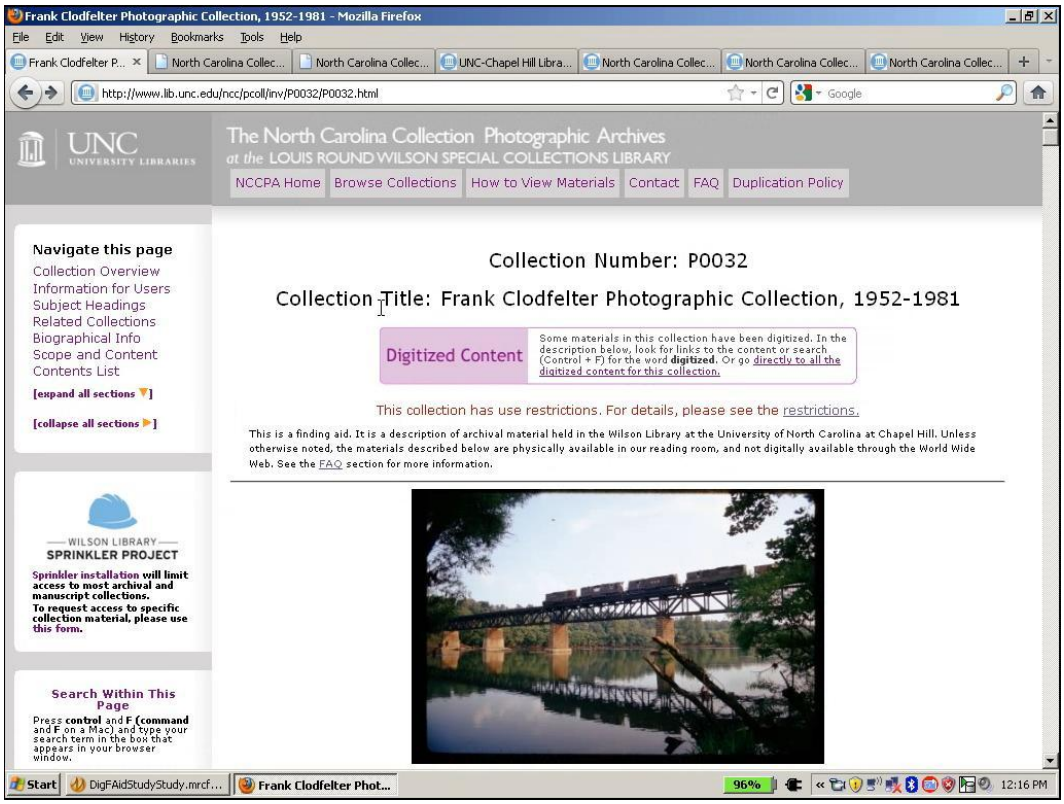
The other novice user looked for a search function within the finding aid again, noticing that there was an area of the page titled "Search within this Page" that was not entirely visible. This participant was completing the study on a laptop that had a lower screen resolution than the desktop computers used previously; unfortunately, the researcher had failed to notice before he began the study that the instruction to use Ctrl+F to search was not visible at this resolution (Figure 9).

Figure 9: Screen at Low Resolution



When it became obvious that the participant knew there was a direction on how to search within the page but was unable to read it, the researcher stepped in to change the screen resolution so that it matched what previous participants had seen (Figure 10).

Figure 10: Screen at Adjusted Resolution



The text in this box that instructs users to use the Ctrl+F function was specifically added to the finding aid templates as a result of Chapman's study in 2009. Usually, this box appears directly under the left-hand navigation menu, but was pushed farther down the page by the special notice regarding renovations in Wilson Library that is currently affecting the availability of some materials. However, the text box was fully visible during all previous tests, though no other participants gave any indication of reading it, whether they used Ctrl+F to search or not. This participant was the only one who actively searched for this direction and learned from the text box. After reading the direction, he used Ctrl+F to find "steam engine" immediately.

Task 4

This task was specifically designed to prompt users to find the link in the purple box at the top of the finding aid to all digital content for that collection in the CONTENTdm interface, by asking if there was a way for users to view all digital images for this collection. This task was also performed on the Frank Clodfelter finding aid (P0032)

As previously mentioned, one participant never saw the purple box because it did not appear during her session. Five people (62.5% of those who had the purple box available) answered this question correctly using the anticipated method. However, three participants (two advanced and one novice) who had the purple box appear during their session never clicked on the link within it, though all three found their way into the digital content through links within the Contents List. One of the advanced users interpreted Task 4 to be still referring to steam engines and used advanced search within CONTENTdm, after having clicked on a link within the Contents List during Task 3. She did find all fourteen digital images of steam engines in this collection using this method and responded "Yes" to this question. Of the two participants who did not click on the purple box, one wrote "I don't see a way besides clicking each link individually", while the other expressed frustration that he did not find what he was sure existed, saying "I would ask for help at this point."

Task 5

This task was intended to learn more about how users understand and navigate the finding aid: how users understand the subject headings and how those relate to the contents of the collection, how users will navigate a large finding aid, and how (or if) users will search within a digital collection. Participants were asked to use the Edward J. McCauley Photographic Materials (P0082), and were asked if they thought the collection

would have images of former North Carolina governor Terry Sanford, why they thought so, and if they could view any such images.

The Edward J. McCauley Photographic Materials were partially digitized and presented as a special digital collection several years ago. This was done before the decision to include digitized material in the finding aid as it is now done at the NCCPA. As a result, there is a separate CONTENTdm collection and the link to the digital content at the top of the page takes the user to a CONTENTdm page allowing them to search or browse digital content within just this collection. The purple box containing this link does not rely on the javascript and is instead a permanent link that appears on the page as it is loaded, without any lag time. Digital content included within the Contents List also behaves differently than in other finding aids, with links underneath the container description that redirect the current page rather than opening a new tab. However, this finding aid uses the same template and stylesheet, and therefore still includes the script that searches for digital materials and takes time to fully load, even though the links to digital content are already present.

This task demonstrated the distinct advantage of using Ctrl+F to search a large finding aid. Every participant found Terry Sanford's name in this finding aid, but only those who used Ctrl+F actually found him within the Contents List. The three advanced users and the novice user who had just learned to use Ctrl+F (44%) began their search with this function and found instances of Terry Sanford's name immediately, both in the subject headings and within the Contents List. Three of the intermediate users noticed Sanford's name in the subject headings (33%), but could not find him within the Contents List by scrolling alone. One of these users concluded that there were no pictures of Sanford in the

collection (she was the only user who answered "No" to this question), while the other two concluded that there must be pictures of Sanford included, due to the subject heading. The other intermediate and novice users found pictures of Sanford via the CONTENTdm collection without searching in the finding aid.

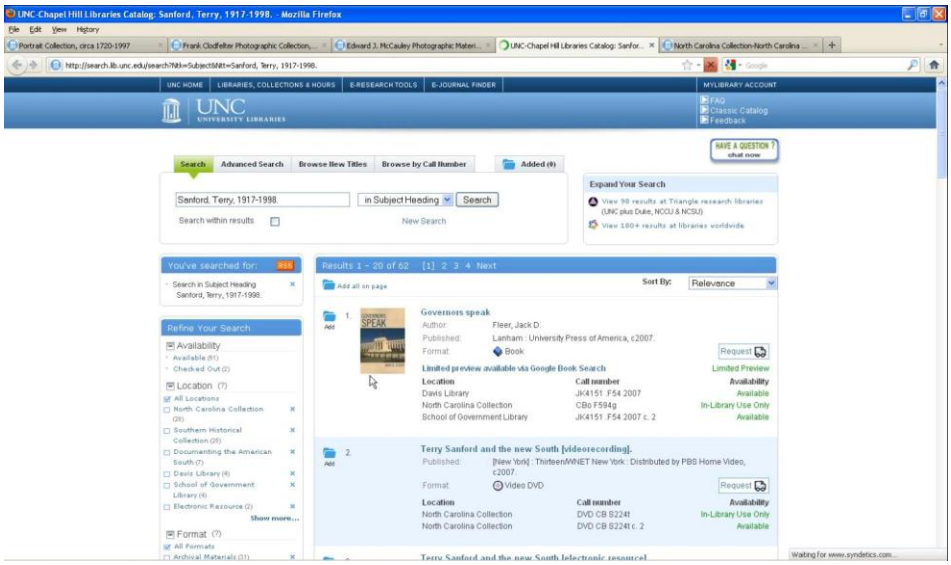
When prompted to view these pictures and asked how many they could see, five users (56%) eventually used the search function in the CONTENTdm collection to find 101 scanned images that have Terry Sanford's name in the description, which they wrote as their answer. Two of these were advanced users who had first found his name via Ctrl+F, two had started with the CONTENTdm interface, and the fifth had first found Sanford's name in the subject headings and only searched in the CONTENTdm collection after scrolling through the finding aid for several minutes with no luck. The third advanced user estimated how many times Sanford's name could be found in the Contents List with Ctrl+F to give an answer of "about 20" while the novice user who used Ctr+F simply said "several" after getting frustrated trying to navigate back and forth between the finding aid and the digitized content in CONTENTdm. In his case, the laptop being used for the study ran more slowly than the desktop used by most others, and each time he clicked on a link within this collection's finding aid, it redirected the page; when he hit the browser's back button to return to his place in the finding aid, the page had to reload and did not immediately return him to where he was in the Contents List (which was more than halfway down a very long page) nor did it continue to display the highlighted results of his Ctrl+F search.

The other two intermediate users who did not use Ctrl+F never found Terry Sanford at all, despite searching for him several different ways, scrolling through or clicking on

various subseries that seemed promising. One participant who knew that Sanford had been the president of Duke University tried a number of different ways of searching for him based on that knowledge (looking in schools, news and events, etc.) before giving up in frustration. The other intermediate user, who appeared to be scrolling randomly, came extremely close to the first appearance of Sanford's name within the collection before giving up. After getting frustrated by searching within the Contents List, these participants also clicked on the link within the subject headings list, sometimes more than once, to confirm that it did not take them to Sanford's appearances in the collection.

In these finding aids, subject headings for topics included in the collection are hyperlinked as subject searches within the entire library catalog. Clicking on the Terry Sanford subject heading link takes users to a new tab displaying all instances of his name used as a subject heading throughout the UNC-CH library system, as shown in Figure 11.

Figure 11: Results of OPAC Search for Terry Sanford as a Subject Heading search.



This is intended to assist users in finding additional material relevant to their interest in a particular subject. The explanatory text indicating that a link does not take a user to

within the collection was added as a result of Chapman's earlier study; however, users who clicked on these links generally did not read that text until after they had discovered that the OPAC result list was not what they wanted and had returned to the finding aid. While a total of six participants clicked on a subject heading at some point during this study (three people did so more than once), only the two participants who did not find pictures of Terry Sanford (despite seeing his subject heading) mentioned this as a source of frustration in the post-test interview. The rest appeared to find it a minor irritation, since none of them expressed any appreciation of this feature and mostly closed the tab immediately after it opened.

Task 6

This task was meant to see if users would find and understand the restriction information about a collection, and is a follow-up to Chapman's similar question. Participants were directed to continue using the McCauley finding aid (P0082) and were asked if there were any restrictions on this collection, and if so, what they were.

Since Chapman's study was conducted in 2009, the "Information for Users" section has been revised due to her findings. Chapman's participants showed some hesitation about their ability to access materials that included audio recordings, due to a requirement that a listening copy be produced before access, and confusion about the sensitive materials statement that made some users believe they could not access materials at all (Chapman pgs. 37-38). While the current study used a different collection with slightly different restrictions, the current results indicate a better understanding of restrictions that is likely due to the rearrangement of this information. Now, when restrictions are present in a collection, the template automatically adds red text to the top of the page under the

collection title and purple box that indicates the presence of restrictions (Figure 12); the template also includes a link to the Information for Users section where the restrictions are spelled out (Figure 13).

Figure 12: Restrictions Indicated at Top of Page

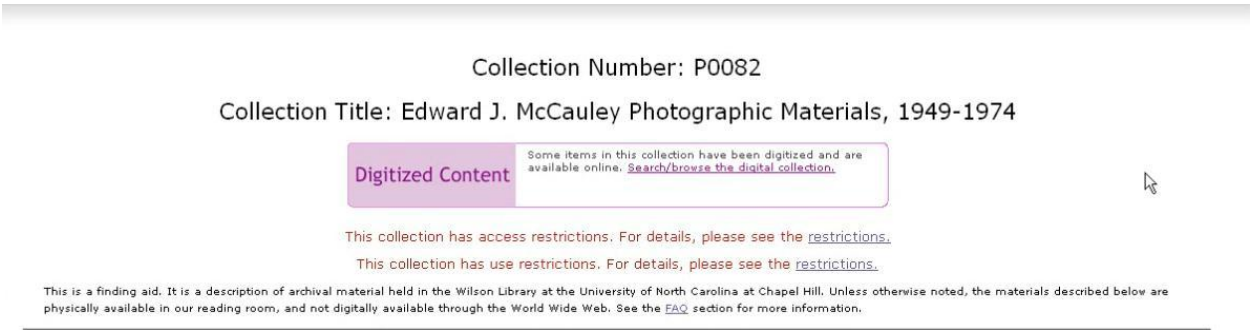
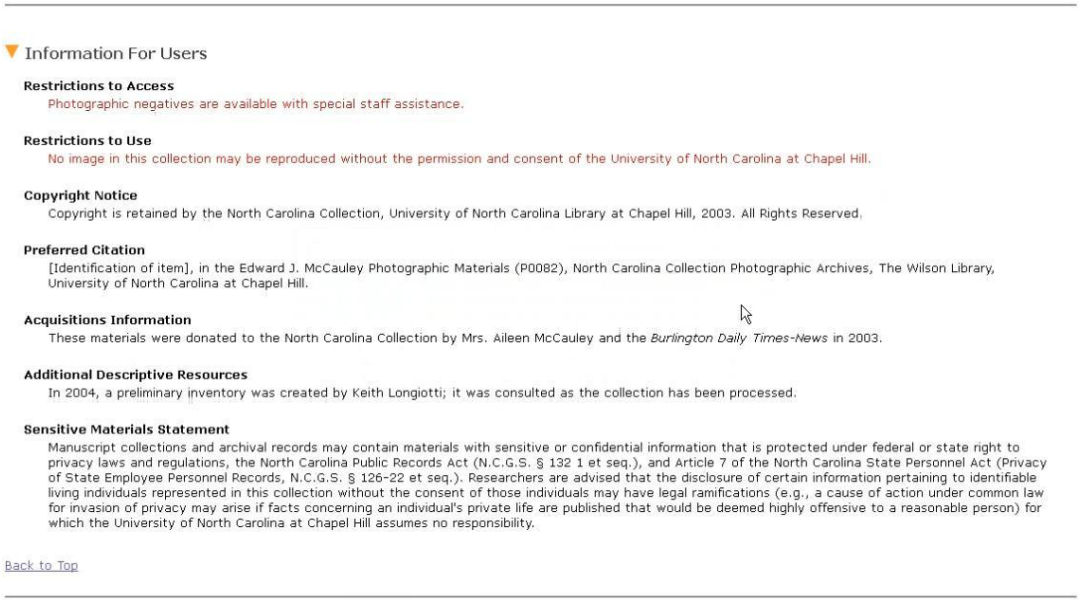


Figure 13: Restrictions in Information for Users



Every participant answered this question correctly and demonstrated a good understanding of the restriction information. Five users (56%) went directly to the top of the finding aid page, saw the red text indicating the presence of restrictions, and clicked

on the links in that text to view the restrictions. One novice user (11%) who was still in the CONTENTdm interface from the previous task searched there first before eventually returning to the finding aid page and seeing the red text at the top, at which point he clicked on that link to see the full restriction descriptions. One advanced user and the other novice user both engaged the navigation menu on the left side of the page to get to the restriction information, one by going directly to the Information for Users section (11%) and the other by going to Collection Overview (11%), from which point the restriction information was mostly visible. Another intermediate user went directly to the top of the page, but did not click on the link in the restriction notification, instead scrolling down until he saw it in the Information for Users section.

All participants then correctly identified the restrictions as allowing access but limiting use, with some users simply indicating that they could access materials and some also mentioning that they would need some staff assistance; all users indicated that they understood they would need permission to reproduce materials. The average time taken on Task 6 was 1:36 minutes, with times ranging from 0:48 to 2:42 minutes.

Task 7

This task was broken into four parts and was intended to see how users would navigate a very large collection, which includes digitized content sporadically throughout, to find materials that are not easily keyword searchable. The last part of the question was specifically intended to see how users would navigate within the CONTENTdm interface, although some information about this was observed in other tasks. Participants were told to use the University of North Carolina at Chapel Hill Photographic Laboratory Collection (P0031), and were asked if they thought the collection would have pictures of

basketball teams or games, why they thought so, if there was a digital image of the 1947 men's basketball team, if there were any pictures of women's basketball and how they could be viewed. In the last part of the task, participants were directed to a specific image, told to view the digital version, and asked how they might look for more digital images of basketball from that page.

Participants generally answered the first part very quickly, and most (7 of the 9, or 78%) used the Abstract and/or Subject Headings from the beginning. Only one user, a novice user, bypassed the information in the finding aid almost entirely; he glanced at the Abstract and said "My gut says yes, but I kinda want to search…" and then went directly to CONTENTdm to conduct an advanced search for "basketball." He was dissatisfied by the results due to the fact that he was now searching all digitized content of the NCCPA, rather than just the UNC Photo Lab collection, as was directed. When he went back to the advanced search page, he attempted to narrow his search to the Photographical Laboratory collection only, but was unable to find this title in the list of searchable collections. After going back and forth between the results list and advanced search pages to ensure he wasn't missing something, he went back to the finding aid and searched via Ctrl+F to find the subject heading and an item described as basketball.

The user who answered "No" to the first part, an intermediate user, based her answer solely on the collection title (and possibly the image from the collection displayed, which is of two women working in the Photographic Laboratory) and assumed it meant that the collection had pictures of the Photo Lab itself rather than pictures taken by the Photo Lab. She quickly revised her opinion in the next part of the task.

The second part of this task asked users to find a digital image, but used terms that differed slightly from item descriptions in how they were ordered. Search patterns were similar to Task 5, with the three advanced users and the same novice user engaging Ctrl+F from the beginning and the same intermediate user and novice users, who had success with searching the digital content immediately, using that approach here as well. The other three intermediate users began by scrolling through the collection, clicking on the subject headings, and trying various subseries in the Series Quick Links section, before the two who knew there was digital content available used the purple box at the top to access all digital content in the CONTENTdm interface.

The four users who began with Ctrl+F quickly found that they needed to experiment with different word order and term usage to find relevant results. Two of these users actually found the two digitized items entitled “Men’s Athletics: Basketball Team, 1947” while searching for pictures of women’s basketball (the next task); one user found one of these items by spotting it after Ctrl+F landed her on a nearby item; and the fourth user found items titled “Men's Athletics: Basketball team portrait, circa 1946-1947” that had not been digitized as well as the items titled “Men’s Athletics: Basketball Team, 1947” that had been digitized (depicting a basketball game in progress), which led him to answer this question in the negative. Another novice user, who had first searched for basketball in the digital collections and now appeared to miss that this question was specifically asking for a digital image, continued using Ctrl+F, and decided that the first result he found with the word basketball and the year 1947 in it (an item entitled “Basketball Event, circa 1946-1947”) satisfied the requirement. The researcher decided that all of these answers were correct.

The intermediate user who began the search for this item in the CONTENTdm advanced search was automatically searching only the Digital North Carolina Collection Photographic Archives, because the researcher neglected to clear the browser cookies and that collection was still selected from a previous study participant. She searched first for "basketball 1947" and found three results, the two images of a basketball game mentioned above and another image of two men holding a trophy. She based her answer on this results page, and revised her earlier assumption that this collection would not have basketball pictures.

The other three users were intermediates who did not know about Ctrl+F. All three of these users found basketball mentioned in the subject headings and clicked on those hyperlinks, even though all of them had also done this in previous tasks with no success. Also, these users all went to the Series Quick Links (as shown in Figure 14) to begin exploring possible places where basketball pictures might be listed.

Figure 14: Series Quick Links for P0031

Prints of basketball images in this collection are included in subseries 2.5 "Departments, Offices, Schools, and Programs, 1946-1990", but none of the participants clicked on this

link. Two of these participants clicked on just one of the subseries in the Prints series, scrolling around and not finding what they were looking for, before moving on. These two users then appeared to realize only then that the question was requesting a digital image and went directly to the digital content in CONTENTdm, scrolling down the page and finding an appropriate image on the first page of results. The other participant was again the user who did not have digital content available to her and also appeared to not notice that the question specified a digital image. She clicked on multiple subseries in the Prints before scrolling extensively through the Negatives series and eventually happening upon an appropriate image, indicating frustration with the search process and the arrangement and description of the collection.

Users then began searching for pictures of women's basketball, of which only two from 1960 (of an intramural team) are currently digitized. The five users (the three advanced and two novice) who had used Ctrl+F to answer the previous question about men's basketball, continued with that method to find images of women's basketball, most often using the terms "women's basketball". Two of the advanced users experimented further after they noticed that titles varied slightly ("women's athletics: basketball" and "women's intramural basketball" are both used in the Negatives series). When asked how to view these materials, four of these users did not see any digitized images and answered that they would need to view the materials in person, while one saw the link to a digitized image and answered that she could view that as well as view the rest in person.

Two of the intermediate users, who had used the CONTENTdm interface to answer the previous question (one by using advanced search and one by spotting an image in the list of all P0031 digital content), also used the CONTENTdm advanced search function for

"women's basketball". Both of these users were searching only the Digital NCCPA collection, because it had been pre-selected by the person who performed in the study just before them. They found the only two images of women's basketball currently digitized, both of which happen to be from the Photographic Laboratory collection.

The other two intermediate users continued looking in the finding aid without the use of Ctrl+F. One of these users had found men's basketball in the CONTENTdm collection and went back and forth between the CONTENTdm page and the finding aid, scrolling quite a bit on each page, before stumbling across "Athletics" in the Prints series and scrolling until she found the women's basketball pictures there. The other user, who was still unable to access CONTENTdm and the digital content, continued scrolling through the negatives near where she had found the men's basketball pictures until she found some women's basketball titles. This user continued to express frustration that she was not able to more easily find images.

The final part of this task was specifically intended to find out how users navigated the CONTENTdm interface. It had first been anticipated that users would spend most of their time during the study using the finding aid and that this question would gather the most information about how users navigated the CONTENTdm interface, but this assumption turned out to be quite wrong. The only user who was unable to complete this task was the user who could not access the digital content; while she did locate the item mentioned within the finding aid, the researcher stopped her at that point.

The five users who used Ctrl+F for the previous two searches again used that function for the exact title given in this question and found the image, then clicked on the link to the

digital item. One intermediate user scrolled to the item within the finding aid by looking for the item number, then was unable to click on the digitized content link (for some unknown reason, the link did not appear), but he waited just a moment before he scrolled to the top of the finding aid, clicked the link in the purple box to get to the CONTENTdm collection, and performed an advanced search to find the item by title. Another intermediate user continued using CONTENTdm's advanced search function to find this item, also by title. The other intermediate user went directly to CONTENTdm via the link in the purple box, and then went through the result list for all Photographic Laboratory images page by page until she found the correct image, using the item number.

All users, after arriving at the correct item, clicked on the thumbnail or the title to look at the full-size image and then scrolled down to look at the metadata that appears under the image (Figure 15). The question asked them to decide from this point how they would search for additional images of basketball.

Figure 15: Metadata in CONTENTdm for P0031/10093.

Much of this metadata is hyperlinked, and two users indicated that they understood this. At this point, however, interpretation of the question varied. Three users (two advanced

and one novice) then selected “advanced search,” while one advanced user first selected “browse” before changing her mind and then selecting “advanced search.” The three advanced users then began performing additional searches to find the best way of getting more digital images of basketball (although the question had not asked them to), trying several different search methods and looking through the collection lists. These users wrote their successful search strategies as their answers. The other user who had clicked on advanced search, a novice user, did not attempt a search but indicated that he would use this method. An intermediate user also indicated that he would use advanced search without actually exploring it at this time, having just used this function to arrive at the image. Another intermediate user noticed that the metadata was hyperlinked and wrote that she would “click on the link to the photo archives” by which she appeared to mean the line listing the Digital Collection as the Digital North Carolina Collection Photographic Archives. The other novice user found the link to the finding aid in the metadata and clicked on that, only realizing at that moment that he had been using the finding aid “all along.” He navigated back to the digital image metadata in CONTENTdm and then clicked on the collection number, which took him to all digitized content for the collection in CONTENTdm, just as the link in the purple box does. He listed this as his answer because “it does get the job done”, even though the results were not exclusively basketball. The other intermediate user also indicated that she would simply click on the link for all digital content in the collection, presumably by using the link in the purple box to CONTENTdm.

Task 8

This task was intended to assess how users might approach a collection with a general research need. Participants were asked to find a picture of former UNC-CH basketball coach Dean Smith using any of the collections they had used so far in the study.

The researcher had assumed that users would approach this task through the finding aids, but most users began this task from wherever they finished Task 7. Two users began searching the Photographic Laboratory collection (P0031) finding aid before switching to the Portrait Collection (P0002) finding aid (one was an advanced user and used Ctrl+F to search there, while the other was an intermediate and scrolled). One advanced user went first to the McCauley Collection (P0082) finding aid, navigated to CONTENTdm from the top of that page, and used the search box on that (which has a slightly different appearance than other CONTENTdm pages) without success. He then went to the Photographic Laboratory finding aid page, then finally to the Portrait Collection (P0002) finding aid, where he used Ctrl+F to find Dean Smith.

Six users (67%) began with the advanced search function in CONTENTdm. One of these users, a novice, gave up in frustration after attempting to limit his search there to only the Portrait Collection and getting no results, going to the Portrait Collection finding aid directly and successfully using Ctrl+F. Two others also attempted to limit their search to collections previously used, but were not able to do so. Of the six users who attempted to use advanced search, five succeeded to some extent, although only one of these users did not attempt to limit or modify their search by collection (this user was also only searching the Digital NCCPA due to selections made in a previous session).

All users ultimately found images of Dean Smith, and 89% of them found digital images of him. Forty-four percent used the finding aid for the Portrait Collection directly and then tried to view the digitized images in that collection, while the other 56% eventually found the same digitized images in their result lists via the advanced search in CONTENTdm.

Participant Feedback

Users who were already familiar with finding aids, whether from UNC-CH Wilson Special Collections or other institutions, were generally pleased with these finding aids. Novice users were much less positive about the finding aids overall, and both also expressed some lingering confusion about what the finding aid actually was. Reaction to the digital content integrated into the finding aid was a little more even across user groups, with the intermediate user group giving the most positive feedback. All users indicated that it was easy to tell if images were available to tell online.

Seventy-eight percent of participants rated the finding aids as "well designed" and 67% thought they were "user friendly." When broken down by user group, the results are slightly less rosy, with only 50% of novice users rating the finding aids as "well designed" and none of them rating it "user-friendly." However, 100% of intermediate users and 67% of advanced users rated the finding aids as both well designed and user-friendly. Most users said in the post-test interview that the finding aid layout made sense, with several comments about the most useful information being placed at the top. Intermediate and advanced users who were used to finding aids from other institutions thought that the organization and design were very good in comparison. An advanced user indicated appreciation for the left side navigation menu, comparing it favorably to

other institutions where information "isn't broken up like this at all." One intermediate user who was most familiar with Russian archives said, "If this were my field, my life would be a whole lot easier." Still another advanced user stated outright, "You guys have some of the better finding aids out there."

Despite these positive assessments, most users had some suggestions for improvement. Novice users specifically mentioned wanting a search box or a way to search within a specific collection that was smarter than Ctrl+F, while an intermediate user who did not use Ctrl+F during this study indicated that he "relied heavily" on search boxes (when available) on other institutions' finding aids. One advanced user suggested breaking up the very long Contents Lists, and both an intermediate and a novice user suggested moving the subject headings to the bottom of the page. Interestingly, another intermediate user mentioned wanting the subject headings to be even more prominent.

One hundred percent of advanced and intermediate users thought that the finding aids were written in language easy to understand, while neither of the novice users thought so. This suggests that there is still a very steep learning curve for people who are brand-new to finding aids, but that those people who are familiar with finding aids find the ones at Wilson Special Collections easy to understand. Both novice users mentioned wanting more help in figuring out what a finding aid was, in the form of some kind of introduction or more instructive FAQs and How to View Materials links.

All users responded that it was easy to tell if images were available online. Even the one participant who experienced technical difficulties with the digital content integration responded to this question and indicated that it was easy, based on a conversation with

the researcher at the end of her test, in which she did finally get to see and immediately understand a link to digital content within the Contents List of a collection. It is interesting to note that although all users responded this way, several had suggestions for improvement. Several users discussed wanting the link to all digital content at the top of the page to be more obvious, with suggestions including making the text yellow, bigger, and bolder. One user also said that she wants an indication of when digital content is NOT available.

In giving feedback on the way digital content was available through the finding aid, it was not always clear whether users were responding to how links to digital content were designed and placed in the finding aid or to the CONTENTdm interface. Given the decidedly mixed responses to this question, it seems possible that users interpreted this question differently. Novice users seemed to think the integration of digital content was decidedly average, while the intermediate group responded very positively. Since the novice users expressed a preference for the CONTENTdm interface over the finding aid but responded very poorly to the finding aid in general, and the intermediate users were very positive overall, it is difficult to interpret these results. Advanced users generally found the digital content through the finding aid very easily, but were not as positive about the CONTENTdm interface, it seems likely that this group interpreted this question as referring to the CONTENTdm interface, which they generally did not find as easy to use. One advanced user who responded enthusiastically to questions about the finding aids said, when asked about the display of digital content, “That one’s not as awesome.” Another advanced user expressed frustration with not being able to easily obtain a copy of digital files from the interface, when “it doesn’t actually stop anyone” and “you’ll give

it to anyone who emails anyway." The third advanced user thought there should be greater "connectivity" between the pages, apparently referring to the difference in look and design between the finding aids and the CONTENTdm pages, and thought the CONTENTdm interface looked "sterile."

Web 2.0

These questions were asked of users in order to follow up on Joyce Chapman's study in 2009, which sought to find out whether users of the Southern Historical Collection were as interested in Web 2.0 features as has been proposed in the archival literature (Chapman, pg. 52). Chapman did not find a great deal of interest in most of the features proposed, and none of these features have been implemented in Wilson Special Collections finding aids. This study sought to find out if this was still true two years later, after the integration of digital content, but the researchers did not investigate participant responses in depth. Chapman's questions, which used a Likert scale to gauge level of interest in seven different Web 2.0 features, were reproduced for this study, but participants were not asked for additional feedback in the post-test interview.

It was found that users expressed the most interest in being able to save some finding aids to an online "bookbag" in order to revisit ones they used the most and in being able to export collection citations to a citation manager. Other Web 2.0 features attracted some level of interest, but users were overall unenthusiastic about most features. In fact, this study found even less interest in many features than did Chapman's study. All results are shown in the Appendix.

Users in this study showed the most interest in an online "bookbag" that would save favorite finding aids. Eighty-nine percent of all users and 100% of intermediate and

advanced users indicated strong interest in this feature, which leads this researcher to suggest that this feature be further investigated. These findings represent an increase from the time of Chapman's study, when only 67% of advanced users expressed this level of interest. Currently, CONTENTdm allows users to save individual digitized items to favorites, but this feature does not allow for the creation of an account that users could sign in to regularly, and does not apply to the entire finding aid or undigitized portions of a collection. Wilson Special Collections will also soon be implementing collection management software that will include user registration and accounts, which could possibly include this feature.

Another feature in which users displayed strong interest was the ability to export collection citations to a citation manager such as RefWorks or Zotero. Sixty-seven percent of all users indicated strong interest in this feature, the same percentage as in Chapman's study, with all advanced users and 50% of intermediate users indicating strong interest. One advanced user discussed this during his post-test interview, indicating that in the History department "everyone uses" Zotero rather than RefWorks and reiterating his interest in the incorporation of this capability to the finding aids.

A majority of users also expressed interest in the ability to view a list of the most used finding aids, with 56% of users overall indicating strong interest. This is a slight increase from 2009, in which more novice users and fewer advanced users indicated interest.

Less than half of users expressed strong interest in any of the other features investigated, indicating that overall interest in Web 2.0 features for archival finding aids remains low.

This study did not attempt to investigate users' reasons for these responses, only to gauge general level of interest.

Limitations

This usability study had a number of flaws and limitations that should be taken into account when considering the results.

Amounts of time taken to complete tasks have been referenced for some of the study tasks, but not for others. The researcher intended to use time as a measure of usability for all tasks; however, during the course of the study it became apparent that the structure of the questions and the choice to ask users to write their answers (rather than always speak them aloud) meant that there was too much variation in time taken for time to be a consistent indicator. Some users wrote more slowly or wrote longer answers than others, and many users did not speak all their thought processes aloud, so it was frequently difficult to determine when exactly they found or decided on the answer to a question. In addition, the structure and order of the questions meant that some users actually ended up answering more than one question at a time, or realizing immediately upon reading a task that they had already found the answer while working on an earlier task. Tasks and questions were not as discrete as they could have been, and the researcher did not encourage the users to think aloud strongly enough, although some users felt comfortable doing so anyway.

The number of participants, while large enough to give some information on usability according to current thinking regarding the study topic (as discussed in the Literature Review), was still small and not representative of the entire user population. Technical difficulties also limited the experiences of at least two participants.

In addition, the researchers (this author and the faculty advisor) knew of only one other usability study of digital content integrated into online finding aids before beginning this study (the one that was conducted by Jody DeRidder and her team at the University of Alabama) and that study had not yet been published. While the researchers attempted to base these study tasks on pervious finding aid and digital content usability studies, this was essentially completely new territory at the time the study was being designed. As a result, the tasks that users were asked to perform are not likely to be the best way of actually getting at the usability of these pages. The researchers did not intend to study the CONTENTdm interface to any great extent and anticipated, incorrectly as it turned out, that users would use the finding aids as the primary discovery tool for digital content. Instead, the study essentially had users perform searches on two distinct interfaces, but did not design the study with that in mind and consequently did not adequately explore these differences. This paper has attempted to address these differences as far as possible, but this discussion is incomplete.

This study may not have provided novice users with enough opportunity to learn what the finding aid was before they began rapidly trying to perform tasks. Chapman's study demonstrated learnability within the finding aid interface, but made different FAQs and How to View Materials pages available to users than this study did. These differences were not realized until the study was underway, and may have put these novice users at a disadvantage in comparison to the earlier study.

Recommendations for future research and investigation based on these acknowledged limitations are discussed below.

Discussion

This study attempted to follow up on some aspects of Joyce Chapman's 2009 usability study of finding aids at the Southern Historical Collection in Wilson Special Collections. Since Chapman's study was conducted, a number of changes have been made to the WSC finding aids, most obviously in the inclusion of digital content. Not every aspect of Chapman's study was included in the present research, and attempting to investigate the usability of the digital content necessitated some significant changes. The following sections discuss the major findings of this study and compare them, where appropriate, to the previous study.

Integration of Digital Content

Where this study primarily differs from Chapman's study is in its attempt to test user understanding of the integration of digital content to the finding aids. The first and most important issue raised here is the obviousness and immediacy of indicating the existence of digital content, or specifying the *lack* of digital content availability. It appears that once users are familiar with the presence of digital content, they expect that it will be available, and may prefer a more obvious indication if it does not yet exist.

The way digital content is integrated into the finding aids at the current time gives two separate indications of its presence. The first is the purple box at the top of the finding aid containing a link to all digitized content for that collection; the second is a purple link at the record level for each container that has digitized content. These two methods showed drastically different rates of success. The second method of indicating the presence of

digital content had an excellent success rate, with 100% of users who had the record-level links available to them noticing and using these links. Users all clicked on these links without any hesitation, indicating that these links are completely intuitive. The purple box's success rate was not as positive.

It was anticipated that users would not notice this box immediately, but the number of participants who apparently never noticed this box or what it contained was surprising. Of the eight participants for whom the digital content integration worked properly, only five (62.5%) ever clicked on the link in the purple box. Of these users, one was an advanced user who indicated previous knowledge of the presence of this link, and commented that it was "only a purple link and it doesn't always come up right away… you have to notice that there's a link there." Another user said, "At first I did have the hesitation to skip this purple box, even though it says in big friendly letters 'digitized content'." Both novice users commented on the size of the text in the box as off-putting. One, who never clicked on the link, said when asked about it that he had "sort of" noticed it, but didn't pay much attention or read what it said because "the text was smaller, so… it just seemed like something that wasn't as important." He also said "it seems like 'the fine print' that, you know, everybody skips." The other said "my natural inclination is to not read little type, because you don't put important things in little type." He also said that he only noticed the purple box "out of the corner of my eye" when "something appeared on the screen," making him first doubt his own perception.

Only one of the four collections used in this study included the purple box from the first moment the finding aid was loaded. The other three finding aid pages, including the first two where users were directed, rely on the javascript in the source code to generate the

box, which takes time to display. The amount of time taken for the box to appear varied slightly by collection, as is shown in the Figure 16 below.

Figure 16: Finding Aid Load Times

Collection Name	Collection Number	Number of Records in Finding Aid	Number of Digitized Items	Average Load Time of Finding Aid
Portrait Collection	P0002	3778	147	0:33
UNC-CH Photographic Laboratory Collection	P0031	>16,000	527	0:43
Frank Clodfelter Photographic Collection	P0032	209	224	0:27
Edward J. McCauley Photographic Materials	P0082	>20,000	n/a	0:44

As this table indicates, the more records included in the finding aid, the more time it takes for the scripts working on the page, and on the CONTENTdm collections, to check for digitized items and create the dynamic links. Users, even those who knew about the purple box and its link to digital content, rarely waited around for the page to finish loading.

It seems likely that while this purple box is visible and some users who were previously unaware of its existence may find it eventually, it is not as obvious as it should be. While the box does contain the "big friendly letters" that says it has digital content and which made some users click on it, it also contains "the fine print" that told other users to skip it. This box and the link it contains need to be made more visible or the presence of digital content needs to be made obvious in some other portion of the finding aid. Three users who began searching for a link to all digital content during Task 4 spent some time

looking in the Information for Users section, while others checked the left navigation menu or the How to View Materials link in the top banner. The user who was unfortunately never able to view digital content (because of some unknown technical issue that prevented the content from loading to the page) searched in multiple places for an indication that digital content existed. The experience of this user demonstrates more clearly than anything else that the existence of digital content must be indicated on the finding aid page in some way that does not rely on a dynamic script. This user searched four different collections that have a combined total of 898 digitized items and did not find a single one, leading her to believe that no digital content existed. By the time she reached the finding aid for the Edward J. McCauley Materials (P0082), which does have a permanent purple box, her previous experience with two collections that did not have digital content visible, appeared to have taught her that there was none to find.

Users indicated that knowing about the presence of digital content was extremely important to them, with one novice user saying "nothing on that page is so important to me as 'here's the link to the digital content'," while one advanced user said "if you go to a page where nothing is digitized, it's not always easy to tell, oh, nothing's there. I'm not missing something." These statements demonstrate that in order for the integration of digital content to the finding aid to be fully successful, the presence or absence of digital content must be explicitly stated. A statement could be added to the Information for Users section from within the template that specifically says no digitized content exists, and individual collections that have digitized content can then replace this with a standard advisory containing a link to the CONTENTdm homepage. The restriction statements work in this way, and this extra step takes very little time, but communicates a great deal.

While part of the advantage in the current set-up of digital integration is that it specifically does not require changing the finding aid each time digital content is added, adding this text when digital content for a collection is first uploaded will save a great deal of confusion for the users, making it absolutely worthwhile.

Control Find (Ctrl+F)

In Chapman's 2009 study, she found that users who utilized the Ctrl+F function had greater rates of success than those who did not. As a result of this finding, text was added to the finding aid template advising users about this function. Previous usability studies or content analyses have discussed instances of this function's use as indicating some type of failure on the part of the finding aid design (Scheir, Yakel, Walters), but Chapman treated it as a recognized tool which the archivist could expect users to utilize. The overall success of users who search this way demonstrates that it is a legitimate method of search and supports Chapman's (and UNC-CH's) view of the matter. In this study, four out of nine users (44%) began their session with no apparent knowledge of this avenue of search. Only one of these users actually read the text advisory and began using Ctrl+F to search the finding aids, but this did allow him to perform more successful searches than the users who did not use Ctrl+F at all. This user expressed some dissatisfaction with this search method and clearly wanted a keyword search box instead of the strict character string searching provided by the Ctrl+F function, but he was nevertheless able to perform more targeted searching in the large finding aid pages used for Tasks 5 and 7 than the users who relied on scrolling the pages or exploring various subseries.

Advanced users who relied heavily on Ctrl+F performed some tasks better and more quickly than intermediate users who searched through the finding aid without this function, but one intermediate user who never used Ctrl+F actually performed several tasks much faster without it. In the second task, which asked users to find a person listed in a finding aid consisting entirely of names listed alphabetically, this user took only 55 seconds to read and answer the question, because she glanced at the way names were listed and then used the scroll bar to rapidly navigate to the portion of the finding aid where the name Wilson appeared. Users of Ctrl+F, on the other hand, took between 1:05 and 2:18 minutes to complete the task. They needed to first figure out whether records were listed by surname or first name and then frequently needed to click through multiple results, reading each name as it appeared highlighted. This intermediate user also displayed the fastest times on Tasks 3 and 6, both of which could be answered quickly by scanning the text of the page or records near the top of the Contents List. She only encountered difficulties when relevant items were buried in very long lists of records that were not easily searchable by topic via the Series Quick Links, and even in those cases, she usually persisted until she found what she was looking for. She did this through a combination of being informed by the subject headings and learning how items were described and arranged within a collection, as in the case of the basketball pictures in the Photographic Laboratory collection (P0031). The experience of this user is illustrative and will be discussed further below.

Subject Headings and Restrictions

Another persistent usability issue was the presence of the linked subject headings. The addition of links to the finding aid at the container level that take users to digital content

may lead them to expect that all links in the finding aid will work this way. Users expect the hyperlinked subject headings near the top of the finding aid to take them to content within the collection that fits this topic, and while the language of the finding aid specifically disavows this, users are disappointed to be unable to search this way. Six participants in this study clicked on a linked subject heading at least once, expecting it to take them to another part of the finding aid or to the digital content relevant to that subject. Three users did this more than once. None of the users indicated that they found this feature useful, although several did mention the subject headings as the source of answers or assumptions about what was included in the collection. One of the advanced users discussed the fact that the use of Ctrl+F to search the finding aids meant subject headings are generally needed "a lot less." He commented that since keyword searching is so easy, subject headings are most useful when searching in the library catalog and they appear as predictive text (not the same as being taken to a catalog search after one is already in a collection that has this subject heading). Two other participants, one intermediate and one novice, specifically suggested moving the subject headings to the bottom of the finding aid. One said that the space they currently occupy is some of the "most important real estate on the entire page" and it made him assume the links would take him elsewhere in the collection rather than to a different page entirely.

At the current time, it is not the practice of technical services staff to assign subject metadata at the item or container level; if this metadata were available, it might be possible to develop a script that would allow the subject headings to function in the way users imagine. However, this level of description is impractical, and users are instead expected to find where in the collection various subjects are represented by reading titles

and scope and content notes. This information is generally formatted in such a way that users who see something of interest in the subject headings can use Ctrl+F to see where in the collection that subject is mentioned, but parsing this information for use in the way users imagine is beyond current capabilities.

Participants in Chapman's study also expressed confusion about the subject headings and their relationship to the contents of the finding aid. At the time of her study, however, the subject headings were not hyperlinked at all. The inclusion of this feature does not appear to have cleared up the confusion significantly, since most intermediate and novice users appeared to first assume that these links would take them to relevant content within the finding aid, before finding out otherwise. Users now express confusion about why the subject headings behave this way, instead of confusion about why the headings are there in the first place.

Therefore, it may be advisable, as Chapman and two of the present participants suggest, to move the subject headings to the bottom of the finding aid. It is worth noting, however, that while users expressed some dissatisfaction with the subject headings as they are, task completion was not actually affected and may have in fact been improved. Two users based correct answers on subject headings, and since these users did not use Ctrl+F, it may be that they would not have come to these conclusions otherwise.

In her study, Chapman also addressed confusion over restriction information. Only 75% of her participants correctly interpreted restriction statements. Restriction information has since been modified and this study demonstrated that 100% of participants correctly interpreted restriction information. While the restrictions on the collections used in this

study differed slightly from those in Chapman's study, this improved rate of success nevertheless suggests that the current arrangement and wording of restriction information is more intuitive to users. Users reacted positively to having this information appear in red, and the fact that all users noticed this red text at the top of the finding aid (while many failed to notice the purple text just above it) indicates that users recognize red as denoting important information, with one participant even specifically mentioning that she liked how "things you need to know are in red."

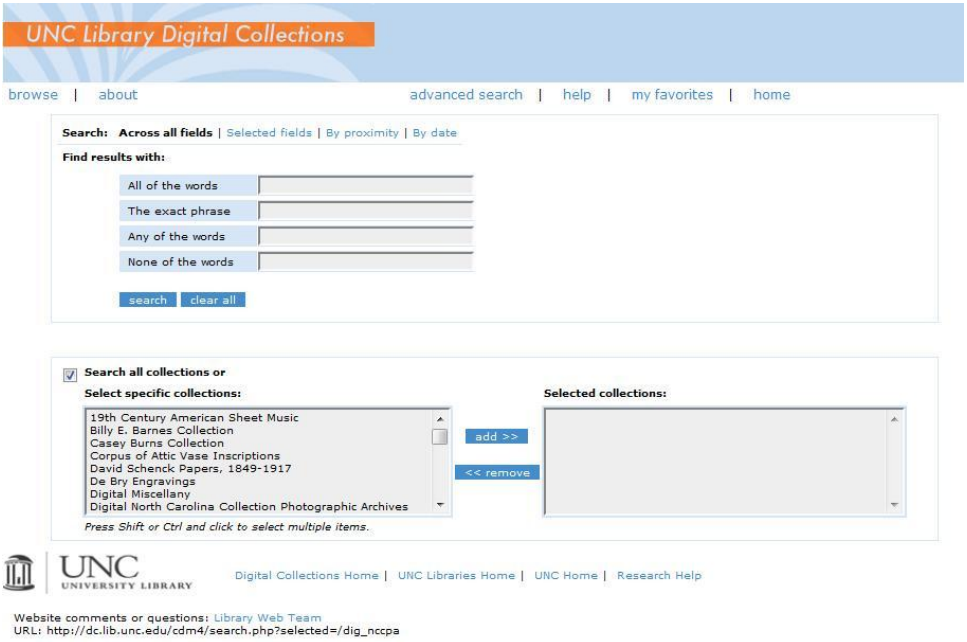
CONTENTdm and the Digital Interface

While it was not the intention of this study to look extensively at the usability of the CONTENTdm interface, the results observed nevertheless speak a great deal to this topic. Further usability studies are highly recommended to add to these findings.

One major issue that arose during use of the advanced search function within CONTENTdm was the list of collections for searching (this screen is shown in Figure 17). The items in this list are primarily the result of a variety of boutique digital collections. These projects were started before the mass digitization procedures were adopted and before digital content began to be integrated into the finding aids. The way these processes work now, all non-special project digital content falls under the umbrella of its parent collection. For instance, the four individual collections used in this study all belong to the North Carolina Collection Photographic Archives. Since the Edward J. McCauley Photographic Materials were a special digital project begun before mass digitization began, this collection appears in the collection list as one users may select to search individually. The other three collections used in this study, however, only had their digitized content uploaded to the CONTENTdm system after implementation of the

current procedures, and thus are included in the overarching Digital North Carolina Collection Photographic Archives in the collection list.

Figure 17: CONTENTdm Advanced Search



Users, however, have absolutely no way of knowing this without being privy to the administrative workings of Wilson Special Collections. One hundred percent of users who had access to the digital content landed on the advanced search page during their study session, and all but one of them attempted to modify their searches via this collection list at some point. Only one user never browsed the collection list on this page, and he had his searches already limited to the Digital NCCPA because the browser maintained that selection from the session before his; this allowed him to find precisely what he was searching for without modifying the collections searched. One other intermediate user also had the Digital NCCPA pre-selected for her, allowing her a better success rate in Task 7, but in Task 8 she also browsed through the collection list on the advanced search page. Most users, however, found that their first search from this page

automatically had “Search all collections” selected, which often gave them a great many irrelevant results.

The success of the two users who performed searches with the Digital NCCPA pre-selected for them from the previous study session suggests that instead of defaulting to a search of all collections, this page should default to searching only the collection from which the user navigated to this page. The nature of these collections, the distinctions between them, and which collections are nested within other collections should also be made more obvious, as users who intended to modify their searches by specific collections were confounded by the presence of a separate listing for the Edward J. McCauley Photographic Materials, but not the Frank Clodfelter Photographic Collection or the UNC-CH Photographic Laboratory Collection. Users demonstrated a number of creative search methods in their attempts to work around this confusion, from selecting certain search fields to adding names to their search terms, but many of these were unsuccessful. Usability guidelines also suggest that when users must resort to these workarounds, the site has failed to some degree (Sharp et. al., Krug, Head).

Some users were confused by the fact that some links open new tabs or windows and some links re-direct from the current finding aid page. This was only mentioned as a problem by one user, but others demonstrated some minor confusion and disorientation when they finished a task and tried to return to a previous page. The McCauley Materials finding aid was the main source of these problems, since it was the only page that had record-level links that redirected the page, instead of creating a new tab. As mentioned previously, this navigation feature combined with page load time created significant frustration for one user, while two other users experienced this to a lesser degree. Some

users also displayed minor disorientation trying to navigate back and forth between the new tabs opened up by clicking on all other digital content links (only the links within the Contents List of the McCauley finding aid redirected the page, while all other digital content links opened new tabs), due mostly to the sheer number of new tabs generated throughout the study.

CONTENTdm's interface also created significant confusion for users as they attempted to use what appeared to be links to more content or functions (such as "next," "refine your results," and "about"), but which in actuality did nothing. One novice user clicked on the word "about" multiple times from different result list pages in the hope that it would do something at some point; however, it was not a link at all, in spite of the fact that the design of the page would lead users to believe that this blue text is a link. On the other hand, item metadata that was clickable as a way to find other items tagged with certain words was only used by one user; most participants appeared completely unaware that these were links or that they might be useful.

Interestingly, users never commented on the fact that the purple box at the top of the McCauley Materials finding aid takes them to a page that looks very different from the page every other purple link goes to, although one advanced user went back to that page during Task 8, indicating a preference for that interface over the other.

Three users verbally displayed interest in the "View in 3-D" link, which appears over thumbnails of search results. This link makes use of separate software from Cooliris[6] and presents thumbnails of images all together in a window that pops out from the page and

[6] More information on Cooliris media sharing software can be found on their website, http://www.cooliris.com/

allows more visual browsing, while still providing contextual metadata and a zoom feature. These users found the term intriguing and all eventually clicked on the link to see what it did. Two of these users then reacted with slight disappointment and later indicated that they found the term "3-D" misleading. However, during later discussions both of these users, plus the other user who tried the link and another user with whom the researcher discussed the function in the post-test interview, all expressed interest in this feature and seemed impressed with it. Another user discussed wanting functionality such as that provided by the view in 3-D link, without knowing that it was already available.

General Navigation Issues and the Finding Aid verses CONTENTdm

Two of the finding aids used in this study describe enormous collections. The Edward J. McCauley Photographic Materials include some 83,000 items, while the University of North Carolina at Chapel Hill Photographic Laboratory Collection contains well over 100,000 items, though the collection is only partly processed at this time. Users, especially novice and some intermediate users, sometimes found the long lists of items/folders/containers overwhelming when trying to search for items. While some of this frustration may be unique to the NCCPA due to the nature of some of their collections, it is a problem that has arisen in usability studies of finding aids before, and it may be inherent to most finding aids for large archival collections.

One of the advanced users suggested that these long lists ought to be broken up, although she also mentioned that alternating white and gray colors helped with looking through these lists. One of the novice users wanted to make the pages more dynamic, suggesting "checkboxes" similar to the CONTENTdm interface or the library catalog as a way to gather relevant results for later review, "because once I scroll past something or hit next,

you know, I don't know what I've already looked at." This intriguing suggestion resembles the Web 2.0 features users expressed the most interest in at the collection level of an online "bookbag" or account that allows them to save favorites. The UNC Libraries catalog has an "add to folder" feature, as do many academic or serials databases (for example, those managed through the publisher EBSCOhost[7]). It is possible that this could be explored with collection management software such as Aeon[8] and it may make browsing much easier for users, especially within very large collections like these.

This study reiterates the findings of previous user and usability studies, which claim that the finding aid is most suitable for browsing, but users want to search by keyword. Unlike DeRidder et. al.'s study, users were not asked to compare interfaces and were expected to use the finding aid as the primary discovery tool. However, the nature of how digital content is linked to UNC-CH's finding aids meant that users did, in fact, use two different interfaces; this was confusing to novice and some intermediate users, who noticed the differences without understanding why they existed. One novice user said of the CONTENTdm display, "It feels like I'm on a totally different page… like I left what I was originally doing." He clearly indicated that he preferred this interface, saying "this seems a lot more dynamic… This feels more familiar to me." Advanced users more familiar with the finding aids appeared to understand the differences between these two interfaces more clearly, but expressed a desire for them to more closely match in appearance.

[7] More information on EBSCOhost can be found on their website, http://www.ebscohost.com/
[8] More information on Aeon Special Collections management software can be found on their website, http://www.atlas-sys.com/products/aeon/

Novice users also expressed lingering confusion over the nature of the finding aid. Both novice users were very experienced internet users who tended to explore and click on links, but had definite pre-conceived notions about usability. As previously mentioned in the limitations section, this study may have inadvertently inhibited their orientation to finding aids, since both users were frustrated by their attempts to figure out the finding aid as they went along. Both indicated at the end of the study that they thought they had some understanding of the finding aid by that time, but they were still a bit uncertain.

While most users completed the majority of tasks correctly, advanced users showed the greatest ease with and willingness to use the finding aid to search for and find items. Intermediate and novice users showed a greater tendency to use CONTENTdm to find items and were less likely to draw any kind of distinction between what they found there and what was actually listed in the finding aid. In contrast, advanced users almost always made this distinction. As one novice user said, "Because there was so much stuff that was digitized, I expected everything to be digitized. So when I ran into this stuff that was like, yeah, this exists, I was like, well isn't that nice for it. I want to see it." The other novice user said, "I still came away from this not knowing if I saw everything I was trying to see."

On the other hand, the intermediate user who never used Ctrl+F, was unable to see the digital content, and had only used Wilson Special Collections' finding aids three or four times, was able to able to perform many tasks quite rapidly due to her familiarity with finding aids from other institutions. She successfully completed tasks more often than not, in spite of being hampered by scrolling through extremely large collections, material arrangement that was not intuitive to her, and the inability to use the search feature within

CONTENTdm. She said in the post-test interview, "In general, I'm usually able to find what I'm looking for… fairly quickly, albeit with some stops and starts. You know, sometimes you just assume it's going to be one place, and then you click on the other place and are like, oh. But that's part of the fun and serendipity of it all."

This reiterates DeRidder et. al.'s findings and, coupled with the experience of novice users, begs the question of how much the finding aid is responsible for educating users about itself and its most effective use. While novice users were able to self-educate, it is unclear whether they would have done so had they not been motivated by their participation in the study, and it appears that experience is the best educator. So will novice users who are not required to use a finding aid ever use any enough to become advanced users?

Walters, in her examination of finding aid usability studies, discussed the fact that participants were usually able adapt to and learn how to use finding aids (Walters pgs. 34-35), and DeRidder suggests conducting a longitudinal study to test how users learn to use the finding aid over time (DeRidder et. al., pg. 19). The success of all users in the majority of tasks in this study also demonstrates that users can use findings aids, but questions remain about how to improve their experience doing so. A user's conceptualization of archives and an archival collection has an impact on their experience with finding aids, demonstrated in this study by participants who did not appear to make a distinction between digital content and the archival collection described in the finding aid. Users claiming more experience with archives demonstrated better understanding and greater ease of use. So how much can the finding aid do to make a user quickly gain a conceptualization of an archival collection? Finding aids may not be intuitive things at

all. As one processing archivist mused to this researcher, "Because it's on the web, does it *have* to be intuitive to everybody?"

The usability literature emphasizes that the usability of a particular object is determined by the users for whom it is intended; that usability is in fact "context dependent" (Hornbaek, pg. 79), a concept with which archivists should be quite familiar. Head discusses how usability involves the expectations users bring to a tool as well as how it allows them to use it (Head, pgs. 4-7), which means that the finding aid, in trying to be usable to user groups who use it for many different purposes and who approach it with many different expectations, is required to accomplish a great deal.

Chapman found two years ago that certain help features, well-designed and easily available, can assist novice users in learning what a finding aid is and how to use it. Recent studies (DeRidder et. al., Allison-Bunnell et. al, and this current work) have suggested that novice users are not particularly interested in learning about the finding aid. Yet practical considerations have led archivists such as Evans, Greene, and the teams at University of Alabama and UNC-CH to realize that the best, most efficient, and most informative way to present the digitized materials (that everyone can agree are wanted), is via the finding aid. So how can these ideas be merged into a successful user experience?

These questions obviously cannot be answered here anymore than they have been definitively answered in the literature, but it is the opinion of this researcher that greater attempts must be made to make archival collections more accessible to novice users. If the finding aid is truly a document that exists to describe the contents of a collection in

such a way that a researcher may find complex subject matter, the results of this study may indicate that it is not also the best vehicle to accomplish more universal accessibility. UNC-CH appears to have found a finding aid design that works well for advanced users and allows intermediate users to get their work done. For inexperienced users of archives, however, perhaps the finding aid cannot be both a description of an archival collection and a completely intuitive tool of discovery. If this is the case, other methods must be explored for increased usability and access.

Areas for Future Research

Given that this is one of the first studies of its kind, there are a great many directions for future research suggested by the results of this study.

The most obvious future research would be an iterative study conducted on finding aids in Wilson Special Collections, with a modified set of tasks that allow for more quantitative analysis and qualitative feedback and thought processes. Some of the modifications to the integration of digital content, particularly in the obviousness and immediacy of a link to all digital content, should be made before another study is conducted, and the next study should attempt to test a greater number of users comprising a more accurate representation of the total user population. In addition to a usability study similar to the one conducted here, it would be useful to conduct some focus groups on how the digital content could be made more accessible. Data could also be gathered on the use of online finding aids through the use of an online survey linked to live finding aid pages; this survey would assess self-motivated use of the pages as opposed to the imposed motivation of this usability study.

It should be obvious by now to the entire archival community that digital content is extremely important to users, and they want it to be easily accessible. As part of the Mellon Foundation-funded grant that initiated UNC-CH's mass digitization project, Laura Clark Brown and her team conducted user studies and created a priority matrix for the Southern Historical Collection (Brown interview). The North Carolina Collection Photographic Archives and other repositories with large photographic and image collections might benefit from further research into the types of research conducted on these types of collections, as well as the use to which users put their digital content. This would allow institutions to make more informed decisions on what to digitize and when. In general, the nature of photographic collections is different from that of many manuscript or record collections, and the research conducted on these collections may therefore be very different. Advanced researchers all indicated they were more familiar with manuscript collections and needed time to adjust to the photographic collections used in this study. Further research should be conducted to identify how photographic researchers want to search such collections, and archival arrangement and description practices should vary accordingly.

At the same time, digitized images (photographs of popular landmarks or figures, for example) are likely to be used for non-scholarly research purposes, and may lend themselves to more casual use in general. Research into how these digital images are used overall would be useful, as well as how this type of use by those who are not advanced users of archives might best be accommodated.

In addition to focusing on the relationship between finding aids and users, it would be useful to compare finding aids that contain digital content to each other. At this time, the

researchers are aware of at least two other institutions that are making digital content available through finding aid pages: the University of Alabama Libraries[9] and the Archives of American Art[10]. Conducting a usability study that would ask participants to use finding aids from all three institutions and directly compare them, similar to past finding aid usability studies (Prom, Schier, Johnston), would provide a great deal of information on how digital content might best be integrated into the finding aids.

[9] Visit the site for Special Collections at University of Alabama Libraries, http://www.lib.ua.edu/libraries/hoole/

[10] Visit the Archives of American Art website, http://www.aaa.si.edu/

Conclusion

This study examined the integration of digital content to the finding aids in Wilson Special Collections at the University of North Carolina at Chapel Hill, in an attempt to add to the growing body of literature suggesting this as desirable. This study also attempted to add to this institution's understanding of the usability of its finding aids as established by a usability study conducted two years ago. Results indicated that the presence of digital content was largely intuitive, but could be improved upon by the use of a more immediately visible indication of its presence or absence that is not delayed by browser loading. It was found that users are able to understand the finding aid but may not always differentiate between it and the digitized content present in CONTENTdm. Those who are more familiar with finding aids and using archival collections indicated greater levels of comfort with using the finding aid and making use of the digital content within it, while users less or not at all familiar with finding aids demonstrated a preference for the CONTENTdm interface. Most users wanted to be able to use keyword searching, both within the finding aid and within the digital collection. The researcher concluded that novice users should either be presented with an introduction to finding aids, if they are expected to use them as sole access to digital content, or be provided with a quick way to directly navigate to digital content, since that was top priority. As all users indicated and one novice user expressed: "I want to see it."

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Appendix A: Demographics Questionnaire

1. Mark your affiliation:

___Undergraduate student at UNC-CH

___Graduate student at UNC-CH

___UNC-CH faculty member/staff member/post-doctoral

___Member of the general public

2. Please indicate the year you were born:

_____

3. What is your sex?

___ Female

___ Male

4. What is your area of work or major?

_____

5. How would you rate your level of experience using archival material for research?

____None

____Beginner

____Intermediate

____Advanced

6. How would you rate your level of experience using computers and the Internet?

____None

____Beginner

____Intermediate

____Expert

7. How many hours per week do you spend on the Internet?

____0-2

____3-5

____6-10

____ More than 10

8. Have you ever used online finding aids for archival material?

___Yes (go to question 8a)

___No

___Don’t know

a. If you answered “yes” to question 8, roughly how many times have you used online archival finding aids from Wilson Library Special Collections (includes the Southern Historical Collection, Southern Folklife Collection, University Archives, and North Carolina Collection Photographic Archives)?

_____

Appendix B: Study Tasks

Task one (novice participants only): Please use the web page for the Portrait Collection.

1. Generally speaking, what kind of materials does this web page describe?
2. Where are the materials described in this page physically located?
3. If you wanted to view the materials described in-person, what would you have to do?
4. Can you view any of the materials described online?

Task two: You are looking for a picture of a man named Thomas Wilson, whom you recently discovered is a distant relative. Please use the same page you used for task one.

1. Is there a Thomas Wilson included in this collection?
2. Can you view a picture of him?

Task three: You are very interested in trains and railroads, and you are browsing for interesting train-related materials. Please use the Frank Clodfelter Photographic Collection.

1. What picture formats are in this collection?
2. About how many color slides are included in this collection?
3. Look for a picture of a steam engine. Are any included in this collection? If so, where? How can you view this picture?

Task four: Imagine that you are conducting research on former North Carolina governor Terry Sanford. Please use the web page for the Edward J. McCauley Photographic Materials.

1. Does this collection have any images of Terry Sanford? Why did you come to the conclusion that you did?
2. If you said yes, can you view this/these image(s)? How many do you see?

Task five: Please use the same page that you did for task four.

1. Are there any restrictions on this collection? Will you be able to access any/all of the materials in this collection? Can you use any images you find in your research?

Task six: You're interested in UNC Basketball (isn't everybody?), and you're curious about past basketball players. Please use the UNC Photo Lab Collection.

1. Do you think this collection will have pictures of basketball teams or games? Why did you come to the conclusion that you did?
2. Is there a digital image of the 1947 men's basketball team? How many people are in it?

3. Are there any pictures of women's basketball in the collection? If so, how might you go about viewing these pictures?

Task seven: You are still interested in UNC basketball. Using any of the collections you have used so far today, please see if you can find where a picture of Dean Smith is located.

Task eight: Again, using or referring to any of the collections, please summarize what information is contained in the Contents List of these Web pages.

Appendix C: Post-Test Questionnaire

Please ask your test supervisor for clarification on any of the following questions.

1. How difficult was it to navigate the finding aids?

(Circle one) Easy 1 2 3 4 5 6 Difficult

2. Did you think it was easy to find specific information?

(Circle one) Easy 1 2 3 4 5 6 Difficult

3. The finding aids were written in language that is easy to understand.

(Circle one) Agree 1 2 3 4 5 6 Disagree

Were there particular parts of the finding aids or particular terms that were difficult to understand? Please explain.

4. In the rating chart below, please circle the number that most closely matches how you feel about the finding aid Web display:

a. Well designed 1 2 3 4 5 6 Poorly designed

b. Easy to use 1 2 3 4 5 6 Confusing to use

c. User-friendly 1 2 3 4 5 6 Not user-friendly

d. I like it 1 2 3 4 5 6 I don't like it

5. Did you find it easy to tell if images were available to view online?

(Circle one) Easy 1 2 3 4 5 6 Difficult

6. In the rating chart below, please circle the number that most closely matches how you feel about how digital content was available through the finding aid:

a. Well designed 1 2 3 4 5 6 Poorly designed

b. Easy to use 1 2 3 4 5 6 Confusing to use

c. User-friendly 1 2 3 4 5 6 Not user-friendly

d. I like it 1 2 3 4 5 6 I don't like it

7. If the following features were available, how likely would you be to use them? Please circle a number for each feature listed.

a. The ability to leave your own comments on finding aids:

(Circle one) Likely 1 2 3 4 5 6 Unlikely

b. The ability to add subject tags/labels to finding aids or specific containers/series in finding aids:

(Circle one) Likely 1 2 3 4 5 6 Unlikely

c. The ability to rate finding aids (for example, 1-5 stars):

(Circle one) Likely 1 2 3 4 5 6 Unlikely

d. The ability to share finding aids with others:

(Circle one) Likely 1 2 3 4 5 6 Unlikely

e. The ability to be able to save finding aids to your own online "bookbag" in order to be able to find the ones you frequently use again:

(Circle one) Likely 1 2 3 4 5 6 Unlikely

f. The ability to view a list of the most used finding aids:

(Circle one) Likely 1 2 3 4 5 6 Unlikely

g. The ability to export collection citations to a citation manager such as RefWorks:

(Circle one) Likely 1 2 3 4 5 6 Unlikely

Appendix D: Post-Test Interview Questions

Which tasks did you find the most difficult to complete, and why?

Did the layout of the finding aids make sense to you? If not, could you describe the parts you found confusing?

If you could reorder the information in the finding aids, how would you ideally have it organized?

Did the way digital content was included in the finding aid make sense to you? Why or why not?

(Advanced users only) When conducting research, which sections of the finding aid do you use the most?

How could the finding aids be further improved? Please explain.

How could the display of digital content be improved? Please explain.

Do you have any other comments, concerns, or suggestions?

Appendix E: Post-test Questionnaire Data Results

Participant	Status	Q1	Q2	Q3	Q4a	Q4b	Q4c	Q4d	Q5	Q6a	Q6b	Q6c	Q6d	Q7a	Q7b	Q7c	Q7d	Q7e	Q7f	Q7g
1	Advanced	1	1	1	1	1	1	1	2	4	3	4	3	2	4	6	6	1	4	1
2	Advanced	3	3	1	3	4	3	3	1	4	5	4	4	6	6	2	5	2	2	2
9	Advanced	2	2	1	1	1	1	1	1	2	2	3	2	5	5	5	4	2	2	1
3	Intermediate		3	1	2	2	2	2	1	1	1	1	1	6	2	3	3	1	2	1
4	Intermediate	2	4	1	1	2	1	1	n/a	n/a	n/a	n/a	n/a	1	1	1	3	1	5	6
6	Intermediate	1	1	1	2	1	1	1	1	1	1	1	1	3	1	2	1	1	2	5
7	Intermediate	1	1	1	1	1	1	1	2	1	1	1	1	3	5	5	1	1	3	1
5	Novice	5	4	5	2	4	4	4	1	4	4	4	3	2	1	4	4	2	1	1
8	Novice	5	5	4	4	5	5	5	1	3	4	4	4	6	4	6	6	4	6	4
Average		2.50	2.67	1.78	1.89	2.33	2.11	2.11	1.25	2.50	2.63	2.75	2.38	3.78	3.22	3.78	3.67	1.67	3.00	2.44
Novice Average		5.00	4.50	4.50	3.00	4.50	4.50	4.50	1.00	3.50	4.00	4.00	3.50	4.00	2.50	5.00	5.00	3.00	3.50	2.50
Intermediate Average		1.33	2.25	1.00	1.50	1.50	1.25	1.25	1.33	1.00	1.00	1.00	1.00	3.25	2.25	2.75	2.00	1.00	3.00	3.25
Advanced Average		2.00	2.00	1.00	1.67	2.00	1.67	1.67	1.33	3.33	3.33	3.67	3.00	4.33	5.00	4.33	5.00	1.67	2.67	1.33
% 1-2		56%	44%	78%	78%	67%	67%	67%	100%	50%	50%	38%	50%	33%	44%	33%	22%	89%	56%	67%
% Novice 1-2		0%	0%	0%	50%	0%	0%	0%	100%	0%	0%	0%	0%	50%	50%	0%	0%	50%	50%	50%
% Intermediate 1-2		75%	50%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	25%	75%	50%	50%	100%	50%	50%
% Advanced 1-2		67%	57%	100%	67%	67%	67%	67%	100%	33%	33%	0%	33%	33%	0%	33%	0%	100%	67%	100%