Alida M. Pask. Art Historians' Use of Digital Images: a Usability Test of ARTstor. A Master's Paper for the M.S. in L.S. degree. April, 2005. 64 pages. Advisor: Stephanie W. Haas

The purpose of this study is to investigate how art historians use images in their research and teaching and to evaluate the ARTstor image database by conducting a usability test. The content of ARTstor is made up of diverse collections of images that ARTstor has acquired through partnerships with museums, archives and universities. This study consisted of interviews with 2 art history professors and a usability test of 5 participants. The interviews provided guidance for the creation of tasks which were use in the usability test. Overall, the participants were impressed with the content and quality of images in the database; however, the results of the usability test found problems with the interpretation the icon functions and the Advanced Search field names and navigating the browsing feature. Recommendations are made for continued cooperation between art historians and ARTstor in order to make ARTstor as useful as possible.

Headings:

   Art/ Databases

   Digital Images

   Human Computer Interaction

   Pictures/ Databases

ART HISTORIANS' USE OF DIGITAL IMAGES:
A USABILITY TEST OF ARTSTOR

by
Alida M. Pask

A Master's paper submitted to the faculty
of the School of Information and Library Science
of the University of North Carolina at Chapel Hill
in partial fulfillment of the requirements
for the degree of Master of Science in
Library Science.

Chapel Hill, North Carolina

April 2005

Approved by

_____

Stephanie W. Haas

Contents

The field of art history places an emphasis on the examination of works of art and other cultural objects. Art historians rely on images of the objects they study; therefore image retrieval is an important part of the research of many art historians. The new image database, ARTstor (www.artstor.org), is designed to be a resource for art historians as well as other scholars and students in the Humanities. The purpose of this study is to investigate how art historians use images in their research and teaching and to evaluate the ARTstor database by conducting a usability test.

In 1988 the Getty Art History Information Program and Brown University published a study about the working habits of art historians. The researchers gathered their information through in-depth interviews and case studies. The study showed that a central part of art historians' research revolves around looking at works of art, both the original objects and by necessity or choice, reproductions of art objects. At the time of this study the types of reproductions available included photographs, thirty-five millimeter slides, color transparencies, published reproductions, microfiche, and microfilm (Bakewell, Beeman, Reese, & Schmidt, 1988). Digital images and image databases were not regularly available or used, but the scholars did have ideas about how digital images, and image and text databases could help them in their research by allowing more access to materials and better ways of searching (Bakewell et al., 1988).

The introduction of ARTstor, the image repository developed by the Andrew W. Mellon Foundation, brings new possibilities and new questions to the field of art

librarianship. The database was released for non-profit institutional subscribers in the

summer of 2004. The goals of ARTstor are

> to assemble image collections from across many time periods and cultures that
> will, in the aggregate have sufficient depth, breadth, and coherence to support a
> wide range of educational and scholarly activities; to create an organized, central,
> and reliable digital resource that supports noncommercial use of images for
> research, teaching and learning; and to work with the arts and educational
> communities to develop collective solutions to the complex challenges that are an
> inescapable part of working in a changing digital environment. (ARTstor Inc.,
> 2004, *History & mission*, para. 6).

Currently ARTstor contains around 300,000 images, but it is expected to grow to 500,000

by 2006. The core ARTstor collection is made up of images from university slide

collections and the combined images from ten standard art history textbooks. The

collection is focused on art images, which includes the expected art mediums as well as

architecture, anthropological objects and visual and material culture.

Image databases have changed the way art scholars and students research art, but

do the databases live up to their expectations? This study investigates how the wants and

needs of a specific group of users, art historians, are met by ARTstor. The study also

looks at how art historians interact with the ARTstor image database. Conducting a

usability test allows a systematic evaluation of the ease with which individuals can use

and understand the database. The database is fairly new and at the time of this study only

one review of it had been written (LaGuardia, 2004a). Through interviews with art

historians and a usability test of ARTstor, this study investigates the strengths and

weaknesses of the ARTstor image database for use by art history scholars and students.

Literature Review

*Scope of Review*

The literature related to digital images and image databases covers digital image indexing and retrieval applied to a specific subject field such as art history as well as digital image issues considered from a more general perspective. This literature review will focus on two areas. The first includes articles written by art historians and art librarians about their needs and wants for an image database and the new research and teaching possibilities created because of such a database. The second group of articles consists of studies on search strategies and retrieval of digital images in general and in the art domain. The first group of writers provided background for this researcher's interviews of art history professors regarding their use of digital images, their desires for an image database, and how they use images in their teaching and research. The second group of research articles was important in understanding the behavior of participants in the development of the current usability testing of ARTstor.

*Use of Images in Art History*

The investigation and comparison of images is an important part of art historical research and instruction as the field is beginning to make a transition from 35 millimeter slides to digital images. There is much discussion about what effect digital images will have on art history. In 1988 the Getty Art History Information Program and Brown University published a study about the working habits of art historians. Several of the art historians that were interviewed had ideas about how they could use an image database to search for works by a particular artist or even to "get information about all the occurrences of blue cloaks in eighteenth-century German painting" (Bakewell et al.,

1988, p. 51). A few years before the Getty study, Helen Roberts imagined the art

historian's perfect image database in her article, "Visual Resources: Proposal for an Ideal

Network." In her proposal she included every way an art historian might want to search

for images including by patron, theme or subject, composition or style, works depicting a

specific historical event, and abstract concepts. The author admitted that some of the

suggested retrieval methods would be easier to index than others, but she believed that

through the cooperation of the art historical community and other groups the "ideal

network" could be a reality (Roberts, 1985).

One of the most important issues for art historians when considering digital

images is the image quality. In the infancy of digitized images the quality was not good

and the file sizes were very large making image storage difficult. In 1997 *The Art Bulletin*

published a special section called "Digital Culture and the Practices of Art and Art

History". Barbara Maria Stafford (1997) wrote an article, "Educating Digiterati", for that

section, in which she warned that art historians have not paid enough attention to the rise

of digitization and that they as image specialists must have a say in the quality of digital

images: "Digital methods produce slight alterations which could affect the way the

original art work is interpreted. If art historians are not to intercede in this matter, users of

these high technology media would be in the dark concerning these salient differences"

(p. 214). In another article in the "Digital Culture" feature, Kathleen Cohen (1997)

discussed the evolution of representations of art objects from copies of paintings to

engravings to lanternslides to 35 mm color slides. In the transition from large lantern

slides to 35 mm color slides, "the price paid for color in the more convenient format was

a loss of quality" (p. 187). Cohen (1997) described the feelings of art historians who are

reluctant to switch to digital images by comparing this change to those brought on by the invention of the printing press: "many of us share the mixed feelings about the medium that I am sure were felt by sixteenth-century scholars and teachers as they saw their beautiful hand-painted manuscripts replaced by printed texts. It is important to realize that there will be trade-offs in digital technologies" (p. 188).

Many art historians and visual resource librarians have written about the benefits of digital images for research and teaching. The importance of images to art historical research was described by Richard Brilliant in his 1988 article titled, "How an Art Historian Connects Art Objects and Information". He described the "visual memory" (Brilliant, 1988, p. 123) which allows a researcher to connect a new object to others that have already been studied and described. Of course it is not possible to see and to remember every art object, therefore Brilliant (1988) wrote, "for art-historical research which concentrated on the art object itself, ready access to large numbers of images is essential to the successful investigation of matters of style, composition, motif, iconography, connoisseurship, the constitution of an artist's oeuvre, the definition of figural repertories, etc." (p. 123). Brilliant described art historians finding these images in the library in illustrated art texts, museum catalogs and microfiche, but Charles Rhyne (1996) considered what digital images make possible. He wrote, "can we imagine how scholarly research, teaching, and publication would be transformed if, like texts, this type of visual evidence were available in our offices when we were formulating ideas and writing?" (Rhyne, 1996, p. 28). Another feature of digital images which was of interest to Rhyne (1996) was the ability to zoom in to look at details, but he says the zoom must be easy and thoughtless to manipulate: "One does not examine art just to answer prescribed

questions. One looks at art to see what is there, to explore anything that captures one's attention. We cannot foresee what scholars will discover or what students will find of interest" (Rhyne, 1996, p. 28).

There are several ways that digital images have the potential to change the teaching of art history. One small change is the way in which professors gather and prepare images to display to the class. As Rhyne (1996) wrote, the use and projection of digital images "will eliminate the time consuming job of pulling and refiling slides" (p. 37). Most art history classrooms allow for two and sometimes three slide images to be projected. Digital images allow for many images to be seen at the same time, and Angela Giral (1998) reports on "the impact of showing nine images of rape in the Renaissance simultaneously on the screen, different from the traditional two-by-two" (p. 24). In addition to using digital images in the classroom, students have access to the digital images used in class from their dorm rooms. Cohen (1997) wrote that when students can study the images away from class, "contact time is used for discussion rather than delivery of information, a technique that led to the development of higher cognitive skills than is possible in the typical 'darkness at noon' art history lecture" (p. 190). She said her role changed from that of a lecturer to "teacher-coach and problem solver" (Cohen, 1997, p. 190). Giral (1998) also described ways that digital images have been used to teach art history in new ways. In the two classroom examples mentioned by Giral (1998), the instructors combined the use of digital images and the actual art objects. In one class students studied the digital images and then looked at the original artworks. The instructor reported that the students saw more detail in the works at the museum because of their previous experience with the digital representations. In another class the

instructor selected groups of digital images that related to an exhibit in the university museum. The students studied both the digital images and the works in the exhibition. They were able to use the digital images to give more meaning to the exhibition pieces (Giral, 1998). In order to bring about these types of innovations in teaching with digital images the faculty needs "a reconceptualization of the use of images and the sources of the same" (Giral, 1998, p. 25). They also "need support from their institutions in developing the required expertise to adapt the new technologies to their teaching beginning with electronic classrooms that deliver the highest resolution with the highest flexibility and the highest ease" (Giral, 1998,  p. 25).

While Giral (1998) mentioned the institutional support that instructors and scholars need to use the new technology that delivers digital images, Christie Stephenson (1999) emphasized that the users' needs should be considered during the development of image databases. The creators and researchers of image databases should be mindful of several questions: "for whom are we building our image delivery system? What is it that we are building and for what purposes do those users want to use it? What functionality do our users need to use what we build?" (Stephenson, 1999, p.422).  She recommended usability testing and "more collaboration between information professionals, computer scientists, human-computer interaction specialists, instructional designers, and end-users (students, teachers, and scholars)" in order to achieve better image systems (Stephenson, 1999, p. 434). Corinne Jörgensen (1999) in her article "Access to Pictorial Material: A Review of Current Research and Future Prospects" also argued for more communication among the various groups of researchers working on the issues of digital image retrieval. She reviewed the research on the indexing of images, image retrieval behavior, and

research related to the needs of specific user groups. Jörgensen (1999) concluded that more research should be done in each individual area, but there is also a need for "a broader research agenda" which would investigate "the interplay and complementarity among these research efforts" (p. 312).

These articles demonstrate the unique needs of art historians in the use of digital images and image databases. Specific interview questions regarding the process of searching for images, the use of digital images in research and in the classroom, and the perceived benefits and drawbacks of the technology were developed from the themes of these studies.

*Image Indexing and Retrieval*

There are significant differences between text retrieval and image retrieval which have an impact on the design of an image retrieval system. As the use of computers became more common, art historians began imagining image retrieval systems (Bakewell et al., 1988; Roberts, 1985). Researchers wanted to have a better understanding of the characteristics of the terms used to describe images and how users search for images. The studies discussed in this section used a variety of methods to study image retrieval queries, terms used to describe images, and the use of digital image retrieval systems.

Peter Enser (1993) conducted one of the first studies to investigate user requests for images. In the study he analyzed image queries and classified them into categories in order to understand the characteristics of descriptors used to retrieve images. Enser (1993) looked at image request forms from the Hulton Deutsch Collection Limited, a picture archive in Europe that received image requests from book publishers, advertising and design companies, magazine and newspaper publishers, television companies and

others. The image requests came from the clients by letter, fax, or over the phone. A Hulton employee then filled out one form per client, but multiple requests could be recorded on each form. From 1,000 of these forms, Enser collected 2,722 individual requests which were the focus of the study. He first attempted to categorize the requests into two categories, pre-iconic and iconic. Pre-iconic images are those in which the subject "is defined by the actual entities, attributes and activities featured within the image", and in iconic requests "the subject content of an image is defined by the interpretation which is to be placed on the image" (Enser, 1993, p. 28). He found it was not possible to divide the requests into these two categories because there were few requests for the broad unrefined concepts that matched pre-iconic images. An example used by Enser was a request for the "first microscope". A request for "microscope" was considered pre-iconic, but determining if an image fit the requirement of being the "first microscope" required interpretation and therefore made the request fall into iconic category. Enser (1993) found it was possible to categorize the requests as unique or non-unique. Requests for unique images were those searching for images of specific items such as a specific person or place, and non-unique requests asked for subjects for which a number of items could fulfill the request. The categories were expanded from two to four with the addition of the concept of refined and un-refined requests. A refined request was one in which additional terms indicating "time, location, action, event or technical specifications" were given (Enser, 1993, p. 29-30).  The resulting four categories were: unique, unique refined, non-unique, and non-unique refined. When he categorized each of the requests, Enser (1993) found that the largest number of requests, 42%, were for unique unrefined subjects, 27% of requests were categorized unique refined, 24% were

non-unique refined and 6% were non-unique unrefined. The total number of unique

subjects requested was 69% for both refined and unrefined unique requests. He also noted

that a significant refinement was in terms of time; 34% of the requests, both unique and

non-unique, that were refined indicated a certain time period or era. The analysis and

categorization of the image queries allowed Enser to quantify how many requests were in

each category and make statements about the development of an image retrieval system.

The article concluded with a discussion of the possibilities for an automatic image

retrieval database. Uniquely defined requests could be easily retrieved by matching terms

to a caption given to each image, but requests such as "girl, 1940s'1950s', preferably

with fair hair, aged 7 or 8, with monkey" would require a more complicated search

(Enser, 1993, p. 37).

The four categories developed by Enser were reexamined in a study by Armitage

and Enser (1997). This study expanded the analysis of visual material requests from one

non-specialized image collection to requests from seven different image archives with

different subject focuses and diverse user groups. The researchers were interested in

finding a "general-purpose categorization of user requests for still and moving visual

images" (Armitage & Enser, 1997, p. 287). The image libraries that participated in the

study are listed in Table 1.

Table 1.  Armitage and Enser Image Archives (Armitage & Enser, 1997, p. 287-8)

| Library/Archive | Description |
|---|---|
| National Film and Television Archive | Moving imagery from film and television |
| BBC Natural History Unit | Moving imagery related to natural history |
| Glasgows's Mitchell Library | Images of local history including the photo archive of a locomotive company |
| Birmingham Central Library (Local Studies Division) | Images of local history and a broader collection of images by internationally known photographers |

| National Monuments Record Air Photographs Division | Aerial photographs covering all of England |
|---|---|
| Witt Library of the Courtauld Institute of Art | A general art history image collection |
| Wellcome Institute for the History of Medicine | Art historical images related to medicine |

The procedure of collecting and analyzing the requests was the same as the 1993 Enser study. When the researchers analyzed the requests they found that they needed a more complex categorization model than Enser's (1993) earlier four category system. The researchers adapted a matrix that expressed not only if a request was refined but also how it was refined. Table 2 shows the matrix and description code, displayed in parentheses, that the study used to analyze and represent the data.

Table 2.  Armitage & Enser's Panofsky-Shatford mode/facet matrix (Armitage & Enser, 1997, p. 290)

| | Iconography (Specifics) | Pre-Iconography (Generics) | Iconology (Abstracts) |
|---|---|---|---|
| Who? | individually named person, group, thing (S1) | kind of person or thing (G1) | mythical or fictitious being (A1) |
| What? | individually named event action (S2) | kind of event, Action, condition (G2) | emotion or abstraction (A2) |
| Where? | individually named geographical location (S3) | kind of place: geographical, architectural (G3) | place symbolized (A3) |
| When? | linear time: date or period (S4) | cyclical time: season, time of day (G4) | emotion, abstraction symbolized by time (A4) |

Using the matrix's code, the researchers were able to express an image request such as, "Rio carnivals: S3 + G2", a specific location (S3) and a generic event (G2) (Armitage & Enser, 1997, p. 291).  The researchers found that despite differences in the library

collections it was possible to see patterns in the characteristics of the image queries. The study found that across all the libraries there were many requests for specific persons (S1) and for specific places (S3). The researchers concluded that the similarities observed in the image queries demonstrated that it is possible to create a general format for the categorization of image queries.

In an exploratory study, Jörgensen (1998) investigated what terms are used to communicate about images and the relationships between the terms. She recruited 107 library science students to do three description tasks for six different images. Participants viewed each of the images for two minutes, and participants assigned to the Descriptive Viewing Task were asked to write a description of what they saw. Participants in the Descriptive Search Task group wrote down how they would search for the images. The participants who completed the Descriptive Viewing Task also took part in the Descriptive Memory Task which asked them to write descriptions of the images from memory after a five week period. Jörgensen (1998) analyzed the responses and divided the terms into categories. From those categories she was able to refine the data into twelve image classes (Table 3).

Table 3. Jörgensen's Twelve Classes (Jörgensen, 1997, p. 174)

| Attribute Class | Description |
|---|---|
| Objects | Named objects that are visually perceived, e.g., body parts, clothing |
| People | The presence of the human form |
| Color | Specific named colors or terms relating to various aspects of color |
| Visual Elements | Elements such as composition, focal point, motion, shape, texture |
| Location | Both general and specific location within the image |
| Description | Descriptive adjectives, e.g. wooden, elderly or size, or quantity |
| People-Related Attributes | The nature of the relationship among people, social status, |

| | or emotions |
|---|---|
| Art Historical Information | Information related to the production n context of the image, e.g., artists, medium, style |
| Abstract Concepts | Attributes such as atmosphere, theme or symbolic aspects |
| Content/Story | A specific instance being depicted |
| External Relation | Relationships to attributes within or without the image, e.g. similarity |
| Viewer Response | Personal reaction to the image |

Jörgensen (1998) found that the distribution of classes across the three tasks was similar. In addition to the 12 classes, Jörgensen developed 3 broader groups:

'Perceptual' classes, related to the physical content of the image…, 'Interpretive' classes which are stimulated perceptually but require additional internal interpretive and intellectual processes in order to name the attribute…, and a 'Reactive' class which includes responses such as conjecture or emotion…(Jörgensen, 1997, p. 168).

The Perceptual classes were: Objects, People, Color, Visual Elements, Location, and Description. The Interpretive classes included: People-Related Attributes, Art Historical Information, Abstract Concepts, Content/ Story, and External Relation. The class Reactive Attributes was the only class in the Reactive group. The results of the study showed that the classes Objects, People, Color and Location appeared most often in the three tasks. She also found that the class Story was a significant class for the search and recall tasks. In order to compare image classes obtained from "participants' unconstrained image descriptions" (Jörgensen, 1999, p. 171) to those developed from theoretical principles, Jörgensen (1998) compared the classes she developed from her empirical research to other image classifications. The two image indexing and

classification systems she chose were the *Library of Congress Thesaurus for Graphic Material* (LCTGM) and the *Theseaurus Iconographiques* (TI). Through the comparison Jörgensen (1998) found that the range of descriptions of images was much wider in her own research than in the existing indexing systems.

The research questions of Enser (1993), Armitage and Enser (1997) and Jörgensen (1998) were focused on the description and classification of images and image queries regardless of the image retrieval system used. One reason for their research was to produce findings that would be a guide for the development of digital image retrieval systems that would serve their users well. Fidel's (1997) study began from the perspective of users of image databases and asked how these databases should be designed and evaluated. For her study she examined 100 requests for images from an image agency similar to the one used in the Enser (1993) study. Fidel (1997) analyzed the image queries by categorizing them into Jörgensen's twelve classes. In order to classify all of the requests the researcher found an additional class had to be created. This was the Object-related class, which Fidel (1997) defined as the class of image attributes that "describe the relationships between objects or object-related attributes (p. 187). An example of a request classified as Object-related was: "volcanoes: spewing with lava and smoke from top and sides" (Fidel, 1997, p. 187). Fidel compared the attribute class distribution of the study's sample requests to the class distribution of the Describing, Searching and Sorting tasks of Jörgensen's study. The findings from Fidel's study showed significant differences between the distribution of classes for the Searching and Sorting tasks. However when Fidel looked at the distribution of the class groups, Perceptual, Interpretive and Reactive, she found similarities between the study's sample

requests and Jörgensen's Sorting task. Fidel (1997) wrote that the similar data was a result of the tasks' similar purpose: "to find images for personal use" (p. 188). This finding led Fidel to develop the idea of the Data and Object poles. The Data and Object Poles are the two ends of a continuum on which users search for and use images as a source of data or as an object. The purpose can be somewhere in between. Fidel (1997) proposed that the way one searches and finds images differs depending on the intended use of the image. At the Data Pole the user selects images solely for the purpose of the information they offer. An example is a map used to get from one place to another (Fidel, 1998). At the Object Pole image requests are for images that will be used as objects, "whether as pictures in a history book, as part of an advertisement about the Internet, or on the cover of the next issues of a magazine" (Fidel, 1997, p. 189). Fidel also discussed users who fall in the middle of the continuum and use images as objects and as data, such as "graphic artists, medical instructors and art historians" (Fidel, 1997, p. 189). This theory is significant for the design and evaluation of image databases because the needs of the user are completely different depending on where the task is in the Object/Data continuum.

These studies by Enser, Armitage, and Jörgensen and Fidel are important because of their focus on the user's role within the image retrieval system. They set up a framework for thinking about the needs of the image searcher.

*Image Search and Browsing in Art History*

Chen (2001) conducted a study to investigate if research on the categorization of image queries could be applied to the field of art history. The researcher collected art history queries and attempted to classify the terms and concepts used in the queries

according to Enser's four categories, Jörgensen's twelve classes and Fidel's Object and

Data Poles. Chen (2001) asked 29 art history students to answer a questionnaire before

and after conducting image searches for a research paper required for completion of their

course. The questionnaire asked for their topic of study and what terms and phases they

planned to use to conduct their search for images. The researcher also administered a post

search questionnaire and conducted post search interviews to clarify unclear responses.

The researcher trained three graduate students to classify the queries according to the

three description structures. The three reviewers analyzed the data and made decisions

about the categorizations individually; if two or more reviewers agreed the judgment was

deemed effective. Chen (2001) found that 73.37% of the judgments for Enser's categories

were effective, however the study found that very few of the queries collected for the

study were refined. Chen (2001) suggested that there were few refined queries because

the students were not aware of the search terms use in the systems they used to conduct

their research. The searchers of the image repository in Enser's (1993) study were

familiar with the indexing system used in the repository and could add more refiners to

their queries. Five of Jörgensen's classes received a significant number of effective

judgments. The five classes were: Location, Literal Object, Art Historical Information,

People, and People-Related Attributes. Chen (2001) wrote that several of these classes

have had a "consistently high level of occurrence in participants' descriptions or queries"

(Chen, 2001, p. 270). The percentage of effective judgments was 51.8% for Fidel's Data

Pole and 52.88% for the Object Pole. Chen wrote that the level of matching of the student

queries to Fidel's Data and Object Poles was low because the theory was not developed

from direct observation (Chen 2001). Chen suggested additional research was needed,

especially qualitative data from interviews, video recording and questionnaires, to determine if existing image query description models are capable of describing the queries found in the field of art history.

Samantha Hastings conducted a series of studies on image searching (Hastings, 1995, 1999) which are applicable to the field of art history because she used a collection of paintings by Caribbean artists to conduct her experiments. Hastings (1995) recorded the queries and image manipulations that art historians performed as they investigated an image database. She then divided the data into four levels of complexity based on the type of information sought, how the information was accessed and what computer manipulations were used (Table 4).

Table 4. Hastings' Levels of Complexity (Hastings, 1995, p. 7)

| Levels of Complexity | Queries | Access Points | Computer Manipulations |
|---|---|---|---|
| Level:1 Least Complex | Includes identification queries for Who, Where, When | Includes Text Fields and Image in general | Use of Search, Sort, and Display |
| Level 2: Complex | For queries of the type, "What Are/" – requires sorting of the text info in the answer set | Includes Sorted Text Information and Images | Use of Search, Select, Sort, Display, and Enlarge |
| Level 3: More Complex | Includes queries of style, Subject, How, and ID of objects or activities | Includes Style, Keywords, and Complex Images | Use of Compare, Enlarge, Mark, Resolution, and Style |
| Level 4: Most Complex | Includes queries for Meaning, Subject, and Why | Includes Style and Subject | Use of Style & Subject Searches plus access to full-text secondary subject resources |

She found that as the query level of complexity increased the number of manipulations the user performed also increased. Manipulations included sorting images, enlarging the image, zooming in, and displaying multiple images on the screen. These findings are similar to Fidel's task Object/ Data Pole concept. The different levels of complexity are similar to various tasks and therefore Hastings' findings show that different tasks cause users to conduct their searches differently. For example, Hastings (1995) found that some user queries such as, "When did…?" or "Who did…?" (p. 5) did not require use of an image to be answered. However other more complex queries such as those that asked to compare images required that multiple images be displayed or enlarged at the same time. The type of query or type of task therefore determined how the image database was used. Fidel and Hastings both consider browsing in their studies. Fidel (1997) suggested that browsing was an effective strategy for users searching for an image as an object, but it was time consuming for users searching for an image as a data source. Hastings (1999) observed the way users browsed for images in a system that allowed users to search images in random order or by categories. She found that users browsed the images for both simple and complex queries; however, the researchers did not know if this was because of the users' curiosity about the browsing categories or if the categories matched their queries. Surveys indicated the users preferred "random categorization" (Hastings, 1999, p. 448) for browsing images, but they also suggested their own categories in which they would like to be able to browse. Hastings' question for further research was to find out how an image database can accommodate the various ways a user may want to search or browse for images (Hastings,1999).

Hastings' research brings together user studies, images searching and browsing and the art history field. Her methods included interviews, surveys, observation and screen capture. There is a need for more of this type of research to understand the process of image searching.

Background Information on ARTstor

The Andrew W. Mellon Foundation started ARTstor in 2001, and it became an independent non-profit organization in January of 2004. The funding for the early development of ARTstor came from the Mellon Foundation through a grant to the Digital Library Federation (ARTstor Inc., 2004, *History & mission*). The funds needed to sustain ARTstor come from subscription fees of participating institutions. The fee structure is based on the type (college or university, museum, or art school) and size of the institution. For a university at the highest end of the scale, the one-time Archive Capital Fee (ACF) is $40,000 and the Annual Access Fee (AAF) is $20,000. The fee for a community college, which is the lowest tier of the higher education fee structure, is $1,000 for the one time ACF and $1,200 annually. The annual fee for art schools ranges from $4,500 for a school with more than 2,000 students to $500 for a school with fewer than 200 students. The ACF starts at $600 for the smallest art schools and is $8,500 for the largest. The fees for museum subscriptions are based on several factors: the institution's operating budget, the museum's library materials budget, the number of periodical subscriptions and the size of the curatorial and library staff. The annual fee for museums ranges from $5,000 to $500, and the Archive Capital Fee ranges from $10,000 to $600 (ARTstor Inc., 2004, *Participating in ARTstor*).

The content of ARTstor is made up of diverse collections of images that ARTstor has acquired through partnerships with museums, archives and universities. The collection development policy of ARTstor is intended to be a broad as possible. The ARTstor website states that it "will be ecumenical with respect to the types and sources of its collections, the cultures and historical eras represented in these collections, the

specialized disciplinary fields and domains these collections serve, and the scholarly and

pedagogical applications they will support" (ARTstor Inc., 2005, *Building ARTstor*, para.

1).  Currently nine collections are available, and together the collections provide

approximately 300,000 images. The broadest and largest collection in ARTstor is *The*

*Image Gallery*, which contains over 200,000 images from university art history slide

collections. The *Art History Survey Collection* contains 4,000 images from ten art history

survey texts. The 4,200 images in the *Carnegie Arts of the United States Collection*

illustrate American art, architecture and visual culture. The *Hartill Archive of*

*Architecture and Allied Arts* contains almost 17,000 images which document the

architecture of Europe, Middle East and the Americas. The *Huntington Archive of Asian*

*Art***,** covers Asian art from 3000 BC to the present in a collection of more than 12,000

images selected from the archive. *The Illustrated Bartsch* is a valuable reference source

of European prints from the Renaissance to the 19th century. *The Mellon International*

*Dunhuang Archive* (MIDA) contains high-resolution digital images of Buddhist caves

shrines and related artwork in Dunhuang, China. Almost 6,200 objects, including

architectural models and design drawings, are represented in the *Museum of Modern Art*

*Architecture and Design Collection***.** The final collection, *Native American Art and*

*Culture from the Smithsonian Institute*, contains over 10,000 images created from

documentary photographs of Native Americans taken in the late 19th century (ARTstor

Inc., 2004, *What's in ARTstor)*. ARTstor plans to continually add new collections to the

database. Some of the organizations with which it has made agreements are: the Frick

Reference Library, the Arthur and Elizabeth Schlesinger Library on the History of

Women in America, the Prussian Cultural Properties Foundation, the National Gallery of

Art, the W.E.B. Du Bois Institute for African and African American Research, and the

National Anthropological Archives (ARTstor Inc., 2005, *Upcoming collections*).

The interface for the ARTstor database has a clean and simple appearance. The

Welcome page lists the nine collections that are currently available with a one sentence

description and thumbnail image for each. Like many databases ARTstor offers a

keyword search and an advanced search option. The Keyword Search box is placed

prominently on the Welcome Page and is also available on all of the pages throughout the

database in the top right hand corner. The Advanced Search is available from the toolbar

that appears at the top of each page in the database. The Keyword Search consists of a

box for terms and a dropdown list that allows the user to select to search all collections or

a specific collection. Selecting the Advanced Search from the toolbar brings up the

Advanced Search box. In the left side of the box the user can select to search all

collections, or choose one or multiple collections to search. The right side of the box

allows the user to combine terms using AND, OR, or NOT, and to search in specific

fields such as *Creator*, *Material,* and *Repository*. The fields in the Advanced Search are

different from the fields in most article databases because they relate directly to the art

and other works documented in ARTstor. See table 1 for the complete list of fields and

ARTstor's definitions for each field.

Table 5. Advanced Search Field Names and Definitions (ARTstor Inc., 2004, *How do I search for images?*)

| Field | Definition | Examples |
|-------|-----------|----------|
| Creator | Artist/ Creator of work, if known | - Edward, Hopper, 1882-1967<br>- Turner, J.M. W. (Joseph Mallord William)<br>- Albrect Durer |
| Title | The title or Identifying phrase given to a Work | - Early Sunday Morning<br>- Sarcophagus of Junius |

| | | |
|---|---|---|
| | | Bassus<br>- Ding tripod with five handles<br>- Chapel de Notre-Dame-du-Haut Ronchamp, France |
| Location | The geographic location of the repository, building, or site-specific work. | - National Gallery, London<br>- Grottoes of Saint Peter, Vatican, Rome<br>- China (PRC) / Shaanxi / Chunhua / Shijiayuan |
| Repository | The location and/or name of the institution housing the work. | - Whitney Museum of American Art<br>- National Museum of Asian Arts –Guimet / Paris / France<br>- Museum of Modern Art (New York, NY) |
| Subject | Terms or phrases that describe, identify, or interpret the Work and what it depicts or expresses. These may include proper names (e.g., people or events), geographic designations (places), generic terms describing the material world, or topics (e.g., iconography, concepts, themes, or issues). | - Landscape / Painting—England—19$^{th}$ C. A.D<br>- Archaeology--China: Qin--211-206 B.C.<br>- Gardens<br>- Bible. N.T. Gospels<br>- Marcus Aurelius, Emperor of Rome, 121-180<br>- Plague |
| Material | The substance of which a work is composed. | - oil on canvas<br>- marble<br>- Wood, paint, and plaster |
| Style or Period | A defined style, historical period, group, school, dynasty, movement, etc. whose characteristics are represented in the Work. | - Western Zhou<br>- French Colonial<br>- Late Anuradhapura<br>- High Tang |
| Work Type | Identifies the generic type of work being described in the record | - Oil paintings. / Cityscapes<br>- Textile / Patterned Silk / Banner<br>- Architectural Models |
| Culture | The name of the culture, people | - Early Christian |

| | | |
|---|---|---|
| | (ethnonym), or adjectival form of a country name from which a Work or Image originates or with which the Work or Image has been associated. **Note**: Available in Art History Survey Collection data records. | - Minoan<br>- India: Tanjore district<br>- Xochicalco (Central Mexico) |
| Description | A free-text note about the Work. | - "Tears / The banner is here incomplete, composed of a piece of patterned silk sewn with three streamers in polychrome patterned silk. One can see a part of a large motif with streamers and a floral ornament: flowers with three petals and long leaves- a quadrangular motif with florets and streamers. Blue and beige colors. / Symmetrical motifs drawn with the grain of the weft. / Mission Pelliot, Tissus, 1970, p. 157-159, pl 31-32" |
| Technique | The production or manufacturing processes, techniques, and methods incorporated in the fabrication or alteration of the Work. | - engraving<br>- Inlay (process)<br>- Encaustic painting (technique) |
| Number | The unique identifiers assigned to a Work. | - 1001.074 C2 / He.847. / [B.74b (88)] / [B.74 (87] (Bartsch)<br>- MC 53 (MOMA) |

It is also possible to browse the database by collection. Clicking on a specific collection on the Welcome Page or from the Collections menu brings up the Collection Page from which the user can browse that collection by topic. The browsing structure for each collection is slightly different based on the nature of the collection contents. Most of the collections are arranged by time period or geographic area. The Collection Page presents a list of topics that can be expanded into subtopics by clicking on a double arrow to the left of each topic heading.

The results of a search or selection of a browsing category are displayed on the Thumbnail Page. There are usually fifteen images displayed per page and a Navigation box in the upper left-hand corner allows the user to page through the results and jump to the first or last page of results. Beneath each thumbnail is an abbreviated form of the image title. Clicking on the title brings up the Image Data box with the full information about the image. Double clicking on the thumbnail opens the Image Viewer which displays the enlarged version of the image. The Image Viewer also contains icons for zooming and moving the zoom window around the image. The lower right-hand corner of the Image Viewer contains a row of icons that allow the user to print the image, display the image data window, display a list of the images in the retrieved set, maximize the Image Viewer from half screen to full screen, remove the controls from the Image Viewer, download the image, and report an error. There are also arrows that allow the user to move to the next image without closing the Image Viewer.

Several additional features are available to users who register with ARTstor. When registered users logon to the database they can add personal comments to individual image records and search these comments. They can also group images into folders. Authorized instructors are able to create folder of images for their courses, which students in those courses can view when they logon to the database. ARTstor developed its own off line image software that registered users can download for free. The software allows users to download high-resolution images and arrange them into presentations similar to a slide show.

Since the University of North Carolina was not a subscriber to ARTstor at the time of the study, the researcher contacted ARTstor to request access to the database for

the purpose of conducting a usability test. The researcher explained that the study would

be part of her Master's paper, a requirement for graduation in the School of Information

and Library Science.  After the researcher explained the methodology that she planned to

use in the study, and signed a license agreement, ARTstor provided the researcher with a

username and password and a proxy through which to gain access to the database.

Despite the attention the release of ARTstor received from art and visual resource

librarians and in articles in *The New York Times* (Arenson, 2004) and *The Chronicle of

Higher Education* (Brock, 2004), there has been only one review of the database. Cheryl

LaGuardia reviewed the database in her E-Views and Reviews column in *Library Journal*

in September, 2004. Her final assessment was that it was, "highly recommended for all

libraries supporting art history researchers" (LaGuardia, 2004a, p. 35). In the review, she

wrote that that it was easy to search using the Advanced or Keyword Search options, the

system suggested terms when the users searches using a misspelled name or term.

LaGuardia was also pleased with the speed at which the images loaded and the easy

enlarging and zooming of images. She scored the content "ten-plus", but gave a score of

seven to the functionality. Her two criticisms of the system were the hidden nature of the

Advanced Search and the lack of a Home link to return to the start page from any

location in the database. (The researcher's observations are that the Home button issue

has been resolved, but the Advanced Search is still placed on the tool bar at the top of the

page, rather than with the main content of the page as LaGuardia suggested it should be.)

LaGuardia has mentioned ARTstor in her column twice since the publication of the

review. In November 2004 she wrote about readers' response to her ARTstor review, and

she asked for more positive and negative feedback on the database from visual resource

librarians. LaGuardia's February 2005 column gave an update on the responses, and

mentioned issues such as: the lack of controlled vocabulary, the lack of interoperability

caused by the ARTstor software, and the cost of the resource. LaGuardia (2005)

communicated the comments to ARTstor and wrote, "Expect another look at the file to

see how responsive ARTstor has been to feedback" (p. 26)

Methodology

The purpose of this study is to learn how art historians search for and would like to search for images, and to evaluate how well the ARTstor database meets their needs. The study was conducted in two parts. The first part consisted of interviews with art historians, and the second part was a usability test of ARTstor. The Academic Affairs Internal Review Board approved the interviews and usability test.

The purpose of conducting the interviews was to find out from art historians how they find, organize and use images in their research and teaching. The interviews provided background information on the research and teaching activities of art historians, and also served as a guide for the creation of the tasks for the usability study. The interview participants were recruited by an email sent to the Art Department faculty listserv (see Interview Request E-mail, Appendix A). Faculty members in the Art History department were chosen to be interviewed as they use images in multiple formats for both research projects and for teaching. The questions for the interview were inspired by studies that have already looked at the working methods of art historians. The study, *Object, Image Inquiry: The Art Historian at Work* by the Getty Art History Information Program and Brown University interviewed art historians about their use of libraries and archives, annotation of images, organization of research notes and images, use of technology and other activities (Bakewell et. al., 1988). In the article "Visual resources: proposal for an ideal network" Roberts (1985) imagines all the ways an art historian or other humanities scholar might want to search an image database. These studies present possibilities for use of image databases by art historians and the interview questions were written with this research in mind. The professors were asked about their use of images in

research and in the classroom. They were also asked to describe what they would want to be able to do with images in an ideal system (see Interview Questions, Appendix B).

*Usability Test*

The second part of the study was the usability test. Several sources informed the creation and selection of the tasks used in the test. In their book, *A Practical Guide to Usability Testing*, Dumas and Redish (1999) wrote that is impossible to test every action a user will perform with a system, therefore the tasks that are chosen should be:

- Tasks that probe potential usability problems
- Tasks suggested from your concerns and experience
- Tasks derived from other criteria
- Tasks that users will do with the system (Dumas & Redish, 1999, p. 160).

Exploration of the database and the comments gathered from the interviews also influenced the creation of the tasks. As suggested by Dumas and Redish (1999) the series of tasks were pilot tested to ensure that the instructions were clear and that the test would take less than an hour to complete. Adjustments were made to the list of tasks based on feedback from the pilot test. The final list consisted of nine tasks that were written to test a variety of the ARTstor database features including zooming in on details, the Advanced Search and saving images. The following is a complete list of the tasks used in the study and the rationale behind the creation of each.

**Task 1:** Use the database to find the painting *Sacramento Valley in Spring* by Albert Bierstadt. Please tell me how many cows are shown in the right side of the painting?

**Rationale:** This is a simple search task to observe how participants search for a known item. The second part of the task encourages participants to interact with the image and use the zooming tools to examine details in the image.

**Task 2:** Please tell me what year was this painting was made and in what museum it is located.

**Rationale:** The purpose of this task was to see if participants found the identification information about the image and to see if they used the information icon or text link to access the data.

**Task 3:** Imagine you want to include this Bierstadt image as an illustration for your research paper for your American Art course. Save a copy of the image to the desktop.

**Rationale:** Like task two this task was designed to test the participants' interaction with the icons in the image window. It also tests the save image feature.

**Task 4:** Use the Advanced Search to find images of lions in artworks that are owned by the Louvre Museum.

**Rationale:** This task tests the Advanced Search and was designed to see the participants' reactions to the terms, such as repository, location, subject and description, used in the Advanced Search.

**Task 5:** Select any two of the images of lions, compare them side-by-side and say one thing that is similar or different between the two.

**Rationale:** Comparison of images is an important activity in art history. This task was written to observe the participants reactions to opening two images at the same time and to the resulting layout.

**Task 6:** One of the images from the Louvre is a lion from the *Babylon Ishtar Gate*. You want to find more about this artwork; please find images that are related to this one.

**Rationale:** Task 6 was designed to see how the participants would interpret the information given in the image identification box and how they would conduct a search for related images.

**Task 7:** If you found a mistake (spelling error, wrong date etc.) with this image, what could you do to get it corrected? You may have to use help to find the answer.

**Rationale:** This task tests if the participants can find information in the Help section and if they identify the *Found an error?* icon.

**Task 8:** For the following task please use the browse feature and the *Art History Survey Collection* to complete the task. Imagine that you are trying to find an image of a famous painting of women dancing in a circle. It was painted in the early 20$^{th}$ century. You know it has bold colors, but can't remember the artist. Please find this painting by **browsing** the *Art History Survey Collection*.

**Rationale:** This is to get the participants' reactions to the browsing feature. The situation that this task is intended to represent is one in which the user saw an image during a previous search and would like to find it again. The user may not remember information needed to conduct a search, but will recognize it when she sees it. This task attempts to study the experience of this type of retrieval.

**Task 9:** This task offers you a chance to explore an area of the database using any of the search or browse options. Search or browse for any image. It may be one that you thought of earlier in this session or something you've looked for before in another place. For this session it is not necessary for you to find it; we are interested in the process of looking for it.

**Rationale:** This task allows the researcher to observe actions that were not previously considered. The task also allows the participants to test the content of the database to see if it contains items in which they are especially interested.

Art history graduate students were chosen to be participants in the usability test because they have experience conducting research in the field of art history and would be likely users of ARTstor. The graduate students were recruited for the test by e-mail (see Usability Test E-mail, Appendix C). The participants were asked to "think out loud" and describe their thought process as they did the tasks. As part of the briefing before the beginning the tasks, the participants were taught how to "think out loud" (Dumas & Redish, 1999, p. 280-281). They were also given a short, five-minute, introduction to ARTstor in which they were told about the structure of ARTstor as a collection of collections. The nine collections that are now available were named with a brief explanation of the content of each collection. The tool bar at the top of the page was also mentioned, by showing them the link to the collections, the tools for professors that allow image groups to be created for courses, and the help section. The participants were then given the first two tasks on a sheet of paper and asked to read each task aloud, and reminded to think aloud. Each of the following tasks was given to the participant on a

sheet of paper after she completed the previous one. The participants' comments were audio recorded and later transcribed. The success or failure to complete each task was recorded as well as the start and ending times for each task (Dumas & Redish, 1999, p. 193). After the test the principal investigator asked the participants about their satisfaction with the database and their reactions to specific parts.

Results

*Interviews*

Two Art Department professors, one male and one female, volunteered to participate in the first part of the study. The interviews were conducted in their offices and lasted approximately one hour. Both of the participants had heard of ARTstor, but neither had used the system. They had some experience using digital images obtained either by downloading them from the Internet or by scanning photographs and slides. Their collection and use of both digital and non-digital images were discussed in the interviews. Both of the professors spoke about the centrality of images to the field of art history and the use of images as evidence for arguments made or as a way to expand one's research. One professor described the role images play in his research: he begins his research with a selection of works that he studies in person and then he begins to compare those works with others by looking at published images that come from books, photographs or other sources. Searching for images by time period was mentioned by both professors as a useful way to expand their research. One professor also discussed the *Index of Christian Art* as an extremely useful resource because of the depth of its indexing. The other professor said it would be useful to search for images based on the idea they expressed. An example is Renaissance cosmology drawings that provide a visual image of the Renaissance world view.

Image quality was a concern of both professors as they had experienced working with poor quality images in all formats including books, photographs and slides. The quality of images is important for research as well at teaching. In addition to having clear lines and realistic color, one of the professors discussed the need for images taken from

specific angles to make the desired point in an argument or in a course lesson. Both interviewees acknowledged the time and labor involved in working with images. The professors had to spend time organizing physical and digital images. One professor organized the photographic prints he kept in his office into albums based on geography or medium, but he owned many photographs that still need to be arranged into albums or folders. The same was true for the professors' collections of digital images. One professor said that she planned to organize her downloaded images into folders, arranging them by course or time period, but at the time of the interview she kept them all in one folder. Another time consuming task was the creation of metadata for digital images. The professors were aware of the need for good descriptive data for digital images. Their experience in creating metadata for their own collections was usually limited to basic information about the image such as artist or culture, title, and date.

In response to a question about the use of digital images, one professor described her experience at a previous school where she used four slide projectors at once during her lectures. She said the juxtaposition of images allowed her to teach twice as much. The flexibility to prepare this type of presentation is one thing that she would like to have with from a digital image system. The professors were also interested in using digital images in their teaching because it gave them more flexibility in the objects they chose to teach. By giving students access to digital images through a networked database the professors no longer have to rely on one textbook or a few books on reserve in the library to provide the images they use in class.

The interviews reinforced several topics discussed in the literature about art historians' use of digital images, such as the importance of high quality images, the

ability to search for images in a variety of ways, and the use of images in teaching. The interviews were also helpful in the preparation of tasks for the usability test. Task 4 which asked participants to search for images of lions was influenced by one of the professor's description of the *Index of Christian Art* and the ability to search for images that contain specific symbols or subjects that are significant for art historians. The importance of comparing multiple images was mentioned during the interviews, and therefore task 5 asked the participants to compare images. The professors discussion of expanding their research and starting from specific images to looking at all images from a certain time or place led to the creation of task 6 in which the participants were asked to look at one image and then search for related images.

*Usability Test*

Five students participated in the usability test. The sample size of 5 participants was acceptable for this study because research has shown a small number of participants are able to discover most of the usability problems, and adding additional participants will not provide new insights (Dumas and Redish, 1999). All of the participants were female and enrolled in an Art History graduate program. Two of the participants were first year graduate students, two were finishing their second year in the program and one participant was preparing to finish her dissertation and receive her Ph.D. None of the participants had used ARTstor before, but the doctoral participant had used other image database systems.

**Task 1 Search by Title and Enlarge Image**

Task 1 asked the participants to search for the painting *Sacramento Valley in Spring* by Albert Bierstadt and to count the number of cows in the painting. Two

participants did a search in the *Carnegie Arts of the United States Collection* first. Two other participants started with basic search and put in a portion of the title, and one did advanced search for the artist's name. Of the two who started in the *Carnegie Collection*, one continued by doing a basic search in all collections and the other did an advanced search.

Responses for the number of cows ranged from 5 to 14. In this particular landscape it is difficult to see the exact number of cows. The painting was selected so that the participants would try to get a closer look as some of the bushes may be cows and vice versa. The researcher saw 11 cows. The person who said 14 cows did the most zooming; she enlarged the image the most and moved throughout the image more than the other participants. Two of the participants did not use the zoom at all for this task. One of the participants who did not use the zoom said, "Although it's kind of hard to make out detail, that looks like another cow in the shadow, I'm not going to count that." There was no obvious connection between the number of cows the participants saw and the amount of zooming they did. It was significant that even though one participant could not make out the detail of the scene, she did not use the zoom feature. One of the participants who did not use the zoom counted more cows than another participant who did use the feature.

The researcher was surprised that some of the participants did not use the zoom for the first task, but she wanted to see how they would naturally interact with the interface so she did not prompt them to use the feature to get a closer look. They both discovered ways to zoom later in the test.

**Task 2 Identification Information**

Two participants opened the information box using the *Image Data* icon, a blue

lower case letter *i* in a white circle, and three found the information by double clicking on

the image title in the Thumbnail Page. One participant who used the icon said, "ok that

was pretty quick, I mean given that I'm not very good at taking the time to read things

before I do it, that was pretty quick to find", but the other one who used the icon had

searched the entire screen before realizing what the icon did. Referring to the icon, she

said, "this doesn't announce itself as what it is at all, so it took me a while to figure it

out."

Two of the participants looked at the row of icons in the Image Viewer toolbar,

but instead of clicking on the icon they closed the image window. They found the

information about the image by double clicking on the image title in the thumbnail

screen. They did not see the *Image data* icon or they did not realize the function of the

icon.

**Task 3 Save Image**

All of the participants found the *Download image* icon easily and went through

the steps of accepting the terms. The participant who expressed frustration with the

representation of the information icon, said "at least they use the floppy disk icon." The

participants all said that this was an easy process.

**Task 4 Advanced Search for Lions and Louvre**

The search strategies for this task varied among the participants. Two of the

participants completed the task successfully with their first searches. One used the

Advanced Search and entered "lion" as *All Fields* and "Louvre" as *Repository.* The other

participant did not use the Advanced Search; she entered "lions and Louvre" as a Keyword Search.

The other three participants revised their searches before they found a successful query. One problem for two of these participants was when they searched for "Louvre" as *Repository* and "lions" as *Subject* or *Description* they retrieved no results. Two participants also tried a search for "lions" as a Keyword Search and retrieved more than 300 images. They entered the search for "lions" alone thinking they would be able to limit the results, but that was not possible. One of the participants completed the task when she entered "lions in Louvre" as a Keyword Search. In the end, the other two participants used the Advanced Search and entered "lions" as *All Fields* and "Louvre" as *Repository* to finish the task.

**Task 5 Compare Two Images**

All of the participants found this task fairly easy. Enlarging two images to compare them side-by-side is done by selecting and enlarging one thumbnail and then enlarging the second image. The first image window is automatically minimized when the second is enlarged and the user must maximize the first window to see the images side-by-side. Some of the participants were confused when they selected the second image and the first was minimized, but they quickly saw the minimized window at the bottom of the screen and then maximized it.  One of the participants minimized the first image herself before selecting the second image.

**Task 6 Find related images, Ishtar Gate**

The terms the participants used to search for related images varied. They were allowed to determine for themselves what "related images" meant so the variance was

expected. Successful search terms were: "Babylon Ishtar Gate", "gates", "Babylon (extinct city)", and "Babylonian", which was used by two participants.

Two participants opened the image information box by double clicking the title of the image and then tried to click on the subject terms listed for the image. Each of the entries changed color from black to blue when the pointer was placed over it, as if it were a hyperlink. This made the participants think that they could follow a link, to search for related images. One participant said, "you can't click on these like the library catalog; they don't work the same as subject headings. So if I wanted to find related works, I would have to go back to the keyword search." Another participant opened the Image data window box by clicking on the *Image data* icon in the Image Viewer. She was able to cut and paste one of the subject headings from the Image data window to the Keyword Search box. The fields in this Image data window did not resemble hyperlinks and allowed the text to be copied unlike the box that opened when the other participants double clicked the title.

Two participants had trouble when they searched for "Babylon" as a keyword. They both found that the first images in the results page were Christian prints, many from the *Illustrated Bartsch Collection*. One solved the problem by searching "Babylonian" in the *Image Gallery* only and was satisfied with the results. The other tried to search for "ancient Babylon" and got no results. She then searched "Babylonian" in all collections, and found several relevant images.

**Task 7 Make a Correction**

Two of the participants found the icon for reporting an error in the image window, and the other three found the *Report a Problem* link under the Help menu. One

participant went directly to the Help menu and found the link. The other two participants first looked for a "contact us" link on the home page, but then quickly found *Report a Problem* under the Help menu.

**Task 8 Browse for Unknown Image**

The participants expressed the most frustration and confusion during this task. The participants were asked to find an image by browsing the *Art History Survey Collection*. Only one participant found the double arrows next to the broad browse topics that opened expanded topics. By expanding the topic *Modern European and American Art and Global Contemporary Art*, the subtopic *Art and Architecture 1890s to 1920s* appears. When the participant selected this subtopic she retrieved thirteen pages of images and found the desired image on the eighth page. Four of the five participants selected Browse entire collection, before selecting a specific topic. Some selected browse from the menu bar at the top of the page while others navigated from the Collection Page. The participants quickly tried a different approach when they saw that the entire collection consisted of 255 pages of images. All five of the participants either tried to do a search for the image or said that they would search rather than browse if they did not have to follow directions. One participant realized that she could search within a selected category. Two other participants expressed the desire to search within a category such as the *Modern European and American Art and Global Contemporary Art*, but were not able to figure out where this type of search could be done. One of the participants did not complete the task. The other three participants, who did not discover the expanded topics, eventually browsed the entire *Modern European and American Art and Global*

*Contemporary Art* topic and found the desired image on the 31st page of the 51 page set of images.

**Task 9 Free Exploration**

There were a variety of reactions to the free explore task. Two of the participants searched for $20^{th}$ century artists and were disappointed that they found nothing or very few images by artists they searched. The other participants searched for Medieval or ancient works and were more satisfied with what they found.

All five of the participants first tried to retrieve images by searching. As previously stated, two of the participants searched for $20^{th}$ century artists by name and did not find what they wanted, because the content was not in the database. Two other participants had to refine or revise their searches before they retrieved images of their desired subjects. One of these participants tried to search for "medieval" and found more than 300 results which she decided not to examine. By searching a more specific term she found what she wanted. The last participant did not find what she was looking for through an advanced search, but then she went to the browse topics page of the *Art History Survey Collection* and quickly found what she wanted. This was the same participant who had discovered the expanded topics.

Discussion

*Use of the Database*

The participants' reactions to the database were very positive. They were pleased with the image quality and the navigability. They said that the database was intuitive and easy to use. There were a variety of responses from the participants when they were asked if the database would be useful to them. They all said that they would use it. Two of the participants were very interested in its use in the classroom as one source of images for teaching and also a tool for instructors to make the images presented in class available for study by students outside of class. One participant said that she saw the database as a good resource to use while studying for the art history graduate comprehensive exam. Two of the students mentioned using the Internet as a source of images and said that ARTstor would be a more convenient and reliable resource.

The interface design of ARTstor is appealing and most of the participants said that the system was fairly easy to use. Some comments from the participants when asked for their general opinion included: "I'm really impressed. It's really easy to use, like anything it takes a little getting used to, but for the most part it's easy", "it definitely seems fairly accessible and easy to navigate for the most part", and "I don't go home and read all the stuff. I just want to jump right in, and I felt like it was easy to do that". Although the participants were pleased with the experience, there were a few things in the design of the database that caused problems for the participants in the usability study. The two main issues were: finding and understanding some of the icons and browsing the Art History Survey Collection. Several of the participants never used the icon that

brought up the image identification information, and all five of the participants found completing the browsing task difficult.

*Icons*

Task 2 asked the participants to find two pieces of information for the image they had found in task 1, the date painted and the museum in which the painting is located. In ARTstor this information can be found in two ways. The user can double click on the image's title, which appears beneath the image on the Thumbnail Page or from the Image Viewer, the user can click the *Image data* icon. Both of these actions bring up an information box with the requested data. Using the icon in the Image Viewer allows the user to view the information and the image at the same time. One participant found this feature useful and said, "I love that information and it keeps the image up at the top." Unfortunately two of the participants never used the information icon, and two participants found the icon, but only after some searching. One participant found and used the icon quickly. Icons are intended to quickly communicate their function to the user and be intuitive. The *Image data* text label that appears when the pointer is over the icon did not help some of the participants understand the icon's purpose. The participant who found the icon after searching for the requested information in a number of places had mixed feelings about the icon and the icon placement. She said the icon was "buried with all these other icons that aren't related" and suggested that the icon should be bigger or moved to a more prominent location. At the end of the test session when the same participant was asked what she thought of the Image Viewer layout, she explained that it was difficult to find the information about the image, but she liked the aesthetics of the layout: "but I also kind of like that they keep everything kind of small that it doesn't

seem too cluttered." Another participant found the combination of icons in the image window confusing. While working on task 6, which asked the participants to find related images, she explained, "I'm searching these little icons below the picture, one says list images, I feel like they should relate to the image I just enlarged and it doesn't seem like [they do]." When she discussed the interface of the image window she said, "I thought that was great, but the little icons below the image, I wish that one of them had been an information icon that you could just click on when you had the image up."

A second task that allowed the participants to interact with the icons in the Image Viewer was task number seven in which they had to find out how to report an error. Two of the participants found the icon, a box with a red *x* and the text descriptor: "Found an error? Click here to report it". The other three used the *Report an error* link under the help menu. For this task the three participants who did not use the icon may not have thought to look for it in the image window. While completing this task one of the participants looked at each of the icons to find out what they did. The comments she made as she looked at each icon give some insight on how well the icons communicate their functions:

> Let's pretend I found a mistake, I'm assuming there's someway of reporting a mistake, it would be nice if it were right down here [looks at the icons at the bottom of the window] "list images" [clicks on the "list images" icon] oh nice so you can go back and forth here, that's nice wow, they've thought of all kinds of things, "maximize window" [tests this icon], "remove controls", I don't know what that means, removing doesn't sound like a good idea, [finds *Found an error* icon] oh that's very intuitive.

Exploring the icons and testing them one by one may be the best way for users to understand what all of them do.  Using symbols that are used in other systems as the *Download image* icon illustrated by a floppy disk, make it easier for users to understand

the function of the icon. All of the participants easily located the icon they used to download an image, because it was a familiar symbol. One participant commented that the *i* "for information" did make sense in retrospect. Some of the icons are for useful, but not essential functions. The *Image data* icon performs a very important function that should be clear and easy to find. There are many ways this icon could be made more obvious to users. A few possibilities suggested by the usability test results include: changing the icon design, rephrasing the label that describes it or moving the icon to a more prominent place.

*Browsing*

Another part of the design that caused frustration was the browse interface in the Art History Survey Collection. Task 8 described a painting by Matisse with out giving the title or artist. The task asked the participants to imagine that they were looking for the painting but that they had forgotten the artist's name, and asked them to find it by browsing the *Art History Survey Collection*. To complete this task in the most direct way the user goes to the topics page of the Art History Survey Collection and then from the eight broad topics listed the user clicks on the arrow next to the topic *Modern European and American Art and Global Contemporary Art* to reveal nine more specific categories one of which is *Art and Architecture: 1890s to 1920s*. The task description said that the painting was made in the early 20th century, and therefore the user selects the *1890s to 1920s* category which would bring up thirteen pages of thumbnails with fifteen thumbnails per page. The user finds the desired image by paging through these screens. Only one of the participants discovered that the broad topics could be expanded to display narrower subtopics. The topics page does give the instructions, "click on double

arrows to expand a category", but the participants' attention was taken up by the categories themselves and they did not see these directions. When the participants selected the *Modern European and American Art and Global Contemporary Art* topic, the first page of unordered images is all architecture, and this confused several of the participants. One said after choosing that topic, "but that's not what I want, it says art but it's all architecture". Another participant said, "I feel like there should be a distinction between architecture and sculpture and painting and when I get in here I should be able to choose".

The order of the images, which follows the order of the subtopics, and is random within the subtopics, was also confusing and frustrating. All of the participants mentioned not understanding the order, and they wanted there to be an order. Comments included: "I don't understand why they're not in chronological order, that's why I went to the end, thinking I could go back [scroll through backwards] and it didn't work" and "I can't figure out how these images are arranged, it seems very random the way they're thrown in here, although I can't imagine that is the case." As she was scrolling through the pages, one participant indicated she thought she was getting close to finding the image:

> I feel good about the groups we're in, hmmm how is this in order, no I don't feel so good about it any more … it's curious as to how the images are filed within this search because it's not by artist name and it's not by medium, so I wonder if it's by some sort of accession number and it's not really by chronological order, so you kind of just have to look through so unless I was really desperate… I would probably never use this kind of search.

Another participant asked about choosing the order arrangement, "Can I select the way it goes? It would be nice if I could choose what order they go. Are they just random?" As part of finding the image, one participant said, "Ok, I need to find out how these are organized." After conducting the usability tests, the researcher discovered that it was

possible to choose to sort the images by title or by artist by selecting *Sort images* from the View menu. Of course neither of these sorting options would be useful if the user did not know the name of the artist or title of the artwork for which she was searching. The *Sort images* function does give a sense of order to the images, but this option was not apparent to the participants. Several participants used the Browse Collections menu which is on the same toolbar as the View menu, but either they did not see the menu or did not think it would be useful to them. In contrast to these findings, Hastings' (1999) study implied that users preferred to browse images in random order. In the Hastings (1999) study users worked with a smaller set of images, 66 total, and this may account for the difference between the two results. Hastings (1999) also found that users suggested categories they wanted to browse. The participants in the usability test also suggested ways they would sort the images.

This study focused on the browse feature of the *Art History Survey Collection*. Due to differences in the collections the browse topics are arranged differently for each collection. Some of the frustrations the participants experienced on this task might not have been the same if a different collection was used. However the arrangement of topics and subtopics and the method of expanding the topics are the same across the collections. The use of a more universal method of expressing that the categories expand, such as using a plus sign, would be one way to make the browse feature easier to use. The order of the images was also a concern of the participants. They were not happy looking through the images in random order. A default order to the images or making option to sort images more obvious would relieve some of this anxiety. Providing more options to the user is a way to make the browse feature more useful.

*Search Issues*

The search feature is an important part of any database as it is the users' means to accessing the content. One way that art historians search for images is to search for all the works produced during a certain period. The search may be limited by geography or medium of the work. Art historians build arguments about the specific artwork or artist they are researching by comparing the specific work to a broad selection of images from the same time period. Both of the professors that were interviewed mentioned expanding their research by looking at images during a certain time period.

Currently searching the ARTstor collection by period or style is not a simple task. The Advanced Search offers a field called *Style or Period*, but this field does not currently yield useful results for all collections or all time periods. A search for the Chinese dynasty "Tang" and selecting to search the *Style or Period* field brought up more than 300 images and the majority of the first 300 hits were from the *Mellon International Dunhang Archive*. A similar search for "Early Christian" in the *Style or Period* field found no results, however a search for "Early Christian" in *All Fields* returned more than 300 results. For these images the phrase "Early Christian" was found in the *Subject*, *Description* and *Culture* fields.

During the final task of the usability study, in which participants were allowed to choose their own topics to search, one participant searched for "medieval manuscripts" in the Image Gallery, and did not find what she expected. When she searched for "Carolingian manuscripts" she was happy with the 299 images retrieved, but she expressed concern that there was not a way to bring up the Carolingian manuscripts by searching a broader term. The participant was able to find the images she wanted without

too much difficulty because she had knowledge of the terms used to describe them. The

participant's concern was for students who would not have as much knowledge of the

terms used to describe works of art.

ARTstor is aware of the complexity involved in providing existing and creating

new descriptive data for visual content. In contrast to most databases of texts, the

classification of images is not always black-and-white. ARTstor acknowledges the

difficulty of describing images on its website:

> there is often no 'right' answer, but rather multiple (and sometimes
> contradictory!) viewpoints that comprise a scholarly debate. A typical example is
> a work of art that is reattributed to a different artist in the light of new research or
> a more technologically sophisticated analytical technique. ARTstor will seek to
> present these differing points of view when appropriate, while simultaneously
> privileging the most authoritative descriptive information (ARTstor Inc., 2005,
> *Descriptive data*, para. 4).

The ARTstor website also outlines plans the organization has for enhancing the metadata

that is now part of the database. The strategies for improving the metadata include a

thorough review and analysis of the existing metadata, and the use of controlled

vocabularies for artist and geographic names. ARTstor plans to group together images

that show different views of the same object and eliminate duplicate images. Finally

when the organization feels that it knows the needs of its users, it will develop a "a more

expressive and extensible descriptive framework informed by relevant standards" which

will allow ARTstor "to provide richer and more detailed descriptive data" (ARTstor Inc.,

2005 *Descriptive data*, para. 12).

*Advanced Search and Keyword Search*

Two of the participants did not use the Advanced Search even when task four

asked them to use the Advanced Search to find images of lions in artworks located in the

Louvre. These participants used the Keyword Search entering "lions in Louvre" and

"lions and Louvre" into the search box and they had the same results of seventeen

images. All of the participants who used the Advanced Search eventually found similar

results, but they struggled with the names of the fields. One participant asked, "what's the

difference between *Location* and *Repository*?", and another said, "I'm torn between

*Location* and *Repository*." One of these participants chose to search the *Location* field,

the other searched *Repository*, and they both found the same results of sixteen images.

The *Subject* and *Description* fields also caused confusion on this task. One participant

searched for "lions" in the *Description* field and found no images. She then changed to

*All Fields* and retrieved sixteen images.

The Keyword Search box is available throughout on the Welcome Page, the

Thumbnail Pages and on the Collections Pages. The Advanced Search is always available

from the toolbar, but is not a visible as the Keyword Search. Since the Keyword Search is

often as effective as the Advanced Search it is logical that the Keyword Search is the

most accessible search option. As the metadata become more standardized the Advanced

Search will become a more effective tool for all users of the database, and then ARTstor

should consider displaying it more prominently.

*Content and Image Quality*

The content of ARTstor and the quality of the images are two aspects that will

affect how art historians perceive the database. The two art history professors interviewed

for this study mentioned the importance of high quality images for the purpose of

teaching and also for their own research several times. The participants were pleased with

the image quality that they saw and impressed with the quality that was maintained when

they zoomed in on details. Comments during the tasks and from the debriefing included: "you can really get a good sense of details and it's nice resolution so you can really show your students some great stuff or see it yourself", "this is stuff I've been looking at for years and haven't been able to get this close to" and "I'm really impressed with this, because a lot of times when you're writing you have to do a visual analysis and you have to get your face right down into the book, and this is definitely a better way."

The participants who searched for 20th century artists in the last task which allowed them to freely explore the database were disappointed that the artists they searched were not represented in the database or that there were only a few artworks. The issue of 20th century art in ARTstor is complicated because of the method of building partnerships with artists and artist right's holders. These steps of working with outside individuals will take more time, but ARTstor believes the result of working with artist representatives will be more rewarding than relying on the educational fair use exemption of copyright law (ARTstor Inc., 2005, *Frequently asked questions*). The participants who searched for medieval and ancient artwork were more successful in their searches. One participant said, "Wow, oh my gosh, these are some of the images I need for my thesis." Another commented "this is something I've had a hard time looking for and it's actually in my dissertation." Using the database as a resource for teaching was an interest of one of the participants and she was impressed to find images such as timelines, diagrams of archeological sites, and maps displaying the locations of cultural groups. Her comments were, "Oh wow, nice diagrams and that's really nice because that's hard to find".

Conclusion and Future Research

This study explored what art historians want from an image database and how took a beginning look at how ARTstor could serve those needs. The usability study focused on the reactions of individual art historians during their first use of the ARTstor database. Different issues may have been discovered in a test that allowed participants to be more familiar with the database.

In this study participants had difficulty interacting with a few areas of the database interface. The most problematic areas were: interpreting the meanings of the icons and the Advanced Search field names, and navigating the browsing feature. The participants were impressed with the content and image quality they saw in the database, and they all felt that ARTstor would be a useful resource. Variations in the metadata made searching for images by time period difficult. This was a significant finding of the research as locating images of works created within a certain time period is important to art historians. ARTstor has plans for enhancing the metadata, which will involve much work. Additional research in the searching habits of art historians will assist in making the metadata system developed by ARTstor of greater use to art historians.

One part of the ARTstor resource that this study did not consider was the tools for instructors. These tools include applications that allow instructors to group images in folders for specific courses and software developed by ARTstor that allows high-resolution images to be downloaded, arranged into slide shows and projected in the classroom. Since a major use of ARTstor is for instruction these tools also need to be intuitive and easy to use.

When ARTstor became available to schools and organizations, an article in *The New York Times* said that ARTstor "could eventually revolutionize the way art history is taught and studied" (Arensen, 2004). One of the art professors interviewed for the study discussed lecturing with four slides displayed at once. She enhanced her lecture through the changing combinations of images that she arranged. The ARTstor tools for presenting images in a slide show should be evaluated on the flexibility they allow for presentations. Cohen (1997) and Giral (1998) reported on ways digital images were used to teach art history in new ways. How do the content and technical tools of ARTstor support art history instruction? Future research should look at how ARTstor is used in the classroom to engage students in the content in new ways, what educational projects are now possible through the use of ARTstor.

One of the participants was impressed with the zoom feature and how close-up she could go to details in a work. After expressing her amazement at what the display of details could teach students, she countered, "and then the art historian has to step in with their own sense of responsibility and remember not to show these things in a way that completely distorts the way they might be used in the time." ARTstor allows art historians to see things that they could not see, or could not see clearly before, but this participant reminded herself that one of the objectives of art history, to understand works of art in their context of time and place, should not be forgotten in the excitement over new technology. While there is a potential for the misuse of images, ARTstor may also be a resource that could help art historians recreate the historical context of an object. As Roberts wrote in her article on the a proposed image database, "Through the use of multiple or split screens, several images can be compared in the electronic medium. A

complex indexing system is needed, however, to bring together those images which share similar characteristics" (Roberts, 1985, p. 36). Future research on ARTstor and other image databases should question how the technology can be used to enhance existing research methods and how it might move the field away from its traditional methods. Collaboration between art historians and ARTstor is essential in order to build a resource that supports research and teaching to its fullest potential.

References

Armitage, L. H., & Enser, P. G. (1997). Analysis of user need in image archives. *Journal of Information Science*, *23*(4), 287-299.

Arenson, K. (2004, August 14). For art history scholars: illumination is a click away. *The New York Times*, p. B9. Retrieved April 6, 2005, from Lexis Nexis Academic database.

ARTstor Inc. (2004). *History and mission*. Retrieved April 6, 2005, from http://www.artstor.org/info/about/history_mission.jsp

ARTstor Inc. (2004). *How do I search for images?* Retrieved April 6, 2005, from http://www.artstor.org/webhelp/Search_tips.htm

ARTstor Inc. (2004). *Participating in ARTstor*. Retrieved April 6, 2005, from http://www.artstor.org/info/participation_info/participation.jsp

ARTstor Inc. (2004). *What's in ARTstor*. Retrieved April 6, 2005, from http://www.artstor.org/info/collections/whats_in_artstor.jsp

ARTstor Inc. (2005). *Building ARTstor*. Retrieved April 6, 2005, from http://www.artstor.org/info/collections/overview.jsp

ARTstor Inc. (2005). *Descriptive data*. Retrieved April 6, 2005, from http://www.artstor.org/info/about/descriptive_data.jsp

ARTstor Inc. (2005). *Frequently asked questions*. Retrieved April 6, 2005, from http://www.artstor.org/info/about/faq.jsp

ARTstor Inc. (2005). *Upcoming collections*. Retrieved April 6, 2005, from http://www.artstor.org/info/collections/upcoming.jsp

Bakewell, E. Beeman, W., Reese, C., & Schmitt, M. (1997). *Object image inquiry: the art historian at work*. Santa Monica, CA: Getty Art History Information Program.

Brilliant, R. (1988). How an art historian connects art objects and information. *Library Trends*, 37(2), 120-129.

Brock, R. (2004). New digital library offers alternative to slides. *Chronicle of Higher Education*, 50(32), p. A32. Retrieved February 28, 2005, from Academic Search Elite database.

Chen, H.(2001). An analysis of image queries in the field of art history. [electronic version] *Journal of the American Society for Information Science and Technology, 52*(3), 260-273.

Cohen, K. (1997). The 'Nina' the 'Pinta' and the Internet. [electronic version] *The Art Bulletin, 79*(2),187-191.

Dumas, J. S., Redish, J.C. (1999). *A Practical Guide to Usability Testing*. Portland, OR: Intellect Books.

Enser. P.G.B. (1993). Query analysis in a visual information retrieval context. *Journal of Document and Text Management, 1*(1), 25-39.

Fidel, R. (1997). The image retrieval task: implications for the design and evaluation of image databases. *New Review of Hypermedia and Multimedia, 3,* 181-199.

Giral, A. (1998). Digital image libraries: technological advancement and social impact on the teaching of art and architectural history. *Art Libraries Journal, 23*(4), 18-25.

Hastings, S. K. (1995). Query categories in a study of intellectual access to digitized art images. *Proceedings of the 58th Annual Meeting of the American Society for Information Science, October 9-12, 1995.*(pp.3-8) Medford, NJ: Information Today.

Hastings, S. K. (1999).Evaluation of image retrieval systems: role of user feedback. *Library Trends, 48*(2) 438-452.

Jörgensen, C. (1998). Attributes of images in describing tasks. [electronic version] *Information Processing and Management, 34*(2-3), 161-174.

Jörgensen, C. (1999) Access to pictorial material: a review of current research and future prospects. [electronic version] *Computers and the Humanities*, 33(4), 293-318.

LaGuardia, C. (2004a). ARTstor comes alive [electronic version]. *Library Journal*, 129(15), 24-25.

LaGuardia, C. (2004b). Book searching made easy [electronic version]. *Library Journal*, 129(18), 32.

LaGuardia, C. (2005). Communication at last [electronic version]. *Library Journal*, 130(3), 26.

Rhyne, C.S. (1996). Computer images for research, teaching, and publications in art history and related disciplines. *Visual Resources,* 12(1), 19-51.

Roberts, H.E. (1985). Visual resources: proposals for an ideal network. *Art Libraries Journal, 10*, 32-41.

Stafford, B. (1997). Educating Digiterati. [electronic version] *The Art Bulletin, 79*(2), 214-216.

Stephenson, C. (1999). Recent developments in cultural heritage image databases: directions for user-centered design. *Library Trends. 48*(2), 410-437.

Appendix A

*Interview Request E-mail*


I am writing to invite you to participate in a research study I am conducting as part of my Masters Paper.

The purpose of this research study is to learn about what art historians want from an image database, to observe how art historians interact with the image database ARTstor and to evaluate its ease of use.

If you choose to participate, I will ask you questions about your experiences using art images and what you would like to do with an image database. With your permission I will tape record the interview, but you may ask me to turn off the recorder at any time. Your participation is voluntary, and if you do participate you may stop participating at any time.

Please email me this week at pask@email.unc.edu or call me at 932-7280 to arrange a time for the interview. Do not hesitate to contact me if you have any questions about the study. You may also contact my advisor, Dr. Haas, at stephani@ils.unc.edu.

Thank you for your interest and for considering being a part of this study.

Sincerely,
Alida Pask

Appendix B

*Interview Questions*

How do you use images in your research?

How do you use images in your teaching?

How do you find images?

What sources do you use to find images?

What frustrates you about gathering images?

How do you want to be able to search for items in an image database?
(title, artist, school, subject etc.)

What information about the images or object depicted by the image is important for you?

How do you store images? (computer file, on paper etc.)

How do you organize images?

How would you like to be able to organize images?

What would you like to do with images that you don't or can't do now?

Appendix C

*Usability Test E-mail*

Dear Art History Graduate Students,

I am writing to invite you to participate in a research study I am conducting as part of my Masters Paper.

The purpose of this research study is to learn about what art historians want from an image database, to observe how art historians interact with the image database ARTstor and to evaluate its ease of use.

If you choose to participate, you will be asked to complete a series of tasks using ARTstor. The tasks will include various actions that are common in the use of electronic databases. It is important for you to know that it is the database that is being evaluated and not the participant. You will also be asked to describe your thoughts as you complete the tasks, and with your permission your comments will be tape recorded. The session should not last longer than an hour. Your participation is voluntary, and if you choose to participate you may stop participating at any time.

Please email me this week at pask@email.unc.edu or call me at 932-7280 to arrange a time for the session. Do not hesitate to contact me if you have any questions about the study. You may also contact my advisor, Dr. Haas, at stephani@ils.unc.edu.

Thank you for your interest and for considering being a part of this study.

Sincerely,
Alida Pask