Study Center Learning:

An Investigation of the Educational Power and Potential of the Harvard University Art Museums Study Centers

A collaborative project between the Harvard University Art Museums and Project Zero at the Harvard Graduate School of Education



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Cover Images

The Busch-Reisinger Museum Study Room

Ancient galleries, the Arthur M. Sackler Museum

Study Room, the Agnes Mongan Center for the Study of Prints, Drawings, and Photographs

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Executive Summary

HARVARD PROJECT ZERO/HUAM REPORT ON STUDY CENTER LEARNING

The Harvard University Art Museums (HUAM) recently completed a collaborative research project with Harvard Project Zero, a research center at the Harvard Graduate School of Education with a long history of investigating cognition and the arts. The purpose of the project was to investigate the nature of visitor learning at HUAM's two study centers, the Agnes Mongan Center for the Study of Prints, Drawings, and Photographs, and the Busch-Reisinger Museum Study Room. Both study centers are open to the public and offer visitors quiet and intimate environments in which to study original works of art and artifacts from HUAM's vast collections.

The project involved several strands of research, including interviews with HUAM staff, observations and interviews in the study centers, interviews with faculty from Harvard and other local universities and institutions across a variety of disciplines, and an extensive review of related literature. The project examined what kind of learning occurs in the HUAM study centers, what makes it powerful, and how it can be enhanced and extended to new contexts and audiences. These questions are timely as HUAM enters a period of expansion and renovation and takes the opportunity to re-envision its mission and activities.

In the study centers, visitor learning is a matter of interaction and engagement, rather than the absorption of information, and there are three distinct areas of visitor interactions that influence learning: (1) interactions with the study center environments, including their physical environments and their contextual environments of supporting digital and material resources; (2) interactions with people in the study centers, primarily but not exclusively the study center staff; and (3) interactions with objects from the collections.

Each of these areas has its strengths and weaknesses. For example, the study center environments can create a mood, and provide contextual cues and resources, that encourage sustained and thoughtful inquiry. But they can also be intimidating spaces that are difficult to access for a variety of reasons. Interactions in the study centers between visitors and knowledgeable staff—including curatorial staff—play a strikingly large role in learning. Staff function as welcoming, interested partners, responsive guides, expert scholars, and co-learners, as well as valued faculty collaborators. But playing these many roles requires time and is often in tension with other duties. Regarding the works of art and artifacts themselves, the ways visitors interact directly with objects in the study centers often engage them in "high-end cognition"—forms of thinking and learning that are characteristic of sophisticated disciplinary

and interdisciplinary inquiry, such as making nuanced discernments, posing sophisticated problems, exploring multiple perspectives, and making generative comparisons and connections. These forms of thinking and learning lead naturally to complex aesthetic understandings, but not all visitors can enter into them on their own, without additional support and resources.

Based on these and similar findings, this report offers several recommendations for improving, enhancing and extending the power of study center learning. Among them are:

- Attend to multiple issues of access to the study centers so that more visitors are aware of their existence and how to use them.
- Develop a dynamic and flexible database for the collections that invites users to explore diverse themes and to examine objects from diverse perspectives and disciplines.
- Create optimal staff roles and structures so that curators and other knowledgeable staff are encouraged to have an active presence in the study centers.
- Develop stronger connections between the study centers and other museum exhibits and activities.
- Explore connections to organizations and institutions beyond the Art Museums and the University.
- Continue to deepen and expand connections with university faculty, especially faculty whose disciplines don't typically connect to art and art scholarship.
- Provide more opportunities for all Harvard undergraduates to develop the skills and habits of mind involved in aesthetic understanding.

At their best, the study centers offer supportive, engaging and intimate environments for exploring original works of art and artifacts. They are environments that provide visitors with access to expert knowledge and help them develop complex aesthetic understandings through guided yet independent learning. Above all, they are environments that preserve the primacy of looking.

Harvard's recent *Report of the Task Force on General Education* (Harvard University, 2007) identifies a rich array of skills and habits of mind that Harvard wishes to cultivate in its students. Among them are skills and habits involved in visual learning and aesthetic responsiveness. These habits of mind—perhaps first among them the habit of prolonged and careful looking—are also of value for museum audiences more broadly, both within the study centers and beyond them. Throughout this report we argue for making the processes of thinking, looking, and learning that come naturally in the study centers more visible and accessible in a variety of museum offerings. We hope that the analysis of study center learning offered in this report provides a useful resource for doing so.

Introduction

The Harvard University Art Museums (HUAM) currently have two active study centers. The Agnes Mongan Center for the Study of Prints, Drawings, and Photographs specializes in works on paper from the collection of the Fogg Art Museum. The Study Room of the Busch-Reisinger Museum brings together works on paper as well as small-scale sculpture, decorative arts, and research materials on modern art and design. More dynamic, participatory, and self-directed than visits to the museum galleries, study center experiences allow visitors to view a far greater variety of objects than appear on display in the galleries and to focus on works specific to their individual interests. Although the Arthur M. Sackler Museum, which focuses on Ancient, Asian, Islamic, and Later Indian art, doesn't currently have space for a study center, it partakes of the study center spirit; by arrangement it, too, makes works in its collection that are not on display available to classes and visitors who wish to view them. The historic building at 32 Quincy Street, the site of the Fogg and Busch-Reisinger Museums, will close for extensive renovations in June of 2008. When the building reopens, it will house all three museums, along with study centers for each of the collections.

Though they were originally designed with specialists in mind, the HUAM study centers have always been open to the public. Their design was derived from a methodology of connoisseurship and they offered scholars and collectors quiet, well-lit spaces for the intimate study primarily of prints and drawings. The study centers are viewed by many as a jewel in the crown of the Art Museums. Most obviously, they are portals to an exceptional collection. But beyond that, they are also exceptional learning environments—rare places where visitors can immerse themselves in prolonged, intimate, and often profound experiences with original works of art.

For readers of this report who haven't yet visited a HUAM study room, consider the Agnes Mongan Center off the courtyard on the first floor of the Fogg Museum. On stepping inside, the first-time visitor is struck by the light that suffuses the room, emanating from the tall north-facing windows and illuminating several large tables occupying most of the space. There is a scattering of people at the tables, some alone and others with companions. The visitors are focused intently on works of art laid out before them. Most of these objects are works on paper—original drawings, prints, watercolors, or photographs. Surprisingly, most of the works are unframed, and not even glass separates the art from the observers. They are studying Michelangelo drawings, or Rembrandt etchings, or Degas

photographs, or Bauhaus textiles. They range in age from 20-year-olds to people in their sixties, and their professions and interests are varied: Among them are physicians, visual artists, educators, musicians, collectors, students, historians, administrators, tourists. Many of them, though certainly not all, have at least a passing familiarity with the world of art scholarship.

Though HUAM has long known that the study centers are powerful places of learning, there has been little systematic research on their educational benefits or potential. What kinds of learning occur in the HUAM study centers? What makes the learning powerful? How might its benefits be enhanced and extended to new audiences and reflected in other museum offerings? As HUAM commences renovation of 32 Quincy Street and plans for the construction of a new museum of modern and contemporary art at the center of Harvard's new Allston campus, these questions are particularly timely. To help address them, HUAM commissioned Harvard Project Zero, a research center at the Harvard Graduate School of Education with a long history of investigating cognition and the arts, to conduct a one-year investigation of the nature of learning in, and related to, the study centers. Between September, 2006 and August, 2007, Project Zero engaged in several strands of research, including interviews with HUAM curators and staff, observations and interviews in the study centers, interviews with faculty from Harvard and other local universities and institutions across a variety of disciplines, and an extensive review of related literature. This document, written by Project Zero, reports the findings of the research.

What is Learning?

Before discussing our findings, we turn, first, to a brief discussion of the concept of learning—a concept that is notoriously difficult to define, but nonetheless at the center of our research. The work of a definition of learning is to capture the nature and dynamism of cognition in all its varieties. It is a job description that is nearly impossible to fill. Here is a very broad definition that most people would find hard to argue with: *Learning is the process of developing knowledge, skills, or dispositions through study, instruction, or experience.* This definition may have broad appeal, but it isn't particularly useful as a research perspective because it doesn't provide much of a focus for inquiry. Here is a more focused definition, perhaps less widely acceptable, but more useful in providing shape to a program of research: *Learning is a dynamic process of meaning-making. It involves constructing new ideas and understandings through interaction with physical, social, cultural, and epistemological aspects of the environment.*

This characterization of learning is meant to underscore that learners do not passively absorb knowledge in a neutral setting; they acquire it through active engagement in multi-faceted contexts. It is a definition that reflects a constructivist theory of learning, which is a dominant theory in education circles today. In broad strokes, a basic principle of constructivism is that people construct knowledge by drawing on and building upon their own impressions, ideas, and experiences, and in interaction with a multi-dimensional environment. Knowledge consists of the meanings made from these interactions, and learning takes place in the interactions themselves. There are many varieties of constructivism, and not all theorists who label themselves constructivists agree on a definition. But most would agree with at least these two points: (1) Learning involves active cognitive and sensory engagement rather than the passive absorption of information; and (2) exemplary pedagogies and designs for encouraging learning—in formal classroom settings and in informal settings like museums—do not simply transmit knowledge; they create opportunities for active and reflective meaning-making.

There are echoes of a constructivist viewpoint in many learning settings these days, including in Harvard's recent *Report of the Task Force on General Education*, with its emphasis on active learning, interactive teaching environments, and student engagement (Harvard University, 2007). In the last two decades, a constructivist view of learning and meaning-making has also permeated the way people think about museums. A constructivist view has served as a lens to explore how visitors and museums negotiate individual and collective narratives and meanings (Hooper-Greenhill, 1992; Roberts, 1997). It has provided a frame of reference for exploring the role of context in museum learning, particularly the way the physical and cultural contexts of the museum interact with visitors' personal, social, and cultural contexts (Falk & Dierking, 1992). It has provided a frame of reference for focusing on the social dimensions of museum learning and for examining how the conversations people have in museums reflect both the processes and products of learning (Leinhardt, Crowley & Knutson, 2002). It has been used as a perspective for examining the complexity of object-centered learning in museums and other informal learning environments (Paris, 2002). As a theoretical lens, constructivism has been generative for museum education and museology because it has ushered in a host of fresh perspectives and new ideas. Museums are often seen as promising constructivist environments because they seem to be venues that naturally encourage people to do the kinds of things that are hallmarks of constructivist learning—to explore and discover their own interests, to actively engage with rich stimuli, and to use their own backgrounds and prior knowledge as explicit frames of reference for constructing knowledge (Hein, 1998).

Like many capacious concepts, the breadth of the concept of constructivism comes at the expense of specificity. Because it re-orients the idea of learning away from the acquisition of facts and toward the interactions and processes by which people make meaning, a constructivist perspective makes it hard to draw a clear line between what counts as learning and what doesn't. From the standpoint of research, this needn't be viewed as a problem and in fact can be viewed as an advantage, because it encourages researchers to look for learning in a wide variety of ways and places. But a bit more specificity may be in order. Here are three additional ideas about learning, particularly in relation to the HUAM study centers, that influenced both the way we approached this inquiry and how we interpreted its results.

Moments of learning are hard to pinpoint. Only with the simplest facts and procedures can we reliably pinpoint a moment when we can say "I know" or "I understand." More commonly, new perspectives and ideas are built upon transformations of previous understandings and unfold over time in the flow of experience. Learning, particularly complex learning, takes time, and it is often hard to discern when a learning process begins and when it ends. Indeed, this point is often made in the context of museum evaluation: When should learning be measured? Immediately after a visitor leaves an exhibit or the museum? A week later, after time for reflection? A year later? A decade later?

From a research perspective, identifying a single moment in the study center experience that captures the fullness of visitor learning in study centers is neither possible nor particularly desirable. More illuminating is to consider the many moments that visitors, and the staff and faculty who work with them, identify as having value, and then to try to discern underlying patterns and themes across them. This is what we have tried to do in our research, and the way we report our findings reflects this approach. The report weaves together perspectives and ideas within and across the three different groups of people we interviewed—HUAM staff, casual visitors to the study centers, and university faculty. Most of the findings are presented in narrative form, and we quote liberally from the interview transcripts, so that individual voices can be heard.

There are many signs of learning and many learning outcomes. From a traditional view, learning occurs when knowledge is transmitted by experts and absorbed by learners. It is then measured by testing to see how much of the transmitted information learners

have retained. Shifting the conception of learning away from the idea of accumulating information and toward an emphasis on active engagement means there are suddenly

many more possible places to look for learning. For example, by taking this perspective in the study centers, we found that learning is present in the kinds of conversations that take place between visitors and staff, in the ways visitors juxtapose and compare objects, in the ways they sketch or draw or take notes, even in the ways they physically orient themselves to the works of art they are viewing. We also found that there are many outcomes of learning in the study centers. To be sure, as we will show, people in study centers learn a lot about particular objects. But they often learn other things as well. For example, people learn about the process of critical looking and about the artistic process more generally. They learn about specific disciplinary and interdisciplinary concepts and about the scope of disciplinary lenses. They learn about learning, about themselves, and about a field and a profession. This concentration of so many possible learning outcomes is one of the key reasons study center learning can be so powerful.

Learning isn't always intentional. Often, people set out to learn something specific and succeed in learning exactly what they intended to learn. Alternatively, people set out on an inquiry and end up learning quite something different from, or something more than, what they originally intended to learn. This happens often in the study centers. Visitors arrive with plans to view one kind of object and learn about one kind of thing. But, often as a result of conversation with a HUAM staff person, they discover new things to look at, make unexpected connections, and develop new questions and ideas. Visitors find this element of surprise and the excitement of unintended learning quite memorable, and it figures heavily in their accounts of their study center experiences.

In addition to departing from intended expectations, learning also happens peripherally and without intentional focus at all. In the study centers, visitors take cues from the physical and contextual environments of the study centers, often without being fully aware of them. For example, there are cues about the nature of scholarly activity embedded in the architecture and furnishings and moods of the study room spaces. There are also cues about the proper outcomes of study center learning embedded in the taxonomic structures of available reference materials, resources and displays. Even if visitors aren't aware of these cues, they can exert considerable influence on visitors' learning expectations and attitudes.

How Can This Report Be Useful?

The foregoing ideas about learning, along with a general constructivist perspective, provide the frame for the research discussed in this report. The goal of the research was to discern the qualities of study center experiences that HUAM staff, visitors to the study centers, and university faculty perceive as educationally striking or valuable, and to look for underlying patterns and themes in the important qualities of these experiences. To do this, we used a qualitative research methodology described in more detail in the following chapter. Broadly, it is a methodology that allowed us to characterize and interpret the complexity of study center learning, rather than to simplify it. Here are three ways we hope this report can be useful.

1. ***Provide a common language to talk about the value of the study centers, both among HUAM staff and in broader conversations with the university and the public.*** This was among the goals explicitly stated by HUAM at the outset of the project. Although the power of study center learning has been widely recognized, HUAM staff have not had a robust, shared vocabulary for discussing its specific features and nuances. Our hope is that the themes and dimensions discussed in this report can provide such a vocabulary, one that allows HUAM staff to recognize and focus attention on specific features of study center learning, and to develop nuanced strategies for improving it. We also hope this language helps foster conversation about the connections between the study centers and the goals expressed in Harvard's recent *Report of the Task Force on General Education* (Harvard University, 2007). Perhaps this conversation could focus specifically on ways to offer more Harvard undergraduates the opportunity to develop complex aesthetic and interpretive understandings through active engagement with original works of art.

2. ***Suggest ways to improve and enhance study center experiences and possibly enlarge their reach.*** Throughout the report, we make several suggestions and recommendations. For example, we recommend design features for the new and newly-renovated study rooms, we make suggestions concerning the development of a dynamic, user-centered electronic database, we recommend ways to make study center learning more accessible and more visible to a variety of users, including novice viewers of art. A list of recommendations appears at the end of each major section of the report.

3. *Help HUAM further develop its educational mission and better understand how the power of study center learning can inform its educational activities.*
Expanding the number of visitors to the study centers is not the only way to expand their reach. If HUAM wishes, more could be done through other museum offerings and activities to highlight some of the features that make study center learning exemplary. For example, one of the obvious and important features of learning in the study centers is that visitors feel encouraged—indeed expected—to spend a considerable amount of time looking closely at a small number of objects. What could galleries to do create similar expectations? What could be done in this regard through lectures, workshops, even classroom visits? Another powerful feature of study center learning has to do with juxtaposing a small number of works of art, making comparisons among them, and considering the contexts these juxtapositions create. Though the works of art on gallery walls are fixed and can't be moved about as they can in the study centers, there may be innovative ways that gallery displays can better help visitors personally experience the power of comparison and the role of juxtaposition. Additional connections between learning in the study centers and other museum offerings are suggested throughout this report.

How is the Report Organized?

This introduction is followed by five chapters. Chapter One describes our research methods and procedures, including the kinds of literature we reviewed and the different study center constituencies we interviewed. As we describe in Chapter One, analysis of our interview data revealed three categories of interactions affecting how and what people learn in study centers. These categories—environments, people, and objects—are the themes of the three central chapters of the report. In Chapter Two, we examine the interaction between visitors and the study center *environments* that surround them, both the physical environment, or the space itself, and the contextual environment of resources and databases. In Chapter Three, we turn to interactions among *people* in the study rooms, particularly interactions between visitors and staff. In Chapter Four, we focus on direct interactions between visitors and the *objects* they view. Finally, in Chapter Five we briefly summarize our main findings and recommendations and conclude with a discussion of the connection between the study centers and the mission of the Art Museums.

Chapter 1
Research Methods

The project wove together four strands of research:

1. A review of relevant literature, including internal HUAM documents as well as published texts in the fields of education, cognitive science, and museum studies
2. Interviews with HUAM staff
3. Observation-interviews with study center visitors
4. Interviews with faculty

A qualitative research methodology, a method commonly used in the social sciences, was employed across all four research strands. Below we describe our specific research procedures. But first, by way of explaining why we chose this methodology, we say a few words about the nature of qualitative research and how it differs from quantitative research.

Qualitative research is a tool for developing rich characterizations of complex settings and the meanings individuals make within them. Its aim is to collect rich and varied information. It contrasts with quantitative research in that it emphasizes detail and complexity over generalizability. Qualitative research is interpretive and suggestive. Its basic elements of analysis are words and ideas, and it is especially useful for capturing the qualities of individual experiences and finding patterns and themes within and across them. In contrast, quantitative research is numeric and focused on measurement: Its basic element of analysis is numbers, and it is useful for counting how many times something occurs and predicting the likelihood that it will occur again. Quantitative research is typically conducted through numerical surveys and statistical analysis. Qualitative research is typically conducted through in-depth interviews and observations and a review of written documents or other complex artifacts. Qualitative data, such as interview transcripts, observational notes, and written documents, are analyzed through iterative, interpretive processes—interplays between theory and analysis—that aim to bring out deep patterns and themes, and it is usually reported in narrative form. The narratives are organized thematically to reveal qualities and patterns and they often rely heavily on quotes from individuals, which give voice to the specific experiences and understandings of participants.

We chose a qualitative research approach for this project because it best addresses the kinds of goals HUAM stated at the outset: understanding more deeply the character of study center learning; developing a common language to describe and discuss learning in the study centers; and envisioning possible connections between the study centers and other museum offerings. This report is a fairly typical qualitative research report. It blends accounts of the faculty, staff, and visitors we interviewed in ways that highlight individual meanings but also bring out broad themes and patterns across the three strands. Though qualitative research is by definition subjective, it can and in fact often does inform institutional decision-making. Just as individuals reflect on their experiences and derive meaning from them in ways that inform their future actions, qualitative research can inform future institutional actions by providing a textured analysis of the value people perceive or experience in particular settings and suggesting recommendations for improving that value. In keeping with this, the report makes several recommendations to HUAM about the design and use of its study centers. But we present our recommendations somewhat separately from the report of the data, discussing recommendations at the ends of major sections, under the heading *Opportunities and Recommendations*, rather than integrating them into the narrative. We hope this structure will encourage HUAM to derive its own implications and recommendations from the research, in addition to reviewing ours. We now turn to descriptions of the research procedures for each of the four strands.

Literature Review

At the very outset of the project and throughout its duration we reviewed a variety of written texts related to the themes of the research. We began by reviewing HUAM internal documents relating to the study centers. These included documents drafted by the Study Center Task Force over the past two years and by other related task forces dating back several years, as well as documents from the Busch-Reisinger Museum dating back to its expansion in 1988, including research done on study rooms by former Busch-Reisinger Museum curatorial intern, Sarah Miller. We also reviewed HUAM strategic plans from the past two years. In addition to these internal documents, we reviewed a variety of relevant published literature concerning learning with and from objects in museum spaces, drawing mainly from the fields of education, cognitive psychology, museum education, and art history. As we amassed a growing collection of literature, we identified themes and trends that informed the development of our research procedures and data analysis. (See Appendix A for a complete bibliography of published texts that informed our work.)

The literature review confirmed what many HUAM staff had already told us—that the study centers, which are open to specialists and non-specialists and committed to supporting learning across the curriculum, are unusual if not unique. It also confirmed our own suspicion that the task Project Zero and HUAM had undertaken—a careful study of learning in such spaces—has few precedents. Overwhelmingly, our reading documented visitor experiences in galleries and exhibits. Though we found some literature related to learning in other museum areas, literature about study centers, or about museum spaces offering similarly intimate viewing experiences, is largely absent from the record. This is itself a research finding. The literature review helped us to locate and understand the gap in the field the present work addresses. It also encouraged us to explore how learning in the study centers is similar to and different from other encounters with objects in museums.

INTERVIEWS

The following three sections describe the procedures, selection process, and participants for each of the three interview strands. Though each strand involved somewhat different activities, the data from all three strands were analyzed together using a common coding scheme derived from themes found within and across the strands. For this reason, we describe the process of coding and analyzing the data after we have described the specific activities of each strand.

Staff Interviews

Selection, procedures, and participants. The first interviews we began conducting were with HUAM staff. Seven interviews were conducted with eight staff members (one interview included two staff members); six of these interviews were conducted between October 2006 and January 2007, and one interview was conducted in May 2007.

The interviewees were selected by the researchers in consultation with members of HUAM staff. The goal was to talk with a range of staff who were deeply familiar with the study centers and could offer informed and diverse perspectives on study center learning from their various backgrounds and roles. We interviewed curatorial staff from departments across the three Art Museums. We also interviewed staff connected with conservation, the archives, and education. Our choices were in part constrained by the length of the project,

and we recognize that there are many additional staff who could have provided valuable insights. A basic interview protocol was used for all the interviews; the protocol was adapted slightly each time to account for the particular perspective of each interviewee. (See Appendix B for sample protocol.) All interviews were audio-recorded and transcribed. These transcripts and audio files have been submitted to the HUAM archives. The staff interviewees included:

- Amy Brauer—Diane Heath Beever Associate Curator of Ancient Art, Arthur M. Sackler Museum
- Marjorie ("Jerry") B. Cohn—Carl A. Weyerhaeuser Curator Emerita of Prints, Fogg Art Museum
- Ivan Gaskell—Margaret S. Winthrop Curator of Painting, Sculpture, and Decorative Arts, Fogg Art Museum
- Melissa Moy—assistant curator of Chinese Art, Arthur M. Sackler Museum
- Peter Nisbet—Daimler-Benz Curator, Busch-Reisinger Museum
- Christina Rosenberger—research coordinator, Center for the Technical Study of Modern Art
- Lynne Stanton—coordinator of public education, Public Education
- Susan von Salis—associate curator of archives, Harvard University Art Museums Archives

Visitor Observation-Interviews

Selection, procedures, and participants. Between January and June 2007, 39 visitors were observed in a study room and 29 of those observed were subsequently interviewed. The chart below shows the distribution of observations and interviews across the two study rooms. There were more interviews in the Agnes Mongan Center (AMC) than in the Busch-Reisinger Museum (BRM) Study Room due to differences in visitation to the two study rooms and the frequency of visitors to each room during the times the researchers were present.

	Observation Only	Observation & Interview	Total
AMC	10	23	33
BRM Study Room	0	6	6
Both study rooms	10	29	39

Of the 39 visitors who were observed (including the 29 who were also interviewed), 26 entered the study room on their own and were invited to participate in the research once they walked in. Thirteen *solicited* participants had not planned to enter the study room, but were approached during their museum visits and invited to enter with a researcher. All solicited participants were both observed and interviewed.

Of the 39 people observed, 25 were female and 14 were male, ranging in age from about 20 to over 60. The majority of visitors were in their 20s (most were students); the second largest group was in their 60s. The average amount of time visitors spent in the study rooms was 43 minutes; the majority spent between 30 and 50 minutes.

For the walk-in observation-interviews, the procedure was as follows. Researchers were present in the study rooms at regularly scheduled times. When a researcher was in a study room, a study room staff person asked every visitor or group of visitors entering the room if he/she/they wanted to participate in the research. Only one visitor declined to participate. When visitors agreed, they were asked to sign the consent form (see Appendix C) and were given copies for their records. Then, with the visitors' knowledge and prior permission, a researcher unobtrusively observed participants from a discreet distance, filling out an observation checklist (see Appendix D) with spaces for recording various behaviors such as orientation strategies, body language and movement, conversation with another visitor or staff member, sketching, note-taking, and any other observable details of the visit. The number and types of works visitors requested were also recorded. As visitors prepared to leave the study room, they were approached by a researcher and invited to participate in an interview**.** Only one person refused to be interviewed, explaining that he was pressed for time.

For the solicited interviews, the selection procedure was different. Six of the invited participants were known to the interviewers; their participation was solicited prior to their museum visit. Seven were anonymous museum visitors who were approached at the museum shop by museum staff and invited to participate.

Once visitors agreed to be interviewed, they were asked a series of predetermined questions, along with follow-up questions that seemed appropriate in the moment. (See Appendix E for the basic interview protocol.) During the interviews, names were neither requested nor recorded: The interviews are anonymous. The interviews were audio-recorded and transcribed, with the exception of three, which were not recorded due to technical difficulties. Written notes were taken immediately after these three interviews.

All participant selection and interview procedures followed standard research guidelines for informed consent and were approved by the Harvard University Committee on the Use of Human Subjects in Research (IRB ID# 109). (See Appendix F for IRB approval letter.) The transcripts of all visitor interviews have been submitted to the HUAM archives and marked for HUAM internal use only. These transcripts are all anonymous. Archival procedures were checked with the IRB and approved by email correspondence. A printout of the email is included in the archives.

Faculty Interviews

Selection, procedures, and participants. Sixteen faculty interviews were conducted over a period of six months, between January and June 2007. Thirteen faculty were from Harvard, including one Harvard teaching fellow. Three faculty were from other local institutions. Faculty were selected by the researchers according to a number of criteria. Most importantly, the researchers sought a range of disciplinary voices as well as variation in experience using art museum resources. Many, but not all, of the faculty interviewed had prior teaching and/or research experience with objects. Nine of those interviewed had previously used HUAM resources. Eight had taught with objects in one of the study centers or with collections from departments of the Sackler Museum. The faculty interviewed represented different career stages and a range of disciplines, including art history, the visual arts, music, history, anthropology, education, psychology, math, and biology. The faculty interviewees included:

- Marisa Bass—Teaching Fellow in History of Art and Architecture
- David Blackbourn—Coolidge Professor of History; Director of the Minda de Gunzberg Center for European Studies
- Patrick Cavanagh—Professor of Psychology
- Elizabeth Cavicchi—Experimental Science Instructor, The Edgerton Center, MIT
- Elizabeth Denne—Benjamin Peirce Assistant Professor of Mathematics
- Rowan Flad—Assistant Professor of Anthropology
- James Hanken—Professor of Biology; Director, Curator of Herpetology, and Alexander Agassiz Professor of Zoology in the Museum of Comparative Zoology
- Robin Kelsey—John L. Loeb Associate Professor of the Humanities, History of Art and Architecture
- Eric Rosenberg—Associate Professor of Art History, Tufts University
- David Roxburgh—Prince Alwaleed bin Talal Professor of Islamic Art History

- Sally Schwager—Lecturer on Education; Director, Learning and Teaching Program, Graduate School of Education
- Nancy Selvage—Director, Ceramics Program, Office for the Arts
- Kay Shelemay—G. Gordon Watts Professor of Music, Professor of African and African American Studies
- Laurel Ulrich—300th Anniversary University Professor, History
- David Wenstrom—Drawing Instructor, Cambridge Center for Adult Education
- Robert Woollacott—Professor of Biology and Curator of Marine Invertebrates in the Museum of Comparative Zoology

Two similar interview protocols were used; one for those who had experience teaching with objects and using HUAM resources, and one for those who did not. Interview questions were adapted for each individual interviewee. (See Appendix G for sample protocols.) All faculty interviewees granted us permission to cite their names in conjunction with their direct quotations in the final report. The transcripts and audio files of faculty interviewees who approved have also been submitted to the HUAM archives.

Coding and Analyzing the Interviews

The procedure for analyzing qualitative (i.e. nonnumeric) data, including interview data, consists mainly of developing and applying a coding scheme. (See Appendix H for the coding scheme.) A coding scheme allows researchers to organize the data so that they can be examined for overarching patterns and themes. Codes are based on ideas, concepts, activities, and choices that seem to be represented in the data. For example, as we worked to understand the experiences of study center visitors, we developed codes to capture the ways visitors oriented themselves to study center environments, the types of people they interacted with and the character of those interactions, the characteristics people emphasized when they described their experiences, their strategies for consulting resources in addition to works of art, and so on.

The development of a coding scheme is an iterative process of generating possible codes, applying them to the data, revising them, applying them again, and eventually checking that the codes can be interpreted and applied to the data by more than one researcher in the same way. Although there were three different sets of interview data from three different groups—HUAM staff, study center visitors, and faculty—this iterative process made it clear to us that the most revealing coding scheme was one that could be usefully applied to all three data sets together. For example, through this process, one code that emerged

was *surprise–immediacy and engagement.* This was a theme that was mentioned by several interviewees in each of the three strands. Each strand brought different perspectives to the theme, and together these accounts help us to understand how and why objects surprise people, and how the experience of surprise can support object-centered learning (this theme is discussed in detail in Chapter 4).

As we looked closely at the three data sets together, another kind of overarching pattern emerged: We noticed that, across the staff, visitor, and faculty interviews, people learned or were perceived as learning in the study centers as a result of three kinds of interactions—interactions with study center environments; interactions with other people in the study center, especially study center staff; and interactions with objects. As we mentioned in the introduction, these three categories of interactions provide the structure for the following three chapters.

Chapter 2
ENVIRONMENTS

The HUAM study centers are learning environments—spaces provided by the Museums that help students, faculty, and visitors enter and understand both the extensive, unedited collections of objects and the ways museum staff and other researchers arrange, examine, and make sense of the works of art in their care. When people walk into a study room, they see other people looking at works of art. The objects usually rest on tables, always close to the observers, and the observers seem deeply focused and absorbed. Though low conversation is often audible, the room feels hushed. Through contextual clues like the cabinets full of frequently requested objects in the Mongan Center and the display cases and binder listing works by artist and theme in the Busch-Reisinger Museum Study Room, visitors begin to sense the presence, proximity, and availability of large numbers of objects of extraordinary variety and quality. They begin to feel that the space they have entered is a kind of sanctuary, special and set apart. In our interviews, they use the words "luxury," "indulgence," "absolutely heady," "treat," "treasure," "rarity," "connoisseur's experience," "like a private museum" to describe the space and the time they spend there.

The study center environment plays a significant role in shaping visitors' experiences, and various environmental features affect their choices, activities, and impressions. This chapter explores these environmental dimensions and the ways they can enhance study center learning. The chapter is divided into two sections. The first is focused on the most obvious of environmental dimensions—the physical environment, which includes a floor plan, furniture, and equipment designed to support visitors' interactions with objects, with museum staff, and with each other. The second section is focused on the contextual environment, which consists of digital and material resources that together provide a rich context for the object-centered learning and research activities study centers promote. These include digital databases and related electronic resources (the digital environment), and curatorial, archival, and art materials (the material and documentary environment) related to works of art in the collection.

Entering and Using the Main Study Room

Stepping through the door. The physical environment—beginning with the door and entryway—is the first feature of the study center most visitors encounter. While it is true that, once inside, visitors experience the separate, protected dimensions of the study center positively, a door can leave a strong impression. A visitor to the Mongan Center who, with the support of the study center supervisor, went on to explore a number of etchings and lithographs, reflected on his arrival and observed, "The door is not welcoming. It looks like a place that I would not just walk into. ... It feels like you might have to be part of a secret club to go in."

Another visitor who had never entered the study center until specifically invited by one of our researchers, commented:

> As many times as I've been here that's just been a closed door that looks very official that I can't go into. ... Administrative offices is what I always thought they were. ... There's nothing about it, as far as I can tell, that actually invites anybody to even open the door. ... In fact, it's got a lock on it, right? ... Well, that's usually a pretty good sign that you're not wanted in there unless you belong.

Those quoted here visited the Mongan Center, where the door is locked unless a visitor appears or rings the bell, and a staff member responds by pressing a buzzer. The Busch-Reisinger Museum Study Room, which has an open door set at the top of a staircase, receives smaller numbers of visitors. In the interviews we conducted there (though they were too few to predict a trend), the door did not emerge as a problem. To be sure, there are genuine concerns about leaving study center doors literally open—issues of safety, climate control, and so on. But some museum staff members agree with the visitors quoted. For example, Christina Rosenberger, former curatorial intern in the Drawings Department, comments:

> I think the door has to be open ... because then people come in. ... I understand that it's a huge climate issue, but I really believe that it's an important enough point that they should make the climate work with an open door. And a glass door that's closed is not good enough.

Doors and entryways can strongly influence a potential visitor's decision whether or not to enter a study room as well as set a tone for the overall experience. In her writing on object-centered learning in museums, Leona Schauble asks, "How can design be used to communicate what kind of place this is, what it is that we do here, and what community we are being initiated into?" (Schauble, 2002). Since learning with study center objects depends on visitors actually stepping inside the study center, this is a design challenge that invites creativity and careful consideration.

An obvious presence of books and objects. Staff members explain how books and objects—including the temporary displays sometimes visible in the Mongan Center, as well as the longer-term arrangements housed in glass cases in the Busch-Reisinger Museum Study Room—can serve to draw people into study centers, interest them, and make them comfortable enough to want to stay. Curator emerita Jerry Cohn points out:

> There are in our study rooms now, and I think there always should be, an obvious presence of books, reference books. And I think that it often encourages people. People come in and read the books before they dare ask for the work of art. And I think that you should always have a few works of art on view just to remind people that that's what's here. And you engage them visually.

The sight of reference books may be comfortable and encouraging. Yet not all visitors feel visually captivated by them when they walk into a study room. Speaking of the Mongan Center, one visitor commented, "There's nothing there that catches the eye." Like many entering the Mongan Center for the first time, he felt his interest would have increased if objects and images were more immediately in evidence. He goes on:

> [I]f you were greeted by a book with descriptions and, I think, even pictures that you could just hold in your hand. And [by], like, other things on the wall that you can also check out. … Fifteen works laid on that wall could serve as an entry point. You could question their being there.

Another visitor has a similar suggestion:

> [I]f, as part of walking through the area, there were half a dozen different little temporary things that were there for a week or two or whatever, and—[if] you're interested in this, here are several different [directions] you could go with it, or [you could] ask the staff, and they had some knowledge of whatever the display was. I'm just thinking out loud here. But basically something that gets things out visually in front of people.

In a similar spirit, curator Peter Nisbet suggests that a study center "be like a restaurant, in a way," and that a curator, intern, or other staff member choose a "special of the day—a group of four or five objects that person thought was a really stimulating or wacky or intriguing combination of things."

There are often books and objects on display in the study centers; as Jerry Cohn points out, they remind people of what is available. And of course people do come to study centers expecting to look at things. It is worth capitalizing on this expectation and considering what more can be done with the display of books and objects to help orient visitors and help them take on a fruitful mindset.

Entry procedures and orientation. Once inside the study room, visitors must learn and follow rules. Currently, the rules are conveyed verbally and thoughtfully by the staff. Cohn explains, "You have to have a friendly smile when people come in, and not too many 'don'ts.' The 'don'ts' are mostly that we strip you of your jacket and your bags and make you use pencils and are your hands clean." These rules, museum staff agree, are necessary to protect the objects against risks of damage and theft, which can increase with the more frequent handling that takes place in study centers.

The rules are designed to protect the objects, but they also communicate values and expectations to visitors. Archivist Susan von Salis comments, "The rules are best presented as *policy*, and everyone has to follow these policies, and that we're not doing it because we don't trust you, we're doing it to secure the safety of our objects, to be really up front about that." Curator Melissa Moy remarks, "We even make them wash their hands. And I know that seems tedious to some people, but … it's really reminding people who come in that this is a real privilege … and that these are, again, valuable works of art that need to be respected and cared for." No one wants people to feel put off: Faculty and staff alike want students and visitors to feel good about the rules, not oppressed by them. When people are enlisted—not admonished—to care for the objects, they are more likely to experience what curator Ivan Gaskell describes as the ideal atmosphere, "one in which you don't feel over-surveyed, over-awed … [or] beholden," and to feel that "you can follow your ideas without constraint other than what is really necessary for the safety [and] security" of the objects.

Becoming oriented to the study room involves more than learning the rules, of course. It also involves figuring out what to do first, who to talk to, how to find resources, how to request objects, and so on. For new visitors, orientation can be daunting. One visitor to

the Mongan Center comments "there was just too much" to take in. She continues: "It was overwhelming to begin with, knowing that there were … so many options and things to look at, and also that I wasn't sure of the parameters of everything I could look at." Another visitor says, "There were no cues. I would have needed some guidelines. … A map … of where to find things, what's in the room, where it is. That would have been helpful."

Several visitors felt that their experiences would have been enhanced by some kind of overview. "I would have found it helpful to have [read or heard], 'Welcome to the whatever center, and what we have here is a collection of …,'" comments one visitor. Similarly, another visitor wished there had been an indication at the moment she entered that the room would not be limiting—that there is a great deal more to see than what meets the eye. Interestingly, visitors are often unsure of the basic procedure for requesting works. Recalling this uncertainty, a visitor makes a suggestion:

> So if I had walked in and saw a little easel that said, 'Please feel free to peruse the card catalog, there's paper on the top with pencils, please write down the numbers and give it to an associate and they will get the artwork for you and bring it to your table,' that would have been very helpful.

Eric Rosenberg, Associate Professor of Art History at Tufts University, sends students to the study center and shares a concern about orientation. "You know, you walk into the Mongan Center, and … right to your left, there's a card catalogue. [As a student], do you really know whether you're supposed to dive into that or not? … There's a few mysteries there."

Of course, study room staff are not unaware of the challenges of orientation, especially for new visitors, and there are some good practices in place that address the issue. For example, in the Mongan Center, visitors find it helpful to orient themselves by examining some of the artwork kept in cabinets, and the staff often guides them to do so. The Busch-Reisinger Museum Study Room has an inviting binder readily available to visitors that lists some works in the collection by theme as well as by artist. The binder helps orient visitors to the character of the collection and also helps them think about how to choose what to look at. Visitors often comment that they find the binder especially helpful. Still, it is worth thinking further about what more could be done to help orient people to the study centers without also making them feel overly oppressed by rules and procedures. Curator Peter Nisbet suggests that orientation might be most effective if it could begin before people come to the study center:

> I think we might get more people ... coming in more comfortably if they were told about the study centers, or read about them, before they actually arrived at the door. And so the extent to which at the admissions desk or with your ticket or with your little guide to how to use the museum or whatever it is, there was something about you can do this, and when you go in, this is what you'll see and this is what'll happen ... I think that that obviously overcomes inhibitions if you know what's going to happen and you're not sort of totally new.

Seating for comfort, concentration, and conversation. When visitors walk into a study room, among the first things they see are tables and chairs. On both obvious physical and less visible psychological and intellectual levels, these features create expectations and set a tone. Like all HUAM staff we spoke with, education coordinator Lynne Stanton thinks the tone needs to be inviting. Imagining entering the study room from the perspective of a first-time visitor, she says, "I can walk into this place and sit down and it's OK for me to be here. I don't know anything about art, but I think that I could probably sit down ... and what are the manifestations of that? Maybe comfortable chairs? ... [I]t needs to be inviting physically ...."

Providing for visitors' physical comfort helps free them from distractions, like fatigue and crowds, commonly encountered in other museum spaces. According to curator Ivan Gaskell:

> You can be relatively physically at ease [in the study room]. You're not going to be affected by what, for many decades, has been described as museum fatigue, because you can be sitting there and quite comfortable, and you can work for several hours without feeling the physical exhaustion.

Tables and chairs not only signal a comfortable environment, but also define a space where one can spend long stretches of undisturbed time in deep concentration. A visitor remarks, "I find that it's like a private museum ... where you can really just concentrate on the work that you want to look at, and be with it. ... It's nice to have private time to work."

Furniture can be arranged in various ways, and the arrangement of tables and chairs in the study room matters. When people spend time looking at objects, they often move around to see the works from different vantage points, standing up to look from above, for example, and leaning in to look more closely. Also, when possible, they move works

around on the table or easel to examine different aspects of them, such as their backs and sides. As we will discuss in more detail in Chapter 4, these physical movements turn out to be a form of kinesthetic engagement that plays a key role in learning, and the arrangement of furniture in a study room can either encourage or inhibit using the body to learn by looking. For instance, spacious aisles and chairs with ample space between them allow visitors to stand up easily and look from higher vantage points without disturbing others. Closely set chairs and tables with dividers make it harder for people to move works around to examine their different sides.

Seating also helps to facilitate conversation among visitors and researchers. This is important: Conversational interactions in the study room turn out to play several different and powerful roles in the quality of people's learning experiences. Much of Chapter 3 is devoted to a discussion of this. In terms of the physical environment, what's important to note here is that study center spaces need to accommodate both quiet study and collaborative work. As Susan von Salis points out, "Oftentimes people come in in pairs; they work on a project together and it's almost necessary for them to talk to each other." Melissa Moy expressed the wish for "a big open room" that would be "comfortable enough that even if you do have a small group of scholars together discussing something, they're not disturbing somebody two tables away who is trying to carefully sketch something."

Natural light. The Museums are committed to furnishing the study centers with windows admitting natural daylight, and specifically north light. Both faculty members and visitors confirmed the importance of this feature. As one visitor observed, when prints are displayed in galleries, they are usually dimly lit to protect them from damage. In the study center, shorter viewing times protect them. Another visitor remarks, "Here you have an opportunity to actually look at things in their natural light, or very close to natural light."

To take full advantage of the north light, the Museums may want to consider opening the study centers earlier on winter days. "I do prefer the natural light, so I timed it a little—I timed it poorly," said one visitor in March. "I came late in the day, so the lights went on and then I get the glare on the plexiglass." David Wenstrom, a frequent user of the study centers and a drawing teacher at the Cambridge Center for Adult Education, agrees. "Most of those Old Master paintings were painted in north light," he says. He wishes that "in the winter [the study centers would] have earlier hours, because it's beautiful north light, which is the way drawings and paintings were made."

A Faculty Perspective: Space for Classes and Other Groups

Supporting class coherence. Like visitors, faculty members value aspects of the study center environment—its seating, relative quiet, and intimacy—that enable them and their students to focus on the objects they examine. In particular, faculty like to reserve the Mongan Center seminar room, a space set aside for small groups and visiting classes. Eric Rosenberg explains:

> "I really make an effort to get this [seminar] room as opposed to the study room, just because it creates a little more intimate and a little more private experience. ... And because it ... perpetuates what's already been constructed in the classroom ... that defines the class as an entity unto itself, just because they're in here, within these four walls.

Most faculty agree that the physical definition of the seminar room supports students in interacting with objects and participating in discussion. The privacy the room provides helps students pay closer attention to objects and to the observations of their classmates, and encourages them to risk expressing their own ideas. As art history professor Robin Kelsey observes, "I think without question, I get more active involvement, more daring comments, more honest admissions coming [from students] when it's done in the seminar room."

Accommodating group sizes in the seminar room. The small seminar room comfortably holds 10-12 people. For some faculty, a larger seminar room would be preferable. For example, Robin Kelsey would like to enroll 15 students in a seminar but finds it problematic to fit that many into the seminar room. Teaching fellow Marisa Bass has the same problem, and she often teaches in the main room because the seminar room can't accommodate her class size. Even smaller bodies are a tight fit: museum educator Lynne Stanton reports that when she brings a group of 12 third-graders into the seminar room, not all of them can sit down.

Viewing objects in the seminar room. Many faculty would like seminar rooms that not only accommodate slightly larger groups, but also provide more flexible viewing arrangements. Concerned both about the safety of objects and optimal viewing for students, Eric Rosenberg explains, "There needs to be a sense of breathing, the possibility of breathing space, you know, between the constituents of the study room, whereby there isn't the feeling that things are too crowded or too jammed in."

Marisa Bass adds that spaces for classes should be "set up in a way for teaching and moving around, because you have to move, looking at small objects." This point is relevant for observers of large objects as well. Robin Kelsey points out:

> It's fine to be all crowded around a little table if you're looking at a little four by six, but when you're looking at an enormous Gursky print, which you can barely fit on that seminar table, there really isn't even the space to look at it. And so a slightly larger room, but one that wouldn't be so cavernous that you would lose that sense of camaraderie and closeness, but a slightly larger one that would give you more possibilities for setting up photographs would be great.

Kelsey, like other faculty, would like more flexibility as well as more space. "I tend to set up the photographs around the room and on the table," he explains, "and as we, as a class, maneuver around the room, shifting attention from one image to the other, it's sometimes pretty awkward in there." Rosenberg agrees:

> [It's important] that the space and the accoutrements of the space be configured in such a way that a variety of looking experiences can be best facilitated. So that would mean that somehow there's room both for chairs as well as standing, you know, for hovering, sort of maybe just outside of the most immediate sphere of the given object, but also for getting one's nose into it to the extent that's allowed, within reason.

Faculty note that the issue of viewing flexibility is challenging but not insurmountable. Kelsey comments, "Somebody with a brilliant design sense could probably do some helpful and innovative thinking about how to make the viewing of objects in a small class work optimally in a seminar room like that."

Viewing objects in the main study room. Teaching is not limited to the Mongan Center seminar room; it sometimes occurs in the Busch-Reisinger Museum Study Room and in the departments at the Sackler. But after the seminar room, the main study room of the Mongan Center is most often used for teaching, and faculty and staff feel that ample space and viewing flexibility are especially important there as well. For example, museum educator Lynne Stanton comments:

> For the docents, we've had lectures by a curator in the [main room of the] study center that explain some aspect of printmaking or drawing.... There are 32 docents and that's a lot of people to put in the Mongan Center .... Space is a real issue to use that place the way I would like to.

Eric Rosenberg agrees. "The space[s] between the tables are tight, and so you maybe can't get quite as many chairs in there. And some people want to stand, or have to stand."

Larger groups would not be the only beneficiaries of more spacious and flexible main study rooms. Teachers of classes of any size would be encouraged to integrate more varied discussion models and other state-of-the-art pedagogical approaches. Elizabeth Cavicchi, who teaches experimental science at MIT, comments, "If you have a viewing table in there, … it should also be possible to move the table to the side or introduce some kind of way that students can sit together in groups, get apart from each other." Cavicchi imagines a space in which she can have students work in small groups or move freely among several displays. Similarly, Harvard anthropology professor Rowan Flad would find it useful to have a large room that could be set up to offer individual workstations for multiple students. He explains:

> One way that materials are often digested in archaeology classes is to have practical laboratories … where you might have a number of stations with materials set up and you do something with that at each station, where you take the collection of bronzes that are sitting in front of you and you try to put them in chronological order according to a stylistic sequence, or something like that. And one could of course do that as a group, clumsily, by taking everything out and putting it on a single table, all doing it, moving on, but it's more efficient and perhaps more interactive if you have a number of stations and if objects move to students or students move to the objects.

Nancy Selvage, Director of the Ceramics Program, envisions an inventive solution to the logistical difficulties of planning collection visits for large groups of symposium participants:

> When 30 people came up to the table, it would be two or three people deep, and it was sort of hard. But if there were big open spaces that people could stand around, and then there was some little conveyor belt or something in the middle of the room that could go around so everyone could see something up close, but it would keep moving, so they wouldn't necessarily have to handle it. … Many objects you really can't pass around as easily as others—but being able to design so everyone can see everybody, you can feel like you're there in a group, but then you can have this intimate little thing passing you by.

Special-purpose rooms and display spaces. In addition to expressing a desire for flexible small and large teaching spaces, faculty have expressed an interest in flexible exhibit space within the study room. History professor Laurel Ulrich, for example, would like to have display cases or small exhibit spaces available for her class to use over the course of the semester. Other faculty and staff have expressed a wish for additional special-purpose spaces in closer proximity to the study centers. For example, David Wenstrom explains, "It would be nice to have a separate room … with an easel, not sitting at a table or anything, so you could actually copy the painting …." Lynne Stanton describes the related needs of the HUAM education program:

> We need a messy room. We need somewhere where kids can paint, sculpt, get messy, throw things around. And that needs to be close to either a gallery or the study center, so they could come from the study center, looking for specific objects, to this messy room and make a paper mache brass pot. I need a performance space, a stage where there can be dancing and music, and that, too, not too far away from where you would make those connections with [objects].

Accommodating group schedules. "Schedule and timing is really critical," reports Sally Schwager of the Graduate School of Education, who also teaches a course at the Extension School, "[When] teaching at night particularly, we just don't have any access to [museum collections]." Nancy Selvage also has been unable to bring classes to the study centers because she teaches at night:

> Most of our symposia have gone on the weekends, but we've been able to schedule it so that we have our study collection visits when it's possible, given [the] schedule [of the Peabody Museum]. But often our classes at the studio are evening classes. We have—the majority of our classes are evening classes, so if we wanted to have a study collection visit or a museum visit as part of that class, we can't do it.

Even faculty who teach during the weekdays have problems. History professor Laurel Ulrich notes that there isn't always coordination between FAS teaching schedules and the availability of the study rooms: When she teaches her 3:00-5:00 class in the seminar room, she's asked to leave by 4:45, just like all other visitors to the museum.

Even when there is not a conflict with the hours of the museum, faculty sometimes find that scheduling the seminar room is difficult. Time is tight, and though classes can book either the Mongan Center seminar room or the Busch-Reisinger Museum Study Room,

there are only two available spaces, and people don't feel comfortable scheduling for long blocks of time or on a regular basis (e.g. for several or all class sessions in a semester). The limited availability of the seminar room can also affect course design. Marissa Bass explains:

> If I had known there was a space where I could teach a whole section, and it was a space that was more frequently accessible, I would probably have … done a separate class on drawings, in which we maybe would have looked at images, projected images and also actual images, too, and then spent more time on each. But in part because of the difficulty of scheduling the Mongan Center, we decided to condense [the drawings and paintings sessions] into one.

The Physical Environment: Opportunities and Recommendations

From the design of the entryway to the arrangement of furnishings to the size and flexibility of different viewing spaces, the physical features of the study center environment play a significant role in learning. The physical environment sets a tone for visitors' experiences, communicates expectations for appropriate kinds of cognitive and kinesthetic activities, and creates or inhibits a variety of viewing experiences. Clearly, to a large extent, the physical environments of the study centers work well, as their frequent use by visitors, faculty, and staff attest. Our research suggests that there are also ways that the learning affordances of the physical environment can be improved and its positive features more fully realized. Here is a brief summary of the recommendations suggested by our research:

Arrival and attention. Finding ways to balance the needs for security and climate control with the need to present an open and welcoming entrance would encourage more visitors to step inside the study centers. In thinking ahead to the new study centers, design alternatives should be explored in which open doors and closed doors are not the only options. The Museums are considering including a separate and inviting reception room at the study center entrance. This architectural innovation certainly would address the difficulties visitors experience with the existing entrance to the Mongan Center.

The practice of offering temporary, experimental, changing displays of objects near study center entryways could be expanded to better catch visitors' attention and interest.

Entryways are especially good places to offer temporary display areas to classes currently being taught in the study centers, so that course-related use of the study centers could be more visible to wider audiences.

Rules, orientation, and selection. Communicating complete, clear, and respectful instructions for requesting and protecting objects would help orient visitors to study center procedures and initiate them to the privileges and responsibilities of using the collections. These instructions could easily be communicated in a simple one-page handout. The handout could be available in the entryway to the study center, as well as online and at the front desk.

Developing more resources that build on the successes of the binder in the Busch-Reisinger Museum Study Room and the cabinets filled with frequently requested objects in the Mongan Center would help new visitors orient themselves to the study rooms and choose objects to view. The signal characteristic of both of these resources is that they help visitors vividly envision the objects and possibilities the study centers hold without constraining or over-determining visitors' choices.

Lighting and furnishings. Continued insistence on large north-facing windows in all study center rooms, and considering earlier open hours in winter, would provide visitors the best possible light in which to examine objects.

To maximize the benefits of providing seating for visitors, chairs selected for the new study centers and seminar rooms should be comfortable and inviting, and tables should be sized and shaped to be arranged and rearranged to promote either quiet study or conversational gatherings—or both at the same time, in different parts of the room. Well-designed small tables, for example, could be joined when necessary to form larger surfaces.

Room size and viewing flexibility. Expanded main study rooms and larger seminar rooms would accommodate classes and other groups of various sizes and promote the kinds of movement and discussion associated with object study and with learning. Flexible furnishings in both the main room and seminar rooms would serve the diverse viewing purposes of different groups and classes.

Various kinds of display props, both built-in and freestanding, and perhaps including some yet to be invented, could be installed and available in both the main and seminar rooms to help make objects both safer and more visible.

Scheduling and coordination. The class schedules of the College and schools could be considered when setting open hours for the study centers and museums. Pushing back closing time even half an hour would make visits possible for more classes. Like Schlesinger Library, for example, the museums and/or study centers might also consider offering evening hours once a week or even occasionally. Increasing the number of seminar rooms would also help to ease scheduling difficulties. These measures would have a direct positive impact on the number and length of student encounters with objects.

THE CONTEXTUAL ENVIRONMENT

The Digital Environment

> *Art museums are not about art history. That's one of the things they concern themselves with, but they offer the opportunity to work with artifacts from many different points of view—as well as their own, if you like. So [HUAM] is inherently a trans-disciplinary institution, and I hope that we can strengthen that.*
>
> *– Ivan Gaskell, Curator*

In large and far-reaching collections such as HUAM's, working with artifacts from many points of view requires powerful organizing structures and strong navigational tools. All the faculty and HUAM staff we spoke with, as well as many of the visitors we interviewed, emphasized the importance of a comprehensive electronic database that documents works of art and related materials in the collections, and is accessible both from the study centers and from off-site locations. Many visitors said they would have searched such a database before coming to the study center. Even more insisted that onsite electronic access to a collections database from multiple public terminals within the study center itself would have helped them find works of art of interest to them. As we will see, for Harvard and non-Harvard faculty and students, the need for remote access to a state-of-the-art database is even more urgent.

A good database would not only reveal the objects in the collections, but also help to orient visitors and empower them to make independent choices. Curator Melissa Moy points out that in the absence of a comprehensive system, staff members usually help choose specific objects: "Usually, when people make requests to see objects, they provide their general guidelines and we will help them narrow it down."

As Lynne Stanton argues, however, the ability to identify objects more independently would strengthen visitors' own identities as legitimate study center users and, in turn, strengthen their active involvement in learning. She explains:

> I can go in a library and I know that I can go to the computer and I can find what I want, so that makes me feel, okay, I belong here. I'm often struck by how wonderful it would be if an art museum could feel to many more people like a library does.

Jerry Cohn agrees:

> Without public terminals in the [study center], ... I think the public does feel inhibited. Everybody is so used to searching on a computer now—if you had an easily accessed interface, something where you just give them a hint on how to search, people would have a wonderful time looking for it themselves.

The need for multiple taxonomies. When asked how they decided which objects to examine, visitors give remarkably similar answers. One says she looked for artists whose work she was already familiar with. "I ... just looked for the artists that I was interested in," echoes another. Both of these visitors identified artists themselves, but relied on the study center staff to choose which of those artists' works to retrieve. Visitors enjoy the works they encounter this way, and in fact, as the next chapter makes clear, knowledgeable and helpful guidance from staff in this area is a great strength of the study centers. Still, visitors wonder about all the unfamiliar artists and objects they may have missed. One visitor who chose an artist and was guided to particular works commented:

> I truly enjoyed seeing the Ansel Adams. I mean, I've never seen an Ansel Adams that close, a real one, so it was very exciting to be in that position. But I think there was so much more I could have seen if I knew what I was looking for.

A visitor who didn't start with an artist's name comments that looking for works in the study center felt like staring at a blank wall. He says of the card catalog, "If I don't know the vast majority of the people named, it doesn't do me much good."

Visitors who arrive without a specific artist in mind need innovative browsing functions. "I would like to be able to describe that picture and ask to have more like it," remarks one visitor. Some feared that searching for artwork on a computer would give them only the

exact item or artist they sought. Echoing Lynne Stanton's thoughts, they wished for a database that works like browsing the shelves of a library: "You see what is stored around that book and you think oh, that's cool, too." Another visitor envisions a browsing function that works the way people explore galleries. He explains:

> Maybe you go to a period you like. Say I like Emil Nolde, so I'll go up [to the gallery] and look, and then I'll see the other dozen artists around there, some of which I couldn't care less about, but some of which are really interesting and I've never seen before and I'll go and look more closely.

To address many of the interests and needs people bring to the study centers, focused searches are required, but an artist search—currently the primary search format—simply isn't relevant or useful. As Marissa Bass observes, searches of fields other than artist are inadequately supported by existing museum databases:

> I think it might be difficult for an undergraduate to go into the Mongan Center blindly and try to find something they wanted to work on, because there really isn't this sort of computer catalogue you can search easily. And the card catalogue is really organized by artists, so you kind of have to know what you're looking for.

Thinking about the kinds of classes that get taught in her department, Bass adds, "[I]t would be great to have categories that you could search. So if you put in Italian Renaissance art, then you would get examples that could be sorted by material and medium or something, or by century." As Susan von Salis points out, there are many themes beyond those directly connected to art or art history that can be informed by the collection, and relevant objects could be accessed through more flexible search functions. For example, "the number of fruits and plants and animals that we have [among] our objects is astounding. [T]hink what [zoology people, for example] can learn from that." She adds:

> [T]here's somebody who has been studying the history of medicine and surgery, who spent a year studying … [an] art object in this collection, not because it was painted by a specific person …, but because of what it was depicting, what was happening in this geographical region at this period of time.

Not only scholars but other visitors as well express an interest in flexible thematic searches. A visitor comments, "If you wanted to see some works with spirals it would be tricky,

unless someone really knows what is here." Visitors do rely on and benefit from extensive staff knowledge when searching for themes of personal interest (Jerry Cohn tells a great story about helping a visitor find works of art including images of turtles [personal conversation]; these would have been impossible to find without her deep knowledge of the collection). But relying on staff knowledge does present a limitation. A visitor observes:

> Other than [the staff member's] actual personal knowledge, it did not appear that there was any way to sort [objects] across a broad variety of dimensions. ... I think the nature of the learning experience could be broader and more multidimensional if the access to the information was multidimensional.

As this visitor suspects, the collections available through the HUAM study centers have the potential to inform a wide variety of themes and interests, but if this potential is to be realized, cataloging of the collections must be expanded. Curator Ivan Gaskell agrees:

> One of the big dangers is that we allow the kinds of choices that we implicitly encourage people to make regarding what they look at to be not exactly determined, but very profoundly affected, by our own taxonomy of the collections.

Just as a table of contents and indices give a book its navigable conceptual structure, the taxonomies used to organize the collections help visitors navigate and juxtapose objects and resources in the study centers. Gaskell continues: "How then do we make—ideally, if you like—everything equally available, so that we're not reinforcing the taxonomic structure that is in place and is institutionally entrenched in the Museums?"

One thought comes from Robert Woollacott, a professor of biology: "Knowing [that] the database is essential for being able to come up with the synthesis that the faculty member would need, it's not something that I think can be turned over to a curator ... because the curator doesn't know [all the ways] it's being put to use." The idea that the development of multidimensional browsing and searching functions could be informed by faculty as well as curatorial input and collaboration is a good one. Not only would it be useful for faculty, it would help create a system that is responsive to the needs of visitors and scholars with wide-ranging interests. And as the respondents quoted above suggest, a more flexible database would not merely be convenient. It would actually free people to discover and invent new ways of juxtaposing, thinking about, and learning from the objects and collections.

The importance of images. A database that effectively supports independence and choice should allow users to browse visually. Ideally, it would include images of every object in the collection and provide thumbnail images in search results. These features were often requested, especially by visitors who weren't sure how to describe what they were interested in. For example, one such visitor specifically wished for a collection of "pictures, little tiny pictures, and then from that I could make a judgment and then decide what I wanted and then see the larger [version] of it." Another wanted "some really focused, simple way of flipping through them and seeing what was there." Yet another wished for "a dozen little mini-displays [that] said, if you're interested in this, this is what we have, sort of behind it, if you will."

Plans are in place to improve HUAM's database. But currently, as Jerry Cohn points out, "[A]lthough there's a lot of stuff on it, a lot of stuff hasn't been photographed, so it's just text that comes up." Despite this limitation, curators and faculty make use of digitally available images to the extent that they can. For example, though at the time of our interview her database was not yet public, Melissa Moy has supported student research at the Sackler with the images so far available internally:

> We've tried—in certain areas when there's part of the collection, like, say, the Japanese prints, many of which have been photographed, [we can have] a Harvard student ... sit at one of our computers with a little bit of guidance from us. We can let them look through those images .... They can make their choices, and then we'll bring them out for them.

Faculty, too, find it useful when students can use digital images to orient themselves to a collection. For example, Rowan Flad's anthropology students first explore the Peabody collection through digital images. Flad has the students "do a search for China or search for East Asia and find everything they can possibly find. And they look through everything online, decide what aspects of the collection they might be interested in, pretty early in the course—or they just want to see." Other faculty recognize that they would need access to digital images if their students are to use the study centers, but they are unsure whether the images are available. "Is there a digitized version of all the works that the Museums have?" German history professor David Blackbourn asks. He speaks for many of the faculty we interviewed. In order to integrate objects into his classes, Robert Woollacott comments that he "needs to see what the options are. And that makes the existence of some sort of electronic catalogue, digital image catalogue, absolutely essential."

But the widespread availability of digital images can have a downside, and a cautionary note is in order. Digital databases enable users to navigate collections and make selections, but the accessibility of good digital images could conceivably reduce interest in studying the objects themselves. "Great digital inventory projects … almost diminish the need to examine the actual to some extent," warns biology professor James Hanken—but he also offers reassurance:

> At the same time, we generate more interest in the material once [more people] know what we have, so there's a corresponding increase in the visitations. So it has two contradictory effects, making information available online. On the one hand, it diminishes the need to see the materials; at the same time, it encourages the need to see the materials.

History professor Laurel Ulrich says the value of digitization rests in part on eventual encounters with original objects—and therefore on access to study centers. "I love what the computer screen can do," she says, "but [there is] also the distortion in that process … exhibits help, but I think the study centers help even more to restore the real-world context for artworks and artifacts." As an example, she describes the Baker Library trade card collection, which is available online:

> I would want my students to see an actual trade card so they see its size, they see it's not the same [as it appears in a digital image]. And since we're right here and we can, I would expect we'll make a field trip over to Baker and see if we can look at some actual [trade cards]. And that would be true for anything that we digitize.

Ulrich's belief that the availability of digital images can actually enhance the experience of viewing real objects resonates with data reported in the upcoming chapter on objects (Chapter 4). As we will see, visitors who look at objects they have previously viewed digitally often remark that the contrast between the two experiences makes a big impact and causes them to see details they might otherwise not have noticed. Comprehensive digital images, then, can make actual objects more accessible and ultimately more vivid, so that students can learn from experience gained in both finding and examining them. As Ulrich concludes, "We're linking up the technologies with the real thing."

The Material and Documentary Environment

As Elizabeth Cavicchi points out, when you see an art object in the artist's studio, "you're in the place where the thing happened—where the thing is evolving, and so there are associations that are taken away by placing it in such a place as an art museum." When looking at an object in a study center, she continues, "you want the students to kind of create [those associations] out of their minds [and] out of what they see in the thing itself—but an environment could support that by being richer …."

The study centers help visitors discover and understand relationships among works of art in part by offering access to so many of these objects in close proximity to each other. But the study centers can do more to support people in exploring other kinds of connections equally important in illuminating objects and their histories. Curatorial department files on the objects are already made accessible to some visitors, and perhaps awareness of their availability can be expanded. The regular inclusion of archival materials, as well as art materials, can also enrich study center environments, supporting visitors in reconstructing various associations and, ultimately, in learning more from interactions with the works of art they select than would be possible without this additional evidence. Finally, though we were unable to interview representatives of all the HUAM research centers, our findings suggest that the kinds of materials and collections the research centers maintain could be very useful to study center visitors.

Curatorial and archival materials. Study center visitors can request not only objects, but also the curatorial department files related to the objects. As Jerry Cohn points out, "[T]he curatorial departments not only have art to curate, they have their files to curate, and the files are also accessible to the visitors of the study center." A visitor who requested an object file comments, "You had [the photographs] right in front of you, and also the information on where they came from, all these different national parks." Like other visitors who had requested object files, he appreciated the opportunity to consider the photographs he had selected in proximity to some of the records of their production and past. Christina Rosenberger speaks about the power of this combination:

> One of the things I think is most important … is sort of this nexus between access to objects and access to files about the objects … and access to curators who know something about the objects. When you get the three of those together you can get an extraordinarily rich understanding of a single object.

Another important type of material is even less frequently offered to study center visitors and, in the existing study centers, is quite difficult for them to find and consult as they examine study center objects. The archives of the museums are home to documents and other items of various kinds. All of these are objects in their own right, and can support museum staff, faculty, students, and visitors alike in considering works of art from new angles and exploring relationships between the works, individual people, and larger contexts of production, existence, and acquisition. As Sally Schwager explains:

> If one is interested in a particular person, an individual or an organization that had a relationship to a work of art, either because they owned it, or they painted it, or they purchased it, or they bequeathed it, or they stole it or whatever … historical documentation might tell one not only about the work of art and the relationship of the work of art, but from my standpoint more importantly I want to learn more about this person, the kinds of questions they posed, the kinds of resistance they exhibited, the purposes they expressed.

Archivist Susan von Salis agrees that studying how the objects have shaped and helped to document human lives and societies, and how societies have influenced the objects, is as important to developing understandings of works of art as studying artists' techniques:

> I understand the point of … looking at the brush strokes … but from my perspective it's also critical to understand the history of that [work], the circumstances under which it was created. … I think it adds a dimension that does help [one] understand the object and the artist, and the time period in which it was done as well as the circumstances under which we acquired it.

Juxtaposing artworks with items from the archives can encourage study center visitors to reflect on and refine their questions about the objects they examine in ways people checking the usual references cannot. As von Salis says, archival materials aren't available in books or online. She goes on to point out that juxtapositions with archival objects can serve to challenge assumptions, raise questions, and shape new ways of thinking about works of art.

Currently, much of the archival material is inaccessible to study center visitors, or nearly so. In order to leverage the benefits of archival material, there are two factors to keep in mind as HUAM considers the design of its new study centers. First, the archival collection must be cataloged in a database that is easily accessed from, or fully integrated with, the

database of works of art in the collections. Second, the study centers and archives should be located close to one another. As von Salis points out, having to move to a different location to consult related archival materials "is, if not an actual physical impediment, a mental impediment to large numbers of categories of researchers." If the archives were nearby, archival materials stored on-site could more easily be brought to the study centers, where the materials could be examined alongside art objects. Furthermore, relationships among curators and researchers could be enhanced if those working in the study centers and the archives could share the same space. Notes von Salis:

> In my experience [at another research institution] ... everyone was in the same reading room, and the number of serendipitous events that happened was absolutely astonishing. ... Sometimes really fruitful sort of chance encounters happen[ed] between researchers who didn't know each other, didn't know they were working on related topics. And then they have gone on to collaborate on future things.

Art materials. In addition to object files and archival materials and as further context for artworks, samples of historical and contemporary art materials can help visitors understand how a work of art was made. Christina Rosenberger emphasizes the power of actual materials in addition to text-based descriptions:

> As much as you can give somebody a book and say, 'Look at this technique,' it's much stronger to be able to say, 'This is the technique. Hold on for 5 minutes; we have printing materials upstairs.' [I]f someone doesn't understand a wood block print you were able to go upstairs, get a wood block ... and while you were up there grab America's sawed wood block print, which is different from the Japanese wood block print that they're using, and you can show them how the Japanese wood block print technique influenced Cassat's later work. And there, all of a sudden, you've got this experience, which is much richer, and much deeper and much more interesting than saying, 'Turn to page 52.'

This approach to learning, which helps people imaginatively envision the production process of a work of art, is especially useful to teachers and students in the schools and community. Says David Wenstrom whose drawing students study technique by copying art in the Mongan Center:

> When I was at the Fogg, I did like that display of pigments that were on the third floor, and ... I think Harvard could come up with some drawing

> materials from over the centuries ... [for example] poured crayons and different types of chalks and charcoal and charred wood.

Similarly, Lynn Stanton, who works with local teachers and students, would like to have more readily available "really practical kinds of stuff that kids could hold." These might be replicas of sculpture or sample brushstrokes or samples of pieces of paper. "For example," Stanton adds, "the high school kids came and they were talking about techniques of Renaissance painting. So if [they] could be shown the gesso layer, the wood, the linen," that would support their learning.

One visitor begins to describe a continuum from examining these practical objects to examining works of art made with similar techniques. "What's kind of intriguing is ... getting to see the print of the carving ... to see the process of how this was made, maybe, or to get to see a couple of different stages." Approaching still more closely the link between materials, techniques, and other decisions made by the artist, he goes on to observe, "I don't know if this was made as part of a series. If you knew that it was made as part of a series, it might change your understanding of it. If it had a context like that that the artist intended, it would be cool."

A Puzzle about the Availability of Information

An obvious and necessary place for visitors to access a digital database is in the study center itself. Accessible computer terminals, or a database that is compatible with the laptops and handheld digital devices visitors bring with them, could help visitors orient themselves to the collection and make choices about what to see. Naturally, a database does more than simply list the works in the collection. Like the reference books and other text-based information found in the study centers, a database supplies a variety of contextual, historical and material information about the objects themselves. A puzzle arises about how the easy availability of such information affects, and should affect, the experience of looking at objects directly.

In the study centers, objects are unaccompanied by prepared explanatory text. Christina Rosenberger explains:

> Maybe you've gone and read in the library before ... but generally, you come, and you are handed something and you look at it, and you're handed something else and you look at it. ... I also think there is the sense of—a

> laboratory is not the right word, but you're there to look at something original ... to look at an object more on its own terms ....

Some visitors notice the absence of prepared explanation and some, like this visitor, wish that more information and interpretation were provided.

> When I go to a museum, one of the most valuable things that I take out of it is the art put into context, and that's not true here [in the study center]. ... I would like to learn more about the period in which [the object] was created, how it was created, where that fits in the history of social movements, in the history of industrial development, in the history of economics, and the history of politics.

Similarly, others asked for "a little bit of history of the artwork and what it was about, and maybe [information about] the artist [and] when he did those—a little background." From the standpoint of cognition, the desire for information is a natural impulse, and typically people's impulse is to seek information in a familiar and convenient form. For example, a visitor expressed the desire for information about "the history of art along the years ... I wonder in a timeline how that's represented. I would have liked to have seen that ... recreated so that somebody as unknowledgeable as me could learn quickly."

But other evidence indicates the importance of caution and balance in preparing such information for distribution in the study centers. In her article "In Search of Aesthetic Experience: Are Museums Getting in the Way?" Susan Myers writes:

> [Nelson] Goodman presents two opposing policies that one might adopt given the situation of a viewer confronting a work of art. He suggests that we might 'show a work properly and get out of the way' or 'make available all sorts of assistance,' such as labels, talks, films, interesting juxtapositions of objects, and so forth. Goodman is essentially addressing the autonomy/heteronomy problem. Should museum professionals let the object speak for itself (autonomous), or should they provide all sorts of external (heteronomous) information for the viewer? I would like to propose that museum educators choose neither extreme, but find an appropriate solution somewhere in the middle.

As we have seen in previous sections, opportunities to create relationships among works of art and between them and related archival and art materials encourage active thinking and learning. Offering access to prepared explanations and interpretations, however, can have a different effect: Staff members and instructors who work in the study centers have found

that external information draws students' and visitors' attention away from the objects and their own efforts to see. Christina Rosenberger observes:

> We found in our class last spring that the students—even when they were asked to look at objects in the gallery, they defaulted to the library first. So they came to the works of art [with] preconceived notions of what they were going to see. So we returned a lot of the first papers and said, 'Go look again,' and basically said, 'We're not at all interested in whether or not you understand the arguments of these art historians, because we know you can. But what we are interested in is your looking and your ability to see things.'

The Contextual Environment: Opportunities and Recommendations

Through its browsing, searching, and information-providing functions, and the extensive cataloging underlying them, the digital environment helps visitors identify and begin to interpret objects. Our research shows that some of these have already begun to work for visitors. As the Museums acknowledge in their plans for a new database, many can be expanded and refined. Our analysis supports these specific recommendations:

Expanded categories. A database visitors can search for objects in an expanded number of categories would allow more independent and flexible identification and juxtaposition of objects—and, thus, would support research, study, and interest in a wide range of disciplines and interdisciplinary fields.

Visual browsing. Offering digital images of every object will assist everyone from visitors just learning to articulate their interests to students or faculty sifting through the possibilities to find the right object for a project or class. These images will also help to increase awareness and even appreciation of the original works.

The Museums maintain and sometimes share documents and other objects related to the works of art in their care. Including these materials among study center resources helps visitors engage more deeply with and develop increasingly sophisticated interpretations of art objects. By making more of these materials more easily accessible, the study centers could better support such experiences. Our research suggests several ways the Museums can more fully realize this potential:

Curatorial materials. Object files are routinely made accessible to researchers, students, and other serious study center visitors. Our findings indicate that people find this material valuable and that this practice should continue and perhaps be expanded.

Archival evidence and exchange. Locating the archives near the study centers, encouraging study center visitors to examine archival materials, and handling requests for and examination of these materials inside the study centers whenever possible will promote juxtapositions of art and archival objects, nurture collaborations between staff members and researchers in the two areas, and create new opportunities for learning.

Art materials. Art materials can raise curiosity about and help people understand not only how a work was made, but also how it was conceived and planned, not to mention what it is composed of, how it has interacted with its environments, how its appearance has changed. Maintaining something as simple as a collection of different kinds of paper students can handle can pay valuable dividends in terms of learning.

As we have seen, the easy availability of external information in the study centers can have unwanted effects. Our research supports the following recommendation:

Information that stimulates inquiry. Information made available in the study centers can be designed not to detract from, and instead actually to encourage, visitors' and students' own inquiry and observations. Information encouraging exploration of a technique, for example, in turn can encourage closer examination of an object made using that technique. Information on other approaches to looking can be provided through suggestions ("Start by looking closely for one minute"), questions ("What do you notice?"), and explicit invitations to consider written information in relation to visitors' own observations.

Chapter 3
PEOPLE

[I]n a study room the visitor will generally interact ... on a one to one basis with people that are answering their requests and bringing them pictures ... I would say ideally that ... person that they meet is somebody with substantial knowledge about the collection .... I mean they've come in with a request but the person they are going to meet is going to be able to amplify their knowledge in some way.

– Jerry Cohn, Curator Emerita

Well, I think she suggested that she had drawings, and I wanted to see the drawings ... and she showed me some of them. She said I'll whet your appetite, and it did.

– Study Center Visitor

Museum staff are charged with safeguarding, preserving, and interpreting the collections, but their responsibility also extends to the sharing of knowledge about the objects, to making "collections meaningful and intellectually valuable" (Ames, 1992, p. 93). In many art museums, curatorial, conservation, and research staff are often isolated from the public. But increasingly, the separation of staff and visitors is viewed as a problem. For example, in an essay on epistemological practices in museums, Schauble argues for "human mediation" and the "essential role of other people" in initiating visitors into the museum community and making their experiences more meaningful (Schauble, 2002, p. 239). The HUAM study centers often provide an interface with the public, and they are one of the important ways that HUAM fulfills its responsibility to share its resources. As curator Peter Nisbet points out, involvement in the study centers "reminds the curatorial staff of its obligation to the public."

Across the staff, faculty, and visitor interviews, the importance of the human resources of the study centers emerged as a key finding. In their encounters and exchanges with people in the study centers, museum staff take on a number of roles: They are welcoming and interested partners, responsive guides, expert scholars, and co-learners. Although it is often acknowledged that museum staff play a key role in providing access to museum resources, few studies on museum learning give adequate attention to the various staff roles, especially those of curatorial and conservation staff, and particularly at university museums. This chapter helps to address that gap by examining the multiple ways HUAM staff contribute to learning in the study centers. The first part of the chapter explores staff roles and how

they benefit study center constituencies. The second part focuses specifically on one of these constituencies—the faculty. It explores existing and potential staff-faculty collaborations and examines the value of these relationships for both groups and for university teaching and scholarship more generally.

Roles of Museum Staff

Staff as Welcoming and Willing Conversationalists

In the previous chapter, we discussed the influence of the physical environment on visitor learning. There, we noted that visitors sometimes experience closed doors as unapproachable and intimidating. The interviews also revealed that visitors—especially those visitors who arrive without a research topic or other specific purpose—sometimes perceive study center staff as unapproachable at first. However, once visitors overcome their discomfort and do talk with staff, they quickly find them very welcoming.

HUAM staff are aware of this, of course, and all the staff we spoke with mentioned the importance of welcoming staff in helping visitors feel comfortable. When visitors tell a staff member about their interest in an object or theme, the staff member usually expresses enthusiasm for the topic. This is one of the first ways visitors feel welcomed. When this happens, archivist Susan von Salis observes, the visitor experiences the staff member as an ally and soon feels less intimidated.

Even after visitors have been greeted, conversations with staff continue to play a significant role in the quality of visitors' experiences. When our researchers were present in the study centers, they observed that that over 80% of visitors engaged in conversation with study center staff beyond the basic greeting and object request. Conversations can occur deliberately, but also by chance, and even between visitors, as one person's curiosity is piqued by an object someone else is examining. All the staff we spoke with, along with many of the faculty and visitors, emphasized the importance of conversations in the study rooms. "The social aspect," Peter Nisbet argues, "shared conversation and so on .... I think it's actually not to be underestimated." Christina Rosenberger, former curatorial intern in the Drawings Department, used the term "active conversation" to describe staff-visitor interactions and emphasize their dialogical, social nature. When people converse in the study centers, whether the conversations are between visitors and staff or between

visitors themselves, good things happen from the standpoint of learning: People's interests are clarified, perspectives are shared, observations are deepened, interpretations are developed, new questions emerge, curiosity is heightened, and excitement is generated—often for staff as well as for visitors.

Conversation is a social activity, and contemporary learning theorists emphasize the importance of the social dimension of learning, arguing that a primary way we construct knowledge is through our interactions with others (Lave & Wegner, 1991; Vygotsky, 1978). Some education researchers with a special interest in museums have begun to investigate the many kinds of "learning conversations" that occur in museum settings, arguing that these conversations are both engines and evidence of visitor learning (Leinhardt, Crowley & Knutson, 2002).

Staff as Responsive Guides, Visitors as Choice-Makers

"Free choice" learning is often cited as a hallmark of museum learning in general (Falk & Dierking, 2002). In an art museum, for example, people choose which galleries to enter, which works to look at and for how long, whether to read informational text before or after viewing a work, and so on. Long-established findings in cognitive psychology describe effective learners as "self-regulated" or "self-directed" (Hiemstra, 1994; Pressley, 1995; Zimmerman & Schunk, 1989). These findings show that learning tends to be deeper and more memorable when people are able to exercise some degree of choice in what they learn and how they learn it.

One of the seemingly obvious features of study center learning is that visitors themselves choose objects from the vast collections, then direct the course of their own inquiries once the objects are before them. However, curator Peter Nisbet wonders to what degree authentic choice occurs in the study centers. "[There] is a lot of handholding .... I think in large measure it's not self-directed, it's handheld." There is great variation in the scope of the choices people make in the study centers, but even relatively small choices, along with the experience of a choice-friendly environment, can have distinct cognitive benefits. For the most part, visitors have chosen to come to the study centers of their own accord. Once they are there, they choose how long to stay and how to interact with an object once it is in front of them. Leveraging the positive role of choice doesn't mean creating an environment of absolute choice in which options are limitless. Indeed, such an environment is almost certain to be cognitively overwhelming. In large measure, the power of choice in study centers has to do with visitors' sense that they are in a discretionary

environment, one that is adaptive to their own needs and interests, rather than in a fixed setting with only one possible pattern of activity.

Guiding visitors' choices is one of the most important things study center staff do. As guides, staff have an unusual challenge: Some visitors have a destination in mind; others need guidance in choosing a destination as well as arriving at one. We describe staff as "responsive" because they adjust the amount and kind of guidance they provide to match variations in visitors' needs. For example, some visitors start the process of selecting an object with expressions of general curiosity. As Jerry Cohn explains, when this happens, there are two ways staff might respond:

> They [visitors] can … talk to the person at the desk. [T]hey come in and ask rather vague questions and the person at the desk's responsibility is to sort of sharpen them up so they can get something. The other way … is people that come in and say what do you think I should look at and the person at the desk sort of starts from scratch.

Alternatively, when a visitor arrives with (or eventually articulates) a specific request for one or more objects, the role of the staff can shift slightly. Curator Peter Nisbet refers to the staff role in assisting visitors as "guided choice"; he also adds the notion of "unexpected choice" to describe times when a staff member decides to bring out additional objects related to a visitor's request. As one visitor puts it:

> [S]he [the study center supervisor] is listening to the questions we are asking and where our ideas are going. She can just bring out a couple [of objects] that kind of take our attention and open up a wider space. We were just looking at [an] etching and now we have a couple of different things to look at that are related through her expertise.

Surprises like these can help visitors expand both their interest in the collections and their perspectives on the works they choose to examine.

As Cohn's and Nisbet's comments about visitor-staff interactions indicate, HUAM staff are well aware of the need to help guide visitors in making choices about what to look at. Curator Melissa Moy adds, "I think self-guided study is good, but it's even better when you can help them along in certain ways, give [people] a little bit of direction." Moy points out that this is true even—and perhaps especially—for faculty users. When faculty and curators choose objects together, curators can consider the research and teaching interests of a faculty member and suggest relevant objects the faculty member may have been unaware of.

Faculty seem to agree. For example, Elizabeth Cavicchi, experimental science instructor, explains that she came to know about the existence of various museum resources through direct connections with curators. "If you have the chance to work with a curator or a museum person over time, you learn more about what the possibilities are." Moreover, her richest experiences were with curators who took an active and sustained interest in her research, sharing impressions and perspectives. Emphasizing the contribution to her own learning, she notes, "[T]he continuing of the researcher and the curator relationship I think is important for the research that comes about …." Elizabeth Denne, a faculty member in mathematics who has not made prior use of museum resources, remarks that working directly with a curatorial staff member would definitely be helpful—"someone who knows the collections, and someone you can talk to, can then go in and say, 'Well, what about this?'"

Staff as Experts

> *[The curator] seemed so thoughtful and so good, it felt a little bit like the master … showing you around in a good way. She wasn't mean or pushy or aloof or anything. Just the depth there, it was a treat.*
>
> *– Study Center Visitor*

In addition to looking to study center staff as guides and conversationalists, visitors also look to them for expert knowledge. Jerry Cohn knows this well. She argues that good study center staff need a fairly substantial amount of art historical sophistication combined with the capacity and desire to learn the collection and know its strengths. These qualities benefit visitors, and they are also important to faculty, who rely on the museum staff for their expert knowledge of the collections.

Staff are valuable to faculty and students not only because they have expert knowledge, but because they also serve as models of their professions. Curatorial, conservation, and other staff voices help to expand students' understandings of the different ways museum professionals categorize, preserve, display, study, and understand objects. For example, drawing on the expertise of one HUAM curator, Tufts art historian Eric Rosenberg designed a study center session on connoisseurship. Recalling students' positive experience, he comments, "[T]hey could really see firsthand how [connoisseurship] was practiced, from a leading practitioner, no less." Rosenberg adds, "[C]ontact with the professionals here, who are charged with managing, curating, interpreting, exhibiting,

acquiring the works of art is very important." Engaging with museum staff, especially curators, provides students "an opportunity … to hear a little bit about where someone can go professionally with the study of art history, especially outside of the academic—or in relation to the academic realm certainly, but in a slightly different realm."

Staff as Learners

Visitors, faculty, and students are not the only learners in the study center. The museum staff are important users of the collections as well, and the study centers provide a context in which staff can learn from each other and from visitors, including student visitors.

In our interviews with HUAM staff, several people remarked that the study centers contribute to their own learning—and not only because they provide access to collections, but also because informal collegial interactions occur within them. It is common for museum staff to strike up conversations with their curatorial and conservation colleagues when their paths cross in the study centers, and learning often occurs opportunistically. Associate curator Amy Brauer remarks:

> [T]he most exciting learning experiences are always when someone else walks in … and they say, 'So what are you looking at?' And, you sort of describe it, and they say, 'Oh, well, did you notice this?' Or, 'I heard about that.' [I] mean, there's just a whole lot more back and forth conversation … in the study center setting … if it's conducive to that, if it's set up like that.

Brauer's comment recalls archivist von Salis's earlier point about the benefits for staff of physical proximity with one another. People learn from one another when they have a chance to converse informally, and study centers can provide that opportunity.

In addition to learning from each other, staff also learn from visitors. Jerry Cohn recalls, "[I]f we're talking with a graduate student about that graduate student's project [and] they say something that interests me, I start looking though the pictures from the point of view of what I heard from that student." Christina Rosenberger describes a specific instance in which a student's careful study resulted in new information about a well-known painting that neither curators nor specialists on the faculty had previously noticed.

> [T]he student came and … stood up with the painting … and told us what she saw and what she learned and how she thought this work was created and it was fascinating to see the different reactions [by curators,

> conservators, and art history professors] … I think that the student was looking at the work … with fresh eyes and … with extraordinary care over a long period of time and so [new] things become apparent.

Fresh eyes can be a wonderful stimulus for learning, and of course unlimited access to fresh eyes is one of the reasons scholars choose to work in a university setting in the first place. Students can facilitate the learning of their teachers and, as Rosenberger goes on to point out, students form an important part of the Mongan Center staff. She observes:

> I also think it's important [to] note that there's learning that takes place at all levels in the study center … you're training the staff, the students who are working there, you're training the interns and the learning goes all the way up the ladder on that one. … [Students] acquire fantastic knowledge of the collection … in this very hands-on manner.

Student staff learn a great deal by working in the study centers, and they also contribute to the learning of others, especially student visitors. The presence of student staff makes other students more comfortable; often student visitors feel less inhibited about interacting with another student than with more senior museum staff. As Rosenberger observes, "[S]ometimes the students who come in aren't necessarily interested in talking to … a curator because … their question isn't big enough for that. But they'll ask it to one of the students they see is working." Student workers in the study centers, like study center staff generally, continue learning themselves as they talk with visitors about their questions.

Roles of Museum Staff: Opportunities and Recommendations

Staff play many roles in the study centers: They are guides and interlocutors, knowledgeable experts and models of professions, teachers and learners. Here are some ideas about how these varied roles might be shaped to further enhance study center learning—for visitors, faculty, students, and for staff themselves:

The presence of HUAM staff. Expanding staff involvement in the study centers would strengthen visitor interest, enable more staff to sustain and deepen their knowledge of the collections, and promote interdepartmental interactions and interdisciplinary collaboration. Possibilities include designating regularly scheduled "on-call curators" and rotating some responsibility for staffing the study centers among all the members of the curatorial departments.

The value of curatorial time. Because the presence of curators as active practitioners and learners enhances the study centers, the Museums could consider reconceiving curatorial roles. If participation in the study centers is recognized as a curatorial duty, it can then be incorporated into staff schedules to ensure that time is set aside for this work.

Students as study center staff. There are many benefits to having student staff: It is good for students, good for other staff, and good for visitors, especially other student visitors. HUAM might consider creating more opportunities for student staff by, for example, creating student internships within the study centers, broadening current roles for student staff, and encouraging student staff members to organize temporary displays in the study centers.

COLLABORATIONS

In our interviews with faculty and with museum staff, the theme of collaboration frequently arose. Faculty express considerable interest in collaborating with curators and other museum staff to explore possible connections between the courses they teach and the art museum collections. They also express interest in the roles study center and museum staff can play in catalyzing and developing interdisciplinary courses. This section explores both of these themes.

Museum-faculty collaborations. Sally Schwager has taken her Graduate School of Education students to the Fogg Art Museum, but she hasn't yet worked with the study centers. Nonetheless, in conversation with our interviewers, she immediately begins envisioning possible collaborations:

> But collaborations, I mean, your imagination could run wild about doing co-teaching … and certainly more extensive conversations … about how the collections that exist and the content of a course might relate, so that the burden of that is not resting solely upon the faculty member or solely upon the curatorial staff, but that it's a conversation. [T]here could be exciting things of that nature.

Our interviews with museum staff clearly indicate that the Art Museums are committed to expanding relationships with the university academic community, including faculty who, like Schwager, are already experienced in using visual images but are less familiar with the study centers, as well as those who don't typically draw on visual objects in their research

and teaching. How can the Museums reach these faculty? If the museums are to forge collaborative relationships with faculty who work outside the circle of traditional art scholarship, there needs to be someone on the museum staff with whom faculty can work directly. As art historian Eric Rosenberg phrases it, faculty need "a kind of interlocutor … [who] is as welcoming as possible, and serves in some kind of role as a sort of mediator of their experience." HUAM is aware of this need, and is currently creating a staff position entitled "faculty liaison." Our research provides strong evidence for the wisdom of creating such a position.

Another important element in enhancing museum-faculty collaborations will be an up-to-date electronic database—a requirement we explored in the previous chapter. Voicing a view shared by many, biology professor Robert Woollacott remarks, a "database is essential for being able to come up with the synthesis that the faculty member would need." But Woollacott goes on to note that the ability to peruse objects electronically doesn't diminish the need for collaboration with museum staff:

> At the same time, most of us who are not in the field of art don't know how to interpret things, necessarily, in the proper fashion or the broader fashion. And the sense of collaboration is what I think is essential, for many people, to make this sort of endeavor possible.

Faculty who have used the study centers and art museum collections in the past often gratefully attribute their ease of access to their close working relationships with members of the curatorial staff. Other faculty look forward to forming such relationships. Art history professor David Roxburgh remarks, "One of the great things about having these objects is also having specialists who are curators in this field, and who can tell you what they're thinking about those objects." Professor Kay Shelemay in the music department raises the idea of courses that include a curatorial collaborator, someone who provides expert assistance and advice.

It's worth noting that collaborations between faculty and museum staff are not viewed by either simply as a vehicle for the passive transmission of curatorial knowledge. Curators know a great deal not only about the objects they study, but also about how to engage people in actively learning about those objects, and faculty value this pedagogical knowledge and skill. For example, Elizabeth Cavicchi enthusiastically describes a curator facilitating student learning in one of her class sessions:

> [T]he curator had put out on the table an array of instruments, and she asked the students to explore these instruments. And the only thing she would tell about them was that they had some relation to each other. And I guess the students had 45 minutes to an hour with each activity .... The exploration of the collection of instruments, which turned out to be [surveying instruments]—it was just a really beautiful experience.

The idea of expanding collaborations between faculty and museum staff is a natural one, and the new curriculum for Harvard undergraduates, with its explicit mention of visual learning, gives the idea fresh energy.

For all its benefits, a renewed determination to collaborate with faculty would place great demands on curators' time. But curators see that the demands of these relationships would also bring significant rewards for themselves, for the Museums, and for all study center constituencies. As Melissa Moy explains:

> I'm sure that under the right conditions we would love to be collaborating with our colleagues more because they have a wealth of knowledge of things ... that we do not have. And, if we are in touch and learn how to use the collections more to help their classes, and they have students that might be interested in [our collections], it's something that benefits us as well, and ... we can use that knowledge and help expand the records, and teach other people about that later, too.

Study centers as a nexus for interdisciplinary inquiry. Working with objects encourages cross-disciplinary study, and the study centers are natural places in which to pursue diverse disciplinary and interdisciplinary inquiries. As curator Ivan Gaskell notes, "I think we're probably the only part of the university that has people who have PhDs in art history and chemistry in the same place."

In our interviews, we invited faculty to imagine how they might use the study centers as a context to develop interdisciplinary curricula, and they were quick to envision possibilities. For example, Professor David Blackbourn of the Center for European Studies mentions this innovative course idea:

> I have actually thought of teaching a class which would be called something like Picture in German History, where each week there would be a work of art .... Works that have multiple images ... [that] either compositionally or in terms of subject matter or iconography have a richness to them, which can be ... unpacked and explained.

Anthropology professor Rowan Flad envisions connecting faculty, students and various members of the museum staff for special sessions on specific topics:

> [C]reating a place where people with different research interests or specialties might come together … [for example] having a course where the conservation staff might be involved, showing how that sort of research gets done and what sorts of questions one can answer, would be really great. And it would be nice … if that was initiated by the center …. [Especially] for the sake of new faculty members, but also for students, to have the sort of continuous communication and … the exposure [to the] sorts of things that are going on would be really excellent.

Flad goes on to explain how the involvement of conservators could also enhance existing courses:

> The other thing that … might be very interesting … would be if one were doing a seminar-style course that was really intensely focused on materials in the collections—the conservation laboratory, if that could be integrated into the course to show how different tests are run and what one can learn and so forth, that would be great. I mean it would require several people to participate and give up some of their time to take students through one analysis or another and the process that goes on, but that would be really interesting.

Professor Kay Shelemay imagines integrating study center objects into a range of music courses:

> [M]aybe we would draw out things in the collection that [relate to the] iconography of musical instruments. Maybe a colleague of mine who taught 17th- or 18th-century music would want to know what representations you had in the Fogg collection … or what 20th-century representations you had, if it were someone doing 20th-century music—what you have that might be relevant to musical themes, or musical instruments, or shared subject matter … on subject matter that is set as an opera, or something. So I could see lots of ways that a study space could be used, especially if there were the ability to draw things in and out of storage.

Faculty also express interest in interdisciplinary collaborations between HUAM and other Harvard museums. For example, biology professor James Hanken suggests that HUAM and the Museum of Comparative Zoology mount joint exhibitions with themes that bridge

art and science. Such exhibitions, he says, could bring "together objects, texts, art works, in a novel way, [so] that we cross disciplinary boundaries and show the human aspect of biology, and the artistic aspect of biology, and the fact that art is grounded in science in some ways."

The Art Museums study centers provide a unique context for encouraging interdisciplinary inquiry among university faculty and museum staff, across diverse academic departments and—by incubating and inspiring collegial and institutional collaboration—even in other university museums with different types of collections.

Collaborations: Opportunities and Recommendations

There is clearly enthusiasm for museum-faculty collaborations—among HUAM staff and among faculty, including faculty members who have already made use of art museum resources and those who have yet to take advantage of these resources. By building on the momentum of the faculty interviews, particularly in the coming year before the renovation process, the Museums can continue to develop strategies to increase faculty awareness of and interest in the study centers.

Connecting with faculty. In the interviews, several faculty mention the need for the Art Museums to take the initiative and reach out to faculty. One possibility is to invite faculty to research sessions on, for example, conservation techniques and other scientific or scholarly investigations undertaken at the Museums. Hosting receptions for faculty, particularly new faculty, is another idea. At these receptions, experienced curators and faculty could demonstrate approaches to teaching in the study centers.

Faculty liaison. Employing a faculty liaison will benefit both the Museums and the faculty who use them. The liaison should work closely with curators and with faculty across the university, and perhaps also with staff from other university museums, to envision new possibilities for enhancing teaching and learning in the university through the use of the art museum collections.

Curatorial time and resources. Increased museum-faculty collaborations will also place new demands on the resources of HUAM staff and especially on curators' time. Although a faculty liaison could help with this to some extent, the successful work of the faculty liaison will likely mean that other museum staff members need more time to co-teach and collaborate with their colleagues in developing class sessions, full courses, specialized

research seminars, and exhibitions. It is important to acknowledge and anticipate this in advance. Plans should be put in place for reconceiving curatorial responsibilities and activities so that these collaborations can be an intrinsic and rewarding dimension of curatorial work.

Making collaborations visible. Demonstrating the learning that occurs through interdisciplinary collaborations could inspire further collaborative projects while sharing the results of these collaborations with a wider audience. This could be accomplished, for example, through temporary displays in the study centers, through online exhibits, and through print and email communications with university faculty and students.

Collaborations with other Harvard museums. HUAM could increase its efforts to develop collaborations with other museums and art centers at Harvard. These could include joint exhibitions, symposia, and other forms of collaborative programming. Such programming could encourage interdisciplinary student and faculty use of art museum resources.

Communities beyond Harvard. While this research focused primarily on collaborative possibilities between faculty and students at Harvard, the study centers could support similar types of collaborative relationships and programming with artists, schools, libraries, and other organizations outside the university as well (we recognize that some of this already occurs). The expansion of the education department and the arrival of a new director of education should increase the capacity of the Museums to share their resources with the wider community.

Chapter 4
OBJECTS

[T]he ability to hold it in a different light, to see what the paper is, just to manipulate it a little bit and see that thickness of the pastel in the drawing by Cadmus and the feeling of it on the paper. With nothing between you and it there's a tactile quality you can see in the fibers of the paper and the pastel on the paper ... that you don't get if it's reproduced in a catalog.

– Study Center Visitor

In general it all comes down to ... seeing things through your own eyes.

– Robert Woollacott, Biology Professor

Objects take center stage in the study centers. They are the primary reason people come to visit, and they are the center of visitors' attention once they're there. So it's easy to assume that objects alone are the singular force in visitor learning. But as the foregoing chapters have brought out, this assumption is too narrow: Alongside objects, human interactions in the study center play an important role in shaping visitor learning, as do the moods and messages communicated by the study center environments.

But center stage is, after all, center stage, and we now turn our attention to it. This chapter focuses specifically on the question of what happens between visitors and the objects they study. The first part looks at this question experientially and identifies trends in how visitors themselves characterize their experience interacting with works in the study centers. The second part looks at the question through the lens of learning: What kinds of things do people learn in study centers, and, from the standpoint of cognition, how does this learning take place?

QUALITIES OF ENGAGEMENT

Even an outside observer who knows nothing about study centers can walk into a study room and see persuasive evidence of learning: People in study centers typically appear deeply engaged. They look concentrated and focused, and seem to be deeply absorbed in studying what's in front of them. These surface signs of deep engagement are easily recognizable. What's harder to see are the distinctive mental states, processes, and

perceptions that provoke and characterize engagement. What causes people to become deeply engaged in the study centers? What does it feel like from the inside—how do people themselves describe what it is like to be immersed in the art and artifacts they are studying? What does it look like from the outside—are there other observable signs of engagement beyond focus and concentration? These are hard questions to answer in full, in part because each person's experience is unique. But when we looked across all the interview data, we found some common themes in the way people described interacting with objects—themes that bridged all three interview strands: staff, visitors, and faculty. Here are the trends our research revealed.

Surprise

When people talk about their study center experience, they usually begin by mentioning the surprise they felt when they first encountered their chosen object. Perhaps the paper was heavier than they expected, or perhaps it was more fragile. Maybe they didn't anticipate how vivid an image would look close up. Perhaps they were surprised by the tangible evidence of an artist's hand, by an object's quality of everydayness, or by its aura of rarity. Whatever the source of surprise, this initial "wow" serves to quickly draw people in. Talking about the power of objects to captivate students' attention, historian of education Sally Schwager puts it this way:

> First of all, there is, and we're talking about graduate students here, there is always a kind of dramatic discovery. In other words, I think because using these visual materials has not been typical in their education up to this point in time for the most part, they are stunned, shocked, surprised, wondrous, dazzled, excited. So to have just simply, "I never knew that existed," is kind of a typical response. So it's wondrous. And I think that's tremendously important, it's just the excitement of new learning.

Sometimes called a "cognitive emotion," surprise plays an important role in learning (Scheffler, 1977). It tells you that there is something novel and unexpected in what's before you, and signals the need to learn more. Study center visitors often report that the initial feeling of surprise is what draws them into a work and holds them there. A strength of the study centers is their capacity to evoke surprise. But this strength is also a challenge. Recognizing that curiosity can be nurtured "through surprise, through the unexpected," curator Peter Nisbet points out that providing surprises for visitors poses something of a puzzle. "[T]he unexpected is precisely what the visitor can't ask for, [they] can't request to see something they don't know about." This is indeed a challenge, but it recalls a finding

reported in the previous chapter concerning the role study center staff play as responsive guides. One thing study center staff seem to do especially well is to gently probe visitors' interests in order to guide them to works they may not have anticipated seeing.

Aesthetic Appreciation

Not every object in the collection may be aesthetically evocative, but many of the objects are extraordinarily so. When people talk about how it feels to be in the study center, they often describe the deep pleasure they take in looking at something beautiful. For some visitors, this is the primary reason for their visit. Curator emerita Jerry Cohn points out that some people come in "just for the aesthetic kicks or to be able to immerse themselves in what they consider is beautiful."

The term "beauty" is vexing for scholars, but visitors use it naturally. Beauty draws people in and makes them feel connected. For example, consider the way this visitor connects to one image over another: "I'm a little more attracted to this one on the right, so I wanted it closer to me. I really like it. It's so symmetrical, even, beautiful lines, look at that arch. It's just more appealing to my eye." Beauty also focuses attention. Absorbed in a Rembrandt etching, another visitor remarks, "So beautiful, this little detail. They're so small but there's so much to see. [These] weird lines that look like squiggles are … so beautiful."

Although the appreciation of beauty is more than merely cognitive, like surprise, beauty plays an important cognitive role in learning. It signals the presence of something worth attending to, and often draws attention to important nuance and detail. In the study centers, beauty's role in learning is amplified by the actuality of the objects. Talking about how her students come to understand Cherokee woven baskets, history professor Laurel Ulrich explains that although students read texts about the baskets and look at pictures, that's not enough:

> They cannot get it without looking at the basket. It's hard to exaggerate the intricacy and beauty of this, these very small baskets, but they're actually woven so they turn in on themselves and have a complete lining woven in one piece with the exterior, the interior and the exterior woven together in a twill pattern with different colored reeds. And to spend an hour trying to figure out how was this made? What is the pattern? Where does it go? They come away with a sense about art and creativity and technological sophistication that I don't think they can get any other way.

Time

> *It takes time to learn: learning is not instantaneous. For significant learning we need to revisit ideas, ponder them, try them out, play with them and use them. This cannot happen in the 5-10 minutes usually spent in a gallery (and certainly not in the few seconds usually spent contemplating a single museum object). If you reflect on anything you have learned, you soon realize that it is the product of repeated exposure and thought.*
>
> *– George Hein, Museum Educational Theorist, 1991*

> *[I]f you stop and look a little deeper and deeper and deeper each time, you find more and more and more ....*
>
> *– Study Center Visitor*

Perhaps the feature that most distinguishes study center experiences from gallery experiences is the taking of time. In traditional museum settings, hallway-like galleries and linear displays can discourage visitors from lingering, urging them instead to keep on moving and take in as much as possible. Indeed, some studies show that the average time museum-goers spend in front of a work or exhibit that captures their attention is about thirty seconds, and often much less than that in large museums. But study centers encourage the opposite trend: In study centers, people take time to look. The presence of tables and chairs, the quiet atmosphere, the availability of time-encouraging tools like magnifying glasses and easels, all set an expectation that visitors will give looking ample time—and they do. The visitors we observed spent an average of 43 minutes in the study center, usually looking at only a small number of works. Voicing an impression shared by many visitors we interviewed, one visitor reports:

> It was just really great to be able to have those three works in front of me and have more or less as much time as I needed just to compare them and really have them right in front of me with a table to draw and everything. It's different than the typical museum experience.

Time unfolds palpably in the study center experience. For example, a visitor who spent time looking at a Cézanne drawing describes the power of the experience as "just getting up close to it and being able to take the time to figure." She goes on to explain how taking time to look allowed her to see new things and form new ideas:

> [Cézanne] has this style where I don't fully appreciate it when I first just look at it. It seems very round, not very studied, almost cartoon-y, in a way, some of the things he does. But then when I can actually see the little details of the things he didn't take out yet, and a lot of sketching marks or what he chose to put emphasis on, it makes more sense to me and I'm able to value it more.

The fact that visitors perceive the taking of time as a hallmark of their study center experience is due in part to their own internal expectations. Considering a visitor's perspective, curator Peter Nisbet puts it this way:

> You know, you're sitting down, you're looking at things, it takes more time. Partly you've made the effort and investment of time to come up, ask for the works, you've hung around waiting for them to be brought out for you, you're not just going to look at it for two seconds and walk out ….

Nisbet goes on to argue that even the time visitors in the study center spend waiting for their requested works to be fetched may have its value, because it provides a space to anticipate complexity:

> [T]he waiting period for an object to be brought out and put down in front of you carries with it the learning experience that actually this is a complicated piece, or it's hidden or it's, we can't quite find it, and you've become aware of the, not just the mechanics of the museum but the process involving the physicality and actuality of the object.

From the perspective of learning, encouraging visitors to expect to spend ample time looking is more than just a nicety. It works to counter what cognitive scientist David Perkins calls "audience impressionism"—the tendency of museum-goers to look briefly at works of art, noting only whether or not they are impressed—whether they like the work—and not much else.

> Audience impressionism is a special case of [a] general problem with human cognition … : hastiness—a disposition to reach a quick resolution driven by the rapid intuitive mechanism of experiential intelligence. Such an approach will not disclose what awaits in a work of art, much less what hides. Striving toward a richer experience of art means working against this deep and natural impulse. It means calling reflective intelligence into play to cultivate a contrary disposition. It means slowing looking down (Perkins, 1994, p. 36).

In the study rooms, slowing looking down has its own distinctive feel. Visitors often talk about time spent there as unfolding in a rhythmic manner, more akin to a deepening cycle

than a steady stream. "[I]f you stop and look a little deeper and deeper and deeper each time, you find more and more and more …." Some visitors describe the process of close looking as punctuated by rests and pauses. They look closely, pause, then look again. "I think what's valuable about that space is that you can actually, every time I've been there, study something in comfort. In fact you could even sit there and not look at it for a while, and then approach it again, and that's rare."

With their chairs and tables and restful feel, study centers are naturally conducive to the taking of time, so it is no surprise that visitors emphasize the qualitative feel of time when they describe their experience. But ultimately it is the objects themselves—the works of art and artifacts under a viewer's gaze—that engage and reward time spent looking. And of course the works on display in the museum galleries can be just as rewarding to spend time with as those in the study centers. Can the study center experience help cure "audience impressionism?" Can it alter visitors' wall-cruising approach to looking at works in museum galleries? Perhaps. One visitor explains that the study center taught her the value of taking time to look even when she isn't initially impressed with the work of art before her. "[In the study center] I am learning to look a little longer. Maybe the next time I go to a gallery I wouldn't do just the cursory 20 seconds on something I don't like. I would maybe just continue to look at it and figure things out."

An academic variety of audience impressionism is the rush to form hasty, sweeping conclusions, and encouragement to take time to look can be as important for university students whose classes are held in the study centers as it is for walk-in visitors. To counter this tendency, history professor Laurel Ulrich and curator Ivan Gaskell, who co-teach a class using the study center, begin the semester with a strategy for encouraging students to slow down and look with fresh eyes. Ulrich describes their approach:

> [W]e tell them, assume you're coming in from Mars and you don't know what this is, what can you see? And then we'll go around the circle. [We] make everybody observe something different from the person before them, and push them pretty hard to see things that they might not otherwise have looked at.

To borrow a phrase from the philosopher Nelson Goodman, works of art "work" when we take the time to pay close attention to them. Wherever visitors are looking at works in the Museums—in the galleries, the study rooms, the conservation labs, or even offsite—probably the single most effective thing a museum can do to help people learn from and with works of art is simply to find ways to entice people to spend more time looking. As this section

makes clear, many visitors to the HUAM study centers do spend ample time looking, and they readily emphasize the rewards of doing so. But for new visitors, spending time can be a challenge: If a visitor doesn't have much experience lingering with art, it can be hard to know how much time one is expected to take in the study center. Minutes? Hours? And, though works tend to "work" once people spend some time with them, for novice viewers, the first few minutes of the encounter can feel disconcertingly unstructured. Both of these challenges are discussed in our recommendations at the end of this part of the chapter.

A Sense of the Singularity of the Object

When people talk about what it feels like to take time looking at objects in the study centers, they often mention feeling a strong sense of the uniqueness of works at hand—an almost stunned appreciation of a work's material reality and its singular characteristics and nuances. In a world of endless reproductions, visitors' sense of the authenticity of the object is salient. As one visitor says, "It becomes an actual artifact, as opposed to simply visual stimulation, which you could get through a screen or whatever."

For some visitors, their sense of a work's singularity is connected to the experience of direct access. Comparing her study center experience to a gallery experience, a visitor effuses:

> For people like me who really love art it's very exciting to … have it presented to you that way. I was very excited when that guy came up with the one I asked for. [You] put the little bit of tissue aside and there it is. That's very exciting to people who love art. When you're used to just going to see the art on a wall, in a frame, behind glass.

As the visitor notes, one way study rooms enhance people's sense of the singularity of a work is in its physical presentation: Works are often unframed and physically accessible in the study centers in ways that they can't be in the galleries. But the contrast with gallery experiences highlights a work's uniqueness in other ways, too. A visitor explains:

> [When] you're walking around the museum you're sharing the same art at the same time with all different people, which is fine …. When you look at art in a museum it becomes part of a bigger thing. [In the study center], every piece became an individual piece. More so. I felt like I was just focused on that particular thing ….

Where is the learning benefit in all of this? The foregoing quote emphasizes how study centers heighten visitors' focus on a single object, and the emphasis on focus is key. A vivid

sense of an object's authenticity seems to help visitors focus in on a work and see more of its unique details. Here's what one visitor says:

> There's something incredible—to be able to do this, one-on-one, with a work of art that you may have seen in a book and you want to be able to say, I want to see this for real, like the Kollwitz pieces, that one self-portrait woodcut, you know, [I've] seen it in a book many, many times, but to be able to actually to see the ridges on the paper, where the ridges are made, the print was made, and to be able to be confronted with that work, one-on-one, the real thing, is, again, a connoisseur's experience. It's wonderful.

A Personal Connection

When people talk about how they engage with works of art in the study centers, they frequently emphasize the personal dimension of the experience. As one visitor puts it, "I felt like this was our personal showing of the art. Even though it's open to the public you still got the feeling that this was your time and you could see whatever you want." In part, as another visitor notes, the sense that the experience is personal is due to the private nature of the viewing experience. "There's something about seeing a picture in front of you, personally. This is … a very personal thing." The intimate feel of the study center environment also encourages a personal connection. "The quiet and laid back atmosphere, really I can be in my own world with the work," a visitor comments. "I really am—just me and the work, and by doing that, I can understand. I learn about the artist, but it's really a connection between me and the work."

Another aspect of the personal dimension has to do with the fact that visitors personally choose the works they will look at. "For me it was more like a secret stash," a visitor comments. "I mean you pick it out and how personal that is, your relationship to it." This sense of personal selection seems to arise even when classes are held in the study centers and professors, not students, select the works. Tufts art history professor Eric Rosenberg explains:

> There's a way in which the study rooms facilitate a very personalized engagement, even if you're part of a group or 10 or 12 students who are together, and you're not inordinately certain at first why you're here. The fact that they know that these things have been pulled for them for that hour or hour and a half, or whatever it is, already I find often locks them into the sense of a very personalized engagement that's addressing them specifically, that they respond to, that they respond positively to.

One of the striking kinds of personal connections visitors talk about experiencing is a connection to an individual artist. For instance, one visitor makes a personal connection to Picasso by identifying with the intimacy of the artist's personal correspondence:

> There is a card that Picasso drew a woman [on] and sent it to—I can't think of his name but he's a composer .... And it's just a note to him, it's like you writing a letter to me with illustrations on it, and this is getting to see what he meant for his friend, and not to sell and not for a wall. Very personal.

Several visitors sketch in the study rooms and some visitors experience a connection to an artist through the act of sketching. Says one visitor, "I find that, especially for doing something like a copy, [I am] able to really make a connection with the artist and the way they approach the subject." Another visitor comments, "I feel like I can really interact ... with [the] drawing .... You can really make a connection with the lines and the form."

From the perspective of learning, personal connection-making has several benefits. Most obviously, when we feel personally connected to something, it becomes more meaningful and memorable to us. Also, making a personal connection often motivates us to spend more time with something and pay closer attention to it. Further, personal connection-making is a form of connection-making more generally, and making connections is viewed by many theorists as a central feature of learning. In the introduction to this report we discussed a constructivist view of learning, held in one form or another by many contemporary learning theorists. As we pointed out in the introduction, constructivism contrasts sharply with a transmissive theory of learning—one that describes learning as primarily a matter of passively absorbing information transmitted from outside sources. From the standpoint of constructivism, knowledge is developed when people actively build on what they know in ways that are meaningful to them. In this view, connection-making is not a nicety; it is a necessity: Learning is a matter of interacting with the information and stimuli at hand and connecting it to one's frame of reference. Note that the visitor quoted above says, *I feel like I can interact ... with [the] drawing ....* From a constructivist perspective, the visitor's interactions *constitute* learning, and the knowledge that she develops in the process consists in the meanings she makes through her interactions, not in a set of facts that exist independently.

Modes of Engagement

Thus far we've been talking about the experiential features of engaging with objects from inside a visitor's experience—features such as feelings of surprise at an object's material presence, the captivating power of beauty, a sense of the uniqueness of an object, and a sense of personal connection to a work or its maker. Now we take a different perspective. What does engagement with an object look like from the outside? What can we tell about the character of engagement by observing people's behavior? These aren't easy questions to answer, because engaged learning doesn't always have vivid outward signs. Often, we simply infer it: As curator Jerry Cohn points out, when someone spends a great deal of time simply sitting and looking at an object, you assume they are learning.

The act of observing an object can be outwardly quiet and still. But it can also be more active. For example, people in study centers often take notes and sometimes draw or sketch. These activities are more than simply devices to record thoughts and ideas, they can also themselves be modes of thinking and looking. Consider the visitor quoted earlier who, by copying a work, finds that she is discovering details and forming ideas about a work through the physical act of tracing the path of an artist's hand. Similarly, the physical act of taking notes can be more than a way of recording one's observations; it can itself be a form of engagement. Consider the experience of this visitor who looked at a work by Picasso:

> I just wanted to write some thoughts on Picasso and the things that I see about what he's doing, and then I started writing down a couple, then I just had a pencil in hand. For one it was so exciting just to hold a pencil in my hand while I was first looking at them, because they were writing in pencil … It was very exciting to have the same instrument.

Using the body to touch, hold, and manipulate the works of art and artifacts, and using tools to examine objects, is also form of engagement that visitors find powerful. Here a visitor talks about the excitement of handling a work himself:

> And then having the magnifying glasses, oh my goodness, what a great asset. That's all I would add. And then you could turn, if you so choose to, turn it around. You can't do that in a museum …. I remember the first time at a gallery where I actually did that, and I was thrilled to death. I talked about it for days. We got to actually hold it …. And flip it around and look at it. It's wonderful. It makes you appreciate art in a different way … in a very real sense, you realize how many people have looked at it, and so how much influence [it's had] on so many people. That's

> the number one thing. And then the fact that you can actually touch it. It's no longer abstract … you know, you're handling it ….

There are several ways to interact with an object kinesthetically, and they can be synergistic. Talking about showing her students some African instruments in the collection of Harvard's Peabody Museum, music professor Kay Shelemay describes how several senses weave together to make the experience powerful: "You can actually see how they're made. You can touch them sometimes, if they're touchable. You can smell them. You can see the materials, it's palpable."

Over half the visitors we observed in the study centers were kinesthetically engaged. By this we mean they purposefully used their bodies in the service of looking at works of art. For some visitors, certain forms of kinesthetic engagement have a clear cognitive component. For example, as we argue above, drawing and note-taking can be seen as cognitive forms of kinesthetic engagement because visitors talk about making observations and coming up with new ideas as a consequence of engaging in the physical movements of these activities. In addition to these clearly defined activities, however, there is quite a lot of body movement going on in the study rooms—sometimes subtle, sometimes less so. If you spend some time watching visitors, you'll start to notice it. People move their bodies to lean in and look at works more closely, they lean back to look at them from a distance; they stand up to look from above, and move around to look at works from different vantage points; they pick works up to look at their backs, bottoms, and sides; they use a magnifying glass to see details. People move around quite a bit in museum galleries, too. In this respect, study rooms and galleries share a positive feature, and it is interesting to compare the kinesthetic affordances of the two spaces.

It is a strength of museum learning in general that museums invite kinesthetic involvement (Tishman, 2005). People can move around works in galleries to look at them from afar, look at them close up, even stoop down to look at them from below. Just as magnifying glasses and other aids are important in the study centers, they can also be used to good effect in the galleries. For example, the recent Ruskin exhibit at the Fogg offered visitors magnifying glasses upon entering—a nice example of how a gallery exhibit can encourage the kind of close looking that is more readily encouraged in a study center setting. But in the galleries, works are typically presented at a fixed viewing level, privileging one visual perspective over others. This is not so in study centers, and the body seems naturally to take advantage of this fact. Even when the objects in the study room can't be touched, they usually afford 360 degree looking. Though the physical scope of visitors' body

movements isn't large—for the most part, visitors are not bounding across the room—it is not small either. It is easy to imagine a physical space that naturally invites kinesthetic engagement, as the current study centers seem to do, but is also easy to imagine one that doesn't—for example, one with cramped table space and narrow passageways that make it difficult to stand up without disturbing other visitors. As HUAM looks toward the new study centers, it seems worth thinking carefully about how to design spaces that accommodate—perhaps even encourage—the natural movements of the body in the service of looking.

Qualities of Engagement: Opportunities and Recommendations

There is no question that a great strength of the study centers is their capacity to deeply engage visitors in the close examination of works of art. This is what they were designed to do, and to a large extent they do it quite successfully, especially for visitors who are comfortable in the world of art scholarship. The taking of time, the pleasure of aesthetic appreciation, the perception of an object's unique features, the experience of connecting personally with works of art—these are all qualities that many visitors mention appreciatively when they describe their interactions with objects in the study centers. There are two reasons to pay close attention to the qualities of engagement that visitors value. The first is simply to make sure that, in the upcoming period of renovation and construction of art museum buildings, new designs and plans for study centers accommodate these features and make it possible for visitors to continue to experience them. The second reason has to do with reaching out to new audiences: As HUAM considers expanding the opportunities for Harvard students and faculty to use the study centers, it may be useful to consider ways to design experiences for novice viewers that make these features more available and their benefits more visible.

Encourage surprising experiences. To a large extent, there are many opportunities for surprise in the study centers: Visitors are naturally surprised by the material presence of the objects they view, as well as by unexpected objects staff suggest or spontaneously bring out. When people are (pleasantly) surprised, they tend to become more attentive and focused. Though this seems obvious, it's worth bringing the cognitive value of surprise to the fore so that HUAM staff can recognize its benefits and feel encouraged to promote it. In the previous chapter we discussed the role of study center staff as responsive guides who accommodate visitors' requests but also make unexpected suggestions about additional objects to view. The benefits of surprise underscore the importance of this role. Offering the unexpected is more than mere thoughtfulness on the part of staff, though it is certainly

that: It is also a way for staff to learn more about visitors' interests and to increase the likelihood that visitors will have a rich learning experience.

Encourage the taking of time. As we mentioned earlier, the visitors we observed spent an average of 43 minutes in a study room looking at a small number of works—significantly longer than the average time spent looking at a small number of works in a gallery. So taking ample time to look at works seems to come naturally for many study center visitors. But new visitors, especially those with little background in art, can be unsure about how much time is appropriate or expected. From the standpoint of effective learning, this matters: When people know what to expect in a learning situation—or what's expected of them—it is easier for them to organize their behavior. There is no particular recipe for helping new visitors develop time-taking expectations, beyond the artful suggestions that naturally come from staff. For example, when an object is delivered to a visitor, simply saying something like, "I'll check back with you in 10 or 15 minutes," is a helpful way of communicating information about an appropriate timeframe. Most likely, staff already do this in a variety of ways. The important point from the perspective of cognition is that helping visitors calibrate their time-taking expectations can reduce anxiety and create a more fruitful mindset for learning.

But there is a further challenge: Once novice viewers have a sense of how much time to spend looking, they then face the question of what to do with the time. In many cases, the objects visitors select are so intrinsically engaging that they immediately draw visitors in. But visitors who have had little or no experience spending long stretches of time with works of art can feel somewhat at a loss about how to proceed. A little bit of structure can go a long way. One possibility could be for the study rooms to make handouts available that suggest a few simple steps for entering an observational experience. HUAM staff—especially those who are involved in teaching and in school programs—likely already know several strategies that work, for instance strategies that suggest different kinds of things to look for in works of art—formal properties such as lines, shapes, and colors; evidence of tools and materials (brush strokes, traces of ink from presses), and so on. Another example is the Visual Thinking Strategies curriculum, which is used by many museum educators and includes the questions: *What is going on in this picture? What do you see that makes you say that?* (Visual Understanding in Education, 2001) The underlying idea is to make available to visitors simple strategies that help them enter into an experience of close looking, but don't overly constrain the experience once they are inside.

Take kinesthetic engagement seriously. People move their bodies in the service of looking. For example, in order to examine a work from different perspectives, people stand up to look at it from above, bend in close to scrutinize details, move around to different sides of a work, turn a work over to look at the back, and when possible, use their hands to feel its surfaces and contours. People also move works to different positions on a table, and make use of different viewing formats such as an easel or pedestal, in order to examine works in different ways and lights. Not every work can be moved or touched or visually explored from varied physical perspectives—some are too large, too small, or too fragile. But to the extent that moving or touching works doesn't involve undue risk to the objects, study rooms should be designed to accommodate the kinds of physical movement that seem to come naturally when people spend time looking closely at works of art.

Learning and Knowledge

So far in this chapter we have discussed the qualities of engagement visitors emphasize when they describe their experiences in the study centers, as well as visible signs of engagement, particularly kinesthetic engagement, that can be observed by others. Though these qualities may not traditionally count as learning, we hope we've provided a convincing argument that they are strong indicators of learning. We would further argue that creating an environment that supports these experiential qualities—for instance, an environment that provides opportunities for visitors to be surprised, that encourages the taking of time, that helps visitors make personal connections, that accommodates moderate body movement in the service of looking—creates powerful conditions for learning.

We now turn directly to more traditional questions of learning and knowledge. First we address the "what" of learning: What do people actually learn in study centers? What kinds of knowledge do people say they or their students gain from direct encounters with works of art? Then, from the "what," we turn to the "how": How do people go about obtaining knowledge? What kinds of learning processes are involved—what kinds of intellectual behaviors? The themes we discuss in these sections reflect broad trends across all three groups of people we interviewed—staff, visitors, and faculty. But the faculty interviews also include views on how the study centers connect—and might connect—to the specific courses faculty teach. Following the discussion of the "how" of learning, then, we mention some course-specific highlights from the faculty interviews. As usual, we close by offering some recommendations related to the themes under discussion.

Complex Knowledge: The "What" of Learning

What kinds of knowledge do people actually acquire in the study centers? First and foremost, of course, they acquire highly specific knowledge about highly specific objects. Many of the interview comments excerpted in the foregoing section bring this home: One visitor describes learning something about the evolution of Cézanne's "cartoon-y" style; another visitor describes learning about Kollwitz's method of making woodcut prints; a professor describes how a class learns to recognize the presence of aesthetic choice in individual photographs and to discriminate between different photographic technologies. It is not the purpose of this report to give a detailed account of what individual visitors learn about specific objects. But at a more general level, we can report an interesting trend: When people talk about what they've learned in the study center, they often mention several *kinds* of learning at once. For example, people talk about learning about specific artistic materials and methods, and about artistic and creative processes more generally. They talk of learning about the meanings of particular works and about the different disciplinary lenses the pursuit of meaning invites (how would a scientist, historian, or artist look at this?). They talk about learning about the process of critical looking itself, and about gaining visual understandings that can't be put into words. Put simply, the character of the objects in the study centers, combined with people's prolonged and intimate encounters with them, seems to inspire learning across multiple dimensions.

There are many possible reasons for this, several of which were brought out in the previous section. Taking ample time to study works, making personal connections to them, getting excited about a work's material reality and noticing its unique details, all seem to set the stage for complex learning. Peter Nisbet suggests another factor. He points out that not only are visitors exposed to authentic works, they are exposed to an authentic process of fetching and handling works, which itself draws attention to their complexity.

> In general I think study rooms offer a learning experience to most people who come in, in really bringing home to them the extent to which a work of art is [a] real thing. That is to say, it's an object with dimensionality and history, and conditions of handling and weight and awkwardness of transportation.

Nisbet goes on to note that, while the aspects of a work of art that are revealed in its transport and handling are implicitly present when it is on display in a gallery, they may not come as readily to visitors' minds there. This makes sense: By and large, objects in museum galleries are temporally static, seemingly there for all time, unmoved and

unmoving in front of us. So although works in a study center can seem to be out of context in one sense—removed, say, from a place in a larger curatorial arrangement that draws attention to certain aesthetic, historical, or contextual features—the setting does draw attention to the complexity of another kind of context—that of an object's material reality, history, and care.

High-End Cognition: The "How" of Learning

How does complex knowledge develop? What kinds of cognitive processes bring it about? Our interviews suggest that visitors are often engaging in what Project Zero sometimes calls "high-end cognition"—forms of thinking and learning that are characteristic of sophisticated disciplinary and interdisciplinary inquiry. We found evidence that visitors, faculty, and students make nuanced discernments, ask generative questions, pose sophisticated problems, make rich comparisons and connections, and construct complex interpretations. These kinds of cognitive processes make for powerful learning in any discipline, and it is noteworthy that the study centers seem to evoke these patterns of thinking in different types of visitors—including those who are professional art scholars as well as those who are not.

A form of high-end cognition mentioned frequently by visitors, as well as by faculty and HUAM staff, is the making of comparisons. Visitors often look at more than one work at the same time. Sometimes they look at portfolios that contain many works; sometimes they request two or more works by the same artist or two or more works by different artists. Slightly more than half of the visitors we interviewed either talked explicitly about the power of making comparisons or were clearly observed making comparisons (for instance, they would place two or more works near each other and visibly shift their gaze back and forth between them). Juxtaposing works is cognitively generative for visitors, and although works are also juxtaposed in gallery settings, in the study centers visitors are more directly involved in the process and they experience the results more immediately. One visitor speaks directly about the topic:

> Because of the fact that I was sitting there with a portfolio I could compare the different techniques that he used in one photograph to the other, whereas I think that in a larger venue where you have pieces on the walls, you can't do that in the same way. I mean you can appreciate it in one photo, but then you can go back and look at this one. Whereas in the museum you kind of have to move from place to place to place, and come back. But here you're looking at both at the same time, which is easy to compare, and to see

> so many in one place it made you aware of the different techniques that he used.

As this comment suggests, visitors themselves are aware of the power of comparison. As another visitor puts it, "I like to look [at] two things, so that there can be some comparison. So maybe one by one artist, one by another, or two by the same artist. Here he's doing something, and look at what he's doing over here." Jerry Cohn recognizes the value of making comparisons and looks for ways to encourage visitors to make them. "[When] people come in and ask to see a drawing, I say why not bring out two drawings? Because obviously comparing, contrasting is … one of the best ways to train your eye, learn things, see differences, articulate what excites you about something." Ivan Gaskell argues that by juxtaposing objects, people are "creating … [their] own discourse by choosing things either to see in sequence or in groups or in a combination of the two." He likens this experience to that of a curator, "playing with things in order to bring out aspects of them that in other circumstances may not be readily apparent, or apparent at all."

Faculty who teach in the study centers also rely on the power of comparison. Here history of photography professor Robin Kelsey explains:

> By showing them, for example, two photographs of the same subject by two practitioners, or even two photographs of the same subject by the same practitioner, you can get them to see the various aesthetic choices that are made in the making of a photograph. You can make them understand the different technologies, because sometimes the same practitioner will take two photographs using different technologies, or Harvard will happen to have a photograph as an albumen print and as a photogravure, and they'll be able to see those differences. If you put them up as digital images or slides in lecture, again they would just have to be taking it on faith, because they couldn't see any of what you're talking about.

The foregoing example is striking because it brings out the theme of complex knowledge. By comparing two photographs, students learn to see different dimensions of the works, in this case the technical dimension and the dimension of aesthetic choice. The connection between making comparisons and complex knowledge is straightforward: When we compare things, we do so by considering the various facets and attributes of the items under consideration and by looking for affinities and differences among them. If we take time with the process—the kind of time that seems to come naturally in the study centers—the two aspects of the comparative process feed each other: Noticing affinities and differences draws our attention to new attributes; discerning new attributes draws our

attention to new affinities and differences. The facets and attributes we identify begin to cluster into categories. For example, we might find ourselves noticing features related to artistic process, to the history or composition of an object, and so on. These categories in essence are dimensions of knowledge—they are understandings about an object that are different in kind as well as detail. To put it somewhat simplistically, complex knowledge arises when the categories we devise are varied and synergistic, when they discriminate between kinds of knowledge but also coalesce into a larger understanding.

Learning and Knowledge: Opportunities and Recommendations

Intersections are key to study center learning. In response to the complexity of the objects, visitors generate varied observations that intersect with multiple disciplinary and interdisciplinary approaches to understanding objects. Visitors also find intersections among the objects themselves as they make comparisons, and these comparisons in turn support further observation, differentiation, and integration of details and perspectives. The Museums can support these important kinds of intersections in the following ways:

Make the anatomy of complex knowledge visible. Complex knowledge consists in understanding several different kinds of things about a work of art or artifact, and it comes about by looking at objects in different ways and through different lenses. Developing complex knowledge about works of art and sharing this knowledge with the public is a large part of the work of art museums, and particularly of curatorial staff. Often the result of such work is a public exhibition or display that is beautifully cohesive. But the persuasiveness of an exhibit's surface unity can also obscure its complex foundations: Visitors come away with some big ideas, but not necessarily a sense of how different areas of knowledge weave together to form them. But in the study centers, where visitors spend long periods of time, a sense of the multidimensionality of knowledge may come more readily.

The foregoing section on complex knowledge revealed that study center visitors mention several dimensions of knowledge, including knowledge about the process of critical looking, about the development of an artist's process, about the history of an object, and about the contexts in which objects were made, used, collected. People often make observations in some or all of these areas as they examine an object, but perhaps more could be done to help visitors identify and explore intersections among these ideas. For example, small displays in the study centers or links in an online database could show how different disciplines can work together to illuminate an object. This encouragement to

integrate different approaches can lead to a more sophisticated understanding of works of art, and also a more sophisticated understanding of the process of learning itself.

Encourage juxtapositions and comparisons. We argued earlier that one of the strengths of study centers is their capacity to encourage "high-end cognition"—forms of thinking and learning that lead to sophisticated disciplinary understandings. We also pointed out that one powerful form of cognition that stood out for visitors was the making of comparisons. Visitors appreciate the way they can juxtapose works in the study room—often in contrast to a gallery setting—in order to discern the differences and similarities among objects and reflect on their interrelationships. Doing this draws their attention to details and nuances in the works as well as features across different dimensions. It also highlights the role of context when looking at works, since juxtaposing one work with another brings out certain features and not others. In this respect, making juxtapositions provides visitors with an inside look at the work of curators, and—since it allows visitors to choose works to view as an ensemble—it even, in a sense, engages visitors in the kind of work curators do.

The study centers already encourage the making of comparisons, and one key way this happens is when staff encourage visitors to view more than one work at a time. It is also supported by the availability of physical props and accommodations that invite comparative viewing, from spacious tables that allow people to lay out several works together, to easels and pedestals that invite the different arrangement of works. The features of study centers that encourage visitors to juxtapose and compare works are worth preserving, and perhaps even enhancing. We mention them here, in the recommendations section, to encourage HUAM to keep them in mind in the design of new study center spaces.

A Faculty Perspective: Course-Related Themes

Like most of the findings in this report, the findings described in this chapter so far capture trends that are common across the three strands of interviews—interviews with HUAM staff, faculty, and walk-in visitors. When we talked with faculty, we specifically asked about the value of study center learning for their students. Faculty mentioned many of the themes described in this and previous chapters, and their views are included in the foregoing analyses.

Beyond the themes we have discussed so far, faculty also have views about how looking directly at works of art and artifacts connect to the courses they teach and the disciplines within which they work. Often these views are framed in contrast to students' text-based learning. In broad strokes, history professor David Blackbourn captures the view of many faculty when he points out that "visual images ... get across to students something that no amount of description by a lecturer can ...." Here are some of the connections faculty mention.

By introducing visual images that convey meaning "no amount of description by a lecturer can," Blackbourn hopes to teach "a richer appreciation for the pastness of the past." Students can learn this concept working with either textual sources or images, Blackbourn argues, but images convey unfamiliarity and change in cultural styles and environmental settings in ways that texts do not. "If you're talking about culture and style," he explains, "it's hard to describe a Second Empire chair ...."

Robin Kelsey talks about how encounters with photographs teach the skills of critical looking. He explains:

> What you can do when you sit [students] down in front of a photograph, and you ask them questions about what they see, is you can get them to tease out the kinds of observations that you don't get at first glance. And you can get them to see the ways in which narrative clues are embedded in the photographs, certain kinds of ambiguities are embedded.

Eric Rosenberg emphasizes the power of comparison for students when works of art are juxtaposed and comments on its capacity to raise important questions:

> This artist does that subject that way. This artist does the same subject this way. Here are 10 different images of what seems to be the same subject matter. Why in this one ... is this figure done that way, and that figure done that way? Does it have something to do with different norms that are accepted in different historical periods or does it have something to do with individual idiosyncrasies that might be defined in one way or another? Does it have to do with socio-cultural distinctions, etc., etc.?

Rosenberg also emphasizes how direct contact with works of art and their material reality encourages students to ask questions that require making connections to other knowledge and skills they have.

> I think often times it is possible to see as a result of [students] engaging with the actual work of art, to see them confronted by materials that ask them to address the production of meaning in a particular arena of human endeavor, in such ways that they have to … wheel onto the stage of their own ability to understand and interpret a variety of tools in order to get at a satisfactory understanding. Doing research, looking at the work of art, reading philosophy maybe … being encouraged to marshal a bunch of different vantage points by which they might come to understand the depth of … meaning in any given work of art … whether it's a totally abstract painting or an image of the crucifixion, from 1410 or something ….

Mathematics professor Elizabeth Denne hasn't yet used the study centers, but when invited to consider how she might make use of them in her teaching, she mentions many concepts in mathematics that students might fruitfully explore through looking at art. For example, visualizing objects in three dimensions is a skill that is important in a number of mathematics areas, and one that is very difficult to develop. Many mathematicians make or use objects to support this process. She also points out that objects and images can motivate mathematics, and mathematical theory in turn can motivate art: Some sculptors, for example, have been inspired by mathematics, and some mathematicians find it helpful to study certain sculptures (e.g., Brent Collins, Henry Moore). Professor Denne says she would be especially likely to use art objects if she were teaching a mathematics class on minimal surfaces. She would want the students to look at more than one sculpture at a time, to enjoy them, to talk about how they can be recognized as minimal surfaces and how the artists created them, to compare the numbers of holes, to examine them from different angles, to notice reflection distortions, and to talk about the mathematical explanations for their beauty. Other math topics she mentioned in which objects are important include topology and geometry, especially symmetry.

Experimental science instructor Elizabeth Cavicchi talked at length about the importance of the aesthetic aspects of scientific artifacts and documents, and of aesthetic experiences in scientific study and research. Describing her experience having her students observe and sketch historical light bulbs in a collection at MIT, she comments:

> I would say that the beauty draws the student in, that they sustain more connection in their drawings or [observations] of the [historical] light bulbs because of that …. Maybe they felt that there was something really here to look at because it had been expressed so beautifully.

One of the ideas Cavicchi hopes students develop is that making observations and

expressing them beautifully are part of both science and art, as well as a link between them. She gives this example:

> We had our class visit the rare book room of the Museum of Comparative Zoology, where we had asked the librarians to select … examples of artwork, mostly prints and some originals, of zoological and botanical studies. Including Audubon, but he was the most recent one. We had early printed books and manuscripts of fantastical creatures, and then more 'scientific style' interpretations of creatures etc. [We wanted to show our students] examples of how drawing and art are part of science.

Cavicchi values not only what students are learning, but how students are learning to learn. She explains:

> I think they're learning to observe. I think that's really a significant hope that I have for my teaching, and I think that's something that we don't cherish enough in teaching and learning experiences, to observe and think and stay with something. Probably for these beginning courses that's really what I hope.

We asked Cavicchi to envision additional possible connections between topics she teaches and works of art that might be viewed in the study centers. Not surprisingly, she mentioned some intriguing ideas. Making a connection with *Leonardo's Deluge*, an animated film of Leonardo da Vinci's water flow drawings from the series *Film on Art, Art on Film,* she envisions looking for

> … pieces of art work that would [serve] the purpose of showing water flows and water patterns comparable to the Leonardo film. The film is gorgeous but is not the authentic [version] of any artist's work …. It wouldn't be Leonardo if it was [from] the Fogg—it would be someone else, how they have depicted water, and using that as an opening for thinking about what it is that the water is doing.

In an email follow-up to her interview, Cavicchi told us about a way of using art in her teaching that she is currently considering:

> I'm thinking to start this term with trying to imagine how someone a long time ago might have understood and explained and demonstrated light, dark, shadow etc. Paintings, drawings could be an alternative to readings, as a resource for the students to look at and interpret—how were these people thinking about light and dark?

Course-Related Themes: Opportunities and Recommendations

Elizabeth Cavicchi's comments, along with the comments of the other faculty just mentioned, are striking in the breadth and distinctiveness of possibilities they suggest. Faculty from a broad range of disciplines readily see how looking at objects can deepen students' understandings of key themes and concepts in their courses, and there are many ways to build on this.

Talk with faculty in various disciplines and departments. As we mentioned earlier, HUAM is creating a faculty liaison position. Since even faculty who had not yet used the study centers had no trouble envisioning curricular connections when our interviewers invited them to do so, the liaison could help to increase course-related use of the study centers simply by asking faculty individually about their interests and ideas. Such conversations may be especially worth pursuing with faculty in disciplines and departments that might not ordinarily make contact with the art museums.

Make course-related use of the study centers more visible. In an earlier chapter, we suggested the idea of offering small display areas to classes using the study center, so that others can see how faculty and students are thinking about the collection. These displays could be located outside the study rooms for all museum visitors to view, including visitors who happen to be faculty. When faculty see or hear about the thematic connections to art museum objects other faculty are making, they may be inspired to envision more of their own.

HUAM could also explore using print or online communications to picture and describe for faculty and teaching fellows relationships between the study centers and particular course-related themes. Professors are busy people, and it's not always easy for them to find the time to visit the museums. But they are also curious people who care deeply about teaching and learning. Such communications, containing evocative images, clear and compelling examples, and perhaps an invitation to meet with a faculty liaison, might entice them to explore and develop more possibilities.

Conclusion

The purpose of this research project was to better understand what kind of learning occurs in the HUAM study centers, what makes study center learning powerful, and how its benefits might be enhanced, extended to new audiences, and reflected in other Art Museum offerings. We did not undertake this project hoping simply to confirm that the study centers are indeed powerful places of learning, although we do confirm this. Rather, we hoped to help reveal the anatomy of learning in the study centers—the various forces and features that combine to make it distinctive—by undertaking a qualitative inquiry into what three different constituencies—visitors, faculty, and HUAM staff—find valuable, salient, challenging, intriguing, frustrating, and engaging about study center experiences.

At the heart of the inquiry was the concept of learning. We began with the idea that learners do not passively absorb knowledge in neutral settings; they acquire it through active engagement in multi-faceted contexts. Accordingly, we looked for learning in the ways people actively involved themselves with various features of the study centers, in the qualities of their engagement or disengagement, and in the interplay between people's meaning-making activities and the contexts in which they occurred, including the environmental and social contexts of the study centers as well as the contexts of visitors' own particular interests, purposes, and background knowledge. Ultimately, we identified three distinct areas of visitor interactions within the study centers that influence learning: (1) interactions with the study center environments, including their physical environments and their contextual environments of supporting digital and material resources; (2) interactions with people in the study centers, primarily but not exclusively the study center staff; and (3) interactions with objects from the collections. Each of these spheres of interactions has distinctive features, qualities, and challenges, which we described in Chapters Two, Three, and Four, respectively. Here is a brief summary of our findings in each area.

The physical and contextual environments of the study centers. The physical environment of the study centers exerts a strong influence on learning. The entryway and changing displays of objects—including some displays featuring course-related use of the study centers—can welcome visitors and capture their attention. Spacious rooms, natural north light, comfortable chairs, versatile tables forming large, clear surfaces, and easels and other appropriate props encourage concentration, conversation, and the arrangement and

rearrangement of objects—all of which we have found to be integral to object-centered learning.

The contextual environment of the study centers consists in the digital, material, and documentary resources available to visitors, and these environmental features also exert a strong influence on learning. For example, an innovative, state-of-the-art electronic database can enable visitors, faculty, and students to envision flexible ways to explore and use the collection and to locate objects both visually and thematically. Making curatorial and archival materials available to visitors, as well as art materials and other resources of the HUAM research centers, can offer visitors more possibilities for juxtaposing and comparing objects and appreciating their complexity.

Visitor-staff interactions in the study centers. Almost every visitor to a study center spends at least some time in conversation with a staff member, and these conversations contribute significantly to the shape and quality of visitors' experiences. Staff play many roles, often simultaneously and always gracefully. They welcome visitors and communicate rules and procedures, and serve as responsive guides who help visitors refine their interests and choose objects to view. Staff are also perceived as experts: Most staff are very knowledgeable about the collection and they share their knowledge with visitors in a variety of ways, typically interacting with a visitor several times during the course of a visit. Visitors rely on the guidance and expertise of study center staff and find it immensely valuable, as do faculty. As HUAM looks ahead to the new study centers, it is important to appreciate the value of study center staff who are both pedagogically skilled and deeply knowledgeable about the collections.

In addition to visitors, curatorial and other HUAM staff use the study centers in the context of their work, and the centers can provide a nexus for collegial interactions and interdepartmental inquiry. Though currently this function isn't fully realized, in part because of space limitations, several staff emphasize the value of interacting with their colleagues in the study centers—opportunistically when they meet one another in passing, as well as intentionally. From the standpoint of architectural design, it would be advantageous to increase the possibility of collegial interactions by connecting curatorial offices to the study centers. It would also be advantageous to re-envision curatorial duties so that curators could have a more active presence in the study centers, engaging in scholarly work there as well as engaging with other staff and with visitors.

Visitors' interactions with objects in the study center. A singular fact about study center visitors is that they are deeply engaged with the objects in front of them. They are immersed, focused, and actively involved in looking, thinking, feeling, and reflecting. When visitors describe their study center experiences, several qualities of engagement stand out. They talk about their surprise at the vividness, detail, and material reality of the objects, and how the element of surprise draws them into even closer looking. Visitors take ample time looking at objects—they spend an average of 43 minutes in the study centers, which is far, far longer than the average time spent in front of works in museum galleries. By and large, the taking of time comes easily, though novice viewers sometimes need support in getting started. Visitors report that as the time unfolds they become increasingly aware of the utter uniqueness of the object at hand—its many details as well as the questions, perspectives, and interpretations it invites. Visitors often talk about experiencing a sense of personal connection with a work or an artist. When permissible, visitors enjoy sensory experiences of the objects. Though the physical movements of visitors are modest, they play an important role. Visitors carefully touch the works, and they adjust their bodies, and the objects, to examine the works from different positions. Some visitors use the act of sketching or writing to explore the movements of an artist's hand. People look through the body as well as through the eyes. The role of kinesthetic engagement should not be ignored, and the study centers should be designed to accommodate it as much as possible.

Though it is difficult to make claims about visitors' internal mental processes based on their verbal reports, our interviews suggest that visitors often engage in "high-end cognition"—forms of thinking and learning that are characteristic of sophisticated disciplinary and interdisciplinary inquiry. For example, we found evidence that visitors make nuanced discernments, ask generative questions, pose sophisticated problems, and make rich comparisons and connections. The power of this latter form of thinking is often mentioned by visitors. Visitors often juxtapose and compare different works—sometimes by the same artist, sometimes by different artists. This seems to heighten their acuity, lead them to new insights, and make them aware of the powerful role context plays in the understanding of works of art.

What kinds of understandings do visitors arrive at in the study centers? In one sense they are as varied as the works and visitors themselves. But in another sense they share a common complexity. When people talk about what they've learned, they typically mention many *kinds* of things. For example, people learn about specific artistic materials and methods, about artistic and creative processes, about the meanings and contexts of

particular works and the various perspectives they invite, about themselves and their interests and tastes, and about the process of close and critical looking. This is one of the great strengths of study center learning—that it can foster learning across multiple dimensions and help build complex knowledge.

Broad Recommendations

As the findings summarized above suggest, the study centers are indeed powerful places of learning, though they also have their limitations and shortcomings. The strengths of study center learning can be leveraged in three complementary ways. One is simply to enhance what study centers already do well and address obvious areas for improvement. The second is to find ways to make other museum experiences more like study center experiences, though not necessarily in all respects. The third is to find ways to make opportunities to visit the study centers more appealing and available both to new audiences within Harvard and to existing and new constituencies in the communities beyond the University. All of these areas have their complexities, and throughout this report we have made several recommendations in each. Here is a synthesis of some key recommendations that cut across various sections and chapters of this report.

Attend to multiple issues of access. There are many issues of access that can stand in the way of maximizing visitors' use of the study centers. To begin with, there is the issue of awareness: Many people in the university community and beyond are unaware of the existence of the study centers. The presence of the study centers could be made more visible in several places, including museum and university publications and websites. If the study centers are the actual and symbolic heart of the Museums, their existence should also be more visible inside the Museums. Even when museum visitors do not visit a study center, the presence of the study centers—and more specifically, the visible presence of the spirit of close looking that is at the heart of the study center experience—should pervade the mood of the Museums. This could be accomplished in many ways, from display cabinets related to the study centers in the museum entry hall, to prompts in gallery wall text and in exhibit brochures that make connections to the study centers, to architectural innovations that allow visitors to see into the study centers from several places in the museum.

Currently, the study centers are only open during limited hours, and their hours don't entirely match the needs of visitors. For example, study centers are designed so that works can be viewed in natural light: Earlier winter hours would help more people take

advantage of this special feature. Also, the short afternoon hours are a significant limitation for faculty who want to teach in the study centers. Ideally, the study centers would be open for much of the time the museums are open, and some faculty request that the study centers also offer some evening hours (despite the lack of natural light). Another access issue for faculty concerns classroom space and availability. Since there is currently only one seminar room in the study centers, it is difficult to reserve space for classes, and class size is limited.

Entering and navigating the study centers also present issues of access, particularly for visitors who aren't used to such spaces. Visitors can feel intimidated by the closed doors of study centers and find it difficult to discover how they should behave and what they should do. Entryways should be inviting, and the rules and procedures for entry—from how to check in with a staff member to where to stow one's belongings to where to wash one's hands—should be easily accessible. Additionally, it can be surprisingly daunting for visitors to figure out what kinds of objects the study centers make available and how to choose what to view. Many visitors would like more help navigating the collections. Currently, the card catalogs and incomplete databases make it hard for novice visitors to get a sense of what's in the collections and how it is organized. The development of a new database, now underway, can go far to address this, but it invites careful thought.

Develop a dynamic and flexible database for the collection. HUAM is well aware of the need for a sophisticated and comprehensive online database, and plans are in place for its development. We recommend developing a database that offers an array of perspectives on objects and allows people to enter and navigate the collections in many different ways. We also recommend including plenty of images of objects in the database, as well as extensive catalog records for supporting archival and reference material and links to other databases. Additionally, we recommend developing a dynamic online interface that allows users to do such things as record personal favorites, view paths through the collection that other users have taken, perhaps write comments and questions related to objects in the collection, and virtually interact with other users. We note that, in order to make the database truly responsive to users' diverse navigational needs and interests, it is important to invite input on the design and content of the database from a variety of people in addition to curators, including knowledgeable study center staff and faculty from diverse disciplines.

Create optimal staff roles and structures. One of the key findings of our research is that knowledgeable and responsive staff are a crucial component of study center learning. This includes the active presence of curators. But if curators are to be actively involved in the study centers, their involvement can't be an "add-on." It needs to be designed into HUAM's conception of curatorial roles, duties, and schedules.

Another research finding regarding study center staff is the value of student staff in the study centers. It is good for student learning, of course, since it is a firsthand way for students to learn about the collection, and about the roles and professions in a university art museum. It is also good for HUAM staff, who report that students bring fresh perspectives to the collection and fresh energy. Student staff are also good for visitors, especially student visitors, because they are perceived as especially approachable; students often feel more comfortable initiating conversation with a fellow student than with a senior HUAM staff member, and visitors in general are comfortable approaching student staff with casual inquiries. More might be done to create opportunities for student involvement, including expanding internship opportunities. There is also value in making student involvement in the study centers more visible to the university community—for example, by inviting students to create temporary displays in the study centers and to organize innovative study center events with special appeal for other students.

Increase faculty awareness and use of the study centers. Many faculty already use the study centers: Our interviews suggest that many more would do so with appropriate encouragement and support. HUAM is planning to establish a faculty liaison position, and we strongly support this idea. We encourage the person in this position to do the following sorts of things: Talk with faculty in diverse disciplines, especially those outside the circle of art scholarship, about how their curricula can be enriched by teaching with objects. Encourage greater interchange between curators and faculty, and provide time and encouragement for museum staff members to co-teach and to collaborate with faculty in developing curricula and class sessions. Make course-related uses of the study centers visible to the wider university community through actual and online displays. Hold events in the study centers that foreground issues of interest to faculty, such as discussions of conservation techniques, presentations of museum-based scientific or scholarly investigations, and lecture-demonstrations of object-based learning in diverse disciplines. We emphasize that many of the works of art and artifacts in the collection invite interdisciplinary perspectives, and study centers provide a natural nexus for interdisciplinary collaboration. This, too, is something the faculty liaison should cultivate.

Find creative and varied ways to make study center thinking and learning visible. A shortcoming of many educational settings is that they showcase the products of knowledge but obscure the thinking and learning processes that yield them. This is unfortunate, because one of the most powerful ways that people learn is through models. Just as looking at the drafts of artists or writers teaches us something about the process of creativity, looking at how people think and learn about art teaches us something about the process of developing aesthetic understanding. Modeling thinking is a matter of uncovering it and finding ways to make it visible. In terms of the study centers, there are all kinds of thinking and learning processes worth uncovering for visitors. For example, visitors who are uncertain about how to choose works to view would benefit from seeing examples of how other visitors have navigated the collection, including the purposes they began with, the choices they made, the paths they followed and the junctures they encountered, the connections they made along the way and the questions they are still exploring. Making visitors' navigational processes visible is a challenge, of course, and it invites innovation. Perhaps there could be a document in the study room in which visitors could record some of this information if they wish. Perhaps visitors' choices and paths could be tracked by a dynamic, interactive database into which they could also enter comments. Even something as simple as an Amazon.com-like recommendations function—one that lists for a visitor who clicks on an object several other objects selected by other people who also selected that object—would go a long way toward making visible the process of choosing objects and making connections.

Elsewhere we mention using small displays inside the study center as well as throughout the museum to make visible the kinds of investigations students and faculty are undertaking in the study centers. Often displays are designed to make a point or to answer a question. But they could profitably be designed to *ask* a question about an object or a set of objects—a question that draws visitors into a puzzle rather than solving it for them, thus making visible and experiential the thought processes involved in scholarly inquiry.

In several places in this report, we mention that study center experiences seem to help people appreciate the complexity of works of art. The anatomy of complex knowledge is worth making visible to visitors because it helps them see how different questions lead to different inquiries and insights. For example, small displays in the study centers could clearly show how different disciplines ask very different questions about an object and invite the questioner to make different kinds of observations and gather different types of information. Another natural way to reveal the anatomy of complex knowledge is through

an online database, which can efficiently provide a wide range of links to various resources related to an object.

Think creatively about helping people find and develop purposes for visiting a study room. In the introductory chapter of this report we mentioned that 13 out of the 29 visitor interviews we conducted were *solicited*—conducted with visitors to the museum who had no intention of visiting the study centers (and in most cases didn't know about them), but who agreed to visit, accompanied by a researcher. All of the solicited visitors claimed to enjoy visiting the study rooms, and indeed, based on our observations, they truly did appear to become deeply engaged with the objects. But when we asked whether they would return on their own, most said they probably wouldn't unless they had a specific reason to do so. This underscores an observation we made throughout the research—perhaps obvious to some, but still worth mentioning. People need a purpose when visiting a study room. Unlike museum galleries, study centers are not places where most people feel comfortable browsing aimlessly. This needs to be taken seriously. Purposes can come from many quarters — one's own interests or needs, a recommendation from a friend or colleague, a course assignment. Interestingly, our research reveals that people's purposes and goals often shift quite dramatically when they enter the study center and continue to evolve while they remain there. This can be the result of searching through a database and, in the process, becoming curious about other things or reminded of other interests. It can be the result of browsing the "greatest hits" cabinets in the Mongan Center or the binder listing works by artist and theme in the Busch-Reisinger Museum Study Room. It can be the result of conversations with staff in which visitors become aware of new objects and perspectives, or the result of similar interactions with other visitors. A sense of purpose is important, and visitors seem to need one in order to walk through the door of a study room and feel mentally primed to engage in a process of inquiry. The value of having a purpose is not so much in its achievement as in the mindset it creates, and HUAM should work with others in the university to help devise purposes for diverse members of the Harvard community to visit the study centers.

Connect to the goals of general education for all Harvard undergraduates. In describing the new program of general education at Harvard College, the *Report of the Task Force on General Education* names "Aesthetic and Interpretive Understanding" as one of the important goals of general education (Harvard University, 2007, pp. 10-11). The report argues that "[r]eading a poem, looking at a painting, and listening to a piece of music are complex capacities," and that developing the capacity to understand these forms involves the development of aesthetic responsiveness. The Art Museums are viewed as an

important cultural and aesthetic resource for the University. As many visitors to the study center have pointed out, there is a significant difference between cruising the walls of the museum galleries and sitting with an object in a study center for an extended period of time. Regarding the development of students' aesthetic understanding, the deeper value of the Art Museums lies in the possibility of offering all undergraduates, not just those with art-related interests, an opportunity to experience the sophisticated and sometimes profound visual thinking and learning that unfolds through a process of direct, extended, engagement with original works of art or artifacts.

Explore connections between study center learning and gallery experiences. The study centers and museum galleries are distinct spaces, but their interdependence can be strengthened to the advantage of each of the two environments and of the Museums as a whole. One straightforward connection is made when galleries include wall text that directs visitors to works of art and artifacts in the study centers, and when study center staff point visitors to works in the galleries. Beyond this, close contact with objects in the study centers can help visitors develop the disposition to take time and examine an object closely. This and other such skills can then enhance their future experiences in the galleries. Galleries can also do more to foreground some of the features that make study center learning powerful. For example, more might be done to encourage people to spend an extended amount of time looking at a single work. Also, more might be done to alert visitors to the power of juxtaposing and comparing objects: Similar objects can be shown in different juxtapositions and arrangements--including juxtapositions with materials from the archives and from other museums and collections--to make the role of context more visible. Additionally, providing high-quality reproductions that visitors can move about, so that they can experiment with and notice the effects of their own arrangements, can support understandings of the importance of context.

Explore connections beyond the Museums. As we have seen, juxtaposing works of art with other objects, such as art and archival materials, allows the observer to experience the work in a richer context and raises more questions for further investigation. Many objects that could contribute to this kind of inquiry are located outside of HUAM, in numerous other museum and library collections at Harvard, and even in some academic departments. By temporarily bringing objects housed elsewhere at Harvard into the study centers where scholars and students can examine them in close proximity to art museum objects, and by working with other Harvard museums, libraries, and departments to develop a unified catalog of works of art and related objects at Harvard, HUAM could contribute considerably to object-centered teaching and learning across the University.

The study centers already work with classes from area colleges and universities, and with at least one high school, but outreach could be expanded so that more high school students can benefit from contact with the unique and extraordinary art museum collections. For example, educational workshops for teachers could be modeled on the receptions and demonstrations for Harvard faculty we recommended in Chapter 3. More public programs, much like the Busch-Reisinger Museum Study Room Close-Up Seminars, could also be offered. By working with public educational organizations and institutions, study centers engage in conversations and relationships that ultimately benefit not only the public, but also the study centers, the Museums, and the University itself.

The Study Centers and the Mission of the Art Museums

In an article about the mission of the academic art museum, James Cuno, a former director of the Harvard University Art Museums, argues that academic museums have a special mission to make scholarly research and the sharing of new knowledge a priority (Cuno, 1994). This is consistent with Harvard's larger mission as a research university, and Cuno goes on to favorably quote Nannerl Keohane's definition of a research university as "[A] company of scholars engaged in discovering and sharing knowledge" (p. 12). He also cites Wayne Booth's characterization of the role of the scholar in society: "Not everyone can be a scholar. Not everyone should be a scholar. But there is no human being whose life would not be enhanced by earning some share in the rational habits. And it is our task to keep those habits alive …." (p. 14).

As Harvard's recent *Report of the Task Force on General Education* (Harvard University, 2007) makes clear, Harvard has identified a rich array of rational habits it wishes to cultivate in its students, including the habits of visual learning and aesthetic responsiveness. These habits—perhaps first among them the habit of prolonged and careful looking—are also habits of value for museum audiences more broadly. The Art Museums are entering an exciting period of expansion and renovation, and they are wisely taking advantage of this moment to re-envision their strengths, mission, and activities. To be sure, the study centers will continue to offer a quiet setting in which scholars can practice connoisseurship, just as their founding designers intended. But they can also offer visitors the opportunity to participate in a much wider range of habits of mind involved in examining, appreciating, and understanding works of art. Throughout this report we have argued for making the processes of thinking, looking, and learning that come naturally in the study centers more visible and accessible in a variety of museum offerings. We suggest that what may make

HUAM distinctive in the future is to become known within and beyond Harvard as an institution that is deeply committed to making visible and available, in every possible way, the processes involved in the prolonged, careful examination of objects. Such a commitment, if realized flexibly and creatively throughout the spaces and activities of the Museums, would directly serve the mission of the University and just as directly enrich the public communities the Art Museums serve.

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Appendix B
Sample Staff Protocol

Introduction:

Our goal: To characterize in rich detail the kinds of learning that happen in HUAM study centers and that might happen.

Themes about the power and potential of study centers gleaned from previous HUAM data and internal documents: (1) direct experience with objects, (2) choice and self-direction, (3) working center or cultural heart of museum because of shared conversation and inquiry, (4) strong model of critical looking.

1. How do these themes strike you: Do you want to elaborate, disagree, add new ideas?

2. What different kinds of learning do you think occurs in HUAM study centers? What do you see or hear that makes you think that? (In other words, what signs of learning do you see? What do you see people doing, or hear them saying, that tells you they are having a learning experience?)

3. What kinds of learning would you *like* to see happen in HUAM study centers, and who would you like to see in the study centers doing it?

4. How do the kinds of learning people do in study centers connect (or not connect) to current shifts or trends in art historical approaches and methods?

5. What are some surprising or especially interesting uses of a study center you have seen recently?

6. What kinds of learning do you yourself do in the study centers, or related to the study centers?

7. What are your thoughts about a powerful study center learning environment? What would be its physical characteristics? Its cultural characteristics? Its mood (or moods)? In what ways might the staff who work in the study centers cultivate or support this environment?

8. What interactions or connections do you see for visitors between study center experiences and gallery experiences?

Appendix C
VISITOR CONSENT FORM

HARVARD UNIVERSITY ART MUSEUMS/ PROJECT ZERO
RESEARCH COLLABORATION:
LEARNING IN AND FROM MUSEUM STUDY CENTERS

Observation Information and Consent Form

The Harvard University Art Museums (HUAM) are collaborating with Project Zero, a research group at the Harvard Graduate School of Education, to investigate learning in the HUAM study centers.

To collect data for this study, we are observing some visitors today. Participation is voluntary, and there is no penalty for refusing to participate. You may withdraw at any time by saying you no longer wish to participate. No information identifying individual visitors will be recorded. Instead, we will focus on how visitors use the study center and its collections. Our observations will help us to articulate how study center resources and experiences already support visitors' varied interests and goals, and to make recommendations to improve these resources and experiences for future visitors. There is no compensation or direct benefit to participants.

As you leave the study center today, a researcher may ask if you are willing to talk with her and respond to a few questions about your experience. This conversation would last about fifteen minutes and would be recorded. The tape recording will be transcribed, and the recording will be destroyed when the project is completed. The transcripts will be kept, without any identifiers.

Please sign one copy of this form and return it to the study center supervisor; keep the other copy for your records. If you have questions about the study, you are welcome to contact the principal investigator, Shari Tishman, at shari_tishman@pz.harvard.edu.

Thank you very much for your help!

_____

Visitor's signature Date

Appendix D

Observation Checklist

Time in	Time out	M or F	Age/Status	Detail	Companions

Entry:

Orientation strategies:

Selection strategies:

Objects requested (number, media):

Actions (record any questions you develop about these in item 9 on the reverse):
Draw/Photograph

Write

Read

Move object(s)

Change position/perspective

Watch someone else (specify)

Talk to someone (specify)

Body language/listen to music

Other

Other resources consulted:

Further selection strategies:

Number of additional requests: _____
Additional objects (group by request):

Appendix E
Visitor Interview Protocol

1. How did you find out about the study center? (Note number and purpose of previous visits, if any.)

2. What brought you to the study center today?

3. How did you decide what to look at? What resources did you consult, if any?

4. What was your study center experience like?

5. What difficulties or problems, if any, did you encounter?

6. Would you come back? What else would you want to see?

7. Have you visited other study rooms? How did this experience compare to those experiences?

8. What exhibits, if any, did you or are you planning to visit today?

9. (If you developed any questions for the visitor while observing, note and ask them here.)

10. Think of someone you think would enjoy visiting the study center. Why would you suggest that he/she come? What do you think he/she would gain from a visit?

Appendix F

IRB Approval letter

HARVARD UNIVERSITY

COMMITTEE ON THE USE OF HUMAN SUBJECTS IN RESEARCH

Federal Wide Assurance (FWA) 4837
IRB Identification # 109

Alfonso Caramazza
Chair
Kenneth L. Carson
Research Officer

Science Center 107A
One Oxford Street
Cambridge, Massachusetts 02138
617-495-9829

REPORT OF COMMITTEE ACTION Application Number: F14407-101

Investigator: Shari Tishman

Project Title: The Project Zero/Harvard University Art Museums collaboration: Learning in and from museum study centers

Funding Source: Harvard University Art Museums

ACTION TAKEN: Approved as amended

TYPE OF REVIEW: Expedited Review Date: 1/2/2007

Conditions, comments, etc.:

None.

Period of approval: 1/2/2007 - 8/31/2007

If project extends beyond approval period, renewal application must be submitted by: 7/20/2007

IMPORTANT: Please see conditions on next page ... *[Page 1 of 2]*

INVESTIGATORS ARE RESPONSIBLE FOR THE FOLLOWING:

1. Procedural changes or amendments must be reported to the Committee in advance. No changes may be made without Committee approval except to eliminate apparent immediate hazards to the subject. Minor changes may be approvable by expedited review; major changes may require action at an assembled Committee meeting.

2. Continuation of subject participation beyond the approval period requires renewal of approval by separate application. *It is the investigator's responsibility to submit renewal requests in a timely fashion.*

3. Should there be reason to think that a subject is suffering or has suffered any harm, anticipated or not, as a result of participation, the investigator must suspend the research and report to the Committee. The research shall not resume without Committee approval.

4. Expedited approvals are granted with the understanding that the Committee may impose additional conditions after review at a convened meeting.

5. Approval confirms that the project as proposed is not in conflict with the Committee's rules and regulations, but it does not imply endorsement or sponsorship by the University. Although investigators may indicate their position at Harvard, they shall not represent that the research is sponsored by the University or a department within the University except by explicit arrangement with appropriate administrative authorities.

for the Committee,

Kenneth L. Carson
Research Officer

Date: 1/2/2007

cc: Helen Page

Appendix G
Sample Faculty Protocol (A)

Faculty Interview Questions (Used HUAM resources)

1. How do you use the study centers/museum collections?
(On your own? With your students?)

2. How are the objects that you and your students examine chosen?
(To what extent do students choose the objects they study, and how do you help them do so?)
How do the objects then inform the design of your courses? Do you find that encounters with these objects continue to shape the courses as they unfold—for you and/or the students? If so, how?

3. What kinds of learning do you think happen with visual objects, or what kinds of thinking do you hope students will practice? What do you expect students to gain from their work?
What evidence do you see that they are making these gains?

4. What structures, problems or obstacles have limited your teaching and/or research in the collections you have used? What arrangements have been especially helpful? What additional resources or relationships would facilitate your teaching in these settings?

5. What are your thoughts about a powerful study center learning environment? What would be its physical characteristics? Its cultural characterstics? Its mood (or moods)?

6. What interactions or connections do you see between study center experiences and gallery experiences? How do your teaching approaches to objects vary between these settings, and how do they stay the same?

Appendix G
Sample Faculty Protocol (B)

Faculty Interview Questions (Had not yet used HUAM resources)

1. What opportunities do scholars and students in your field have to think deeply about visual information, phenomena, or evidence? How are works of art connected to the topics you teach?

2. What objects or visual resources have you used in your research or teaching? How have you used them?
(On your own? With your students?)

3. What characteristics do you look for in a work of art you might use in your teaching?

4. What kinds of learning do you think happen with objects, or what kinds of thinking do you hope students will practice? What do you expect students to gain from their work? What evidence do you see that they are making these gains?

5. How could the museums encourage you to explore the possibility of teaching in the study centers? What resources or relationships would facilitate your teaching in these settings?

6. Who else in your field, at Harvard or elsewhere, would be interested in these questions?

Appendix H
Coding Scheme

A—High-end cognition

Passages may be marked with A only, or with A plus one or more of the more specific codes B-F.

B—Choice and self-direction

C1—Surprise—Immediacy and engagement (attention captured)

C—Close observation/extended engagement (attention sustained)

D—Progressive pedagogy

E—Thematic/disciplinary flexibility

F—Conversation/social interaction

G—Web-based orientation/navigation

H—Entry procedures and non-web-based orientation/navigation

I—Staffing and visitor-staff interactions

I2—Staff members or teachers as learners

J—How SC learning can inform broader museum experiences

J2—How SC learning can transfer to other learning experiences

K—Defining/expanding audiences for SCs/for SC "knowledge arts"

L—Related resources/reference materials/object files

M—Architecture and physical environment

N—Miscellaneous (seems important but doesn't fit existing codes)

O—How objects inform teaching/planning/curriculum development

P—Traditional (lecture) pedagogy

Q—Other pedagogy

R—Qualities noticed in objects