Case Study: ARTstor at the University of North Carolina, Chapel Hill

This case study offers an in-depth look at the University of North Carolina – Chapel Hill's decision-making process in licensing and implementing ARTstor as a campus-wide resource. UNC [1] has been an ARTstor participant since 2005 and has taken advantage of ARTstor's hosting pilot for its institutional collections. UNC's approach to implementing ARTstor has allowed it to derive value in multiple ways – through its users, who have gained new tools for the study of images, and more broadly as an institution, which has maximized its resources and discovered new partnerships.

This case study demonstrates how other ARTstor participants might leverage UNC's best practices to maximize value from ARTstor at their own institutions and helps potential participants reflect on the reasons why licensing ARTstor may be a beneficial decision for them.

Background

Prior to its decision to participate in ARTstor in 2005, UNC used a homegrown digital image management system called E-Media Cooperative (EMC). This platform was created in the late 1990s as a project in the Department of Classics, where faculty wanted to share images of classical art and archaeology with students. The demand from faculty in other departments for similar tools led to involvement by the university's educational technology department, particularly because it did not make sense for each department to develop these systems on its own. In this way, EMC evolved into a campus-wide resource.

As faculty and student demand grew, EMC started to crash frequently and the on-campus instructional technology support group (ITS) responsible for maintaining it – the Center for Instructional Technology – had trouble keeping up with demands for updates and support. The required maintenance was unrelenting and consumed ever more resources. With a team of only six people devoted to all of the university's applications, continuing to support EMC clearly required too much effort.

Thus, in 2004, a committee was convened to undertake the search for a new platform. The committee was comprised of representatives from many different campus divisions, including:

◊ Department of Art:
  - Visual Resources Curator [2]

◊ University Library:
  - Director of Public Services
  - Associate University Librarian for Access Services and Systems

◊ Center for Instructional Technology (ITS)[3]:
  - Academic Outreach Consultant

◊ Office of Arts and Sciences Information Services (OASIS)[4]:
  - Associate Director for Academic Technologies
  - Associate Director for Academic Computing and Systems

The committee assessed the university's diverse needs – ranging from the need for good teaching tools to the need for an archival solution – and evaluated its options, examining over 30 software products and platforms on the market at that time. After an extensive investigation, the group recommended ARTstor, which would satisfy the need for a faculty- and student- accessible teaching and research tool and provide benefits that EMC could not provide. Not only did ARTstor's connection to the Andrew W. Mellon Foundation and JSTOR mean that it was a trusted brand, but also, the committee realized that ARTstor would immediately add value in three key ways:

◊ *Rich Source of Content:*
The ARTstor collections themselves, containing over 500,000 images at that time, would amplify the use of images on campus by providing faculty and students with more options for their teaching and research.

◊ *Presentation & Teaching Tools:*
ARTstor's well-developed tools, including the Offline Image Viewer (OIV), would address an important teaching need – especially as slide projectors were becoming increasingly obsolete. ARTstor's ability to integrate with the course management system (Blackboard) by offering stable URL links to images and groups of images was "also a plus," according to the Associate University Librarian.

◊ *Platform for Institutional Collections:*
ARTstor's institutional collections hosting pilot would allow UNC to provide access to its own digital images through ARTstor's platform.[5]

As a result of the committee's collaborative decision-making process, which would ultimately be a major contributor to ARTstor's successful adoption on campus, different parts of the university agreed to share costs and support services for the UNC community. The library paid ARTstor's Archive Capital Fee and OASIS volunteered to pay the Annual Access Fee for the first three years of participation.[6] Members of many campus departments, including OASIS, the University Library, and the Department of Art, originally took on – and have continued to perform – the responsibility of promoting ARTstor to students and other faculty.

How Has UNC Derived lasting Value from Participating in ARTstor?

In implementing ARTstor, UNC administrators were cognizant of the potential to better steward the university's resources in pursuit of its mission. The sections below explore specific ways in which UNC's decision has led to increased institutional value and individual user benefits.

1. Economic Benefits: Cost Savings & Reallocation of Resources

While initially the cost of licensing ARTstor may have seemed high, UNC has realized a substantial net cost savings when other infrastructure investments are taken into account. When it became clear that EMC could no longer adequately serve the university's needs, OASIS had investigated the possibility of building a new homegrown system. There was no question that UNC's engineers could build a solid application to replace EMC, but OASIS leadership estimated that this would take four developers about six months, an expenditure that in itself would dwarf ARTstor's one-time Archive Capital Fee.

While the investment in developing a new local system may have been feasible, campus leadership recognized that the real problem was performing ongoing maintenance of a new homegrown platform. OASIS's acute awareness of the costs of technical maintenance stemmed from its experience with EMC, where the difficulty lay not just in keeping up with faculty feature requests, but also with run-of-the-mill upgrades. For example, every time a browser or operating system upgrade was released, the EMC code had to be updated. As a manager within the group explained, "It's the support costs afterwards [that made it impractical]. There'll always be new feature requirements, technology upgrades, server maintenance, changes to the database, operating system, and browser updates. . . .[We thought], let's have someone else take care of this." Another OASIS leader added that "it didn't make sense to build something that was available [externally]." OASIS wanted these time-consuming responsibilities off its plate, and after an explicit calculation, realized that the annual salary of the full-time employee dedicated to EMC maintenance ($45,000 to $50,000) could more than cover the annual fee for a licensed resource like ARTstor.

OASIS also considered the cost of faculty and student support for a homegrown system, which for EMC could reach 20 to 30 hours of staff time during peak periods. One IT staff member who was intimately involved in day-to-day user support during the transition from EMC to ARTstor said ARTstor's reliability and the "stable source of support" were tremendous selling points for him and for faculty. While some users still turn to OASIS or the library for help, many go straight to ARTstor's User Services team with questions, and these are questions that IT no longer has to field.[7]

Deciding not to build its own platform and turning to ARTstor has also meant that the roles played by those who support the use of images on campus have changed for the better. Both in the technology departments and in the case of the Visual Resources Curator, the added efficiency that came with ARTstor allowed a renewed emphasis on pedagogical support. Technology staff can now spend more time with faculty, instead of countless hours of EMC programming and maintenance. Similarly, the Visual Resources Curator said she has "a more consultative role" in classrooms than she previously did, when much of her time was spent finding and collecting slides for faculty members.

Although it can be difficult to give up the sense of control that comes with a homegrown system, UNC's technology groups also realized that EMC was limiting progress in other areas. One of the principal decision-makers explained, "If [you] just let go, then that frees you to do other things. With ARTstor, all of a sudden, all these problems went away," freeing OASIS to focus on other priorities. For example, since EMC was eliminated in December 2006, OASIS has been able to progress more quickly in developing a crucial application that enables students to schedule appointments with advisors.

2. Improved Local Image Collection Development and Curation

The resource reallocation brought about from licensing ARTstor has resulted in a more useful image library at UNC. By way of background, it is important to mention that UNC's use of visual resources – much like other institutions across the country – has changed considerably in the past few years as slide projectors have been phased out and digital technologies improve. Prior to licensing ARTstor, the Visual Resources Library had begun digitizing its slide collection at a steady pace, but digitizing all 250,000 images was estimated to take 20 years.

The Visual Resources Curator has taken advantage of ARTstor participation to focus on and accelerate select digitization efforts – resources that would previously have gone into digitizing images already in ARTstor are now dedicated to more specialized digitization in service of UNC faculty members. Today, when a faculty member requests an image, the Visual Resources Curator first checks to see whether the image is already among the 500,000 images in the ARTstor Digital Library. She estimates that about one-third of the requested images are already held in the ARTstor collections and can be used directly from ARTstor.

Moreover, the Visual Resources Curator noted that this resource reallocation has positive reverberations throughout the network of ARTstor participants. "It makes a lot more sense for us [visual resource curators] to draw upon a common pool rather than each scanning the *Mona Lisa* on our own," she said. This "common pool" allows her to pursue "a more focused digitization based on the needs here at UNC."

In addition, ARTstor's metadata model has informed cataloging of the local UNC collections by promoting standardized metadata – an improvement that makes images available campus-wide that previously could not have been found easily, if at all. The process of migrating images from EMC to ARTstor required that the metadata conform to a single standard, which the EMC system did not have.[8] When images were uploaded to EMC, they often had incomplete or inconsistent metadata because the images were described by a particular professor for his or her own use. As the Visual Resources Curator explained, "It's good to standardize [metadata] through ARTstor and make it available and searchable to others across the campus."[9] Having a single standard makes the images discoverable to other instructors on campus; without the ability to find these images, UNC had not been able to fully realize the benefit of its institutional collections.

3. A Single Point of Access

Through hosting – combining institutional collections with ARTstor collections so that users can search just one resource – access to UNC's institutional collections via ARTstor has grown steadily.[10] Once the Visual Resources Curator has created a new image for a professor, she adds it to the Visual Resources Collection, which is hosted by ARTstor on behalf of UNC. This collection, containing over 33,000 images, is one of five hosted institutional collections at UNC, all of which are available on the ARTstor Digital Library servers.

ARTstor's search functions enable seamless cross-collection searching, whereby users can draw upon UNC's local collections, ARTstor collections, and images uploaded to personal collections, as they create image groups and presentations. For example, one art history professor explained that she creates classroom presentations using the ARTstor Offline Image Viewer (OIV), incorporating her own images, images from UNC's Visual Resources Collection, and ARTstor's images. "It's a great teaching tool… everything [is] in one place," she said – especially compared with the old methods of marking the relevant pages in many different books or posting the images that students needed to study on a wall in a classroom the week before an exam. Another art history professor refers her students to materials in ARTstor, since no single textbook has all the images she needs for a given class. She, too, is able to create image groups within ARTstor that are more complete because they draw content from a variety of sources.

In departments where there has not traditionally been a central "point person" for images, ARTstor can provide a welcome single destination for researchers. The botanical garden at UNC, for example, currently does not have a standardized system in place for responding to image requests. However, planned digitization projects and ARTstor-enabled access will allow the garden staff to refer its faculty directly to ARTstor as a first step, instead of addressing each request individually. Related to a point illustrated earlier in the case study, this time-savings – in this instance brought about by ARTstor's capacity to serve as a single point of access – will free the garden staff to focus on only the most specialized questions and on other mission-related activities.[11]

UNC's hosted collections continue to grow in interdisciplinary directions. ARTstor's single platform, with its powerful tools, continues to attract content from faculty. In addition to the botanical garden's soon-to-be hosted collection of North Carolina plants, a number of faculty are interested in contribut-

Institutional Collections Hosted at UNC - Current and Future

◊ *Visual Resources Collection:*
UNC's digital "slide library" of approximately 33,000 images, to which the Visual Resources Curator continues to add

◊ *Apollo Collection:*
4,300 images that originated in the Department of Classics and which, as one of the university's earliest digitization projects, led to the development of EMC (the homegrown image platform that existed prior to ARTstor)

◊ *Crusader Art:*
677 images of Christian art from Palestine contributed by Art History Professor, Jaroslav Folda

◊ *History and African and Afro-American Art Collections*:
1,200 images originating in these departments

◊ *Magness Collection of Mediterranean & Near Eastern Archaeology*:
1,380 images

◊ *UNC Research Laboratories of Archaeology Digital Image Archive:*
200 images contributed by Professor Steven Davis

ing collections because of the advanced viewing and zoom capabilities the platform offers. Faculty legacy collections are also being added to ARTstor such as a collection from History Professor, Michael McVaugh, of images relating to medical history. Professor McVaugh will be retiring soon, and he does not want the great effort he spent collecting these images during his career to be lost.

As described in the textbox on page three, the number of institutional collections is growing because faculty members see ARTstor as a central repository for the images they have collected. As a result of having an attractive platform for this content – and because key campus constituents from the University Library and the Visual Resources Library actively support digitization – the UNC community gains access to collections that previously sat on the hard drive or in the slide carousel of just one professor.

4. Enhanced Teaching and Learning

For the average user at UNC, ARTstor's impact is most palpably felt in teaching and learning. Often, ARTstor is woven into the fabric of a course and is central to the learning process; at UNC, focused usage – knowing where to find what you're looking for in ARTstor – drives high usage. One student explained that her professor made it clear that ARTstor would be an important study tool and distributed a handout on how to use ARTstor to the class. After ARTstor was fully implemented at UNC, the University Librarian observed that several faculty sent her thank-you notes to express their appreciation for this important resource.

Indeed, faculty at UNC reported that ARTstor makes it easier to incorporate images into their classes than when they had to rely on slides. The Chair of the Department of History learned about ARTstor last autumn when he co-taught a class with a professor in the Department of Art. In his more than 25 years of teaching, the history professor has accumulated a large collection of slides to use in his courses. Seeking the assistance of UNC's Digital Media Laboratory, he had digitized most of his collection, but ARTstor's collections yield an even greater number of possibilities for his presentations. He blends his own images with those from ARTstor in the presentations he creates with OIV. This spring, when he taught the introductory western civilization class at UNC, he used ARTstor's OIV in every one of his lectures, and continues to use it in presentations at conferences and other external venues. "I'm a convert," he said. In fact, librarians outside of the Department of Art have derived value from ARTstor's interdisciplinary handouts, which explain how ARTstor can be used in fields like African Studies or Literature.[12]

UNC faculty members appreciate the convenience of assembling presentations in ARTstor. "ARTstor makes it easier to create presentations" than it was with the older system, said one art professor. The Chair of the Department of History also mentioned this key benefit of ARTstor. He explained that before using ARTstor, there was a limit to the amount of time he could spend searching through slide collections, and therefore a limit to the number of images he would use in his courses. Now, he can instantly – even late at night when the department is closed – find out whether an image is available to him and insert it into his presentation, which means his classes are richer in images. Professors also find it easy to change presentations at the last minute and to add images as they find them, leading to higher quality presentations.

After saving presentations and image groups, professors are able to call up the images they have used in the past much more quickly and simply by clicking a file rather than reassembling a slide carousel each semester. A graduate student who taught two undergraduate classes last year remarked that it is satisfying to see the number of presentations and groups in ARTstor grow. "I won't have to reinvent the wheel in the future," she said.[13] ARTstor users at UNC have created 972 image groups, 693 of which were made by professors. Many of these are assembled in shared folders; sometimes professors will create image groups for course lectures and share them with their students, who can refer back to the groups when reviewing their notes or studying for exams.[14] Rather than studying photocopied images hung on the walls of a study room in the Department of Art, students can access online image groups either directly on ARTstor or through links from the course management system. [15] And, students can access the images on their own time, from their home computers.

In addition, a graduate student who teaches studio photography courses explained that the sheer breadth of the combined ARTstor and UNC collections has been useful: "Photographs are so familiar to all of us that it can be difficult to look at photography with new eyes. I want to show my students an encyclopedic selection of photographs so that they can begin to make distinctions again." When she notices that a student's work is moving in a certain direction, she often refers him or her to a particular photographer's work in ARTstor for deeper exploration and historic context. One student reported that ARTstor has "more of what we need" as its collections continue to grow to accommodate the requirements of its users. This illustrates how ARTstor's tailored approach to collection development provides benefit to both faculty and students.

Satisfying all of these diverse (and evolving) needs for images remains complicated, of course, and ARTstor cannot fulfill all that every user might hope for. But by working in an ongoing, collaborative, and back-and-forth approach with the UNC staff who are closest to their users, ARTstor continues to make significant progress.

A Collaborative Solution

From the beginning, strong communication among stakeholders at UNC in choosing and implementing ARTstor mitigated the difficulties that campus-wide collaborative initiatives often encounter. ARTstor encouraged collaborative decision-making at an unprecedented scale because so many departments had compelling reasons to support a cross-functional resource. The technology departments needed to find a replacement for EMC, and administrators at the University Library were seeking to support more digital resource projects on campus but had had minimal involvement with the homegrown system and with faculty members' digitization efforts.[16] In fact, the new University

Librarian had begun to formulate a long-term vision that would incorporate more technology in an effort to expand the library's reach, and involvement in ARTstor would add to these efforts. [17]

Participating in ARTstor also offered opportunities for each department at UNC to assume leadership in its area of expertise. In addition to important contributions from the technology departments, both the Visual Resources Curator's and the librarians' on-the-ground knowledge of faculty needs and experience in curating collections was an asset to ARTstor's rollout at UNC. The curator and librarians shared knowlege about creating comprehensive and accurate metadata and bibliographic entries, as well as about content standards, archiving practices, and copyright issues pertaining to such a resource. The University Library staff is also uniquely equipped to hold training sessions for faculty and students while the Visual Resources Curator is available for one-on-one faculty support.

Beyond sharing processes and responsibilities, the multiple stakeholders at UNC have also collaborated in their outreach efforts to promote the use of ARTstor on campus. This outreach occurs largely through interpersonal contacts; both the library and the technology groups use liaison systems in each department to understand the needs of the faculty and students. ARTstor is also publicized through various departmental emails on campus – OASIS has access to email listservs with larger audiences than those of other departments, which is helpful in spreading the word to faculty and students about ARTstor.

Whereas only the Visual Resources Curator and faculty members in the Department of Art oversaw and used images when slides were the predominant teaching tool, ARTstor often involves various groups across campus with complementary goals and areas of expertise, including faculty from other academic departments, technology, and the University Library. Prior to ARTstor, these groups typically had few opportunities to work together. Such alignment of interests across campus in selecting, implementing, and promoting ARTstor has laid the foundation for its beneficial impact in achieving cost savings, improving local image collections, streamlining access to images, and enhancing teaching and research. Moreover, this "culture of sharing," which grew out of selecting and implementing ARTstor, has the potential added benefit of informing other collaborative projects at UNC.«»

End Notes

1. UNC has an annual operating budget of $1.8 billion. There are 3,100 faculty members; last year (2006), 27,500 students enrolled in the university, of which 15,000 were undergraduates in the College of Arts and Sciences.

2. As at many universities, the Visual Resources Library is under the aegis of the Department of Art and operates independently from the University Library.

3. ITS is a campus-wide resource.

4. OASIS serves only the College of Arts and Sciences.

5. ARTstor provides access to hosted collections to the campus to which the images belong, as well as to any other campuses specifically designated by the hosting institution.

6. The Archive Capital Fee is a one-time fee designed to ensure that ARTstor has the resources to innovate and adapt its content and tools to new technologies and standards. The Annual Access Fee is an annual subscription fee and supports the annual costs of maintaining the service.

7. ARTstor records show that the User Services team has received 599 messages from individuals at UNC, of which 226 came directly from end users (over the period of July 2005 to April 2007).

8. ARTstor currently uses an XML schema based in large part on the Visual Resources Association (VRA) Core schema. For more information about ARTstor data standards, please see *http://www.artstor.org/our-organization/o-html/standards-data.shtml*

9. Converting the metadata was, however, the most challenging part of the transition for UNC staff. As a result of feedback from participants in the institutional collections pilot program with UNC and other schools, ARTstor will be introducing new tools and features to improve processes for metadata development and the integration of hosted collections with ARTstor collections.

10. Over the first three months in 2007, accesses to institutional collections have more than doubled, from 6,235 to 15,780.

11. The botanical garden recently approached the Visual Resources Curator to partner on an effort to digitize images of North Carolina plants for inclusion in ARTstor as one of UNC's hosted collections. ARTstor's metadata scheme will add important structure that the collection currently lacks.

12. ARTstor collections are useful to faculty and students across multiple disciplines. ARTstor provides interdisciplinary guides to ARTstor content at *http://www.artstor.org/using-artstor/u-html/interdisciplinary.shtml*

13. When faculty members leave one institution for another ARTstor subscribing institution, ARTstor can transfer their image folders over to their new accounts.

14. ITS staff explained that student needs have been a key driver in technology projects like EMC and ARTstor. As digital resources become more accessible on campus, students grow to expect them – and they become key users.

15. UNC uses the Blackboard course management system. Some faculty members paste links to image groups directly into Blackboard. Prior to ARTstor, students were also able to access images on EMC if they had been uploaded to the system; however, the system often crashed, particularly during high-usage exam periods.

16. A notable exception is the library's "Documenting the American South" project, created in collaboration with some faculty beginning in 1994. See *http://docsouth.unc.edu/*.

17. See the UNC Library's 5-year plan: *http://www.lib.unc.edu/Plan20051118.pdf.*

This case study offers an in-depth look at the University of North Carolina – Chapel Hill's decision-making process in licensing and implementing ARTstor as a campus-wide resource. UNC was selected for this case study based on its high volume of activity in the ARTstor Digital Library. The study was conducted by Ithaka Strategic Services (http://www.ithaka.org/strategic-services) in spring 2007 and includes analysis based on institutional research, usage data, and interviews with approximately 25 campus constituents including librarians, faculty members, administrators, and graduate students.

We are grateful for the participation of UNC-Chapel Hill community in conducting this study, in particular, Sarah Michalak (*University Librarian*), JJ Bauer (*Visual Resources Curator*), and Lisa Norberg (*Director of Public Services*).
