

# **Progress Report**

## ***Communicating Place Grant***

### **October 2002**

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*Summary of activities to date for the "Communicating Place" grant from the Ed Tech Curriculum Development Program*

The purpose of this grant is to investigate how mobile field tools for recording and representing places can improve architectural studies. Having researched and selected tools such as palmtops and laser tape measures, I am now testing the use of these tools with students who are deploying them in the field and sharing collected information. Building on previous experience with field visits, we are developing guidelines for thoughtfully approaching a site with recording tools. The guidelines and student results will be published on an accessible project Web site for all to use.

### **Tools Selected**

Initially I examined a spectrum of tools that permit investigation of architectural ideas and settled on inexpensive digital tools that are available off-the-shelf with minimal customization. In contrast to more sophisticated tools such as environmental 3-D scanners, simpler devices are more likely to be used by architects who typically work in small low-overhead firms. Because digital tools become obsolete quickly, elements in an inexpensive "toolkit" can be upgraded individually as newer editions and budgets become available.

A key criterion for a tool's inclusion in this project is how much training is required: the selected tools have short learning curves that suit their occasional use by novices.

The selected tools reflect the wide range of architectural concerns. For recording time-based activities and interviews, I chose these tools:

- Digital movie camera
- Audio-recorder (previously purchased)

For capturing geometric and spatial configuration, I selected these tools:

- Leica Disto laser measuring device
- Compaq iPAQ personal digital assistant
- PocketCAD by Arc Second software (runs on the iPAQ)
- PhotoModeler software by EOS Systems (runs on the iPAQ)
- Digital cameras (borrowed or previously purchased)

For sketching and remote sharing of sketches, I chose the following tool:

- Inklink device and software by Seiko (runs on the iPAQ)

Because it allows a sequence of sketches to be tracked, it could potentially reveal how the procedure of a students drawing could be improved.

For sketching, in-field editing & archiving I also considered lightweight notebook computers by Fujitsu. I am waiting for the next generation that combines the P-1000's stylus-activated screen with its cousin's P-2000 CD-RW drive and low-power consuming Transmeta Crusoe processor. Other products considered included communication devices such as short-range walkie-talkies, a portable scanner to speed traditional artifacts to the network and the Social Science Instructional Lab's GPS devices.

## **Integration of Tools in Classes**

Rather than focusing efforts on a single class, I use all my classes to develop an understanding of place-recording methods. Seminar, design studio and media classes provide different opportunities to look at historic and theoretical approaches toward place representation along with contemporary practical applications. Developing this specialized knowledge will allow me to enrich design and digital method teaching at all levels.

### ***Spring Quarter 2002***

During spring quarter I began research to determine which tools would be part of this investigation. Then we began trying some tools with the Spring Rome Seminar for students who would be going on the summer Rome Architecture and Urban Design Program. I focused the class on the representation of special places in Rome as a way to strengthen the intellectual basis for place-recording investigations. Gathering resources for the class helped me enrich the bibliography on techniques for place-based recording.

Students in the 2-credit Rome Seminar used the digital video camera to explore how to represent changing light or human activity. Just one week after a brief training on the use of iMovie, students were able to produce credible videos that communicated an expressive sense of place.

### ***Summer Quarter 2002***

As the director of the Rome Architecture and Urban Design Program, I had planned to integrate the use of digital video cameras, iMovie, and Disto tools. But the lack of computer facilities and support in Rome meant that the technological demands of pursuing the agenda were too great in light of other teaching and administrative duties. Students pursued place-recording with traditional watercolor painting along with digital cameras, and limited use of video and audio recording. Individual students produced animated slideshows with narration focused on urban approaches, historical development and comparative interiors.

Students used the Disto in Rome for taking quick measurements of large spaces, particularly vertical elements of church interiors. This proved useful in developing students' abilities to estimate distances in ornate interiors, which would have been impractical with conventional measuring techniques.

I hired a graduate assistant, Stina Lane-Cummings, to help in testing devices and writing usage guides with the findings, and she began work at the end of the summer. Initially she tested Photomodeler software and provided brief guidelines. Then we concentrated on preparing material for the Arch 281 class. She wrote a Quick Start guide for taking field measurements to summarize procedures with both tape measures and laser measuring devices. For the Disto laser measuring device, she condensed and clarified information supplied in three different manuals (some of

which were rough translations into English) and summarized the relevant features in a Quick Start Guide as well as a longer Reference Guide. In addition, she has debugged functional problems with the InKlink sketch tool and the Disto-PocketCad combination by working with technical support.

### **Fall Quarter 2002**

Field-testing of the tools began with the 75-student intermediate undergraduate 281 Architectural Design Studio. This studio examines an urban site in downtown Corvallis. To record this place and test the tools, one group within my studio focused on the dimensions of physical buildings through the use of Disto and PocketCAD. One person used InKLink to capture sketches. Another group used the digital video camera to examine human use of the street. Divided into five studios team-taught by five professors, this second-year studio provides a good opportunity for comparing concurrent efforts. In addition, efforts from previous years can be compared through the Web archive.

I have alerted my colleagues to the availability of the equipment and have begun to train small groups of students from other design studio classes on an as-needed basis. Because site field visits are typically at the beginning of the term, there were already conflicting requests for our small pool of tools in the first week.

Concurrently, I have been migrating my large introductory computer graphics class to more appropriate settings: We are adapting the Arch 610 lectures to hands-on sessions in a new classroom equipped with wireless laptops, Condon 204. The equipment allows students to immediately try out principles with a partner and share results through the Internet. In addition, moving companion tutorial sessions from traditional labs to the design studio rooms allows students to more fully utilize their own computers.

### **Collaborative Work**

To fully leverage the potential of this grant, I am taking advantage of other available resources whenever possible.

To supplement the toolkits, I have been using equipment from Knight Library's Media Services as well as AAA's Faculty and Student Services. Media Services has 23 digital still cameras available for checkout and 15 digital movie cameras. These have proved convenient for students to borrow; these particular models are easy for beginners to use for site visits. In addition, I met with the Media Services group, to brainstorm preliminary planning for work in Spring 2002. I used advice from the equipment supervisor to purchase a video camera in the Sony line they have found to be durable, with similar controls.

Design collaboration with people in a remote location is an ideal application for these digital tools. Working with Professor Joachim Kieferle of the University of Wiesbaden, my 610 Introduction to Architectural Computer Graphics class will complete a small collaborative project with their German "pen pals" exploring place representation. In this project, each student takes a digital image of a special place in their home town, and trades with a student from the other country. Each student then simplifies the received image into an emblematic road sign, and finally collages sign and landscape. While this project doesn't require use of the grant's mobile tools, it provides an opportunity to see German perspectives on presenting place-based

information and emphasizes the global partnerships possible with the Web. A more extensive collaborative project is planned for Winter 2003.

## **Initial Observations**

### ***Single-purpose vs. open-ended tools***

We found a distinction in how the students reacted to different tools. Initially I thought that the "open-ended" tools such as the digital video camera, InkLink sketching, and PhotoModeler tools had the most promise for designers because they hold the most possibilities for creative interpretation. But single-purpose tools like the Disto have been the ones that students have found most useful. The Disto is the digital substitute for a tape measure; it's easy to understand how to apply the new tool immediately, and it speeds a previously tedious chore, allowing more time for thoughtful reflection.

In contrast, though, while students were immediately intrigued by the novelty of the Inklink note-taking and sketching tool, they ended up using it very little. They disliked its ball-point pen interface and found the challenges of carrying equipment and downloading the data burdensome. To guide students in using these potentially richer open-ended tools, I need to develop strong domain-specific examples and provide direct instruction with ample experimentation time.

### ***Place and problem context***

In order to prescribe the best tools for each situation, it has been important for me and my assistant to methodically learn the tools, trouble-shoot functional shortcomings, and clarify procedures. From our personal experience with the set of tools, we have been able to select the ones most appropriate to specific student needs. For example, students who worked on a rural site did not need the field measurement guide that we developed for an urban assessment.

Although tools such as the Photomodeler (2D into 3D photogrammetry) are appealing, their usefulness is greatly dependent on the nature of the environments being investigated and the intended use of the information. For example, students modeling a city block by block, they could use a familiar computer modeling program rather than Photomodeler. With the modeling program, students could produce simple geometric shapes more precisely and more easily. On the other hand, modeling historic buildings of medium complexity would work well with Photomodeler.

### ***Equipment management***

From the wireless laptop classroom and initial place-tool circulation, I am learning that equipment management requires careful planning and on-going adaptation. As I streamline procedures, I plan to make the tools available for checkout through either the AAA Faculty and Student Services or Knight Libraries' Media Services. Open check-out requires me to simplify directions for tool usage and pre-install any necessary software. To keep the use of the tools seamless for students, requires management overhead to set up tools and respond to their maintenance.

## **Presentations**

Work on Communicating Place was presented in the following professional settings:

- National Conference on the Beginning Design Student, Portland State University, March 2002
- Lecture, University of British Columbia, March 2002
- Chaired education panel at AIA Six Degrees of Collaboration Conference, April 2002
- Chaired workshop on "Emerging Pedagogies" at ACSA National Conference in New Orleans, April 2002

## Budget Progress

Item	Quan.	Price	Total
<b>Equipment</b>			
Digital video camera (with tapes, battery, case)	1	\$929.87	\$929.87
6-in-1 Memory Card reader for cameras	1	\$49.99	\$49.99
Compaq iPAQ PDA (refurbished)	2	\$359.25	\$718.50
Disto laser measuring device	2	\$700.00	\$1400.00
Disto PocketCAD Autosync cable	1	\$35.00	\$35.00
Gender changer for cable	1	\$10.00	\$10.00
PocketCAD by Arc Second	2	\$199.00	\$398.00
Disto addin for PocketCAD	1	\$199.00	\$199.00
PhotoModeler software	1	\$00.00	\$0.00
InkLink software	1	\$99.95	\$99.95
Pen ink refill	2	\$9.95	\$19.90
Shipping and handling	1	\$9.95	\$9.95
		<b>Subtotal</b>	\$3,870.16
		<b>Alotted</b>	\$7500.00
		<b>Remaining</b>	\$3,629.84
<b>Personnel</b>			
Student assistant	150	\$10	\$1500.00
		<b>Alotted</b>	\$5000.00
		<b>Remaining</b>	\$3500.00
<b>Upcoming Equipment</b>			
Miscellaneous hardware		\$3,629.84	
<b>Upcoming Personnel</b>			
Student assistant		\$3500.00	
Consultants		\$3000.00	
Visit by Prof. Ellen Do, University of Washington, Design Machine Group			

## Future Plans

Work for the next stage centers on the following:

### 1) Deeply investigating a narrower toolset

I will look at how the tools can be used to capture the enclosure and lighting of a spatial sequence, using both measurable data and sensory input. For open-ended tools, we need to develop concrete examples that show their potential and in the process discover what questions the tools are best suited for and how place comprehension differs with mobile tools. Through creating examples and guiding students, I will be able to better understand what flow we can best use them as teaching tools.

**2) Designing targeted exercises** that exploit the strongest features of the tools and test their usability and robustness in different teaming and site situations. Tools have been first been tested for their ability to do straight-forward tasks in broad site-surveying. A next step is to plan how tools could be used together in a team effort targeted to capture spatial sequence. Projects that require immediate remote transmission of site information make digital tools more advantageous, so I will integrate the mobile tools into future collaborations.

Trial duration could make a lot of difference in how students are able to use the tools. For the hand-held devices, students need time to understand how to use the functions of the software, to become comfortable with the logistics of carrying and maneuvering the tools.

**3) Creating assessment tools** to accompany the exercises that measure student attitudes, skills and understanding. I am developing survey forms to discover the tools' effectiveness for specific inquiries and impediments for usage. I am discussing with my advisors, ways to measure how tools affect understanding of the environment and the subsequent effect on the design thinking. A consultation meeting with Prof. Ellen Do of University of Washington is tentatively scheduled for the weekend of November 2.

**4) Broadening tool deployment** through class exercises and volunteer trials; making more sets of the equipment available. Checkout logistics must be solved; I plan to streamline the tools and assemble them into kits that are easily handled by Faculty and Student Services. A solution must address the consolidated demand that occurs at the beginning of the quarter.

In summary, the grant has provided a good opportunity to start to see the potential of mobile field tools in architectural teaching. I will continue to progress on this effort through discussion and collaboration with colleagues.