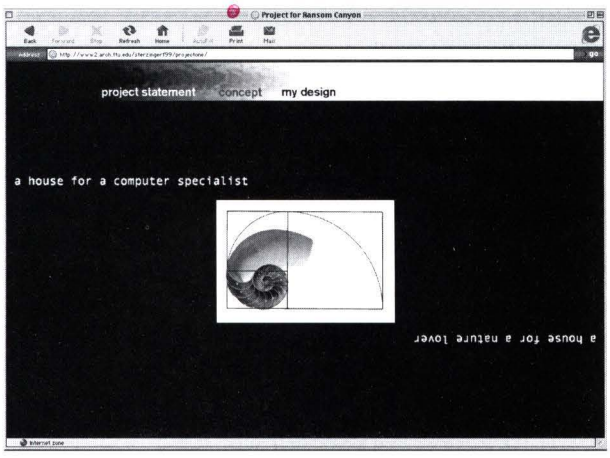
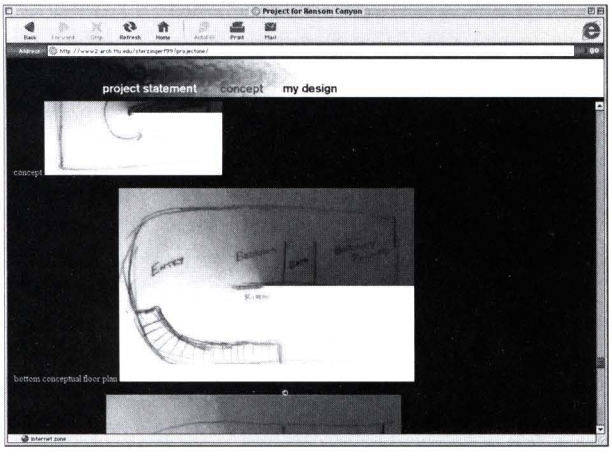
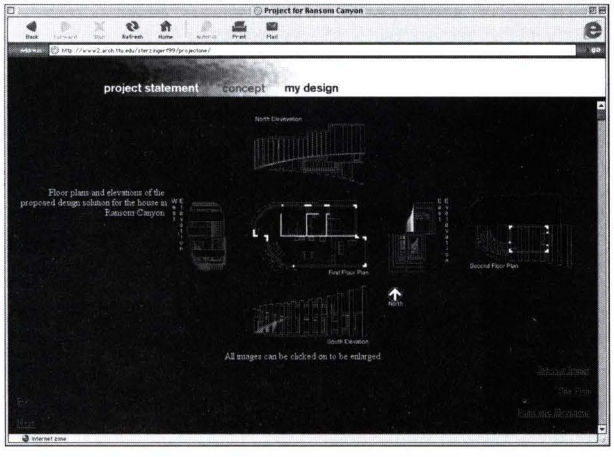
by Urs Peter Flueckiger and Robert D. Perl

Texas Tech's E-Studios

LAST YEAR AT TEXAS TECH UNIVERSITY, WE began teaching four experimental on-line undergraduate architecture design studios. By integrating computers and the Internet into the studio experience, we sought to explore meaningful ways to synthesize digital media into educational processes. The College of Architecture provided secure classrooms, Internet access, and space on its network server. Third- and fourth-year undergraduates supplied their own computers and off-the-shelf software. As the instructors, we provided a variety of teaching, architectural design, and computer experiences. All participants brought enthusiasm to embark on an educational adventure.







Pages from Jarrod Sterzinger's Web site show his work on a fall 1999 class project. (top) Sterzinger's project statement demonstrates the dual aspects of his design. (center) Conceptual sketches by Sterzinger illustrate his preliminary ideas. (bottom) Sterzinger offers plans, elevations, and sections in his final presentation.

Design projects, schedules, and the expected quality and quantity of work were roughly the same for the students as for their classmates in concurrent paper-and-pencil studios. They posted their research, preliminary work, and final submittals on Web sites they themselves designed and managed. Lively critiques took place in on-line discussion forums where the designers received and responded to written comments from professional mentors, students at a distant school, the Texas Tech faculty, and their classmates. Of particular interest was a six-week period when Flueckiger taught his class from Switzerland, with only a dial-up connection for communication.

These students opted to take the e-studio rather than a section of a traditional design class. Their design abilities represented a cross section of students enrolled in third- or fourth-year studios. All had taken the first of the two computer classes required at Texas Tech. (The first covers the basics of CAD and 3-D modeling, the second emphasizes advanced rendering and imaging.) To learn the fundamentals of Web page design and management, all took a three-credit-hour co-requisite course (also taught by the two of us) in which each student administered a personal Web site. Each student had exclusive author rights to his or her pages and was responsible for page design, site navigation, and file management on the site. Using Microsoft FrontPage, students learned how to create and edit Web pages, establish hyperlinks, and manipulate images. Additional Web skills were addressed on a "just-in-time" basis.

A computer screen is a small window into the multidimensional processes of design. Communicating the complex flow of intentions, concepts, explorations, alternatives, refinements, systems, etc. through the Web is a very different task than participating in a traditional classroom discussion or pointing to a detail in a large display pinned on the wall. In person, photocopied case studies are recognized as research, and initial sketches are easily distinguished from presentation drawings. However, on the Web, a hyperlink can lead to anything, from anywhere, at any time. A Web site must contain content, of course, but the site must be organized to allow the viewer to easily navigate to find that content. When designed properly, the organization should be nearly invisible to allow the content – in this case, a student's architecture – to come through in all its glory (or lack thereof). On the Web, small file sizes allow pages to download faster. However, if files are too small, images will appear fuzzy and will not properly communicate the designer's proposal. The target was to make student work viewable even with a slow, dial-up connection, a screen resolution as low as 800x600 pixels, and in both Microsoft Internet Explorer and Netscape Navigator. This mark is difficult to reach, but allowing contact with all visitors is very important. The value of clear site navigation and usability was discussed, and sometimes debated, throughout the semester. Preliminary work, final presentations, and subsequent critiques were – and still are – viewable by anyone, without passwords or any other restrictions.

Fall 1999

Once Perl's Architecture Design III class began, each student was assigned a mentor, a professional architect working in an office. Loyal Texas Tech alumni, the mentors each volunteered half an hour per week for the fifteen weeks of the semester. They were asked to view a student's work and offer written advice and criticism to the student via the Web. Many mentors viewed several students' work to better understand how their student compared to others. They posted their comments in the student's FrontPage discussion forum which was available to everyone, and the students read and learned from comments addressed to others. Students also commented on each other's work. Mentor comments were consistently focused and thoughtful.

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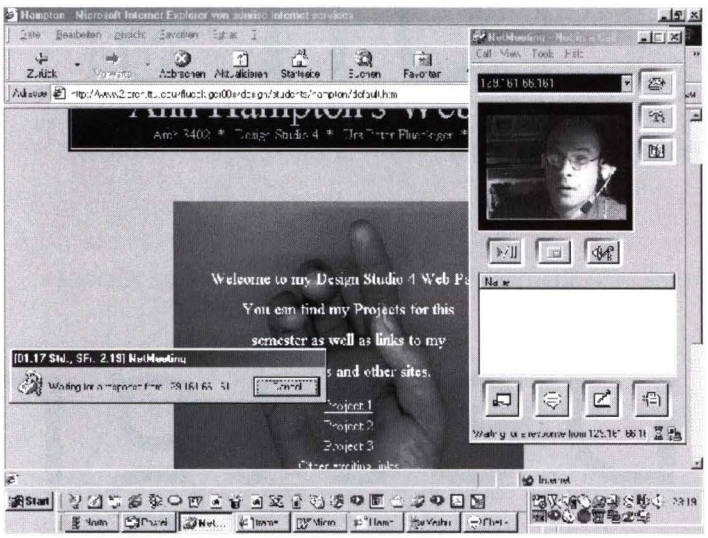
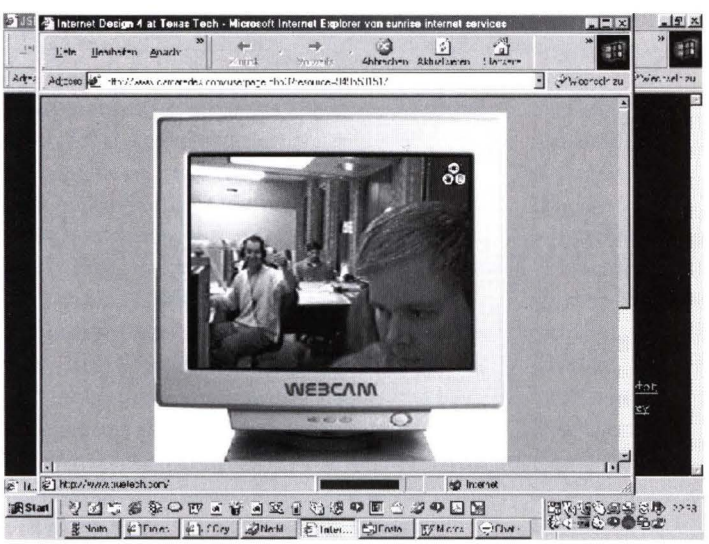
Flueckiger's Architecture Design V studio collaborated with the Savannah (Georgia) College of Art and Design (SCAD). An introductory two-week design project was assigned to get everybody used to each other and the new design environment. This was particularly important for the purpose of establishing a consensus for the means and process of communication with the students at SCAD, as the interaction was exclusively through the Internet. This introductory project involved designing a house for a computer specialist working remotely from a picturesque canyon location near Lubbock.





(top) While unexpectedly delayed in Switzerland during spring 2000 semester, Flueckiger continued to teach his class via Web Cam. (bottom) Flueckiger was able to keep a virtual eye on his students at the other end of the server connection.

The client, whose office is completely virtual, desires to live in a house that better reflects and interfaces with his/her lifestyle. The project statement led students to a virtual museum exhibition (via a link to the then-current "The Un-Private House" at the Museum of Modern Art in New York) relating to the themes and concerns surrounding the introductory design project. All 26 exhibited projects at the MoMA incorporated the computer and digital media in their design process and presentations. The students were encouraged to travel via cyberspace and observe relevant and recent architectural designs where digital media were the primary forms of design development and documentation. (Besides learning about the exhibit's featured projects, the students also saw how architecture could be presented on the Web.)

Following the introductory project, the rest of the semester was devoted to the main design project, an educational and lodging facility for artists and people interested in art at an historically significant and active art-studio retreat in Marfa, Texas. In addition to posting student designs on the Web, research information was posted for the SCAD students to download (from more than 1,000 miles away), so they could access the necessary site, climate, cultural, and historical information to begin to develop their designs for an exhibition hall that would complement our students' facility designs. Discussions via AOL Instant Messenger were routinely held as the students working from different locations worked out the specifics of obtaining and coordinating information. Site information was recorded with a variety of digital cameras, and links for downloading software for viewing were provided in the Web pages.

Spring 2000

Last spring the Internet design studios continued, with each teacher having a section of third-year design students. At the beginning of the semester, Flueckiger was unexpectedly delayed in Europe, waiting on a six-week process of visa adjustments. Perl set up blank Web sites and discussion forums on the college server for students in both sections. Perl began work with his group of students, all new to the Web. Flueckiger, seven time zones ahead, started working with his students (all had taken Perl's class the previous semester) asynchronously and synchronously, via a slow modem connection. The "virtual" teacher regularly placed critiques, comments, and answers to student questions in each student's discussion forum. The comments were posted and read at times convenient to the participants. Synchronous communication during studio hours created additional challenges, but was justified by the "hotter" nature of the telephone-

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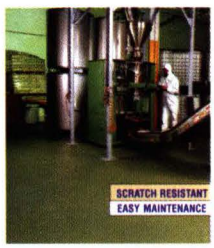
To View the Students' Work

Syllabi, project statements, and work by all the students who participated in the e-studio, can be accessed from any computer with Internet access and a browser. In the College of Architecture we work with Microsoft Windows NT and Microsoft Internet Explorer 5. Some work uses Macromedia Flash or Live Picture, both available as free downloads.
To view these Web pages, visit the Web site of the College of Architecture at Texas Tech University: http://www.arch.ttu.edu/Architecture/ and follow the links to Perl and Flueckiger's courses.
Or visit www.texasarchitect.org and look for the link to Texas Tech.



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like interactivity. Flueckiger stayed up late to talk and see (via Web Cam) his students through Microsoft NetMeeting while each design developed. He later returned to Lubbock to complete the semester.

During the course of this experiment, the students and the teachers quickly learned to appreciate the advantages and to sense some of the additional possibilities of the new e-studio. Students could immediately begin project research directly from their studio desk with instant access to library catalogs, inter-library loan requests, the Avery Index, and online searches. Just as the Internet can expand the scope and sources of research material, the medium offers a variety of means of communication that can be integrated with design media.

The students' computer skills developed rapidly, as their computers were available continuously and used during each studio class meeting. Some computer classes offer techniques of using specific programs providing skill development, but this type of "tools" approach typically has its limits. The e-studio was not geared towards specific programs or methods, but promoted integration through diversification. Design excellence is ultimately measured in terms of content and potential, not mere technical prowess.

As each semester progressed, we observed not just a change in the appearance of design drawings, but also a radical change in the process of the architectural design review. Traditionally, design reviews are held in a classroom setting where students presented their work, typically standing in front of presentation materials (drawings, sketches, models) and an audience of teachers and peers. More often than not, these presentations include last-minute, hurried modifications and additions—not to mention a little performance anxiety. By posting the presentation on the Internet, however, the student can be, and must be, more thorough and focused, as the presentation can be more carefully reviewed and the content repeatedly scrutinized. This includes the design work as well as written design intentions, concerns, and research findings, as well as the graphic format of the presentation itself. Likewise, the format allows – even necessitates – a more thorough critique. Reviewers have more time to review the presentation, read comments from others, and compose their own comments. In addition, an interested observer from halfway across the country or halfway around the world can log on and offer a perspective not so easily procured within the familiar setting of the classroom. (Still, we recommend that traditional design reviews continue to occur since in-person performance remains an important aspect of the architect's professional role.)

As a long-term design project develops, the advantages of electronic presentations and drawings become increasingly apparent. A student may easily save and access design explorations, variations, and alternative versions as the project evolves. Educational discussions and interaction between the student and teacher can refer to design materials from any stage in the design. Work can be retrieved quickly, compared with, and overlaid against the current design developments.

Obviously, computers and the Internet are becoming increasingly important in higher education. At Texas Tech, the architecture faculty is trying to incorporate and employ both in meaningful ways. The projects represented here are just the beginning of what we believe will become part of every architecture design studio within a few years. In our studios, we observed a smooth transition from traditional pencil-and-paper drawing to the digital world and back again. Traditional media need not remain distinct from digital media—when understood in terms of process, the two can go hand in hand towards developing a student's (and a design's) potential.

This process certainly enriches the students' learning experience. Moreover, we are convinced that involving the College of Architecture at Texas Tech with the global community via the World Wide Web enriches people's knowledge on both ends of the server connection.

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