

## *Hyperstruction Studio*



### **Project Background**

As student profiles, backgrounds, aptitudes, and expectations continue to evolve, UCR is committed to engaging its students in a variety of flexible, dynamic learning environments. These flexible learning spaces will combine physical appointments and various technologies in such a way that a variety of instructional approaches may be adopted. *The goal of providing such environments is enhanced student engagement and improved learning success.* UCR's Hyperstruction Studio (a.k.a. the Classroom Instructional Innovation Incubator) allows campus faculty to explore innovative pedagogies and as a result create a campus "road map" as UCR considers how to best enhance teaching and learning in the years ahead.

### **Project Summary**

UCR's Hyperstruction Studio was envisioned as a space in which every element (from the carpet to the walls to the technology) is targeted toward student and faculty engagement. This high-tech classroom was designed with an array of digital display sources, collaboration software, movable furniture, expansive whiteboard space, podcasting and videoconferencing equipment, and much more, all carefully considered and implemented with the space's goal of cultivating innovative instruction in a flexible and open environment. This classroom is not part of the Registrar's general assignment classroom inventory, allowing for great flexibility in scheduling and support.

This room and its technological appointments represent the lessons learned from years of classroom and instructional technology initiatives at UCR. Faculty who use the facility will create technology and pedagogical roadmaps for the next decade of campus instructional technology support initiatives. It is part of campus commitment to move from bolted seats and chalkboards to dynamic instructional environments where the distinction between instructor and student is blurred. The Hyperstruction Studio builds on past successes such as UCR's Smart Classrooms and Flex Classrooms, but expands upon them to create a uniquely collaborative teaching and learning environment.

## Project Description

### Environment

The Hyperstruction Studio allows instructors to explore a variety of pedagogies via the utilization of adaptable, flexible furniture and various technologies designed to facilitate collaboration and interaction. The primary determinations of what types of technologies were to be made available in the Studio were driven by the pedagogical value of that technology. Even the physical appointments were considered, e.g., the floor design is used as a way of creating ad hoc groupings of students.



The choice of table color was considered and also can be used to implement grouping.

The placement of the control technology in the room was considered as a way to encourage new approaches to teaching. The console that controls visual presentation was deliberately placed away from the instructor workstation area forcing the instructor to move. The presentation of ideas is a separate process from the initial creation of those same ideas and entails a different engagement mechanism.

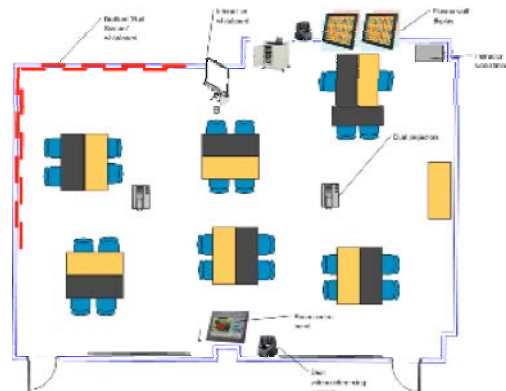


Figure 1  
Hyperstruction Studio Layout  
[http://hyperstruction.ucr.edu/images/layout\\_fs.gif](http://hyperstruction.ucr.edu/images/layout_fs.gif)

Another important factor in placement of the technology was to remove single points of total control. The room is designed for movement. The orientation of the table clusters is at 90 degrees to neighboring clusters. There is generous spacing between the table pairings to allow free movement. The number of tables placed in the room was also considered to give the room a feeling of space. Creative wonderings are positively influenced by a feeling of openness. Participants are encouraged to look in all directions so the multiple screens allow for viewing information in any direction. As information moves from one screen to another, the direction that students look changes. Change in physical view engages the student and presents new viewpoints and new possibilities.

The type of technology available for use is different in each corner of the room. The Studio can be considered as composing roughly four separable areas within a single confined area. The technology available in any single part of the room helps to reinforce that separation. The idea here is that content creation occurs at multiple levels and the path to presenting those ideas should not be inhibited by the positioning of a particular technology.

Ideas need to flow from students using the laptops while working either as a member of a dyad or a table grouping. These localized ideas can then easily propagate to a larger presentation venue and presented to neighboring groups as well as to the room in general. The way the information is presented by the faculty moderator determines the nature of the grouping. The driving mechanism here is to foster a high degree of collaboration at multiple levels.

## Technology

This Hyperstruction Studio's technological appointments consist of an array of presentation, collaboration and peer-learning technologies. The displays include two LCD Projectors, an annotation board, a video-wall, and an annotation panel. This technology is in addition to the standard Smart classroom package, which includes a DVD player, VCR, high-resolution document camera, PC computer, and wired and wireless networking.

### Equipment Highlights

- **Annotation and control panel (Crestron)**

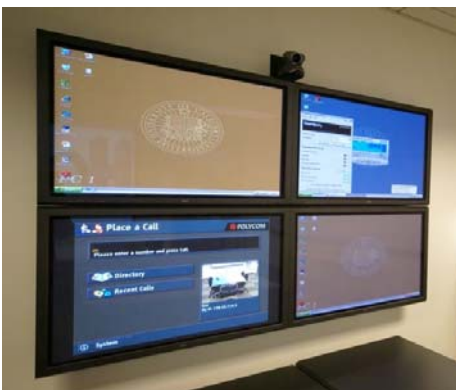
The Studio includes a Crestron annotation panel that allows faculty to annotate any content displayed in the room, e.g. Powerpoint slides, video, or still images. Faculty can, for instance, circle a particular element in a chart or write explanatory notes in real-time. In addition to computer displays, faculty can select videos or videoconference sources to mark up. This annotation panel is also touch-sensitive and controls the room's multimedia in an intuitive user-friendly way.

- **Interactive board (3M)**

This interactive board allows faculty to control the computer using touch, leading to more engaging and interactive lecture sessions. Faculty are able to annotate any computer image being displayed, as well as archive those annotations.

- **Videoconferencing**

Often it is difficult to bring in a subject expert for a guest lecture. The videoconference unit in the Studio supports immediate connection through standard IP, ISDN, or the high-quality CalREN Video services. Faculty are able to push the remote video and data received to any of the numerous displays in the room. The unit also includes two remote controlled cameras, a ceiling microphone array, and a wireless lapel microphone.



- **Video wall**

The display system in the Studio includes four 42" LCD displays. These displays can each display any source in the room, or be combined to display a single large image in video-wall mode. With four displays, small groups can sit close-by and participate in a videoconference session as they work on two computers.

- **PC Computers with wireless keyboards and mice**

The Studio includes four PC computers running an array of software programs, including Teamspot, a tool that facilitates collaborative team sessions among laptop users. Students can use the room’s tablet PCs or their own laptops to collaborate on a single large room display. This collaborative tool supports:



- Collaboration on one host display
- Sharing of laptop desktops
- Sharing of documents & websites
- Annotations on screen
- Archival of all share documents and annotations

- **24 Gateway Tablet PCs**

In order to facilitate digital documentation and collaboration, tablet PC’s were made available in this room. Each tablet has an array of software including Microsoft Office, SPSS statistical software, Teamspot, as well as the standard media players and internet browsers.

- **Podcast & Webcast**

The technologies built into the Studio support audio podcasts as well as live webcasts. A wireless lapel microphone was included to provide higher-quality audio during videoconference sessions. In addition, the audio feeds into one of the computers, which runs MP3 recording software on a schedule. This software archives audio and feeds it to the UCRpodcast server. The Polycom videoconference unit also supports Quicktimevideo-streaming.

**Equipment Details**

The table below describes the set of equipment purchased to realize the vision of the Hyperstruction Studio.

Manufacture	Model	Description	Qty
<b>Advanced Technologies</b>			
Dell	OptiplexGX280	Faculty PC	3
Wolfvision	VZ8PLUS	Document Camera	1
DVD	Toshiba	DVD	1
VHS	JVC	VHS	1
Sharp	XG-C430X	LCD Projector 4000 lumen	2
Dalite	Cosmopolitan Electrol	Motorized Screens, 84" Wide	2
H-ITT	H-ITT	Audience Response	4
JBL	24CT	Ceiling Speaker pairs	3
Telex	FMR-500	Wireless microphone	1
Custom	Xcel Furniture	Instructor Station	1

**Mobile Interactive Whiteboard**

3M	9200IW Plus	Interactive Whiteboard	1
Dell	GX280	PCs for Smartboard	1
Extron	RGB 182v	Computer Interface	1

#### Videoconferencing

Sony	EVI D70	Room Cameras - for VTC	2
Polycom	VSX 8000	Videoconference Codec	1
Panasonic	42PH9UK	42" Plasma display	4

#### Advanced Controller

Crestron	DTT17	Touch Panel	1
Crestron	UPX2	Annotation Controller	1

#### Furniture

Steelcase	Turnstone	60"x24" Tables	14
Steelcase	"Uno"	Chairs	24
Bretford	Rail System	Whiteboard Rail System	1
Physical Plant	2 color	Carpet floor	120

#### Laptops

Gateway	M285E	Tablet PC Pro	24
Spectrum Industries	H3 Laptop Cart	30 Unit Laptop Charging station	1

## Faculty Training & Support

### Instructional Technology

The Instructional Technology Group within Computing & Communications is available to faculty to assist in utilizing and designing innovative pedagogies to take advantage of the room's cutting-edge technological features and instructional philosophy:

- **Dr. Leo Schouest** has been with the UCR campus for over 20 years and has in the last three years successfully implemented many IT principles within the Science environment. With a total of 30 years experience in higher education at both private and public research and teaching institutions, he provides a balanced and academic-centered perspective to the Instructional Technology Group mission.
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- **Dr. Ming Yang** holds a Ph.D. in Educational Administration with a research emphasis in Instructional Design. Dr. Yang has extensive experience in multimedia integration of instructional content in the classroom. He has implemented Distance Learning and multi-campus delivery models for several years.
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- **Dr. Mark Nicolay** earned a Doctor of Musical Arts degree from USC in 1989. With experience in Music and Fine Arts computer applications, he brings a creative component to Instructional Technology Group. He is also the campus site license coordinator and has extensive experience in most software licensing aspects.

### Technical Support

The technology itself includes various support mechanisms to minimize any interruption to lectures:

- **Crestron Web Interface**– Crestron technical support personnel can remotely log into the control panel and provide remote assistance.
- **Crestron Help** – A HELP button has been enabled on the touch panel that, when pressed, will ring a help call into the UCR Multimedia Helpdesk. Technical staff will then call the campus phone located in the classroom and attempt to walk faculty through an issue. If remote assistance is not possible, a technician will rush to the room and provide assistance.
- **Altiris Computer Client-Server Management System** – All computers tie into a client management system that allows technical staff to remotely repair, update or even “image” a computer within minutes.

## Timeframe

December 2005 – Hyperstruction Studio proposal completed

August 4, 2006 – Proposal approved and funded

Summer 2007 – Implementation completed

December 7, 2007 – Faculty Welcome event

December 19, 2007 – C&C Open House

January 8, 2008 First class taught in facility

## Next Steps

As the Hyperstruction Studio continues to evolve, the following technological additions are in the works:

- **3D Display Package**–A package has been ordered which consists of a 3D projector, computer, and shutter-glasses. It will enable 3D modeling and higher-quality displays of course material, such as chemistry models.
- **Course Capture Package**– This solution will allow faculty to archive video, audio and VGA sources for on-demand streaming. This package is being considered as an enhancement to allow students to review material outside the classroom. It will leverage the cameras and microphones already present in the room.

## Customer Satisfaction

“As I watch the class, I’m impressed by the extent to which most folks seem to be ‘engaged.’



That is, most of the time, most everyone is actually involved in doing something related to the tasks. The other good thing that I’m liking is that there seems to be a lot of ‘peer teaching’ going on – fancy word for helping others. The format of the class was intended to keep us active, and interacting with each other and the problem. I had hoped that the dyads and teams would foster ‘peer-led instruction.’ And, I wanted to emphasize real-

world like experiences of working with research data that builds confidence, a willingness to experiment, and practical skills. So far, I think it’s going quite well with regard to these.”

– **Dr. Robert Hanneman**  
**Professor of Sociology**  
**Sociology 203b, Winter ‘08**

...I like the whole set-up of the room, where you don't have actually assigned seating for the desks going one way. And the seating, it's just, you can look anywhere and the postings up on the wall, or it's projected on the wall. Which it makes it good; that way you don't have to turn your body. You can just write whenever you want, right on the desk. So it makes it good, it makes it for a better lecturing 'cause a lot of the time you can't see above a person, or you have to start moving around. But right there you can just look anywhere and you know what the professor is talking about.

– **Student (anonymous)**  
**Sociology 203b**  
**Winter '08**

I believe that my "opening" the classroom and allegiance two-way learning is what impresses my students most. Opening the classroom requires space-to walk around and engage students through eye contact- using as much multimedia as possible - DVDs, youtube, music- and giving students the opportunity to present, talk, and exchange ideas in large and small groups. The Hyperstruction Studio has been perfect and has enhanced my pedagogy....Other rooms have computers, inputs and DVD players-but the ease of control, access, and presentation-screens- as well as the white boards...is efficient, simple and elegant. The class is truly open, fluid, and quickly changing to fit my pedagogical needs and to allow for student collaboration. One on one interviews and the focus group would have been difficult in a traditional classroom setting; movable chairs, tables, even carpeting-the coziness- facilitated this. And instant blogging via the classroom laptops gave us a real-time seminar-learning-exchange. It has been a truly amazing experience and I don't want to teach any seminars outside of the Hyperstruction Studio.

– **Dr. Scott Brooks**  
**Professor of Sociology**  
**Sociology 201B, Spring '08**

I like that we can share from laptop to laptop. The multiple screens make it is easy to see presentations from the whole room. The flexibility of the tables so that groups can work together; moving around easily.

– **Student (anonymous)**  
**Sociology 201b**  
**Spring '08**

I like that you can post whatever is on your laptop onto the main screen so that everyone can see it, making it much easier to follow a lecture.

– **Student (anonymous)**  
**Sociology 201b**  
**Spring '08**

I used Surge 170 for my 293 class (22 students) this morning, 10:10-11am. We had a video conference call with Dr. Solomon Lia who is at UCI... The face-to-face dialogue that the technology/room facilitated (versus teleconference call) was much more lively and engaging. It was fun and more efficient to have the meeting this way and I won't even compare it to getting on the freeway and driving to UCI with 1 or 2 students (compared to having the whole class involved).

– Dr. Daniel Jeske  
Professor of Statistics  
Statistics 293, Spring '08

### Relevant Websites

A complete overview of the Hyperstruction Studio including image galleries, video of the space in use, and a faculty member's teaching blog, visit:

<http://hyperstruction.ucr.edu>

### Project Team Members

#### *Computing and Communications*

- Israel Fletes, project lead
- Leo Schouest
- Mark Nicolay
- Lyndon Scott
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