Virtualizing the Collaborative Studio

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CITA BIM GATHERING 2015
12th and 13th November 2015
Virtualizing the Collaborative Studio

Typical Studio

- Taught much in the same way for the past 150 years.
- Problem-based, synthetic learning environments
- Structure typically encourages individual work through one-on-one faculty guidance.
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Co-Lab Studio

• The Collaborative Studio is a 30-person design class that groups architecture, landscape architecture and architectural engineering students (construction, structural, mechanical, and lighting/electrical engineering) in six-person interdisciplinary teams.
• Just completed its 7th Year
Co-Lab Studio

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Integrated Project Delivery workflow where all members share responsibility and leadership.

ARCH: 6-credits – 5th Year
LARCH: 5-credits – 4th & 5th Year
AE: 3-credits – 4th Year
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Integrated Project Delivery

- High performance, sustainable buildings requires much more collaboration across disciplines early in the design process.
- Most complex projects require large, highly collaborative, interdisciplinary teams, often widely dispersed geographically.

HOK
**Projects**

- Real project - typically out for bid
- Has the complexity for an ARCH/LARCH ‘capstone’
- Manageable size (~25,000 S.F.)
- Has landscape program component!
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Building Information Modeling (BIM)

- Students work with a range of design and analysis software.
- BIM is the central collaboration enabling software.
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Student Work
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Outcomes

• Booklets
• Posters
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Outcomes

• Presentations
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Space and Time

• Getting everyone in one place and at the same time is a continuing difficulty

http://didyk.info/einstein-relativity-and-the-space-time-continuum/
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An Integrated Future

Space Constraints

- Space typically configured for individual work
- Inadequate space to host additional students

Need the right kind of space for team collaboration
Collaboration Pods

- Separate meeting spaces
- Dispersed on campus
- Mini “Firms”
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Collaboration Software

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### Virtualizing the Collaborative Studio

<table>
<thead>
<tr>
<th></th>
<th><strong>Synchronous</strong></th>
<th><strong>Asynchronous</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Same Place</strong></td>
<td>Same Time</td>
<td>Different Time</td>
</tr>
<tr>
<td>Collocated</td>
<td>Face to Face Interactions</td>
<td>Continuous Task</td>
</tr>
<tr>
<td></td>
<td>Decision Rooms, Single Display, Shared Table, Wall Displays</td>
<td>Team Rooms, large public displays, project management, Shift work</td>
</tr>
<tr>
<td><strong>Different Place</strong></td>
<td>Remote Interactions</td>
<td>Communication + Coordinate</td>
</tr>
<tr>
<td>Remote</td>
<td>Video conferencing, instant messaging, shared screens, multi-user editors, white boards</td>
<td>Email, bulletin boards, blogs, group calendars, wikis, task managers white boards</td>
</tr>
</tbody>
</table>

[Adapted from Time/Space Matrix for Groupware]
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**Key Features**
- Web Camera Sharing
- Voice IP
- Cross Platform
- Jabber includes HD Audio & Video Telephony
- Limited Connections

**Video Conferencing**
- Skype
- FaceTime
- Google Hangout
- GoToMeeting *free*
- Join.Me
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Key Features
• Video Telephony
• VoiceIP & Conference Phone
• Sharing Desktops
• WebEx: Asynchronous commenting
• Audio quality varies
• Session Recording
• White Boarding

Web Meeting / Conferencing
• Citrix GoToMeeting
• TeamViewer
• Cisco Jabber & WebEx
• Adobe Connect
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Web Meeting / Conferencing

University Park, PA

Philadelphia, PA
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Web Meeting / Conferencing

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Key Features
- Sketching on shared documents
- Sketching on shared desktops (except Adobe Connect)
- Cursor Tracking
- ConceptBoard – Asynchronous Activities
- Web Camera and VoiceIP

White Boarding
- ConceptBoard
- TeamViewer
- Adobe Connect
- GoToMeeting
Key Features

- Control workstations remotely
- Have access to your applications from any device
- Provide technical support
- Virtualize Mac software on PC and vice-versa
- Mitigates need for video adapter

Remote Access

- TeamViewer
- Google Chrome Remote Desktop
- VMWare
Key Features

• Asynchronously collaborate on models
• Share maps and models with teams
• BIM 360: Comment and Annotate in 3D Space
• BIM 360: Run clash detections on ‘glued’ models
• Notifications of activities

Mapping & Modeling

• Autodesk BIM 360 Glue
• Autodesk 360
• Esri ArcGIS Online (AGOL)
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Key Features

- Task Management
- Milestone Tracking
- Gantt Charts
- Time Tracking
- Voting

Project Management

- Trello
- Teamwork
Virtual Environments

- Variety of types of spaces
- 3D Spatial Sense
- Rich Interaction Capabilities
- Asynchronous or Synchronous
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Collaboration Hardware
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Audio & Video

- Samsung 60” LED Displays
- Logitech Pro HD Webcam
- Logitech Jabra Omni-Directional Speakerphone
- Belkin Rockstar Audio Splitter
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Multi-Touch Displays

• Aesus Slate Tablets
• PQ Labs – Multi Touch Surface
• Wacom Cintiq
• Lenovo IdeaCentre
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Video Gateways

- Steelcase Media:scape™
- Crestron DigitalMedia™
- Crestron AirMedia™
- PQ Labs iStick™
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Democratizing the Technology

- Non-proprietary technologies
- Enables practitioner involvement
- Enables community involvement

[Kumar, S (2008)]
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Research Questions
Co-Lab Studio Research

• Seeks to create enhanced environments for collaborative information exchange
• Do virtual studio environments alter the quality of studio collaboration compared to resident studio environments?

• How do we best include outside professional design and construction expertise into the studio design experience?
• How to best engage design studios to geographically dispersed students?
An Integrated Future

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THANK YOU