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ArchéA
Architectural
European Medium-sized City
Arrangement

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IO3
2021

Manual of best practices for a blended flexible training activity in architecture for higher education institutions

UNIVERSITÀ DI PARMA
DIA Dipartimento di Ingegneria e Architettura
ALMA MATER STUDIORUM UNIVERSITÀ DI BOLOGNA
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This volume returns the results of the Intellectual Output 03 of the research project “ArchéA. Architectural European Medium-sized City Arrangement”, with the aim of analyzing and restating the state of the art achieved in the field of flexible mixed training in architecture, strongly encouraged by the emergency period of the Covid-19 pandemic. The result is a collection of good practices carried out internally and externally to the ArchéA partner network, in the context of higher education institutions, made possible by new virtual tools capable of mediating teaching and mixed and flexible learning around the disciplines related to the project.

ArchéA. Architectural European Medium-sized City Arrangement

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edited by Enrico Prandi and Paolo Strina

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Analisys of the Best Practices

Call for papers

Fig.01 Typical desktop configuration, prepared for online instruction. Note overhead document camera and microphone, external webcam and stand (on right-hand side of monitor), and tablet with pen-type stylus (in foreground)

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Bradley Walters

Growth Opportunity: Transforming Studio-Based Education through Digital Tools during the Global SARS- CoV-2 Pandemic at the University of Florida

University of Florida, United States of America

In *Learning from Our Mistakes*, Henry J. Perkinson (1930-2012) suggested that there are three primary approaches to education: education as initiation, education as transmission, and education as growth (Perkinson, 4-5). In architectural education, we see all of these models well-represented. In some cases, initiation and the notion of "teaching through example" is primary. This educational model is structured around an idea that students learn to be architects by observing an architect, doing architectural work. In a classical atelier model, the architect, faculty member, or tutor is positioned as a master, with students working and learning below them as apprentices. It depends on a clear hierarchical structure, as well as the idea that learning takes places through a process of initiation.
The idea of education as the transmission of information from one person to another is a persistent one. It is the idea at the heart of the lecture format, where those with knowledge (architects, faculty members, tutors, etc.) share that knowledge with others. Education as transmission is also about a fundamentally closed and limited body of knowledge that can be parsed, ordered, packaged, and relayed from person to person, or from generation to generation. As the receiver, the pupil's knowledge is always limited by the extent of the teacher's knowledge in this educational model.
The creation of new knowledge in architecture, however, requires more than the initiation into a pre-defined profession or the transmission of a limited body of knowledge from one person to another. It builds on Perkinson's idea of education as growth. In this model, he suggests that "the teacher's task now is to create a proper environment, an environment that will promote 'the growth of the individual'" (Perkinson, 4-5). We see this in an increasing number of assessment models as well, where the focus has shifted from what is taught to what is learned. Course objectives have been replaced with "student learning outcomes." Education, in these models, is measured by the transformation and growth of students through the course of the class.
At the University of Florida School of Architecture in Gainesville, Florida U.S.A., we deploy a studio-based educational model that allows faculty, graduate teaching assistants, and students to collaborate in the advancement of architectural knowledge. The studio model is less hierarchical than the atelier model, relying on frequent group-based discussions to further the work and thinking of everyone in the room. Each participant (students and faculty alike) are challenged to contribute equally and meaningfully during discussions, asking difficult questions of each other to further both the conceptual approaches and the technical resolution of the work.
This educational process is fundamentally about the growth of individual students and the collective advancement of the discipline. We work on the development of processes of thinking and making that are reflective, critical, and expansive. It requires educational processes that are immersive and engaging, allowing for rapid feedback loops between individuals. The participatory space of the studio is crucial.
During the SARS-CoV-2 pandemic, our in-person studio courses transitioned to fully online delivery methods to reduce community transmission of the virus. The immersive and rich studio-based instructional model was required to transform and adapt to accommodate new online teaching methods and instructional tools. The challenge: How can we preserve the focus on students' educational growth

Fig.02 Overhead document camera allows for real-time sharing of materials located on the tabletop, including pencil/pen sketches, models, and printed reference books. Hand gestures can also be used to describe formal relationships, supplementing other modes of communication. Note that the microphone is sitting on top of the document camera, positioning the microphone within approximately 25cm (10-inches) of the mouth of the speaker, allowing for very clear audio. It is located just above (and outside) the field of view of the webcam.
Fig.03 External webcam is supported by an adjustable stand, allowing it to be moved close to the speaker and overlap the screen. This allows for better eye contact between instructor and students.

and provide rapid feedback loops at a distance, using technological tools as needed?
To make this transition possible, we engaged numerous technological tools. We used Zoom for conducting synchronous, real-time web-based classes. One of the most important software tools we deployed was Miro, a cloud- based collaboration program that functions like an infinite pin-up space. Students would post work to Miro in advance of every class, and the studio discussions would involve presentations of work, discussions about other student's work, and sharing of hand-drawn notes, web-links, and reference projects. The work from each day was posted adjacent to the student's work from the prior class, allowing students and instructors to look back and read the trajectory of the work through the multiple iterations. Students were able to access the Miro boards at any time outside of class, to review the work of their peers and to review comments and notes posted by the instructor.
For most classes, I would use two computers simultaneously, allowing one computer to manage the online class (including microphones, cameras, etc.) and another computer that could be used as a tablet for making drawing annotations during class. The Microsoft Surface Pro 7 proved incredibly facile for real-time drawing during class. The pen stylus was highly responsive, allowing for a seamless discussion that could fluidly move from drawing to drawing as needed during class.
Cameras were important. All students and faculty used web cameras to allow for everyone to see one another and to facilitate non-verbal communications. I would typically use two webcams for class. One showed my face and upper torso, while a second overhead camera allowed for sharing of the desktop space. This second document camera was useful for the sharing of printed books, physical materials, model constructions, hand sketches (on paper), and hand gestures. Both cameras were mounted on adjustable stands allowing them to be moved as needed during class. For sharing or more intricate model constructions, students would often use their personal cell phones or tablets as secondary web cameras. This would allow them to easily move around their models, zoom in, and literally inhabit the model with their camera.
And last but not least, clear, high-fidelity audio was critical. My setup typically involved a lavalier microphone, mounted overhead very close to my head as well as external speakers that could be independently adjusted. Students would encounter some feedback issues if they joined the class from the same physical space. In these cases, it was important to toggle microphones on and off carefully to avoid feedback.
Throughout this transition, the central motivating goal was to push the technology to facilitate highly responsive educational environments that stimulated and engaged the students in multiple ways. Some of the tools, like the cloud-based Miro

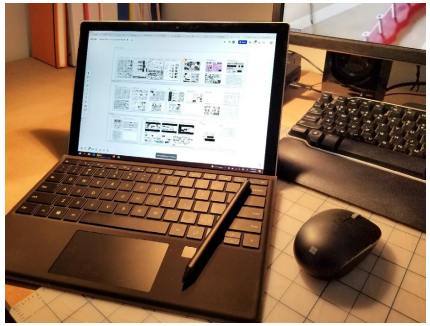

Fig.04 Secondary Microsoft Surface tablet computer with pen/stylus, mouse, and keyboard interfaces. Pen interface is essential for real-time digital drawing with students and navigating shared digital software platforms.

platform, allow for an even better educational environment than more traditional plotted drawings in a physical studio space.
The following specific technical tools were deployed, and are provided here for reference:
Hardware:
1. Computer #1: For Running Online Meetings + Audio/Video + Document Camera + Document Sharing:
- Dell® Mobile Precision M4700 laptop computer: 3rd Gen Intel® CoreTM i7-3740QM Processor (2.7GHz, 6M cache), 16.0 GB DDR3-1600MHz SDRAM 4 DIMMS, AMD® FirePro® M4000
  Mobility Pro Graphics with 1GB GDDR5, 500GB 2.5" 7200rpm Hard Drive, Dell WirelessTM
  1504 802.11g/n Single Band Wi-Fi Half Mini-card (2013)
- Dell Precision E-Port Plus Docking Station Port Replicator (2013)
- External Storage: Western Digital 2TB Portable External USB 3.0 hard drive (2013)
- External Monitor: Dell P2815Q Ultra HD 28-Inch Screen LED Monitor, 60 Hz refresh rate, 71.12cm (28-inch) screen size, 4K UHD 2160p resolution
- Logitech M317 Compact Wireless Mouse
- Dell Y-UK-DEL1 USB hub multimedia internet wired keyboard
- Webcam: Logitech C925E Webcam with 1080p HD Video and Built-In Stereo Microphones, USB
  connection, UVC H.264 encoding, 78-degree field of view (2020)

- Webcam Stand: Oxendure webcam stand with 55.88cm (22-inch) suspension boom scissor arm and heavy desktop-mounted base (2020)
- External Microphone: Fifine USB Lavalier Lapel Microphone K053, with sound card for PC and Mac computers (2020)
- External Speakers: Acoustic Audio 20X USB 2.0 powered computer speakers, with (2) 70W active satellite speakers and USB 2.0/3.5mm connections
- Overhead Document Camera: IPEVO V4K Ultra High Definition USB Document Camera, with 8 megapixel camera (3264 x 2448 resolution)

2. Computer #2: For Interactive Real-Time Drawing, Annotations, and Resource Sharing
- Microsoft Surface pro 7, Intel Core i7, 16GB RAM, 1TB Memory
- Surface Pen
- Microsoft Bluetooth Mouse
- Surface Pro Type Cover

3. Continuous electrical service, provided by Gainesville Regional Utilities (GRU)

4. Internet Access:
- Wired category 5e ("Cat 5e") cable service to residential address (Gainesville, Florida U.S.A.)
- Internet service plan with up to 150 Mbps download, up to 10 Mbps upload, and 1,280 GB data per month (Actual service, as tested: 10.2 to 23.7 Mbps download, 8.5 to 8.9 Mbps upload, 18 to
  21 ms ping, and 2 to 15 ms jitter; service provided by Cox Communications, Inc.)
- Internet Modem: Arris TouchStone CM8200A Modem
- WiFi Router: T-Mobile Personal CellSpot, Wi-Fi CellSpot Router, Asus TM-AC1900 Dual Band
  (2.4GHz and 5GHz), 3x3 Wireless-AC 1900 Gigabit Router
- WiFi Extender: Netgear® WiFi Mesh Range Extender EX8000, with AC3000 Tri-Band Wireless
  Signal Booster & Repeater (Up to 3000 Mbps Speed)

5. Printer + Flatbed Scanner: Hewlett Packard (HP) OfficeJet Pro 8710 wireless color printer and scanner

6. Lighting:
- Directed task lamps: IKEA Antifoni 40W Halogen desk lamps (2)
- Facial illumination: IKEA 10" Fado table lamp with LED bulb (1)
- Ambient natural and artificial light from numerous sources

7. Supplemental:
- Alvin TM 2224 translucent self-healing cutting mat, 18"x24" (45.72cm x 60.96cm)
- Rapid, paper-based model-making materials at the ready
- MUJI Gel Ink Ballpoint Pens, 0.38mm Black
- Ticonderoga pencils, wood-cased #2 HB Soft
- X-ACTO XLR Heavy Duty Electric Pencil Sharpener
- Drawing paper

Software:
1. Windows 10 Enterprise edition

2. Zoom (Zoom Video Communications, Inc.; https://zoom.us/) – for conducting real-time or synchronous
face-to-face online meetings

3. Miro (https://miro.com/) – cloud-based virtual pin-up space

4. Canvas Learning Management System (Instructure; https://www.instructure.com/canvas) – course
management

5. The full range of architectural design and drawing software, including Rhinoceros 3D (Robert McNeel Associates), AutoCAD/Revit (AutoDesk), Photoshop/InDesign/Illustrator (Adobe), Lumion (Act-3D), Enscape 3D, and others as required for specialized tasks (Grasshopper 3D, Ladybug tools, etc.)

6. Traditional desktop and cloud-based word-processing software, including Microsoft Word, Google Docs, and Apple Pages.

Necessary but typically overlooked:
1. Acoustically separated and quiet room: Where this is not available, headphones with integrated microphones become essential.

2. Ready access to numerous reference books, both in both physical and digital formats: The ability to quickly reference physical books proved exceedingly helpful.
3. Coffee: De'Longhi Combination Espresso/Coffee Machine BCO430 and Lavazza Perfetto Ground Coffee

4. Spousal support and/or dependable child care: Teaching in this format is impossible for parents of younger
children without the support of others. This is the foundational requirement that allows for everything else to happen.

Bibliography

Perkinson, Henry J. *Learning from our Mistakes: A Reinterpretation of Twentieth-Century Educational Theory*. Westport, Conn: Greenwood Press, 1984.

Walters, Bradley and Lisa Huang. 2018. *Oculata Manus: On the Role of the Body in the Making of Creative Minds.* In *Developing Creative Thinking in Beginning Design*, edited by Stephen A. Temple. Routledge. 225- 239. https://doi.org/10.4324/9781315622927.

Wilson, Frank R. *The Hand: How Its Use Shapes the Brain, Language, and Human Culture*. New York: Pantheon Books, 1998.

Zambonini, Giuseppe. *Notes for a Theory of Making in a Time of Necessity.* Perspecta 24 (1988): 3-23.