INTERACTIVE PRACTICES IN REMOTE TEACHING OF STUDIO CLASSES: a jewellery design case study

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Abstract

In March of 2020, global pandemic suddenly compelled us to teach our "hands-on" studio classes in cyberspace, with "hands-off" technology. Amid the confusion there was one thing we were sure of, we could not afford to lose a year to Covid. Our task became to re-imagine teaching and learning jewellery craftsmanship at a distance. This case study chronicles how we translated the first two classes in jewellery design from face-to-face to remote, interactive studio experiences.

The "interactive" component was the most challenging. Discussed here are the strategies we tried that worked, as well as the ones that failed, compelling us to search for new solutions. In the end, the most successful approach involved a multi-media blend of technologies. The illustrations in this paper depict some of the projects our students accomplished using our experimental approach during the Covid year. It tracks their growth as designers/craftsmen, and our learning trajectory as educators. The great calamity of Covid forced us to invent new ways to reach our students in the permanently changed here-and-now. This case study describes what we learned, and how we made it work.

Introduction

Before Covid 19, studio classes consisted of live demonstrations, followed by hours of structured practice. The teaching and learning happened face-to-face. It was interactive, with spontaneous explanations and bench-side demonstrations to support the written and spoken content of each lesson. Additional "open studio" time was provided for students to work on their projects with a technologist present to insure they learned the safe use of the industrial grade equipment for jewelry manufacturing. That's how it worked before Covid.

In March of 2020, we were suddenly compelled to translate the studio classes onto the remote platform. That meant:

- No face-to-face instruction.
- No real-time interaction beyond the two-dimensional computer screen.
- No access to studio equipment.
- No opportunity for students to learn to work with the machinery in a state-of-the-art studio. Every project had to be accomplished by hand.

We couldn't afford to lose a whole year of our two-year Associate of Applied Arts degree program to the pandemic. We had to create new projects that accomplished the curriculum safely in a dorm room or on a kitchen table, while providing an enriching learning experience.

This case study encompasses how we re-crafted the first two experience-based studio classes in our jewelry fabrication curriculum to the remote platform. Discussed here are the strategies we tried that worked, as well as ones that did not. The most successful approach combined traditional studio practice with a multi-media blend of live-streamed demonstrations, and videos we created and up-loaded for the students to view again and again. We used digital meeting platforms to create a synchronous experience. This worked to a limited degree, but we discovered that the secret to interactive engagement with the students in real-time was technology they loved best and used as an extension of their hands—Smartphones.

Literature review

In 2019 and 2020, the problem of how to teach studio classes remotely was brand new. The terrifying pandemic made in-person classes at first uncertain, and later impossible. The resources available to us included conferencing platforms, virtual chat rooms, and videos we could incorporate into PowerPoint presentations. All of these were originally designed for delivering lecture based curriculum. They stopped short of the hands-on interaction we needed to teach craft.

We searched the literature for specific examples of practice-based curriculum, taught remotely. We found an interesting historical example, but precious little published before and during the pandemic on how to re-create an interactive studio experience online.

The longest established remote learning platform is the School of the Air, in Australia. Created in 1951, it still provides a means for children in the Outback to receive education where populations are too isolated to support a conventional school. We accessed the Australian Research Council Linkage Project on Interactive Distance Learning for Isolated Communities (ARCL) project discussion papers (Crump et al., 2010). They chronicle distance learning in Australia from its earliest days, when the Royal Flying Doctor service was used to connect communities, through the use of pedal radios, and then on to shortwave, and finally wireless internet. The system now uses one-way video feeds and two-way webcam images and audio. The instructional videos are produced in studios in each school district. Homework is handed in online. Live interaction occurs when students are brought together three or four times a year for shared experiences.

For immediate help on how to pivot to the remote platform, we networked with peer institutions to find out what they were doing. The following are articles written 2020 and 2021 to help studio faculty pivot to remote teaching:

The University of North Carolina published an article online, titled, "Home Remote Teaching Resources for Art and Art History". (University of North Carolina, 2020). This is a compilation of advice to faculty, meant to help keep students engaged and track progress. Suggestions included:

- Modify projects to be done at home.
- Use an online forum to assign additional reading and require written responses.
- Require students to post photos of work in progress.
- Employ videos for demonstrating techniques.
- Use of PowerPoint presentations was encouraged to introduce units and assignments.

Mary Ellen Flannery, senior writer for NEA Today, the online journal for the National Education Association, published a compilation of the best advice for faculty collected during the pandemic from readers of the NEA Journal. (02/17/2021). Her findings included many of the suggestions listed above, and added an emphasis on the use of laptops and tablets for students to record musical and theatrical performances for critique and evaluation. (Flannery, M. 2021).

In fall of 2021, Boston University Center for Teaching and Learning published what amounts to a toolkit for teaching remote art classes, (Boston University, 2021). Suggestions included a litany of the same advice:

- Adapt course objectives to remote learning.
- Stress skills students might be able to develop without access to materials, equipment, and space in the studio.
- Present information with videos stored on the course management system students can

access online and re-play again and again.

- Have students work off-line independently and then reflect on what they learned through writing and digital presentations.
- Utilize video conferencing discussions to build a sense of community in the class.

Finally, of particular interest is a resource published by Yale University. In a pdf compiled by the "Studio, Performing Arts, and Collection-based Task Force", the steering committee outlined principles to guide decision making in teaching studio classes remotely (version 6.30.2020, Yale University). Under "Teaching Recommendations", the paper basically agreed with the points previously listed. It added an emphasis on health and safety, and advised faculty to prioritize courses that are best suited to remote instruction. In other words, teaching the classes that require specialized equipment, interactive lab-practice, etc., should be restructured, or even put in abeyance until face-to-face instruction could safely resume.

Addressing the limits of the literature:

The literature we reviewed agreed entirely on most points. All of the advice focused on stop-gap measures centered around technology designed for lecture classes. Give and take in studio classes was relegated to verbal pedagogy, with pre-recorded videos standing in for studio practice. Nowhere could we find documentation of research that described the kind of interaction we were looking for.

To teach well, we had to let go of the idea that the pandemic would soon subside. There was no guarantee that the future would once again include unrestricted, in-person instruction. To close the gap between real studio experiences and remote teaching, we took the best advice from the literature and built on it as we went along, eventually finding a way to see our students' hands working and to help them learn craftsmanship in real time.

Methodology: An organic approach

This was not a dispassionate study with limits, controlled conditions, and academic funding. We approached the problem organically...building the plane while we were flying it. After the fact, the methodology that best describes our study is divided into three working parts:
Our experiences and reflection: Even before the pandemic, students were changing

New students were coming to us as the product of education based on annual achievement scores. They were conditioned to expect a right or a wrong answer. Filling in the blank was enough. Nuanced problem solving wasn't evidenced in their motor skills or design development. The disconnect between imagining a design and making it was difficult to mend in some cases and impossible in others.

Attention spans were shorter. When grit was required to fight through a difficulty, some students would turn away, saying "I'm just not good at this". This is easy to understand. Even before Covid, Generations X, Y and Z have been sitting in front of computer screens since they were embryos. The tech-mediated education they receive in school is useful for conveying scripted content, but it cannot replace the competence and confidence they learn from building ideas into realities in a studio art class.

It was becoming harder to get them to recognize the value of failing well when there is so much cultural pressure to get a high mark and move on. Tight academic schedules leave no time to let new skills marinate. And being "liked" on Facebook is instantly gratifying. Hard won, personal victories are not.

As teachers of jewellery fabrication, we noticed all of this, but our initial response was to double down on what we were already doing. It wasn't until the pandemic that we realized we needed to radically change our delivery to reach these students.

Conceptualisation: We failed, then we figured it out

Re-assessing projects and lectures for presentation online was the easy part. For the projects in the curriculum that were impossible to perform safely at home, we created illustrated lectures and pre-recorded video presentations. Soldering, annealing, ingot making and all the processes that depend on torches and heavy industrial equipment were handled in this way. For the practice-based part of the curriculum, we focused on projects that helped the students synchronize hand and eye.

Then we had to face the hard part. With the studio off-limits during Covid, we had to invent a way to teach our hands-on curriculum with "hands-off" digital technology. Like Alice through the looking glass, everything was backwards, and just beyond our grasp.

At first, we tried adapting the procedures listed in our literature review. We relied heavily on the PowerPoint format, laced with pre-recorded videos.

That strategy fell flat. Students hung around and listened to the lecture for a few minutes, then turned off their cameras and disappeared into cyberspace. When that didn't work, we enhanced our slide presentations with step-by-step illustrations and explanations. We live-streamed demonstrations for each skill students needed to learn. They watched, but had a difficult time understanding how to make their own hands do what they saw us do. When we asked what we could do to help them adjust to learning online, the students said they missed calling us over to their bench for help. They complained of having trouble connecting with the concepts we were teaching, and with one another. We had to find a way to bring them together—our experience has taught us students learn faster and better when they learn on two fronts—from us—and from each other.

We recrafted our approach to exploit the cyber tools our students use all the time. But first, we drafted a list of touch points to help us create a community in our cyber class.

- Live stream most sessions from the studio to establish a professional atmosphere—and to make the students' fingers tingle for tools.
- Create projects that bake-in design fundamentals with the fabrication skills needed to create jewelry from their designs.
- Teach the "how" with the "why". Understanding how a process has evolved through time provides firm ground for students to stand on when they innovate.
- Incorporate real-time give and take problem solving in class for each project—with each student.
- Use deadlines to create an undercurrent of urgency.
- Remain steadfast until the very last minute—and then encourage anyone having difficulty to try again. Reward resilience.
- Teach students to forgive themselves as they learn difficult new skills—nobody can really grasp any new knowledge without persistence.
- Forbid self-deprecating remarks. Assuage dismay with fact-based hope. Praise progress

often. This helps it take root and become lasting.

The Experiment:

We devised a multimedia approach using gooseneck tripods and cell phones. The credit for thinking of this goes entirely to Professor Teratani. It was his idea to exploit the fondness students have for their cell phones to create a live-action studio experience.

On the first day, we showed a slide presentation picturing all the tools students would need for remote learning in our class. One of the items on the list was a gooseneck tripod for their Smartphone. Next, we taught the students how to set up a workspace at home by clamping a bench pin to a table or window sill. Then we showed them how to set up the gooseneck tripod with the Smartphone, focusing the camera on the bench pin and plugging it into their computer. We set up an identical tripod on our own bench.

When they logged-on, everyone in the class had a clear, simultaneous connection with us and with each other. The shared experience of watching each other at work helped catalyze a sense of community. Live streaming was essential for this. The wide screen gallery array projected beautifully on their home screens, and on our studio White Board. The students could see every demo and hear every explanation, and we could see how well they were "getting it". The lecture content and some pre-recorded demos were presented in class with our narration. Time was allotted for Q and A. All of the written and recorded content was archived in the course management system for students to view as often as they chose.

We were surprised at how much more voluble students were in the written chat than in a face-to-face class. In a normal session in the studio, they cannot view the demonstration and talk to each other about it at the same time. In the chat box, they shared epiphanies, asked questions and answered them. They watched each other's hands as they worked, and saw our live streamed responses on their screens as we repeated demos and fielded their questions. This eased their performance anxiety. Students found it easier to forgive their own mistakes when they could see everyone else engaged in the same struggle.

Figure 1. Gooseneck tripod with Smartphone positioned over the student's bench pin

Figure 2. This is a workspace created at home using the ledge of a window sill. The blue pillowcase is positioned to catch wax filings. One of the most important things we teach in our curriculum is working safely. We teach the importance of bench height in ergonomics, good light and ventilation, as well as the necessity of keeping the place clean to avoid cross contamination of working materials with living spaces. The positioning of Smartphones over each student's workspace allowed us to monitor safe working—and to correct problems instantly before bad working habits could form.

Figure 3. Professor Teratani demonstrating wax carving at his window-sill bench.

Figure 4. The gallery array of students working, projected on the large format White Board in the jewellery studio with students' Smartphones plugged into their computers.

Figure 5. We enlarged the images when we fielded questions and often put images up in the full-screen format for clarity.

Adapting Projects to suit the remote Learning Platform

We created projects that emphasized the elements of three-dimensional design—line, form, space, texture and balance. For the earlier projects, discipline was embedded by compelling students to adhere to specified measurements. The designs could be as free as their imaginations—but overall craftsmanship had to be measurably precise.

Sawing, piercing, wax carving and finishing were done at each student's bench during class with our interactive instruction. The hours of practice that would have been done in the "open studio" were done at home, instead. The completed wax carvings for rings and flatware were sent to local casters, returned as raw castings and finished by hand by each student.

Project 1: Piercing and Sawing

The assignment: To create a symmetric pierced design incorporating at least 100 holes.

Skills learned:

- Drilling metal
- Sawing metal with precision
- "Grit", the courage to try again
- Visualizing mirror image design and creating an effective intertwining of active and empty space.

These designs were accomplished with a jeweller's saw and drills on a bench pin, at home. Dimensions: two inches by two inches square

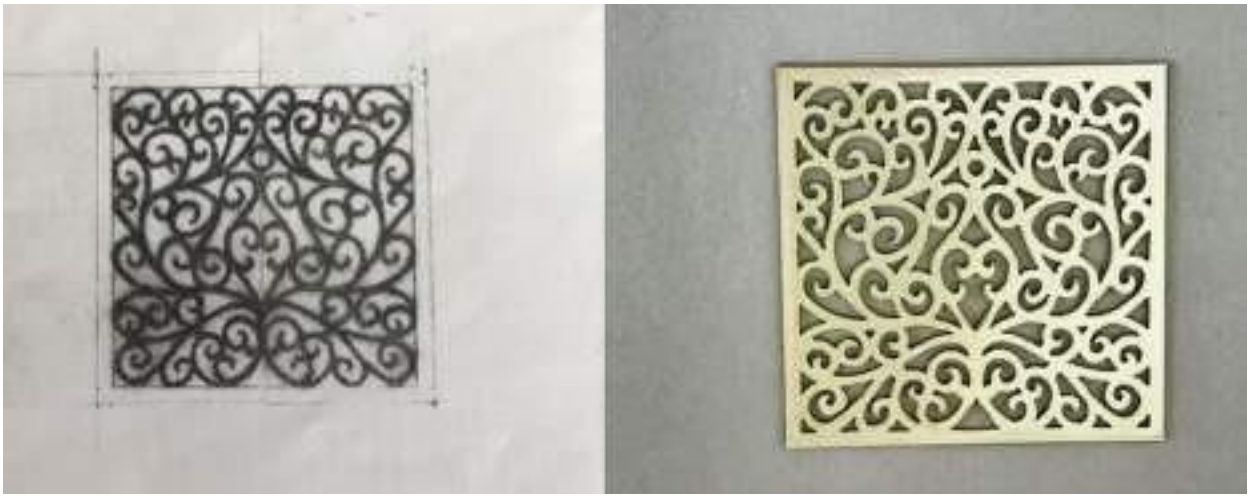


Figure 6. This is the teaching example Professor Teratani made for the first project. The thickness of the brass is 18 gauge--one millimeter. This project teaches precision and confidence with the jeweller's saw. Filing to correct wavy cuts was not permitted. Students were required to hand in their photos of their original design and their finished work for comparison and accuracy.

Most of this cohort came to us directly from high school, or were career changers with no experience with handling a jewellers' saw, or a drill. Learning these new skills was difficult for everyone, as these images of their work illustrate. No one got it right the first time, but in the end, their perseverance and resilience surprised us—and themselves.

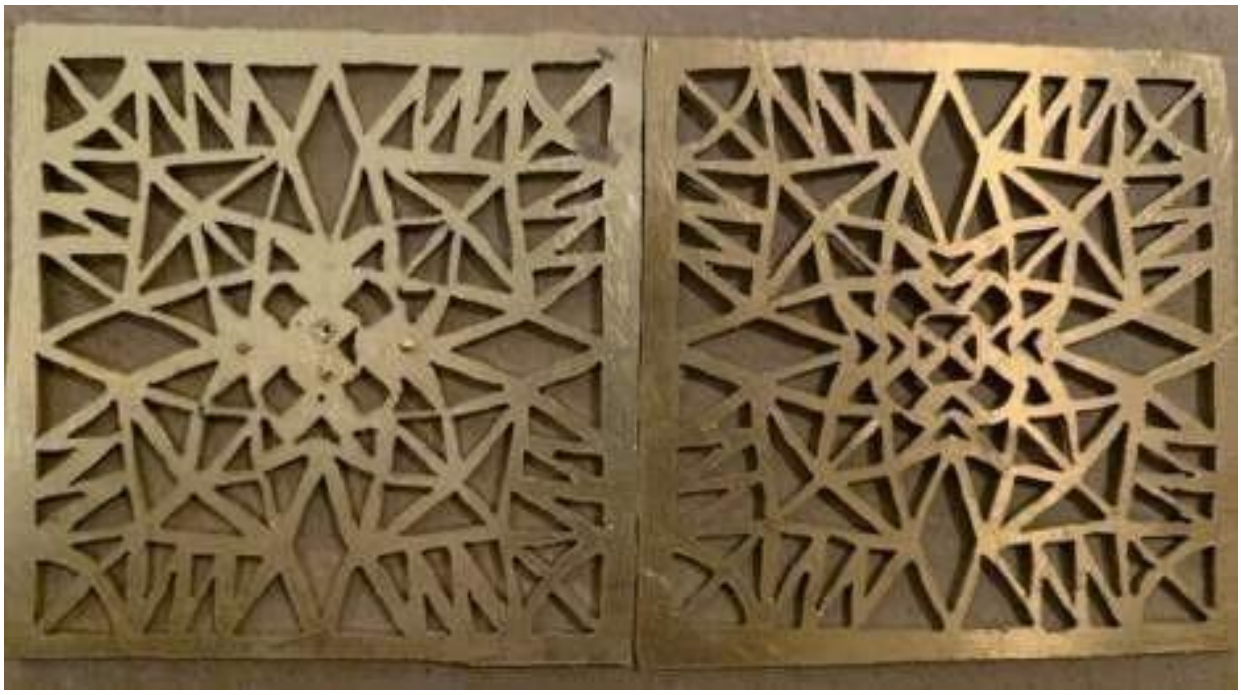


Figure 7. This student had a very difficult time learning to control the drill and the jeweller's saw. This is an image of the first attempt next to the final version, handed in for grading.

Figure 8. Two interpretations of a symmetric pierced design. Both of these took design liberties with the "100 holes" requirement. We pointed that out, and then also pointed out how successful they were in telling a story with the interplay of positive and negative space.

Project 2: Rings – Learning to visualise in the Third Dimension by carving in wax

Wax carving is one of the oldest methods for creating models for casting. It is especially adaptable to the remote platform because it can be done by hand, with a few simple tools. We used it to teach students how to turn a block of wax into a ring that fits precisely. They learned how to carve and hollow out their carvings to a correct, castable weight, and to use wax as an expressive sculpting medium.

Figure 9. The first ring assignment required precise measurements, and the design had to be expressed on more than one plane. The ring had to be equally beautiful from all sides.

Figure 10. These two photos illustrate the ring in progress and finished. Light is used as a tool for checking the thickness of the carved wax. Darker areas are thickest, and must be hollowed out to a single millimeter before the ring can be cost-effectively cast in precious metal.

Figure 11. This student created a cat sculpture. The cat's tongue is a hidden secret seen only by the

wearer.

Figure 12. Rings from the second semester. The assignment was to create a ring that features a bezel-less setting. This ring embodies all the learning goals from the previous one, with the added tasks of learning to clean up and polish the casting, and setting the stone. Students were taught to make their own setting tools in steel for this project.

Figure 13. This student designed a whimsical hand reaching for the stone.

Figure 14. This student incorporates texture to emphasize the sculpture, and made the difficult to polish recessed areas an asset to the design.

Project 3: Creating Flatware

In the second semester, the curriculum included flatware. We had to modify the unit to eliminate hot-forging methods—the use of a torch was off-limits. We created a presentation that illustrated how flatware is traditionally made, and then demonstrated how the process can be modified to make flatware without a torch. This project incorporates the skills students already learned in wax carving, piercing, sawing, filing and added a new skill: riveting.

Figure 14. These are teaching examples created by Wendy Yothers. The handles were carved, cast and riveted onto the knife.

Figure 15. The cheese knife parts are ready for assembly. The three-dimensional effect on the blade was created by filing and polishing.

Student interpretations of the flatware assignment

Figure 16. We encouraged students to design flatware to serve their favorite food. It had to be functional, but the form was up to them. The photos show the front, side and back of the knife. The blade is pierced brass, riveted in place. We insisted that the rivets be either an integral part of the design, or invisible. The assignment called for only one cast piece. This student "pushed the envelope."

Figure 17. A tomato server

Figure 18. A sandwich spreader

Figure 19. The process.

Figure 20. Here is the finished piece. The design tells a story. This lizard is getting a fly.

The Final Project: Nunome Zogan, Japanese Inlay

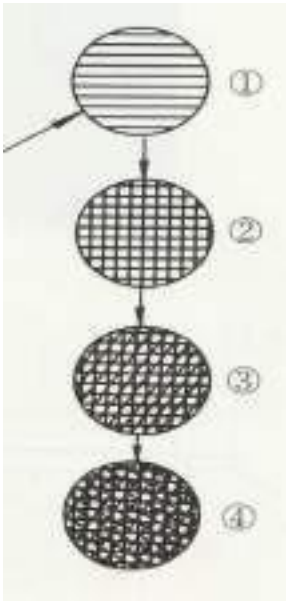
Nunome means “grain of fabric,” and zogan means “inlay.” This project was included to give students an awareness of jewelry design across cultures. Nunome zogan is a texture inlay technique in which thin metal leaf is hammered into a pattern created with a special chisel. It is a “cold” process—no soldering is required, and that makes it suitable for safe practice at home.

Instead of soldering, the metal leaf is held in place by a carefully patterned texture that resembles the fine pattern of woven cloth.

Learning goals for this project:

- Tool making
- Precision in making textures with the tool
- The introduction of a design esthetic that celebrates the use of non-precious metals in a jewelry context

Figure 21. A brooch made by Tomoyuki Teratani in the nunome zogan technique.



Figures 22, 23 and 24. Left, the chisel each student made. Center, the sequence of the pattern, and far right, an example of the pattern on brass, ready for inlay.

Student Work: The materials used were brass, inlaid with aluminium foil

Figure 25. This photo shows a close-up of the background texture made with the chisel and how it remains visible through the foil in the finished earrings.

Figure 26. This student incorporated mirror image design learned in the piercing project.

Findings and Analysis: what we learned teaching studio practice remotely

Teaching remotely forced us to re-examine every aspect of our teaching practice.

- Our old method of extemporaneous lectures/demonstrations had to be distilled into videos that were scripted to anticipate questions, needs and difficulties. We posted them online for students to view and review.
- We learned that live, interactive demonstrations were actually more effective when projected on the computer screen. Every student could see clearly, and ask questions in the chat box without interrupting the flow of our lecture.

- We learned that Smartphones with the cameras focused on students' hands while they worked helped us to respond immediately to their questions with spontaneous demonstrations that pinpointed each specific problem. The images projected on the gallery array allowed the whole class to see and be involved in the problem-solving.
- We learned that reviewing the homework images in a structured critique each session accelerated the learning process. Students discussed their difficulties and shared their solutions. They supported each other openly, thus creating a safe space that included unembarrassed praise and thoughtful, constructive brainstorming.
- We learned to use the inescapable solitude of the pandemic to communicate the importance of perseverance. No matter how thorough the teaching, it never sticks until students try what we show them on their own. Learning at home—alone—forces students to come to grips with this bittersweet piece of wisdom: We can hand them the keys to the door, but they have to figure out how to unlock it. (Tompkins et al, 2016 Their finished projects are evidence of this. Each one tells a story of resilience.

Analysis of what we learned requires several more semesters of trial, and then comparison with other scenarios for remote teaching and learning done in other studio classes. Covid was a unique situation.

The urgent need to convey the content of the curriculum consumed all of our care and attention—we couldn't afford to lose a year, or a student. Our successes and our failures happened daily, and are too numerous and various to quantify as research data. We wanted to plant the seeds of craftsmanship and resilience into our cyber studio experience. How well they take root will only become apparent after the test of time.

Discussion and Concluding Thoughts:

"Reach students where they are now—not where they used to be." Troy Richards, Dean of the School of Art and Design, Fashion Institute of Technology.

We discovered that a new door to students' imaginations can be pried open with their texting thumbs on their Smartphones. In the past, our teaching practice assumed students had some kind of studio art experience in primary and secondary schooling. Our assignments were designed to connect with what we assumed they had already learned in art or shop class. Trouble is—for the past thirty years or so, art experiences have become increasingly virtual in schools. Computer design programs and rapid prototyping do a lot of the actual "making" for students. Young adults leave school knowing their way around a keyboard, but not much about building ideas into tangible art. We've seen evidence of this again and again in their application portfolios.

Nevertheless, students are as smart as ever—smarter—and just as creative. The technology they have in their hand-held devices connects them to each other and the rest of the world—instantly. They are natives of Cyberspace. The main difference between us and them is generational. Their generation has had less opportunity to build their ideas in cloth, clay, wood and metal. For that reason, a real studio experience in their education is vital.

The global pandemic forced us to use the remote platform to convey content we believed could only work effectively in the studio. We had no choice but to find a way to bend digital technology into an interactive learning tool that would enable us to reach our students. In the end, we used their phones to connect their imaginations with their hands, and it worked pretty well. We were able to use that connection to pull them through the glass screen separating us. Once we got them to our side, we could help them learn how to make what they can imagine.

The pandemic made us better teachers. It forced us to face—again—that education is a two-way street. If we demand our students be open to new ideas and experiences, we must be equally open to their evolving capacity to receive them. We must learn and re-learn to use technology as creatively as any of the other tools at our workbench—and to adapt it for our purpose—whether it is for conveying our lecture content, our studio practice, or our art.

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