

A P O R T R A I T O F

THE ARTIST

A new TC program grapples with the

I N T H E

nature of creativity in the 21st century

DIGITAL AGE

BY ELLEN LIVINGSTON ■ PHOTOGRAPHS BY DEBORAH FEINGOLD



IT STARTED SEVEN YEARS AGO WITH A PRACTICAL PROBLEM. THE TEACHERS COLLEGE PHOTOGRAPHY LAB HAD SPRUNG A LEAK. NEVER MIND WHAT AN OLD-STYLE DARK ROOM WAS DOING UP ON THE LIGHT-FLOODED ROOF OF GRACE DODGE HALL. THE WATER DAMAGE WAS SIGNIFICANT, AND THE OLD LAB WOULD HAVE TO GO.

Found Sound

MUSIC MAKER Art & Art Education doctoral student Max Levi Frieder in TC's Thingspace, building one of his "Foundstruments" — a music-producing creation made from found objects. The Thingspace features vinyl cutters, 3-D printers, laser cutters and other tools.



HERE SOME MIGHT HAVE SEEN ONLY HEADACHES, JUDITH BURTON, PROFESSOR OF ART & ART EDUCATION, SAW OPPORTUNITY. TOGETHER WITH A DOCTORAL STUDENT WHO HAS SINCE GRADUATED, SEAN JUSTICE (ED.D. '15), AND FUNDED BY THE MYERS TRUST, BURTON SET ABOUT CREATING THE MYERS MEDIA ART STUDIO, A CUTTING-EDGE NEW FACILITY IN THORNDIKE HALL LOCATED IN — WHERE ELSE? THE BASEMENT.

But this being TC — home over the years to artists ranging from Georgia O’Keeffe to Raphael Montañez Ortiz and educators from Arthur Wesley Dow to Maxine Greene — hardware was only a part of the conversation.

“TC has historically played a key role at turning points in art education,” says Burton, who also directs the College’s Macy Gallery. “So we felt a responsibility to grapple with the rapidly expanding influence of technology in every aspect of the arts.”

At that time, Burton taught a course called “Processes and Structures in Visual Education,” which emphasized developing students’ creativity and imagination rather than conventional technical skills with any particular set of tools or

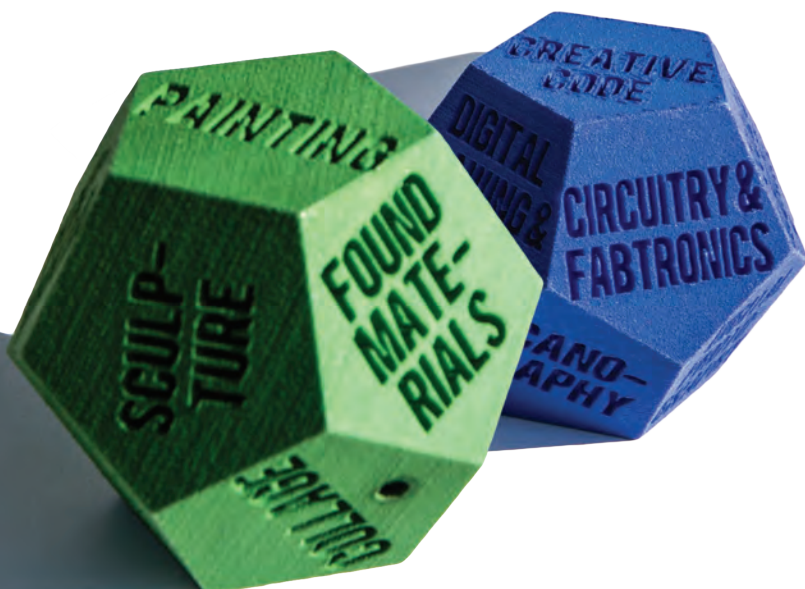
projects. She asked a new faculty member, Richard Jochum, to begin thinking about how to apply the same sensibilities to working in the digital medium. Jochum, now Associate Professor, obtained a TC Provost’s Investment Grant to develop a creative technologies curriculum. He also launched a series of annual symposia and mounted a digitally focused exhibition in Macy Gallery titled “New Gifts.”

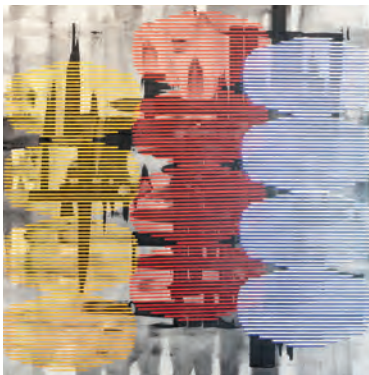
But there was one more piece of the puzzle. As Burton contemplated the growing presence of computers in art and art education, she found herself thinking about the importance of physical stuff and making things with one’s hands. In 2014, while giving the keynote address at an exhibition called “thingworld” at China’s National Art Museum, she had a revelation. The unique proposition of a creative technologies curriculum at TC would be its grounding in enduring artistic traditions.

Possible Art

RICHARD JOCHUM’S students roll these multi-sided dice to set the parameters for new artworks they create. One student’s toss triggered a project showing what Van Gogh’s “Starry Night” would look like in different eras and settings.

“As we move forward into this world in which we’re giving away so much to the machine, human sensibility is getting lost,” she says. “And it was suddenly clear to me that we needed to create a space to bridge between the computer screen and more physical 3-D engagements with visual and traditional tools and materials such as wood, metal and found objects. We needed to continue using the same kind of language about art in order to keep the digital





DIGITAL DISPLAY Images from an exhibition on creative technology, mounted in Teachers College's Macy Gallery in June 2015. The exhibition was co-curated by Richard Jochum and Sean Justice, assisted by TC doctoral student Meghana Karnik and supported by a TC Provost's Investment Grant. The show featured 22 artists, most of whose works were interactive, creating an enhanced user experience. For example, the far-left image in the second row and the far-right image in the third row are of clothing that can be illuminated through a wireless connection to an iPad. The bottom middle image shows a light box that the viewer can press to make colors more or less intense.



Good Stuff

TRASH TALK Judith Burton and Jaymes Dec (second photo from top) discuss found art in the Thingspace, TC's "space to bridge the computer screen and more physical 3-D engagements." Top: a soldering tool. Bottom: an old TV monitor part.

from becoming something wholly different."

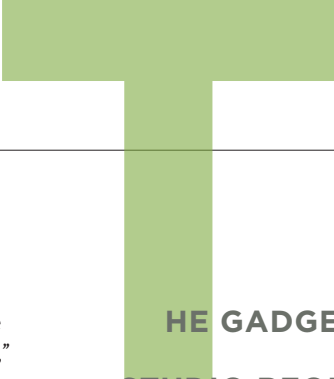
Late this past winter, it all came together when New York State formally approved a free-standing certificate program at TC in Creative Technologies, open to anyone, and a specialization in Creative Technologies within the College's Ed.M. program. Both will officially begin this summer, though some of the core courses have been offered for the past several years.

The 15-credit sequence of courses not only provides hands-on experience with emerging technologies, but poses compelling philosophical questions about art and where it is headed. What does it mean to be an artist in the digital age? What role should traditional art forms play? Are there still clear standards for what constitutes art and core artistic skills? How should teachers incorporate new technologies into their school classrooms? How can artists find meaning amid technical innovation that changes almost daily? And how to transfer entrepreneurial and problem-solving skills enhanced by art?

"We're living in a world of digital materialism and we need to engage our students with that world in order to understand what it's about," Burton says. "We need to provide leadership rather than being led by it. That means finding creative and exciting ways to use technology that build upon and enhance the artistic traditions that have developed over the course of human history."

NEW MEDIA, NEW FORMS

When Richard Jochum met for the first time this past February with students in "New Media, New Forms," a required class in creative technologies for all Art & Art Education M.A. students seeking teaching certification, he told them, in essence, to check their egos at the door. "There's always going to be someone who knows more than you do about some new technological advance," he said — so forget about mastering the medium in the way that painters and sculptors aspired to in the past. Instead, Jochum advised, focus on collaboration and staying open to new and different ways of doing things.



HE GADGETRY IN THE MYERS STUDIO REQUIRES A VOCABULARY MORE REMINISCENT OF SCIENCE FICTION THAN THE ARTIST'S ATELIER. BINS ARE FILLED WITH DRAWDIOS, ARDUINOS, INVENT-ABLING KITS, MAKEY-MAKEYS AND IMAC WORKSTATIONS.

“Different” is certainly the word evoked by both the Myers Studio and the adjoining Thingspace (or “fab lab,” for fabrication laboratory) created by Burton, Jochum and their team of digital natives. Merely describing the gadgetry in the Myers Studio requires a vocabulary more reminiscent of science fiction than the artist’s atelier. The room’s bins are filled with drawdios — tiny synthesizers that use a pencil to create musical sounds; Arduinos, which are microcontrollers used to build interactive devices; invent-abling kits, designed to help school-aged children create simple engineering projects; and maKey-maKeys, electronic tools that connect every-day, non-wired objects to computers, endowing them with new powers (the classic example: a row of bananas that becomes a playable piano keyboard). The studio’s banks of iMac work-stations, replete with webcams and microphones, enable artists to access powerful art programming tools such as Scratch, TurtleArt and SketchUp.

Next door, the Thingspace is equipped with wood and metal shops, as well as vinyl cutters, 3-D printers, laser cutters, large-format printers and other equipment that simply didn’t exist a decade ago. The tables and shelves are littered with the detritus of the late 20th century — old

television sets, phones, vacuum cleaners — awaiting deconstruction and reconstitution into new forms and objects.

“The goal is for us to learn to embrace an expanded notion of materials,” Jochum told his students. “We want to lower the barrier, so you feel more inclined to revisit some of these new materials and say, hey, I want to have my own

Confidence Man

STUDENT CENTERED

Jochum at The Wall, an exhibition space in Macy Gallery where students are encouraged to show their works. The goal, with all forms of art, is for students to say, “I’m not intimidated.”





THE ASSIGNMENT: CREATE AN INTERACTIVE ART PIECE ABOUT A CHILDHOOD EXPERIENCE. ONE STUDENT CONNECTED SMALL RUBBER BALLS TO HER COMPUTER; WHEN THEY BOUNCED, IMAGES OF BOUNCING BALLS SHE HAD PLAYED WITH AS A CHILD JUMPED UP AND DOWN ON THE SCREEN.

students make pop-up books in my art classroom — not just with traditional paper and crafts, but maybe with circuits that light up. The goal is to have you say, “I’m not intimidated.”

THE REANIMATORS

James Dec’s Thursday evening course on Digital Foundations in Creative Technologies also emphasizes the core theme of integrating digital technology with the material world, but it goes deeper into the programming side of that equation. One chilly evening early in the spring semester, students presented projects they had completed using a program called Scratch. The assignment was to “create an interactive art piece about an experience from your childhood that influenced or inspired you.” One student had connected small rubber balls to her computer; when they bounced, images of bouncing balls she played with as a child jumped up and down on the screen. Another had recreated a scene of her father pushing her on a swing as she delightedly shouted “Zero G!”

Scratch is a programming language developed by MIT scientists specifically to get young children hooked on computer programming. It employs a system of graphic blocks, each representing a different animation element (for example, “play sound”) that can be used in a nearly endless number of combinations. “Scratchers” program by dragging together these blocks, which resemble puzzle pieces and fit only when they make sense.

Dec says he’s seeing a new kind of creativity rapidly taking hold in K-12 classrooms, powered by the availability of these types of education-oriented programs, a wide range





Tech Team

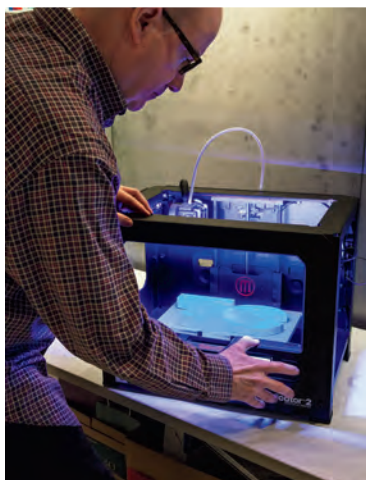
IT TAKES A VILLAGE

In TC's Creative Tech program, everyone adds knowledge. Above: Program catalyst Judith Burton flags TC's role at turning points in art education. Below, left: Student Bashir Oyakhilome Harrell in Myers Studio, which Sean Justice (Ed.D. '15; below, right) helped equip.

of open-source computer hardware and software, and the burgeoning "maker movement," in which would-be inventors band together to create new machines and electronic devices from old equipment. Dec himself has been at the forefront of that movement, setting up New York City's first school-based Maker Space/Fab Lab at the Marymount School of New York in 2011. Today, Dec says, such spaces have become commonplace at the city's independent schools, and public schools are now scrambling for funding to establish them as well.

Rather than teaching coding or the use of software in a vacuum, projects in Creative Technologies encourage students to think about the ways the digital can animate and redefine the physical. Recent projects in Dec's class have focused on using copper tape and conductive cloth to make paper crafts and articles of clothing that light up and make sounds. In one instance, students used a program called TurtleArt to create intricate geometric shapes based on traditional Islamic tile designs. Once completed, students will use a software program called Tinkercad to transfer their designs into clay tiles that can be produced on a 3-D printer.

"Art has always been about technology even going back



Historic Figures

TC PIONEERS: The College has been home to many artists over the years who went on to achieve global fame. From top: TC alumni Georgia O'Keeffe, Ad Reinhardt, Agnes Martin and Raphael Montañez Ortiz.





IT'S NOT JUST THAT WE ARE LEARNING TECHNIQUES AND TECHNOLOGIES," BURTON SAYS. "IT'S THAT WE ARE MOVING TOWARD LEARNING HOW TO LEARN, HOW TO BE OPEN AND FLEXIBLE, BE MORE ADAPTIVE AND IMAGINATIVE. THESE ARE THE SKILLS WE NEED THESE DAYS."

to the caves," Dec says. "The paintbrush can be considered technology. What's happening now is that a much broader range of tools is becoming more accessible and cheaper."

Burton and her team emphasize that the interaction between the arts and technology is very much a two-way street. She talks about replacing the acronym STEM (for science, technology, engineering and mathematics) with STEAM — a vision in which art is understood and taught along with the other subjects "in such a way that they extend and inform each other, making thinking more multidimensional, layered, flexible and complex."

"It's not just that we are learning techniques and technologies," Burton says. "It's that we are moving more toward learning how to learn, how to be open and flexible, be more adaptive and imaginative. Maybe you don't know how to code or use this or that piece of technology. But if you have a way of approaching it and the ability to acquire the knowledge you want, if you know how to play and explore and experiment and be reflective — to learn openly and flexibly — you can ultimately do almost anything. These are the skills we need to be learning these days."

It was in search of those skills that Denise Hand sought out Dec's class. A New York City middle school teacher who already had a strong background in technology, Hand wanted to expand her computer skills but felt most courses approached the subject in a dry, technocratic way.

"My concept of computer science is much more like what we're doing in this class," Hand said in February. In one of her projects, she created a model of Paul Revere's midnight ride that — using circuits on cardboard, like the "sliders" in some children's books — could actually light up with one light or two. In another, she created an interactive Gotham-like cityscape, replete with a structure modeled on the Empire State Building, in the style of a famous pointillist artist, that changes to red when the right buttons are pushed. The point of both projects was to learn to manipulate different tools, not invent something of immediate utilitarian value, Hand said, but she has no doubt about the ultimate payoff. "I feel like any time I learn something new it does appear in my own classes, whether 100 percent directly or in a more roundabout way."

SETTING THE PARAMETERS

When he first began teaching New Media, New Forms, Jochum assigned a final project in which students tossed three six-sided dice to set the parameters for a new artwork they would create. The sides of the first die listed new technologies, such as scanning, audio or computer coding.





Beyond Technology

LEARNING ABOUT LEARNING Jochum, doctoral student and Thingspace Coordinator Andrew Corpuz, and doctoral student Sohee Koo. Opposite page: On the shelves of the Thingspace, artists can rummage through the dust bin of technological history.



The sides of the second die represented more traditional media such as painting, sculpture or collage. The third die listed broad themes, such as identity or community. Each student rolled the dice and was challenged to create an art work that incorporated whichever three parameters were coming up — for example, painting, audio, community — creating a multitude of possibilities. Yet after teaching the course for a number of years, Jochum decided that even three six-sided dice are too limiting. So now he uses three 12-sided dice, which — practicing what he preaches — he creates from scratch with his students on a 3-D printer.

Jochum has been fascinated with the final projects students have created in years past. One woman whose toss of the dice turned up creative coding, painting and environment created a computer program in

which users could manipulate a sliding control to adjust the visual representation of the air quality in famous paintings. Thus, a viewer could see not only how Van Gogh saw his “Starry Night” through the clear air of late 19th-century Provence, but also how it would appear if the artist had been gazing out of the window into the thick pollution of early 21st-century Beijing.

GEN X-BOX?

In the classic Marx Brothers movie *Duck Soup*, Groucho Marx’s character, President Rufus T. Firefly, glances at an official briefing and says, “Why, a four-year-old child could understand this report. Run out and find me a four-year-old child. I can’t make head or tail out of it.”

That moment more or less came to pass in Jaymes Dec’s class in February. Several of the students were getting frustrated trying to master Scratch, including one who described her project as “a massive failure that was driving me insane.” Having anticipated such responses, Dec had brought a guest expert to class: his 10-year-old niece, Lucia, who proceeded to breeze through five or six Scratch

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programs in which she is completely fluent.

It was an amusing moment, but it echoes comments made by speakers at a summit on arts education that Burton convened at TC this past winter.

“We are facing a society and economy which are characterized by complexity, ambiguity and uncertainty,” said Gerald Bast, President of Austria’s University of Applied Arts in Vienna. Artists are experts in dealing with these issues, he said, and art education should enhance their imaginative and associative abilities, problem-solving and critical thinking.

With the tools and materials on hand in the Myers Studio, Richard Jochum says he can only guess what his students will come up with in the future. If you’re the parent of an elementary or middle-school student, he says, it’s just a matter of time before he or she comes home with a creation made with one of those tools — something that lights up or moves or makes noise.

Will it be art? That’s one for the critics. 

MORE ABOUT CREATIVE TECH

Watch a PBS MetroFocus segment from February to learn about TC’s new concentration and advanced certificate program in Creative Technologies.

<http://bit.ly/1orcNfT>

MORE 21ST-CENTURY LEARNING

TECH -

The College is a hub for digital innovation

NOLOGY

to create better teaching and learning

CENTER

THE CREATIVE TECHNOLOGIES PROGRAM IS ONLY ONE FACET OF TEACHERS COLLEGE’S INCREASINGLY WIDE-RANGING LEADERSHIP IN DIGITAL INNOVATION IN EDUCATION. TC IS WELL KNOWN FOR STRENGTHS IN:

COGNITION AND CONCEPT FORMATION

TC’s Institute for Learning Technologies (ILT) explores grounded cognition — the fuller understanding resulting from the learner’s ability to create mental and perceptual simulations of concepts or processes. ILT unites “John Dewey’s emphasis on the importance of learning from experience with E.L. Thorndike’s insistence on empirical rigor,” says Director John Black, developing and evaluating visualizations, animations and physical embodiments to teach math, science and literacy.

Black, Cleveland E. Dodge Professor of Telecommunications & Education, has consulted for IBM and Xerox and mentored many education technology start-up leaders.

Assistant Professor Catherine Chase explores how the design of instruction affects student learning, transfer and motivation. She studies an instructional method called Invention-with-Contrasting-Cases, in which students invent a representation of a fundamental scientific structure that accounts for the variation across cases. Chase guides students through the invention process using a computer-based Invention Tutor.

Associate Professor Sandra Okita, a faculty member in the Communications, Media & Learning Technologies Design (CMLTD) program, explores how forming peer-like relationships with robots, agents and avatars helps young students learn and share knowledge and ideas. She has also demonstrated that using robotic companions can reduce pain and emotional

anxiety in seriously ill children.

Black and ILT provide and evaluate embodied learning experiences and programming instruction in the Teachers College Community School.

GAMES AND VIRTUAL REALITY

TC's CMLTD Program studies the digital revolution's impact on all areas of education and human experience. CMLTD "explores how existing and emerging forms of computing — including mobile technologies, digital platforms and interactive media — affect education and all human experience," says Director Lalitha Vasudevan, continually redefining educational technology research and design.

Digital games tap users' desire to win and enable them to experience their actions' consequences. Vasudevan, Associate Professor of Technology & Education, is launching a Master of Arts program in Design and Development of Digital Games centering on the

creation and study of games to stimulate learning and behavior change.

Research Assistant Professor Joey Lee, Coordinator of TC's Games Research Lab, "gameifies" climate change and other science learning topics. Through Columbia University's partnership with the NASA Goddard Office of Education, he's creating a portal aimed at improving teachers' classroom use of virtual reality. Lee offers teachers a summer "Teacher Tinker Technology Bootcamp" on games, robotics, virtual reality, apps, interactive websites and other tools.

LEARNING ANALYTICS

Associate Professor Alex Bowers mines data to help school districts predict and improve long-term outcomes for different populations of students. A former pharmaceutical cell biologist, Bowers uses a technique called cluster analysis to identify, as early as the third grade, students at risk for failure to graduate.

Fiona Hollands, Associate Director of TC's Center for Benefit-Cost Studies of Education, has helped create new digital tools to enable schools and districts to conduct cost-benefit analyses of different interventions. Hollands co-authored a sweeping assessment of massive open online courses.

PARTNERING WITH SCHOOLS

TC's Center for Technology and School Change (CTSC), led by Associate Professor of Practice Ellen Meier, helps schools link their

Library Maker Spaces to classroom activities. Through CTSC, New York City 11th and 12th grade English and Social Studies students use technology to create oral histories within their communities. CTSC also partners with New Haven, Connecticut schools on technology-based teacher professional development and curriculum design.

FACILITATING DIGITAL COLLABORATION

Within the College's Gottesman Libraries, directed by Gary Natriello, Ruth L. Gottesman Professor of Educational Research, the EdLab creative services unit has facilitated digital initiatives such as the national distribution of a curriculum about Hurricane Katrina and its aftermath.

THE MAKER MOVEMENT

Assistant Professor Nathan Holbert's Snow Day Learning Lab makes and studies games, toys and technologies that offer children opportunities to experience and explore different phenomena, revealing how, in a digital age, they make sense of the world through play. Computer science, engineering and maker activities are also framed to appeal to more girls and young women.

Making media is also a focus of CMLTD's Media & Social Change Lab, directed by Vasudevan and involving other program faculty, including Assistant Professor Ioana Literat. 