



Cover Story

The classroom (r)evolution

Active learning has been in place at TCU for years. But with multidisciplinary Rees-Jones Hall now open, students and professors have a new technology-rich, 21st century place to learn together.

by Rick Waters '95

Photos by Leo Wesson

TWENTY MINUTES into Keith Whitworth's 10 a.m. section of Introductory Sociology, the American Dream faded. The middle class had struggled to break even and hold on to property. The outlook was bleaker for the lower classes who teetered on bankruptcy, wondering what they would run out of first – money or hope.

None of this seems to bother the instructor. Whitworth's Wednesday morning class is unfolding as expected.

Hands in his pockets, he strolls the classroom sidestepping backpacks and noting signs of frustration: clenched fists, crossed arms, shaking heads.

It is early March — three days before Spring Break — and Whitworth's 40 undergraduate students in Room 211 at Rees-Jones Hall are playing a rigged version of Monopoly.

Five students at each table surround one of eight game boards. One student pushes back from a table and sighs heavily. The entire class pauses for a moment.

Whitworth makes a rhetorical announcement. "Can you rob the bank? Yes, you can ... if you don't get caught," he said. "The instructions don't say anything about that."

The rules are like the traditional game: Players circumnavigate the board, buy property, build houses and make as much money as possible. But in this manipulated version, players start with different amounts of cash and assets based on their date of birth.

The two oldest players represent the two highest quintiles of U.S. household income and begin with Boardwalk, Park Place, all four railroads and other properties. The younger three players get nothing.

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The economic disparity is not fair, and that's the point. "Social stratification may be one of the most difficult topics covered in sociology," said Whitworth. "This exercise is supposed to help students see the structural nature of inequality. They experience the different levels, and it challenges the idea that talent and ambition are enough to overcome societal barriers."

The game is one aspect of student-centered active learning in one of TCU's new next-generation classrooms. The walls are writable. The furniture moves. Technology turns lectures into multimedia extravaganzas. Class discussions, small-group projects and even board games are not outside-the-box activities; they're the new normal.

In Rees-Jones Hall, students use smartphones and tablets to reserve time in private study rooms, which fill quickly. Soaring hallways are covered with quotations, factoids and graphics.

The silver-level LEED-certified building is as environmentally thoughtful as it is intellectually inviting. Smart water fountains keep visible count of plastic water bottles saved.

Yet the building, with all its technological amenities, is only part of a larger story of transformation. TCU is in the midst of an educational evolution that has spread across academic programs during the past decade, focusing more on student learning outcomes and less on faculty teaching agendas. The plan places a premium on creativity, collaboration and personal discovery.



Students in Ron Pitcock's Cultural Memory in the U.S. class read from *Extremely Loud and Incredibly Close* while discussing story notes projected on the room's front wall.

Some call it "authentic learning" because it tweaks the roles of instructor and learner. Teachers still assign homework and determine final grades, but students are expected to act as partners in presenting and parsing the material.

"[Students] want to do it. They want to take ownership of their learning and stay more engaged and interested in the content," said Whitworth. "They're more motivated to grasp new concepts and skills. And that, ultimately, prepares them better to succeed in college, their future careers and adulthood."

With the August 2014 opening of Rees-Jones Hall (and neighboring Annie Richardson Bass Building), the university now has multidisciplinary spaces to match the pedagogical plan.

"What's happening here is revolutionary for our campus," said Leo Munson, associate provost for academic support. "These two new buildings allow us to begin this learning evolution on a large scale. For years, we've had individual faculty teaching in these ways. Now, Rees-Jones Hall allows us to have a larger cadre of adopters."

"It's a shift from a teaching paradigm to a learning paradigm," said Romy Hughes '08 MLA, assistant provost of educational technology and faculty development at the William H. Koehler Center for Teaching Excellence. "These classrooms make it easier for students to flex their analytical muscles and apply skills and knowledge on a daily basis."



Sociology professor Keith Whitworth helps students with a Monopoly game exercise during a lesson on social stratification.

“WHERE EDUCATION IS HEADED”

Back at the Monopoly games, the classroom noise crescendoes. Wealthy players shuffle \$100 bills to their struggling neighbors to roll for them and move their tokens. At one board, haggling over rent forces two players to mortgage their assets.

No one is discussing class mobility or socioeconomic ranking – at least not yet. Whitworth will address those concepts during the next class. For now, he increases the interactivity by using some of the classroom’s tech capabilities.

He asks the richest and poorest players at each table to chronicle their experiences. The wealthiest may enjoy the luxury of using their own laptops or smartphones to jot one-sentence status updates on a Google Docs page that Whitworth has created on the classroom’s computer panel. The document is displayed on the room’s front wall through dual projectors and updated in real time as students type.

The poorest players, however, move to one of the room’s two wall-to-wall whiteboards and compose their thoughts using a dry erase marker. But there is only one pen, and a line forms.

“It’s like real life. Resources are limited,” Whitworth laments.

“I’m just trying to get by,” one frustrated player writes.

“This is not fair,” scribbles another. “I’m about to be out and never had a chance.”

At the front of the class, rich players revel in their economic status: “I feel and love the power of being the wealthiest.” “I rule this board!” “The lowly peons must worship MEEEE!”

Two days later, the class uses the players’ comments to apply sociology’s three primary theoretical perspectives. A take-home worksheet with questions, plus homework readings, bridge the board game fun with the deeper, larger lesson.



“I think this is where education is headed,” said Jesse Thompson, a sophomore theatre major from Midland, Texas. “Activities like this make it more hands on, more application-based. I feel like I am learning for now and the future.”

“Most of my classes have group-learning projects and use technology in the classroom,” said classmate Justin Sanchez, a freshman nursing major from Saginaw. “My generation is wired to learn this way.”

Rees-Jones Hall has 11 such classrooms equipped with dual input wireless projectors, document cameras and video players. A wireless control panel the size of a brick manages the gadgetry.

Faculty members can show a YouTube video on one screen and PowerPoint slides on the other, or an Excel spreadsheet, or a journal article.

“There is no default setup for a given day,” said Joanna Schmidt, classroom integration developer for the Koehler Center and building manager for Rees-Jones Hall. “These classrooms are spaces where you can do what you need to do in that moment on that day.”

Two of the rooms are designated smart classrooms, which feature large desks arranged for groups of five or six.

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Each table has a 27-inch flat-screen television connected to the room’s Crestron AirMedia unit that allows an instructor to display class content to every group’s monitor.

For presentations, students can flash their table’s work to the entire class on the front wall. When they’re finished, another table of students can take over. With a click, an instructor can toggle from group to group.

Smart classrooms also include a kiosk of 36 Microsoft Surface Pro 3 tablets so that every student and teacher has equal access to the technology.

In his Cultural Memory in the U.S. course, honors professor Ron Pitcock uses nearly all the tools. During a class discussion in April of the Jonathan Safran Foer novel *Extremely Loud and Incredibly Close*, he scrawled notes on the whiteboard as students debated whether the main character had Asperger Syndrome.

At one table, a group of four students pulled up the WebMD page about the disorder and added the symptoms to their electronic notes on their own monitor. Moments later, Pitcock projected their quick fact-finding results overhead for all to dissect. As the discussion went on, the professor opened the novel to a passage in the second chapter and positioned it under the room's document camera. Students read a half-page aloud while performing a criteria match exercise.

"The students are the ones who make this classroom work," said Pitcock. "The technology is great if it allows us to build upon the skills they bring to the classroom and use their love for technology to build knowledge together."

In Suki John's Dance in World Cultures course, students research the history of two distinct forms, make an oral report and demonstrate the steps.

Nearly every class meeting, her students collapse the tables in the room and arrange them in a horseshoe shape to watch their peers. When it's time to dance, they fold up the chairs too.



Students in Suki John's Dance in World Cultures course collapse the tables and chairs to convert a next-generation classroom into a performance space.

"You can be as creative as you want to be," said John, professor of dance in the School of Contemporary and Classical Dance.

As a faculty fellow in the Coleman Entrepreneurship program, John also teaches Entrepreneurship in the Arts with Sally Packard of the School of Art and Michael Sherrod of the Neeley School of Business. For the professors, the best part of collaboration is sharing teaching ideas.

Sherrod likes showing TED talk videos about the origins of good ideas in his management course called Entrepreneurial Opportunity Recognition. Inspired, John weaved more visual media into her courses.

Rees-Jones Hall is open to all disciplines, so "the building belongs to nobody but is available to everybody," said Nowell Donovan, university provost.

In the hall's first two semesters, 31 departments from all eight TCU colleges conducted classes there, led by 74 faculty members. Twenty-four of them teach more than one course in the building.

Brock Kingsley of English leads Reading as a Writer in a smart classroom and Intro to Creative Writing in a next-generation

room. In the former, he uses AirMedia to broadcast audio of authors reading their own work for group discussion. In the latter, he uses the same tools to project old black and white photos on the front wall, then assigns students to flesh out a character with feelings, actions and thoughts.

Amanda Irvin, who has taught classes for both English and Women's Studies departments in the hall, has assigned her students to create Facebook profiles of story characters and a Twitter feed to narrate plot. Her students also have made YouTube commercials and movie trailers for novels.

"Using technology enhances their level of comfort in digital composition and increases their online literacy," she said.

One of Irvin's favorite exercises is called "three bullets and a photo." Teams of students receive a topic — say, 19th century finances — and must apply it to a work, such as Louisa May Alcott's *Little Women*. In only 30 minutes, each group must produce one slide with a picture and three points.

Each group takes a turn showing its work and answering questions. At the end, all the slides are added in a Google Presentation that students can access throughout the semester.

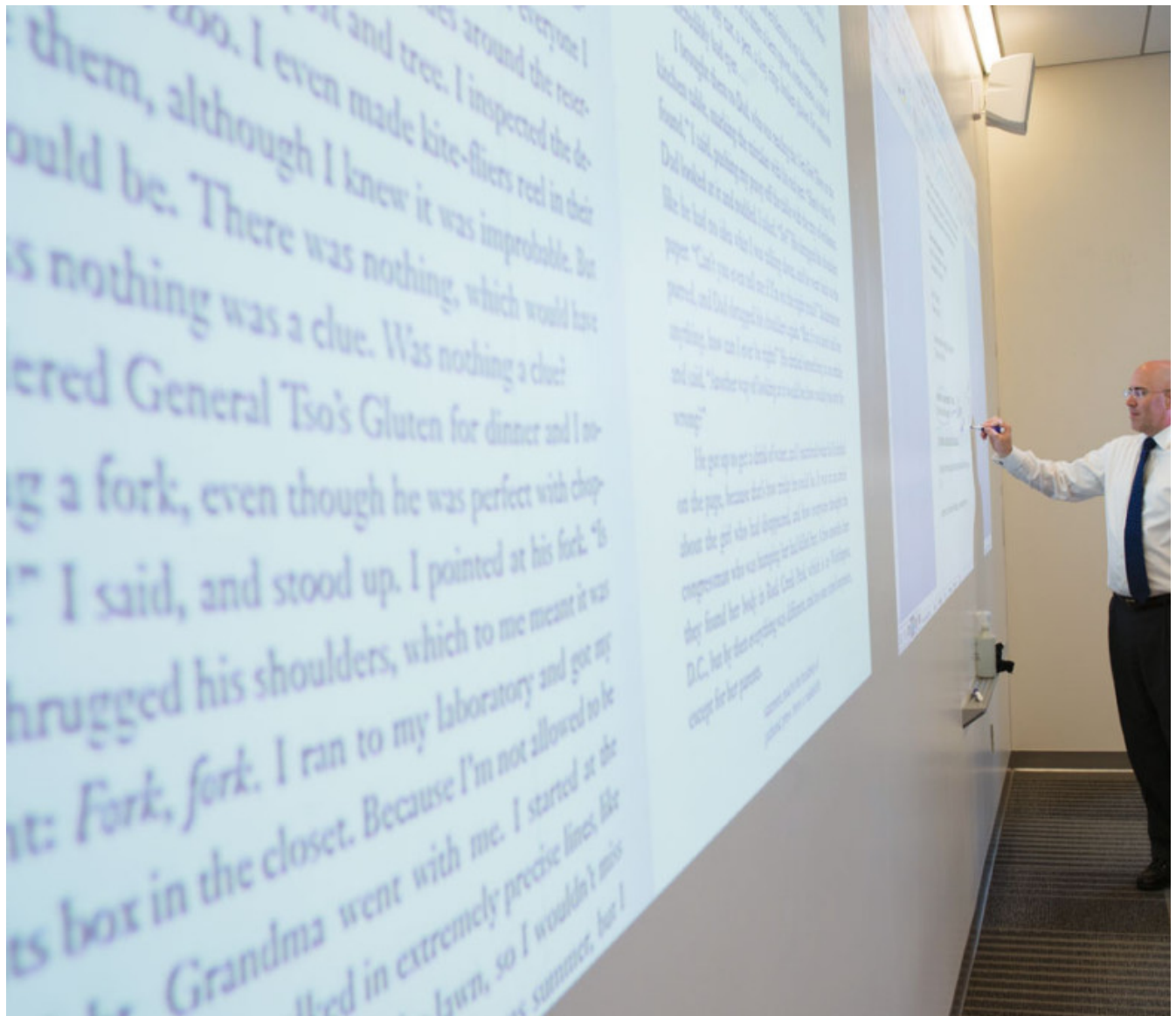
Not only have the students learned the material, Irvin said. They've created their own scholarship.

"The technology is great," she said. "But it can't get in the way of the education. I've found that if I stick to the content with only one supporting activity, the impact is huge."

Students love it.

"You can't be a passive learner or space out in classes like this," said Kaitlin Hendrick, a freshman computer science major from Odessa, Texas, in Suki John's Dance in World Cultures class. "You have to come prepared for class because there will be participation, and you'll have to demonstrate you know the material."

"It's fun. The whole atmosphere makes me want to engage in the class and get the most out of it that I can," said classmate Hayley Henley, a freshman business major from Little Rock, Ark.



In the course Cultural Memory in the U.S., pages of *Extremely Loud and Incredibly Close* are projected onto the front wall of a smart classroom using a document camera, while Dr. Ron Pitcock uses a dry-erase marker to circle student notes displayed by the room's AirMedia technology.

NO MORE "SAGE ON THE STAGE"

"I hear and I forget. I see and I remember. I do and I understand."
 – ancient Chinese proverb

The old-fashioned lecture isn't dead. It's still the fastest way to cover content and tell students what they need to know. But research shows that many of those young learners forget what they hear even faster.

"Learning is not a consequence of pouring information into a student's head. It requires the learner's own mental involvement and doing," said Hughes. "Explanation and demonstration alone almost never lead to real lasting learning."

Active learning places the responsibility of learning on students with teachers coaching beside them. Rather than passively listening or even dutifully taking notes, students are out of their seats, thinking, moving, working in groups, presenting, demonstrating, questioning, discovering for themselves.

They work through problems, identify examples, apply knowledge they have – or perhaps information they just acquired – all to perform assignments in class.

Yesterday's "sage on the stage" is happening less. Today's "guide on the side" is happening more.

Yet active learning is not new. Popularized in the early 1990s after a report by the Association for the Study of Higher Education, the pedagogy traces its roots to educational psychologist Benjamin Bloom's taxonomy of learning behaviors in the mid-1950s.

Bloom's approach challenged a century-old notion from the Industrial Revolution that professors delivered knowledge to empty vessels. But pioneering educators Maria Montessori, John Dewey, Jean Piaget and others argued that learning is not so much of an additive process with new knowledge piling on top of old.

Instead, learning is as a dynamic sequence in which connections are established. Activity centered on the learner enhances understanding. Learning requires dialogue, not transmission.

Scholars in the 1970s and 1980s brought supporting research about attentiveness. Most teachers speak about 100 to 200 words per minute. If students are really concentrating, they might get half, findings showed. Another study in 1986 by University of Michigan psychologist Wilbert J. McKeachie revealed that learners tended to retain about 70 percent of content in the first 10 minutes but retention dropped to 20 percent in the last 10 minutes. Adding visuals to a lesson tripled comprehension, the study found.

Higher education has been the last to enter the active-learning domain. Hughes became a proponent when she was doing faculty and staff training in the Arlington school district in the mid-1990s. From there, she took the active-learning approach to Hill College and eventually TCU in 2001.

Two years later, she launched the Koehler Center's Student-Centered Active Learning boot camp program. By 2008, the center saw a spike in the number of faculty members asking, "How do I get my students more engaged?"

"University professors tend to teach like their mentors," said Hughes. "It is a public profession, teaching in front of students, but rarely do faculty talk about *how* they teach."

"[Professors] are excited because, for many of them, it takes them back to the time when they first wanted to be a teacher."

Romy Hughes, assistant provost of educational technology and faculty development at the William H. Koehler Center for Teaching Excellence

The three-day SCAL boot camp gets faculty members trading ideas about curriculum development, syllabus writing and active-learning techniques. They try out the technology and see how it can work with active-learning pedagogy.

"There is an emotional response from before and after SCAL training," said Hughes. "They leave energized. Their emotive language changes. They're excited because, for many of them, it takes them back to the time when they first wanted to be a teacher."

For example, Harriet Cohen of social work was doing interactive exercises in her classes before she came to TCU, having studied adult learning styles as a social worker for 26 years.

But the boot camp training affirmed that faculty have to teach in ways that meet learning needs across the spectrum.

"I've always tried to integrate the experiential with the cognitive and didactic," said Cohen. "I can't ask them to memorize theory. It doesn't make sense without context. They need to put the theory into practice. Active learning has the class doing both."

The pedagogy also gives faculty members flexibility to be more creative, she said. Teachers should go back and re-learn their own content, prioritize what's most important and search for new and inventive ways to present it to a new generation of students.

"My personal approach focuses on two questions," she said. "What are the most important points in the content? What is the best way for the students to hear and comprehend those major concepts?"



Cohen shows videos with her own captions added, highlighting key points tying back to the lesson. She also poses questions on the whiteboard for student responses to test how much they're absorbing.

It takes extra time, but if students grasp the material, that's the role of the teacher.

Irvin agrees. "It *is* more prep time, but it's not more *work*," she said. "I think active learning requires me to allocate my time differently. I spend more prep time before class, but I spend less time agonizing over poorly written assignments and papers."

Seeking periodic feedback from students is valuable as well, said Cohen, who does twice-a-semester check-ins with students after the first and second months of class, rather than waiting until the end of the year.

"Their responses help me understand how they learn and what they need," she said. "Ultimately, that enables me to be a better teacher."



Opened in August 2014, the 62,000-square-foot Rees-Jones Hall houses academic classrooms, faculty offices, interdisciplinary spaces and an incubator lab. The building is also home to the TCU Energy Institute, TCU Ideas Factory and the Institute for Child Development. A pedestrian air bridge will connect Reese-Jones Hall and the Mary Coats Burnett Library.

MORE SMART CLASSROOMS?

As the Koehler Center trains more teachers in active learning, the university is watching how the pedagogy is changing instruction and learning and how many faculty embrace student-centered methods.

The opening of Rees-Jones Hall and Annie Richardson Bass Buildings has prompted more teachers to seek training.

Will smart classrooms pop up all over campus? TCU earmarks \$4 million annually for classroom and laboratory renovation. Winton-Scott Hall is scheduled for a refresh this summer, said Munson, associate provost for academic support.

The planned expansion of the Neeley School of Business also is likely to employ smart and next-generation classrooms. Other possibilities are Tucker Technology and Sid Richardson buildings, he said.

“The question we always face is timing. How much technology and infrastructure do we put in at a given time?” said Munson. “We don’t want to get too far out in front and let technology get dated while our faculty are still growing. Do we have enough faculty who want to teach in this methodology? If we do, then we absolutely should provide it. Or do we not yet have enough faculty to go beyond Rees-Jones and Bass? Eventually we will.”

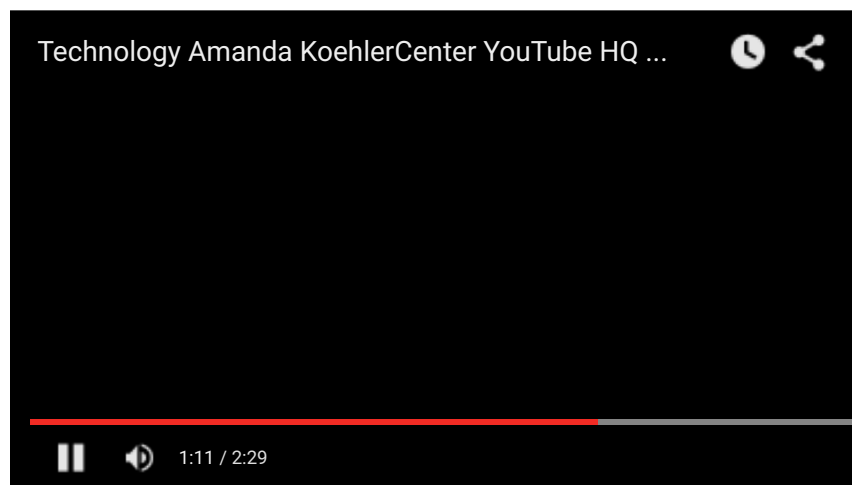
So far, after nearly a year, feedback has been overwhelmingly positive, said Hughes, who studied other universities' smart classrooms before Rees-Jones Hall was built.

The spaciousness of Rees-Jones' classrooms and adaptability of the furniture have been big successes. Comfort with the technology is increasing, she said, and more faculty members are proposing multidisciplinary classes.

Munson sees another positive. Walking through Rees-Jones at 4 p.m. on a Friday in March, he points to the activity of the study rooms. "These are full almost every day, even on the weekends. The magnitude of usage and the type of usage we are seeing is really different," he said. "They're writing on the walls. They're using the LCD monitors. It's an extension of the classroom. That's a really big deal. We'll see even more as the library expansion is finished."

As Munson exits Rees-Jones, he looks at the hall's lobby display highlighting the phrase "Knowledge is freedom" in 24 languages. He nods his head and grins.

"This place is just the start."



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1 Comment

1. [DiAnna Corrigan](#) on July 11, 2015 at 4:34 am

I just finished the article "The Classroom Revolution." This is exactly the kind of educational experience that I have been wanting, both as a graduate student and a teacher. I am bored with traditional methods, and I knew that an answer had to exist somewhere! Thank you, Rick Waters, for writing this article. I have already shared the Web link with colleagues!

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