

USC Rossier

MAGAZINE



THE SCIENCE OF LEARNING

Empowering Educators, Students and Communities

Dear Friends of Rossier,

For much of my life, I've been either a student or a teacher. But I've always been a learner.

As a young student, I didn't give much thought to the process of learning. Like many of my classmates, I just loved school. And when I was excited by a teacher or a particular subject, things clicked. I was motivated to go deeper. But now we are learning more about the cognitive principles at play in these "aha" moments.

In this issue, we bring you stories that illustrate the science of learning — and by that, I mean how students come to understand new ideas and what motivates them to become more engaged.

Our faculty are using MRI brain scans and EKG readings to investigate those "aha" moments, and their research shows that positive emotions activate brain mechanisms that can lead to deeper learning (see page 4).

We know now that learning requires head *and* heart, bolstered by mindful practices that emphasize students' physical and psychological well-being. Students can't learn if they do not feel emotionally supported. And this presents important implications for how we teach.

When this research in cognitive science is translated into everyday practices in teaching and learning, the outcomes — as described in these pages — range from higher math and English scores for high school students to greater persistence in STEM subjects for girls to an increase in confidence and self-worth among students facing severe hardship in their home lives.

Understanding and implementing advances in learning science can make us better students, teachers and lifelong learners. By changing our ways of thinking as educators, we are advancing the field and transforming the lives of students.

Fight On!

KAREN SYMMS GALLAGHER, PHD
Emery Stoops and Joyce King Stoops Dean
USC Rossier School of Education



ON THE COVER: Artwork by Pablo Garcia Lopez: PET (butterflies of the soul), silkscreen, crystal beads and digital print on black plexiglass, 4 × 4 feet, 2009, private collection. www.pablogarcialopez.com. For more on his artwork, see page 6.

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PHOTO BY MARGARET MOLLOY



The Science of Learning

F

rom neuroscience and computer science to educational psychology and sociology, the interdisciplinary research underway at USC Rossier is reshaping what it means to teach and learn in the 21st century. Our faculty, students and alumni are translating this groundbreaking research on the science of learning into innovative interventions in the classroom, empowering both teachers and students in the process. —R



THE NEUROSCIENCE OF EDUCATION

Professor Mary Helen Immordino-Yang explores the connections of emotions, learning and the brain —

By Elaine Woo

TWO DECADES AGO, Mary Helen Immordino-Yang was a novice science teacher at a racially diverse junior-senior high school outside Boston when an inquisitive student launched her on an unexpected journey.

After a shaky start to a unit on evolution, her seventh graders were finally warming to the topic of early humans. But after showing some films about hominid origins, Immordino-Yang could tell that something was troubling the class.

The problem became clear when one of her African-American students spoke up.

“Why do they always show early humans as Black?” the student asked.

In the highly diverse class where racial and ethnic relations had been strained, some students clearly thought the portrayals were racist.

Immordino-Yang responded by plunging into the science: that humans originated in Africa where the equatorial sun caused adaptations, such as dark skin, to help block ultraviolet rays. As she talked about photons, pigmentation and DNA, she recalls, “I could see the lightbulbs going on.

They were beginning to see that basic scientific principles

were a source of explanation for this really deep problem that was socially important to them.”

For the middle schoolers, that discussion triggered a deeper engagement in learning and with one another. For Immordino-Yang, it was eye-opening. Why, she wondered, did an

emotional connection to the course material make such a difference?

SOCIAL-EMOTIONAL IMAGINATION

“Science was a tool for understanding something deeply relevant to their experience as a person,” Immordino-Yang, a USC Rossier professor of education, psychology and neuroscience, says. “The role of sociality and meaning-making in human development: That’s what my work has been circling around ever since.”

She left teaching after two years when she was admitted to the Harvard Graduate School of Education, earning a master’s degree in education in 1998 and a doctorate in human development and psychology in 2005. In 2006, she moved to USC as a postdoctoral fellow at the Brain and Creativity Institute, directed by USC Dornsife Professor of Neuroscience Antonio Damasio, and quickly began to make inroads with research on the neurobiology of social emotion and its impact on adolescents’ academic learning and development.

“A decade later, it is apparent that Mary Helen created a new field within neuroscience,” Damasio said recently. “It can be properly called the neuroscience of education.”

Over the past decade her work has garnered prestigious awards, including the Cozzarelli Prize from the National Academy of Sciences and early career awards from the American Association for the Advancement of Science and the American Educational Research Association. In spring 2018, she received the Midcareer Grant from the Spencer Foundation.

“Just engaging the students in a meaningful way in thinking about their social situation and their future inspired them to do better.”

Why Butterflies?



Our cover illustration, by artist Pablo Garcia Lopez, was inspired by the words of Santiago Ramón y Cajal, the Spanish neuroscientist who won the 1906 Nobel Prize for Medicine.

“Like the entomologist in search of colorful butterflies, my attention has chased in the gardens of the grey matter cells with delicate and elegant shapes, the mysterious butterflies of the soul, whose beating of wings may one day reveal to us the secrets of the mind.”

— Santiago Ramón y Cajal, *Recollection of My Life*, 1937

Currently, Immordino-Yang is analyzing data from a study involving 500 ninth and 10th graders at Artesia High School that focused on adolescents’ “social-emotional imagination” — the ability to think meaningfully about their present and future selves, which research suggests is crucial to academic achievement and success in later life.

“NOT A TYPICAL STUDENT”

Immordino-Yang, who grew up on a Connecticut farm, was herself not a typical student. She was bored and stressed in school, and with her parents’ blessings, she regularly traveled abroad, building boats with street children in Russia, studying in Ireland and documenting traditional boatbuilding in Kenya. She also spent considerable time in France and learned French, Russian and Kiswahili. “I didn’t need to sit in geometry class. I’d just work through the book, come home and ace the final exam,” she recalls.

At Cornell University, she majored in French literature but had also pursued as much science coursework as possible — psychology, biology, physics, astronomy and other subjects. She dreamed of becoming a furniture maker, but a minor accident left her unable to work as a carpenter, and, out of desperation, she decided to try teaching. Massachusetts granted her a provisional certificate, and when she met her seventh graders, she knew she had found her calling. Her loves of science, culture and development all came together in the pursuit of answers to the complex questions of how people learn and how to educate.

Once she got to Harvard, this new pursuit blossomed.

Guided by Kurt Fischer, an expert on cognitive and emotional development, she studied two young men who had impressive learning and language abilities despite having an entire hemisphere of the brain removed to control severe epileptic seizures. She concluded that emotion and social interactions played crucial roles in reorganizing the brain and helping the boys to recover.

At USC, Immordino-Yang collaborated with Professors Antonio and Hanna Damasio in the first studies of complex social emotions, like admiration for virtue and compassion, and then on the first studies of how culture organizes the neural processing of emotional experience. The relevance of this work for

education was proposed in a widely cited 2007 paper, “We Feel, Therefore We Learn: The Relevance of Affective and Social Neuroscience to Education.”

Together with the Damasio’s early work with brain-damaged patients, Immordino-Yang’s groundbreaking research showed “that it is the emotional dimensions of knowledge that allow people to call up memories and skills that are relevant to whatever task is at hand,” she wrote in her 2015 book, *Emotions, Learning and the Brain*. “Without the appropriate emotions, individuals may have knowledge, but they likely won’t be able to use it effectively when the situation requires. Emotions are, in essence, the rudder that steers thinking.”

To test that idea in adolescents, Immordino-Yang designed a unique study of social brain development that followed 65 Los Angeles-area students from 2012 to 2017. Supported by a \$600,000 National Science Foundation CAREER grant, the study used individual interviews and MRIs to learn about how the students feel social and self-relevant emotions, and how their emotional feelings and cognitive meaning-making shape and are shaped by their brain development.

MAKING MEANING

One of the most intriguing findings from the neuroimaging was that the brain networks that control breathing, heart rate and other essential bodily functions are also activated when a person admires or empathizes with someone else. Those feelings about others are intertwined with feelings about the self, as evidenced by study participants’ comments that they felt inspired by the stories to improve their own lives and help their communities.

Those findings helped guide the design of the Templeton Foundation-funded project at Artesia High, a school serving a predominantly Latino neighborhood in Lakewood, Calif.

For that study, conducted with USC Dornsife Dean’s Professor Daphna Oyserman in the spring of 2016, the researchers developed a survey that collected information in five areas: how the students think about their future selves; how they understand the challenges facing their community; how they conceptualize possible solutions to those problems; how much they engage in constructive reflection; and how they incorporate ethical deliberations into their conception of

“Emotions are, in essence, the rudder that steers thinking.”

their self. The answers were used to calculate a social-emotional imagination quotient, or ImQ, which Immordino-Yang described as a “proxy for the developmental ability to make meaning out of one’s social situation and identity.”

According to early findings, after interacting with the researchers, the students with high ImQs showed more improvement in their math and English grades over the course of the semester than they had during the previous semester and changed how they thought about their self and life purpose. “Just engaging the students in a meaningful way in thinking about their social situation and their future inspired them to do better,” Immordino-Yang says.

Video narratives were also a major element of this study. A control group was shown an educational video about how batteries are made. The other students viewed short films about a poor teenager in Sierra Leone named Kelvin who taught himself and others in his village to build batteries from junkyard parts, started his own radio station and fulfilled his dream to become a disc jockey and help his community through hosting public debates.

Those who watched the educational video used words like “interesting” or “informative” to describe how they felt about what they had seen. But about 60 percent of students exposed to Kelvin’s story had a starkly different response. They mentioned feeling deeply “inspired” and “motivated,” and wanting to expand their horizons and try new things.

“I believe that this video will change my life forever,” wrote one student, “because it has now motivated me to come out of my safe zone to experiment and try new things that life has to offer.”

Rebecca Gottlieb, a Rossier PhD candidate, is helping to analyze the responses. “The students were much more likely to talk about things like wanting to better themselves, and much more likely to make ethically oriented statements,” she says. “They talked about wanting to achieve, feeling determined, wanting to put in more effort, and what people should do to make a difference. They seemed to be engaging in more reflection, saying, ‘This makes me wonder why’ or ‘It makes me think or imagine.’”

Notably, the Kelvin videos did not mention the words “inspired” or “motivated,” yet the two-thirds of the students who used those terms to describe their reaction not only showed growth in their ImQ score over the course of the semester but significantly improved their math and English grades. Watching and reflecting on the African teen’s achievements “motivated them to do better,” Immordino-Yang says. “It was the emotion they conjured for themselves — inspiration — that made the difference in whether they actually changed.”

“The question now,” Immordino-Yang notes, “is how to get kids to a place where they can feel inspired, where they can make themselves inspired. How can we think of inspiration as a skill they are capable of developing?”

Artesia High School Principal Sergio Garcia agrees.

“Imagine you have a light switch or button and all of sudden you can motivate kids who were not motivated, who were failing forever, having reading problems forever,” he says of the interventions tested by Immordino-Yang and her team. “I see it as an incredible tool that can change a kid’s life.”

Immordino-Yang hopes that research such as hers will hasten the widespread adoption of methods such as project-based learning and portfolio assessments, which are authentic modes of learning and demonstrating knowledge that have been shown to stimulate genuine curiosity and the ability to sustain deep thinking about a subject. What has been missing until now is persuasive evidence from neuroscience that feelings push forward academic learning.

“The science,” Immordino-Yang says, “is catching up.” —R



Professor Gale Sinatra at the Museum of Natural History in Exposition Park, Los Angeles.

NO DENYING IT

Professor Gale Sinatra brings a real-world approach to the way we learn science —

By Diane Krieger

PHOTO BY CODY PICKENS

“I had never before encountered such personal angst and internal struggle over a perceived conflict between one’s worldview and science.”

GALE SINATRA’S AHA-MOMENT came in Salt Lake City in the mid 1990s. A young researcher at the University of Utah, she was studying the relationship between reading and learning. In a reading study with adults, she had chosen what seemed to be an interesting but innocuous scientific passage on human evolution.

She was dumbfounded when her participants reacted with raw emotion.

“They said things like: ‘I can’t tell my family any of the information I just read. They would disown me,’” recalls Sinatra, now a professor of education and psychology at USC Rossier. In the fall she will be installed as the Stephen H. Crocker Professor of Education.

The passage was on evolution, and many of her study participants, it turned out, believed their faith to be in conflict with the science.

Comprehension wasn’t an issue. They clearly had understood the reading. But they categorically rejected it. A common response Sinatra heard in her assessment interviews: “If I were to believe that I was related to an animal, I would have no reason to go on living.”

“That just floored me,” she recalls. “I had never before encountered such personal angst and internal struggle over a perceived conflict between one’s worldview and science.”

That research study changed the course of her professional life, and has led to the present moment. Sinatra is now a thought leader in the field of educational psychology, specializing in untangling the complex web of emotions and motivations that lead to successful learning — or to science resistance.

In August, she will be installed as president of the American Psychological Association’s educational psychology organization, Division 15. It’s a high honor and major responsibility, as each APA division is independent and shapes its own agenda. Appropriately enough — given her expertise in the public understanding of science — Sinatra plans to focus her presidency on the theme of sustainability, both environmental and organizational.

THE SCIENCE BEHIND SCIENCE DENIAL

The rejection of science takes many shapes, and Sinatra is a pioneer in classifying and pinning them down like exotic moths and butterflies. She and psychologist Barbara Hofer of Middlebury College are currently working on a comprehensive book for educators and communicators about the psychology of science resistance, doubt and denial.

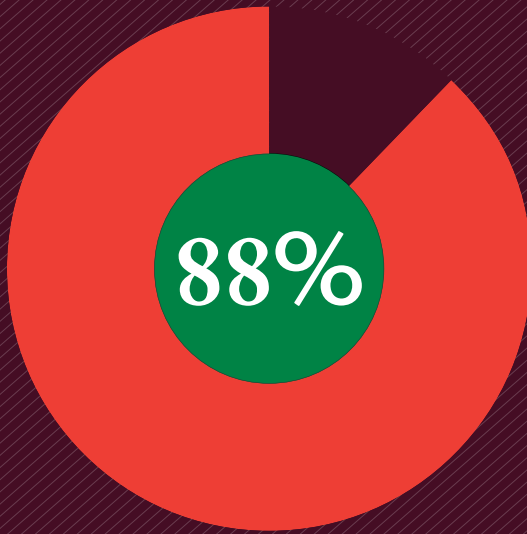
Other books — notably Chris Mooney’s best-selling *The Republican War on Science* and Andrew Shtulman’s *Scienceblind* — have spotlighted aspects of the phenomenon. But Sinatra and Hofer’s forthcoming volume will be the first to flesh out a broader picture of psychological influences and suggest teaching strategies to mitigate the problem. (The project builds on their 2016 article, “Public Understanding of Science: Policy and Educational Implications,” in *Policy Insights from the Behavioral and Brain Sciences*.)

Sinatra has previously edited two books, written dozens of book chapters, co-authored more than 60 scholarly papers and delivered nearly 200 conference presentations in educational psychology. She joined the USC Rossier faculty in 2011 and served as associate dean of research from 2016 to 2017. Her own scholarship is headquartered in USC’s Motivated Change Research Lab, where a team of doctoral students and postdocs are helping Sinatra peel back the cognitive, motivational and emotional processes that lead to attitude change, conceptual change and successful STEM learning.

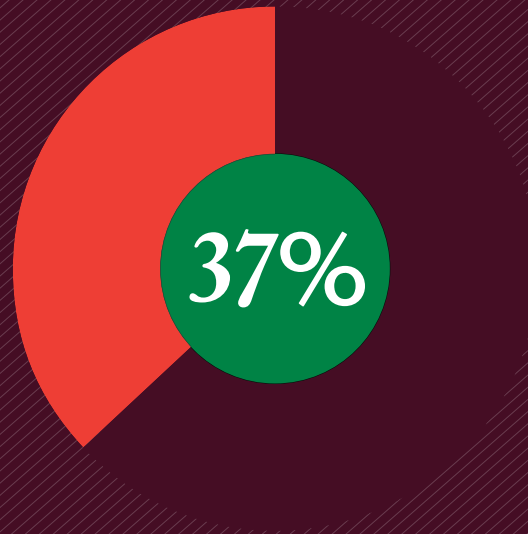
The learning platforms they study have come a long way since Sinatra hit a wall with that text about evolution 20 years ago. An intriguing project now underway at the La Brea Tar Pits, for example, investigates how different kinds of smartphone-based augmented reality experiences might lower emotional barriers to science learning in an informal public setting. In collaboration with Benjamin Nye, director of learning research for USC’s Institute for Creative Technologies, Sinatra’s team recently piloted a five-minute prototype featuring an animated baby mammoth trapped in the oozing asphalt. Its mother approaches but cannot free her calf. The panicked pachyderm’s cries eventually lure some opportunistic dire wolves into the deadly pool. The pilot, completed last fall and tested with 60 visitors, was conducted to set the stage for a three-year collaboration with the La Brea Tar Pits and

» continued on page 10

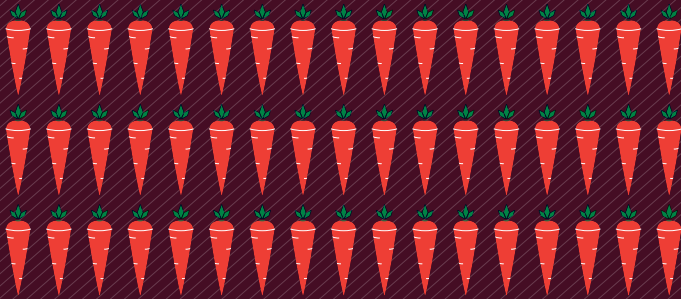
CLOSING THE GAP



of scientists agree genetically modified organisms are safe to eat



of American adults agree genetically modified organisms are safe to eat



That's a **51-point** difference between what experts and laymen think

SOURCE: Pew Research Center study, 2015

» Museum that breaks new ground in measuring the learning and engagement value of an arsenal of emerging 3D tools and techniques (see “Re-Living Paleontology” on page 11).

WHO'S IN DENIAL?

Sinatra doesn't have direct expertise in evolution or climate change, but she has thoroughly educated herself on the big issues that seem to stoke the most egregious science denial. Religious fundamentalists, she notes,

don't have a monopoly on rallying around spurious facts. The tendency crosses belief systems and party lines. “Anti-vaccination and anti-GMO groups are progressive left, while the anti-climate change, anti-evolution movement is very much on the political right,” she says.

The statistics are stark. A 2015 Pew Research Center study found that while 88 percent of scientists agree genetically modified organisms are safe to eat, only 37 percent of American adults hold that view. That's a 51-point difference between what experts and laymen think.

» continued on page 12

RE-LIVING PALEONTOLOGY

A USC collaboration with La Brea Tar Pits and Museum promotes the public understanding of science —



N

early a half million people visit the La Brea Tar Pits each year. For Gale Sinatra and Ben Nye, that's a half million chances to promote public understanding of evolution, climate change and the nature of science.

Scientists used to assume that saber-toothed cats' claws were all the same size, so that's what visitors saw in museum displays of the specimens around the world. This changed in the 1980s when a

rare skeleton of the extinct species was found among the salvaged fossils from the building of the Page Museum. The fossil showed that the digits on the claws ranged in size — similar to fingers on human hands. The feet of dozens of saber-toothed cats had to be remounted to reflect this new-found evidence.

This is how science works in the real world, says Gale Sinatra, and she intends to give visitors to La Brea an augmented slice of that reality. Sinatra and Nye, an expert in intelligent tutoring systems and artificial intelligence at USC's Institute for Creative Technologies (ICT), are working toward » *continued on page 13*

“Plenty of people still think the Earth is flat. It really doesn’t have anything to do with science. It has more to do with psychology, which I find utterly fascinating.”

» Nearly two centuries after Charles Darwin’s fabled voyage on the HMS Beagle, the statistics on views of evolution aren’t much better. Despite a 98-percent scientific consensus, only 65 percent of Americans believe humans evolved over time: a 33-point gap.

Sinatra attributes these glaring disconnects between thoroughly documented scientific evidence and contemporary popular beliefs to several factors — among them, a general erosion of trust in experts; new levels of scientific hypercomplexity that make it virtually impossible for laymen to independently assess the validity of expert claims; and a mass media propensity for “balanced reporting” that misleadingly places rigorously tested results on an equal footing with quackery and conspiracy theory-mongering. The internet’s powerful information democratizing and tunnel-building effects only compound the problem.

RESISTANCE TRIGGERS

The roots of resistance to scientific evidence are complicated, according to Sinatra. “There isn’t one simple thing,” she says. “It’s values, community, identity, vested interest, to name a few.” Coal miners, with their livelihoods at stake, might have a strong financial incentive to reject evidence for human-induced climate change. Sinatra’s Utah study, where she exposed the faithful to a “refutation text” at odds with their creationist

worldview, is an example of identity fueling resistance to science.

With so many possible causes, there can be no one-size-fits-all fix. To make inroads with resistant learners, science educators need to be curious and nimble. “It’s important to understand what the nature of resistance might be, where it stems from, in order to craft a message that would be better received,” Sinatra concludes.

HMS Beagle in the Straits of Magellan.



BREAKING THROUGH

Combatting science denial requires what Sinatra calls a “hat trick.” First, overcome misconceptions with facts. Next, turn the negative emotions associated with those unwelcome facts into positive ones. And finally, familiarize everyone with the logic of the scientific method.

“When these three things happen, you see change in people’s attitudes,” she says.

The landscape has changed since Sinatra’s reading study at the University of Utah sparked unexpected anger and pushback from its students, who were predominantly followers of the Church of the Latter Day Saints (LDS). Today, LDS does not take a position on biological evolution, and the LDS community includes many science teachers and active scientists.

Educators can leverage that kind of change to promote learning. Sinatra recently collaborated with a colleague on workshops to help biology teachers in West Texas feel comfortable teaching evolution even if their religious beliefs did not support evolution. Another joint project through Arizona State University has self-identified Christian biologists discuss their faith with their students and explain how they are able to strike a balance between religion and science.

“When I started this work,” Sinatra says, “we did not know much about the motivational factors in understanding science.” To change a flat-Earther’s mind, it was assumed that merely explaining the day-night rotation cycle and seasonal change would do the trick. “Now we know it’s not that simple. Plenty of people still think the Earth is flat. It really doesn’t have anything to do with the science. It has more to do with psychology, which I find utterly fascinating.” —R



an ambitious collaboration with the La Brea Tar Pits and Museum to develop a series of interactive and immersive experiences that let visitors walk in a paleontologist's dusty shoes.

Each immersion will lead guests through the same narrative: a series of first-person encounters with the scientific process. Using their smartphones, visitors will be able to examine the fossil evidence, formulate research questions, weigh competing hypotheses and adjust their beliefs based on the cascade of evidence. Everything will be organized around a physical timeline that serpentine around the park, and visitors' footsteps will correspond to the passage of time, from the early Pleistocene to the present day.

"The concept of deep time is very hard," notes Nye. "People have trouble grasping the relative difference between 50,000 years ago and 55 million years ago." Walking a timeline makes that concept more accessible. It can also clear up a common misconception that dinosaurs were trapped in the asphalt. Over the years, paleontologists have extracted upwards of 750,000 specimens from the site's 100-plus pits, including the remains of prehistoric mammals, birds and insects. No dinosaurs, though.

The La Brea Tar Pits (they're really asphalt, but the misnomer has stuck) are uniquely suited to illustrate the scientific process, says Nye, "because all the science happens in one place. This is where the animals were preserved, excavated,



Through the collaboration with the La Brea Tar Pits, Gale Sinatra will explore visitors' emotions and motivations for science.

prepared, curated and exhibited." The process continues to this day, as debris and organisms land in the open pits. Fossils as tiny as pollen have been collected. Asphalt is an excellent preservative, and fossils recovered from the pits — unlike most fossils, which are really stone casts of petrified matter — retain much of their organic structure.

This means the La Brea Tar Pits "capture a very comprehensive sweep of the ecosystem," says Nye, giving researchers a rare opportunity to examine the intimate relationship between climate, moisture, vegetation and animal life.

The augmented reality (AR) experiences Sinatra and Nye propose to build will take full advantage of this complexity to introduce visitors to the various methodologies scientists can use to study and document phenomena like ecosystems, climate change and evolution.

Because virtual environments are labor-intensive and expensive to create, such technical decisions are made early in the design process. Side-by-side comparison of actual

learning gains are needed to see the tradeoffs between different options.

An important goal of the project is to leverage AR technology to draw visitors in and motivate them to learn more about the science that goes on at La Brea. Any given day, large numbers of school buses can be seen bringing children from all over Los Angeles to the museum. Sinatra sees this as an opportunity to address a key mission of USC Rossier: urban education. While Nye will test various design choices to build the most engaging AR experience possible, Sinatra's goal will be to explore visitors' emotions and motivations for science as they experience this new technology.

In their proposed project, Nye's colleagues from ICT's Mixed Reality Group will design and evaluate alternative AR treatments and develop the best option into an ongoing installation for the La Brea Tar Pits.

He and Sinatra have applied for a grant from the National Science Foundation to fund the three-year project. —*Diane Krieger*

EMPOWERED LEARNING

Professor Brendesha Tynes launches new center at intersection of technology, education and race —

By Liz Dwyer



Professor Brendesha Tynes, center, has launched USC Rossier's Center for Empowered Learning and Development with Technology (CELDTech).

their own math or science teachers mention innovators of color? And how should the nation's schools effectively educate the real-life Shuris who are growing up without equal access to the experienced teachers, classroom materials and advanced coursework they need to succeed in a technology-driven economy?

Those are some of the questions that Brendesha Tynes, an associate professor of education and

psychology at USC Rossier, hopes to answer through her new role as director of the Center for Empowered Learning and Development with Technology at USC Rossier. CELDTech, which launched in October, will “be the premiere center,” says Tynes, “for guidance on integrating technology in schools that serve Black and Latino kids, and the place that people look to for methodologically rigorous research on these populations.”

IGNITING A SPARK

In particular, Tynes has a laser focus on transforming the nature of research on the intersection of technology, education and race. Under her leadership, CELDTech's team already has a half dozen projects up and running, ranging from studying how urban

SOUND-ABSORBING SNEAKERS, a remote piloting system and a kinetic energy-absorbing suit. If you've seen “Black Panther,” then you've gotten a glimpse of inventions like these — creations that make Wakanda the most technologically advanced nation on Earth. While such inventions do require a bit of the fictional metal vibranium, there's no denying that they're birthed in the workshop of the movie's heroine, Princess Shuri, a Black teenage girl who might as well have “STEM Genius” tattooed across her forehead.

But not only are STEM masterminds usually white men in the movies — like Iron Man's Tony Stark or James Bond's Q — that's who students tend to see presented as real-life STEM role models, too. Evan Spiegel, Sergey Brin, Mark Zuckerberg. These are household names in America. What's the effect on Black and Latino kids who consume technology created by White tech bros, all while never hearing

schools and communities incorporate blended, project-based learning to researching the ways electronic devices are being used to boost academic and social-emotional learning of students of color.

Tynes, who was born and raised in Detroit, knows firsthand what it's like to have an educational experience that affirms and centers your background. "I had a really amazing school experience from pre-K all the way through high school," she says with a laugh. But it was an elementary school African History Club that, says Tynes, "informs a lot of the work that I do now."

Mr. James, the teacher who led the club, taught Tynes and her peers culturally relevant lessons that weren't included during regular classroom instruction. "We were learning about Paul Robeson and reading Langston Hughes poems," says Tynes. Mr. James lit such a fire under the kids that one school year the students even raised money to travel to Egypt. And along with building students' entrepreneurial capacities and sense of cultural self-worth, Mr. James also built their academic skills. "In fourth grade, I was writing and editing our newsletter," says Tynes.

The spark ignited by the club fueled Tynes, the daughter of a single mother, to be editor of the school yearbook, the vice president of her senior class and the president of the National Honor Society. Degrees from Columbia, Northwestern and UCLA soon followed. "From African History Club I had the attitude that if I could — it sounds cliché — but if I could imagine it for myself, then it was possible," says Tynes. "I wondered what it would be like for kids today to have the kinds of experiences that set them up to be their absolute best selves."

SEEING THEMSELVES IN STEM

To that end, Tynes says she deliberately included the phrase "Empowered Learning" in the name of the center. "When I think of an empowered learner," she says, "I think of kids having more agency in terms

of their educational experiences, kids seeing themselves in the materials they read, being able to solve problems in their communities using technology and being able to critique those structures in society that keep certain groups at one position and other groups in another."

Survey data released in January by the Pew Research Center shows that the majority of Americans — 80 percent — say that racial and ethnic diversity in the workplace is important. However, nearly 60 percent of Black Americans working in a STEM job

say their workplace doesn't pay enough attention to increasing racial and ethnic diversity, significantly more than the 15 percent of White Americans who say this is the case.

In the spirit of transparency, Facebook released data in August that revealed only 3 percent of employees doing technical jobs at the company are Hispanic and a mere 1 percent are Black — abysmal diversity numbers that are the norm in Silicon Valley.

"If we wanted to address the racial diversity problem, we would," says Tynes. "Instead, we give small amounts of money and other resources, but not enough to actually move the needle."

Other Silicon Valley leaders have posited that what matters the most is that a company has a diversity of viewpoints. During an October panel discussion about fighting racial injustice, Denise Young Smith, Apple's former vice president of diversity and inclusion, raised eyebrows when she told the

crowd, "There can be 12 White, blue-eyed, blond men in a room and they're going to be diverse, too, because they're going to bring a different life experience and life perspective to the conversation."

"There are some who feel race isn't a factor because if a student has access to a computer, they can get on Khan Academy or YouTube and learn," says Tynes. "In other cases, people feel that only certain populations are interested and are able to master STEM-related subject matter."

How widespread are ingrained racial stereotypes and erroneous ideas about fixed vs. growth intelligence and STEM? One indicator might be that, according to the Pew research, 45 percent of STEM

"I wondered what it would be like for kids today to have the kinds of experiences that set them up to be their absolute best selves."



The center seeks to help students feel like they belong in a computer science classroom.

workers believe that Black and Hispanic students being “less interested” in STEM is a reason lower numbers of Americans from those backgrounds are employed in STEM fields.

For Tynes, the problem isn’t that students of color aren’t interested in STEM. Instead, “the discrimination they face in the classroom, the lack of rigor in the curriculum, the lack of meaningful learning experiences — all of these factors play a role,” she says. “Black children come to elementary schools bouncing off the walls with an eagerness to learn. I’ve seen firsthand the academic spirit that wells up in them and makes them excited to read and do math and science. And then slowly but surely, by high school, we beat it out of many of them.”

Pew also found that roughly three-fourths of STEM workers say that the biggest obstacle to racial diversity in STEM fields is that Blacks and Hispanics are less likely to have access to a quality education to prepare them for these fields. A June 2016 report from the U.S. Department of Education’s Office for Civil Rights found that majority-Black and Latino high schools are less likely to offer classes in STEM subjects, including basics such as algebra II, chemistry and physics. And, even when those courses are offered, Black and Latino kids are often steered into less rigorous courses. The result of such inequitable academic tracking can also be seen in the number of students who took the AP Computer Science exam in spring 2017. According to the College Board, about 15 percent of the nearly 104,000 test-takers were

Latino, and just under 5 percent were Black.

“What we want to do is come up with frameworks for educators and for researchers to help them make the curriculum more inclusive — to make it so that our kids feel like they belong in a computer science classroom,” says Tynes. “They are the creators of — the movers and shakers of — popular culture. They can transform computer science, too, once given equal opportunity.”

To successfully reach students, educators “have to know something about the histories of children of color,” says Tynes. “You have to know something about their cultures and development. You have to see their strengths and the unique genius that they bring to the classroom.”

For educators who don’t possess the reservoir of technological and cultural knowledge,

or who don’t know which resources best meet the needs of their students — or how to integrate those resources into their teaching practice — CELDTech has a plan to help, says Tynes. “We’re setting up discussion forums on our website,” she says. Those forums will allow educators to address “a particular challenge or issue that they want to understand or need support in.”

“Julian Bond said, ‘Violence is Black children going to school for 12 years and receiving 6 years’ worth of education,’” she says. “I worry a lot about that and how my work can address these systemic challenges.” So Tynes says, “To do this work, we’ve assembled some of the best people, not only on campus, but in the country,” she says. The center’s associate director is Stephen Aguilar, a USC Provost Postdoctoral Scholar for Faculty Diversity in Informatics and Digital Knowledge who is transitioning to a tenure-track position as an assistant professor of education at USC Rossier in the fall (see page 17).

Meanwhile a science and tech role model like Shuri from “Black Panther” is such a media rarity that the potential impact of the character on students is not lost on Letitia Wright, the actor who played her. “I hope it can spark someone to say, ‘I’m not a superhero, but I can be a scientist or build the next spaceship, like Shuri,’” Wright told *Vogue* in February. When that happens, let’s hope that the work of Tynes and CELDTech is there to ensure the history, culture and budding genius of Black and Latino students is nurtured, just like it is in Wakanda. —R



To watch a video about Brendesha Tynes, go to rossier.usc.edu/m/B/Tynes

TECHNOLOGY WITH PURPOSE

Incoming professor uses learning analytics to put students' needs first —

I

ncoming Assistant Professor of Education Stephen J. Aguilar knows firsthand what it's like to be faced with the tough decision to change out of a STEM major.

"When I took my first computer science midterm I completely bombed it," says Aguilar, "and if you think about it, failing is something that happens all the time within the computer science community." The son of Mexican immigrants, Aguilar grew up attending public schools in Colton, a predominantly Latino community of 50,000 about 60 miles east of Los Angeles. Technically-minded, he would often spend time after school at his father's business, where he helped fix broken word processors and other office equipment brought in by customers.

Yet, like many secondary students of color who don't have access to high quality STEM instruction, Aguilar wasn't prepared

for college-level computer science work — and meeting with the professor after the botched midterm quashed any hopes he could recover. "When I spoke to him about my grade, he said, 'You cannot pass my class because I curve. Even if you got 100 percent on the final, you would still get an F in the class.'"

"So, I was basically weeded out of computer science," and with bittersweet laughter Aguilar notes that "the worst part of the whole ordeal was that the midterm wasn't even a project, it was handwritten C code on paper." After a brief stint as an undeclared major, Aguilar chose to double major in psychology and philosophy — taking graduate courses in the latter during his senior year at Georgetown University.

A desire to level the educational playing field motivated him to join Teach For America after graduation. "My current research is informed by the fact that I was a classroom teacher for a couple of years in a very challenging environment where you want to be as effective as you can without burning out," he says of his time teaching middle school in East Palo Alto, Calif. A master's degree from the University of Chicago and a doctorate in education and psychology from the University of Michigan soon followed.

Now he is transitioning from a postdoctoral fellowship at USC Rossier to tenure-track faculty in the fall, and is the associate director of the Center for

Empowered Learning and Development with Technology (CELDTech). Despite not majoring in STEM, Aguilar is developing a research agenda centered on his first love: technology.

"I'm hoping to reshape the way we approach technology in the classroom," says Aguilar. "It's not about saying, 'Here's a widget,' chuck it in these classrooms and that'll make students learn better." Instead, Aguilar cares deeply about "giving teachers the tools and training they need, and ensuring technology is designed to give students what they need, when they need it."

Learning analytics, Aguilar argues, "is one of the ways we can support individualized learning — but to do it right, learning analytics-based technologies must also be attuned to students' histories and cultures."

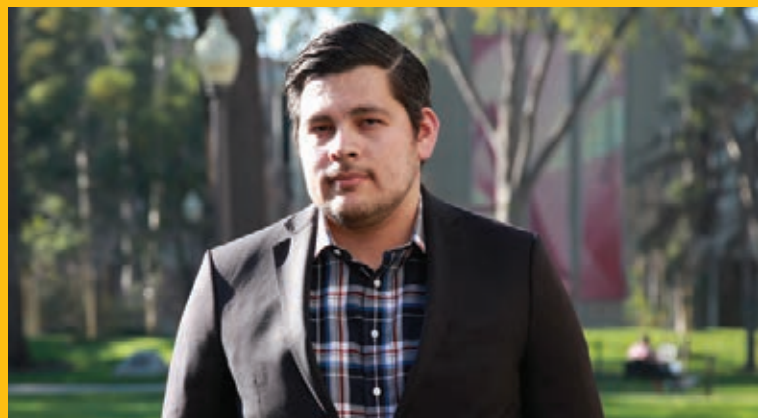
For Aguilar, getting it right is personal. "English is my dominant language, but my first language is Spanish," he says. "My first memory of kindergarten was actually crying because I didn't understand the teacher's directions well enough."

Aguilar believes that technology can facilitate and celebrate individual differences. "The world works differently for different people," says Aguilar, "and if we actually care about teaching individuals, we must acknowledge and design for these differences."

—Liz Dwyer



To watch a video about Stephen Aguilar, go to rossier.usc.edu/m/SAguilar





CHANGING THE EQUATION

Greater support from teachers is critical to boosting girls' persistence in STEM —

By Martha Groves

IF PROOF WERE NEEDED that it's a man's world in the math-intensive scientific fields, consider the numbers. In 2016, the National Science Foundation found that, while women make up half of the college-educated workforce in the United States, they hold just 29 percent of the science and engineering jobs, with the greatest disparities appearing in engineering, computer science and physical sciences.

USC Rossier Associate Professor Erika A. Patall thinks she knows a big reason why.

She and a team of researchers collected data from high school students in physics, chemistry, engineering and biology. The students attended a variety of schools, many of which were Title I urban schools in Texas with high percentages of students from low-income families.

The researchers asked students to respond to a questionnaire each day after class for six weeks. Boys and girls — B students, on average, who were willing to participate in the study — were asked about their science teachers' level of support for their needs as individuals and about how they felt in class each day. Did they feel engaged, motivated and satisfied? Were they bored? Did teachers invite their questions? Did teachers try to create activities that considered the students' interests or see the learning experience from their point of view?

UNITED STATES

FIELDS OF SCIENCE & ENGINEERING

WOMEN
29%

MEN
71%



 WOMEN  MEN

35.2% Chemists



11.1% Physicists and Astronomers



10.7% Electrical or Computer Hardware Engineers



SOURCE: National Science Foundation, 2016

“Girls’ classroom experiences and motivational beliefs during high school play a critical role in predicting whether they persist in STEM fields into college.”

— Erika A. Patall, associate professor at USC Rossier



USC Rossier Associate Professor
Erika A. Patall

“What we see is that, on average, girls are less engaged in physics, chemistry and engineering classes than boys and perceive their teachers as providing less support for their motivation,” Patall said. The study did not find this to be the case in biology classes. “On the days when students perceived their teacher to have provided more autonomy support, they were more engaged.”

Motivation researchers use the term “autonomy support” to describe a teacher who considers the students’ perspectives and takes seriously the students’ questions and comments and their psychological needs. Students of teachers who provide little autonomy support say they feel less motivated and competent; they ask fewer questions and enjoy the class less than students who feel supported by teachers.

“Undoubtedly, girls’ classroom experiences and motivational beliefs during high school play a critical role in predicting whether they persist in STEM fields into college,” Patall wrote in a paper titled “Motivational Gender Inequity in High School Science Classrooms.” The study was funded by the William T. Grant Foundation.

Patall said students and teachers could all learn from the findings. Girls who ask questions in class or offer other input, even when they’re bored, might find themselves more engaged, which in turn leads to more supportive responses from teachers. “It brings about this cycle of being more engaged,” she said, “and facilitates greater interest and persistence in STEM.” Another strategy Patall suggests is to train teachers to adopt a mindset more supportive of student autonomy.

“If we want to encourage more girls to pursue math-intensive science fields like physics and engineering, educators are going to have to tap into girls’ existing interests and values and support their sense of autonomy during science class,” she said. —R

Building Pathways

A NEW ALL-GIRLS SCHOOL IN LAUSD PROVIDES A SUPPORTIVE SETTING FOR STEM SUCCESS



Encouraging girls to become independent learners is a core mission of the STEM-oriented Girls Academic Leadership Academy in the Mid-Wilshire area of Los Angeles. GALA — Los Angeles Unified School District’s first public all-girls school — opened in 2016. In March, the school was formerly named Girls Academic Leadership Academy, Dr. Michelle King School for Science, Technology, Engineering and Math. It now has 320 students in sixth, seventh, ninth and 10th grades, and will have about 700 girls when it reaches full enrollment in 2020.

These highly motivated students take trains, buses or carpools from 79 zip codes throughout the city to get to GALA, which provides a richness of experience unheard of in their previous schools. They meet female computer engineers and high-speed-rail engineers on their field trips, and that enables them to see themselves in those sorts of jobs.

Principal Elizabeth Hicks, who is wrapping

up her EdD degree in Organizational Change and Leadership at USC Rossier, helped draft the proposal for the new school with specific goals in mind.

“We know that girls’ scores in STEM subjects tend to drop from middle school to high school and that fewer girls nationwide are taking AP courses in calculus, chemistry and physics,” she said.

The 6th-12th grade model reflects a conscious strategy to build STEM pathways. “We want to get the girls excited about STEM, keep their skills up and foster the expectations that they will be taking the rigorous courses when they get to high school.”

Teachers are highly collaborative and work together to develop experiential, hands-on projects across the curriculum.

“Because we are getting them early, we build the idea that the more we support each other, the higher we all can get,” says chemistry teacher Emilie Hill. “By the time these girls make it to 12th grade, the sky’s the limit.”

“GALA is a place where girls interested in STEM can continue their pathway and, hopefully, go on to college careers in STEM,” Hicks said. And that’s a good thing, she added, because “we’re going to need to fill 500,000 jobs in the STEM area in the next decade.”

—Martha Groves

O P E N I N G



Identifying and serving gifted and talented students at a younger age —

By
Susan L. Wampler

A LATINA KINDER-
GARTNER from the
Ontario-Montclair Unified

School District sits in the back of her classroom, responding one-on-one to questions designed to probe her problem-solving ability and gauge her curiosity. After looking at a drawing of a lion in a cage made out of plants, she is asked, “How can it get out?” Many of her classmates said the zookeeper should be called, while a few others suggested the lion eat the plants. Instead, she asks: “Why does he want to get out? Where would he go? It would be dangerous for him.”

While there is no correct answer, less typical responses like this kindergartner’s may serve as indicators of potential giftedness.

This session and others like it are part of Project CHANGE, a study led by USC Rossier Professor of Clinical Education Sandra Kaplan and funded by a \$1.7 million grant from the Jacob K. Javits Gifted and Talented Students Education Program of the U.S. Department of Education. A second Javits grant, Reach EACH, is supporting research to improve reading achievement of all students in a heterogenous classroom, including special needs students, using a curriculum designed for gifted students. The research builds on more than three decades of work by Kaplan in gifted and talented education (GATE).

This question was from a set of curricular task cards that has been developed and

researched to provide a nontraditional means of identifying giftedness in students of academic, cultural and linguistic abilities who have largely been overlooked by traditional methods of identification. The study also focuses on earlier identification, while serving as a catalyst to stimulate critical and creative thinking skills among all students.

DIVERSE SCHOOLS OF THOUGHT

GATE programs traditionally have primarily employed only intelligence quotient and achievement test scores to identify ability. While that approach maintains numerous proponents nationwide, Kaplan’s investigations show that the reliance on those two criteria leads to underrepresentation of students from low-income families with cultural differences and who possess limited English-language skills, are in foster care or have disabilities.

Many view the gifted, English-learner and special education populations as distinct groups. The reality is that an individual student could be all three of those.

“In California, we see a disparity in terms of identification,” Kaplan says. “While there is evidence that the potential for academic giftedness exists across all groups, many urban school districts do not manage to discover gifted and talented students from underrepresented populations with the same frequency as they do students from other societal groups. The pool of gifted students should reflect the diversity within a school. In reality, it doesn’t match, and, as long as we keep emphasizing standardized test scores, it probably won’t match.”

Through the Project CHANGE grant, Kaplan and colleague Jessica Manzone PhD ’13 aim to identify more underrepresented children as gifted by emphasizing behavioral indices rather than test scores, while also helping teachers see their students in a different way. They hope to build on a national effort to encourage teachers to become identifiers and instructors of talent, abilities and potential in young learners, rather than solely perceiving themselves as nominators of giftedness.

To facilitate the goals of early identification, teachers are using a curriculum that gives

ABOVE: Professor Sandra Kaplan leads Project CHANGE, a study on gifted and talented education (GATE).

T H E G A T E

“We want to help students develop an insatiable appetite for learning — and help them learn how to learn.”

students opportunities to demonstrate talents, abilities and giftedness that might be lying dormant in other types of curriculum.

“We’re looking at economic, cultural, linguistic and academic diversity,” Kaplan explains. “But what makes us unique is that we are looking at children who are pre-K to second grade.” Children generally are not tested for giftedness until second grade or later.

The longstanding reasons for delaying such testing include a belief by some that, developmentally, giftedness doesn’t mature until age 7 or 8 — or that certain schooling is required before a student can show a particular aptitude, such as being able to write in order to demonstrate linguistic ability. Much research refutes this idea.

AN INCLUSIVE PEDAGOGY

Kaplan’s approach can be administered in regular classrooms in a setting comfortable for students. While she employs nontraditional instruments to identify giftedness, her lessons center on four traditional GATE teaching standards: depth, complexity, acceleration and novelty. She emphasizes open-ended questions, interpretive play and other prompts that challenge children to share the rationale behind their thinking and abilities.

Curricular lessons teach students, for instance, to use “because” as a lead-in to their evidence, as in “I think this because...” Or if a class is reading *Cinderella*, children are not asked close-ended questions such as “Who is the main character?” Or, “What is the setting?” Instead, they discuss what “happily ever after” means, or how the story would change if the glass slipper were a regular shoe.

This method allows all children an equal opportunity to participate in the giftedness identification process, as they no longer have to wait to be nominated by a teacher in the second or third grade. It also enhances critical and creative thinking among all students.

“Every student has the right to be appropriately challenged and to engage in the development and activation of potential,”

Manzone says. “Whether or not it ever leads a student to a formal gifted identification or not, doesn’t make any difference. We’ve raised the level of academic rigor for all children.”

Infusing these types of lessons into the regular curriculum at an earlier age has another distinct advantage — providing a strong framework for future learning.

“We want to help students develop an insatiable appetite for learning — and help them learn how to learn,” Kaplan says. “We are interested in developing intellectualism as well as intelligence.”

“If we can catch students at the preschool level and get them thinking in divergent ways, then that is going to imprint how they become a scholar and a thinker as they move through the grade levels,” Manzone adds. It also helps prevent children from becoming disengaged with school.

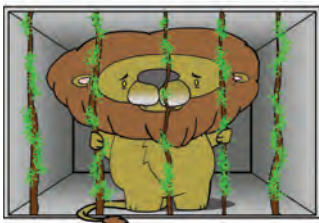
Karen Anderson, who oversees the GATE program for the Pasadena Unified School District, agrees. “Dr. Kaplan’s research with younger children is really significant in moving our perceptions of the labeling of gifted children,” she says. “Sometimes it’s too late by the time they get to third grade. They have perceptions about learning that are already embedded that are not helpful to their development of critical and creative thinking. Or what they’ve learned is actually hurtful and inhibits the development of such thinking.”

For more than a decade, Anderson has served as a demonstration teacher with the California Association for the Gifted, as well as for Kaplan’s USC Summer Gifted Institute — now in its 33rd year. She also is an adjunct professor in USC Rossier’s Master of Arts in Teaching program.

Helping teachers incorporate the pedagogy into their own classrooms counters unintentional academic prejudice, Manzone notes. “One of the best things to come out of the grant lessons is hearing teachers say, ‘Wow, Johnny really did an excellent job in that lesson. I never thought he could do X or Y.’” It’s the teacher’s perception that changed — not the child’s ability.

“It’s not about gifted students being separate,” Anderson adds. “It’s about inclusivity. That’s what I value most about this work.” —R

How can he get out?



A student’s answer can be revealing.



Hattie Mitchell EDL '17, founder and CEO of the Crete Academy, with first grader Khloe, Principal for the Day.

Creating Community

Alumna Hattie Mitchell EDL '17 founds a school dedicated to serving the needs of students impacted by homelessness —

By Matthew Kredell

BEHIND THE GATES of Crete Academy, children play on a slide and swing set throughout the day. Each class takes its turn getting a half hour of physical activity in the small playground, including a pair of sisters, one in the 3rd grade, the other in transitional kindergarten.

When they started school in September, they kept quietly to the side at recess. Now they are in the middle of the action, running around happily and shouting with their classmates.

But like nearly 17 percent of the students at Crete, the girls are homeless.

Hattie Mitchell EDL '17 opened the South Los Angeles charter school in September 2017, mere months after completing her Doctor of Education degree in educational leadership at USC Rossier. Her goal was to meet the needs of children from families experiencing homelessness or extreme poverty.

The school now has 132 students from transitional kindergarten through sixth grade. Many are currently homeless. Many more were recently homeless. And 97 percent receive free or reduced-price lunch.

When the girls' mother, Joel, first brought them to Crete, the family had nowhere to live. While typical school administrators might be unprepared to handle Joel's situation, Mitchell's team swung into action. The top priority was finding the family a place to stay for the night. The only space available was on Skid Row, so the after-school program director volunteered to take

them in until they secured transitional housing in Koreatown.

"I may be homeless, but I love my kids," Joel says. "If Crete never opened its doors to me and my kids, I would never be in the situation I am now. Crete took me from being a homeless mom to a shelter mom in a position to get permanent housing."

"Our model addresses the basic needs — food, shelter, belonging," Mitchell says. "When a child comes to us, she might be hungry or need a place to stay, the parents might not be around or there might be a single mom. The social workers in our wellness program work directly with the families to stabilize them. This could mean getting them into housing, getting the parents a better education or helping with their career paths."

A SENSE OF BELONGING

It is this whole-of-family approach that differentiates Crete from other elementary schools. The school's wellness program team helps families obtain government aid and assists parents in exploring potential education and work opportunities. They not only got Joel transitional housing, but also helped her to enroll in classes to get her GED.

Emotional support is a priority as well. Behavioral issues are common in children coming from families with unstable living situations. So each student is assigned a staff member who spends time getting to know the child for 10 days. "The goal at the end of the 10 days is for every kid to feel like they have a place and they belong here," Mitchell says.

"Our model addresses the basic needs — food, shelter, belonging."

The Crete Academy cultivates a sense of family.



And belonging there means they have to be able to get there, so Crete sends vans to pick up students who are scattered throughout the city. Nearly half rely on the service. “We knew if we were truly going to serve this population,” says Mitchell, “we had to provide transportation.”

Once at Crete, students walk into classrooms purposefully designed to help them learn. Aromatherapy diffusers spray a lavender mist to help calm students who struggle to sit still; the children practice mindfulness and deep breathing and take multivitamins with fish oil to promote brain activity and focus.

It was also essential to Mitchell that Crete offer a college preparatory program that supports future degree attainment as a key tool for breaking the cycle of poverty. “I wanted to build a school that provides extra support to the most at-risk students while also giving them a challenging and quality education,” Mitchell says.

Above all, Crete works to cultivate a sense of family. Many of the staff have enrolled their children at the school, including Mitchell, whose son Brett is in first grade.

More than half of the students stay for the free after-school programs, where they play sports and participate in music, dance, cooking and gardening and get tutoring help. Parents and caregivers are also welcome at the school for free yoga classes, workshops in résumé writing and interview preparation, and classes in parenting and financial literacy.

“When they show up at district schools with all those needs, they may meet one counselor who may be able to help if not too busy,” Mitchell says. “Everybody here has a heart for these kids. This isn’t just a job for me or anyone we hire. We make sure students and families know that they belong, that they have a purpose, and that — regardless of their circumstances — they can create the future they want. We’ll provide the resources for them to do that.”

MAKING HER VISION A REALITY

Mitchell came to USC Rossier to learn how to become a great leader and inspire people to share her vision.

That vision was forged earlier in her life by three experiences.

Growing up, Mitchell and her family didn’t always have enough money to cover basic necessities, so she understands the effect poverty can have on success in school. “I know what some of these kids are going through,” she says. “I have taken cold showers, opened

“I believe the work we do is not only for today but for 20 years from now.”

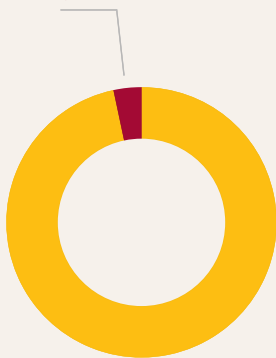
Homelessness in Schools

The Los Angeles Unified School District identified

17,258

homeless students within district boundaries for the 2016-17 school year

That's **3.4%** of enrollment



and the highest total ever recorded by the district



To watch a video about Hattie Mitchell, rossier.usc.edu/m/HMitchell

up rotten milk cartons and had my power shut off. There were times when I could see the anguish in my father's face — part disappointment and part sadness. However, he instilled in me an incredible work ethic, and from a young age I took hold of the belief that I would do and be whatever I wanted if I worked hard.”

As a high school junior in a rural part of California's Central Valley, Mitchell sat down with a counselor and expressed her desire to go to college. “You're not college material,” was the reply.

That could have been the end of Mitchell's hopes, but her mother was assertive in figuring out what her daughter needed to do to get on the college track. By taking extra classes during her senior year, Mitchell earned admission to California State University, Los Angeles.

As a freshman, she volunteered on Skid Row and was shocked to see a six-month-old baby crawling on the street. That was the moment she vowed to start a school that supported homeless children.

She credits adjunct professor Mark Johnson, superintendent of the Fountain Valley Unified School District, with helping her make that vision a reality.

“When Hattie first shared her vision with me, I remember thinking how incredible it was to meet someone who was so committed to serving students with such extreme challenges,” Johnson says. “And while there are a number of educators who have a dream or vision for serving students who need us the most, there was a quiet confidence in Hattie that made me believe she was actually capable of accomplishing such a thing.”

Johnson encouraged Mitchell to get started on forming the school right away, rather than waiting until after she completed her degree. She ended up working on the 228-page charter petition simultaneously with her dissertation.

“Were it not for the discipline and structured writing a dissertation requires, I wouldn't have been able to produce my charter petition,” Mitchell says. “I believe Rossier gave me the tools, resources and wherewithal to produce a petition that was approved unanimously by the LAUSD.”

CRETE is an acronym for the school's core values — character, responsibility, equality, teachability, excellence.

With the resources the school provides, families and children are creating their own future regardless of their background.

Joel, for example, is working toward becoming a phlebotomy technician.

“She didn't have many options before, but now she really has an opportunity to make something of her life and show her kids that, even if you fall on hard times, you can pick up and continue to move forward,” Mitchell says.

Mitchell shares that message with all of Crete's students and their families.

“We want to end the cycle of poverty with the 132 kids we have,” says Mitchell. “I believe the work we do is not only for today but for 20 years from now, when the kids we graduated can make a difference in their communities in positive ways.” —R



A HIGH SCHOOL TEACHER is midway through an American history lesson and senses that her students are losing interest. She hears a brief tone in her earpiece that prompts a quick glance at her computer screen, confirming her suspicions, so she re-engages the class with a reference to the musical “Hamilton.”

A geometry teacher hears an automated voice in his earpiece that tells him his students’ sensor data indicate high anxiety. He might want to slow down or review the last theorem.

The Center for Human-Applied Reasoning and the Internet of Things (CHARIOT), a collaboration between the USC Rossier School of Education and USC Viterbi School of Engineering, aims to provide intuitive and easy-to-understand tools that allow teachers to personalize learning by tracking levels of engagement in the classroom.

“People by the millions are using Fitbits to get feedback on their exercise routines,” says Kenneth Yates, a professor of clinical education at USC Rossier. “We’re creating tools that can provide similar information to instructors about learners, which can then help them pace and personalize their instruction.”

Yates is a co-director of CHARIOT along with Rao Machiraju, an executive-in-residence at USC Rossier, and Bhaskar Krishnamachari, a USC Viterbi professor. Yates brings knowledge of cognitive science and educational psychology, and Krishnamachari specializes in the “Internet of Things” (IOT) — or the network of objects that connect and exchange data. Machiraju adds deep technology, internet expertise and industry experience.

“I remember connecting to the vision Ken and Rao laid out right away,” Krishnamachari says. “This seemed like an amazing opportunity to work with my colleagues at USC Rossier to develop innovative technology that has an impact on

the world of education in a really positive, meaningful way.”

CHARIOT’s first project is a study of USC undergraduate students using wearable technology developed by partner Smartron to collect sensor data on emotions during a game of Sudoku that varies in difficulty.

“We’re creating tools that can provide ... information to instructors about learners, which can then help them pace and personalize their instruction.”

— Kenneth Yates, USC Rossier professor of clinical education

The center is conducting a proof-of-concept study by correlating the data from sensors and visual recognition to written surveys in which participants rate their cognitive affective states.

“We’re trying to see if technology can be applied in new ways to give us new insights into the teaching and learning process,” Yates says.

The second phase of the project will be to build the platform to collect multiple samples concurrently from 5-to-10 subjects, and a third phase will deploy the system in a real classroom and provide learning analytics back to the instructor and feedback to the students.

Eventually, CHARIOT plans to partner with K-12 schools to show that the technology works across grade levels to help students reach their optimal learning achievement.

It will also be a great boon to those high school history and geometry teachers, who will benefit from having a teaching assistant for every student. —R

CHARIOT Begins Testing Wearable Technology

New center helping teachers become more attuned to their students’ levels of engagement —

By Matthew Kredell

Q+A



Raven Barrow

MFT alumna builds community —

RAVEN BARROW MFT '12 is a two-time USC alumna, having earned her undergraduate degree in 2007 before receiving her master's in Marriage and Family Therapy (MFT) from USC Rossier. She started her education at the Foshay Learning Center, one of hundreds of students to participate in USC's Neighborhood Academic Initiative (NAI), a seven-year pre-college preparation program. Since completing her master's, she has worked at the Federal Public Defender's Office while also founding a nonprofit called Self-Actualize Me. She is now conducting practicum work for her PsyD in Clinical Psychology from Alliant: California School of Professional Psychology, with a multicultural community clinical emphasis.

We spoke to her about her multilayered approach to building community.

How did you become an advocate for people with so many diverse needs?

My journey wasn't always so clear. It kind of began when I was a student in the NAI program, at the Foshay Learning Center, which really pushed me to be an advocate for the community, to give back. Then I fell in love with forensic psychology as an undergrad at USC and became interested in the intersection between psychology and the law. This in turn led me to the Federal Public Defender's Office, where I'm an advocate for individuals who can't afford representation.

So it was my legal work that actually led me to the MFT program because I wanted to be part of the intervention for people who don't have resources. I wanted to give them someone to talk to before their problems became so significant that they had to turn to a life of crime. In the MFT program, I learned how you can really become an advocate for individual change by creating second order change within the community.

What do you mean by second order change?

It's not just one person changing their thinking about something, but it's creating change in the system. It's changing the way generations of families think about their outlook on life, helping families become more resilient and then passing that on generationally.

At your nonprofit, Self-Actualize Me, you talk about a family-centered form of actualization. What is the origin of that philosophy?

In the NAI program, the entire family had to be part of the learning process. My school knew the importance of parents being fully involved in the program in order for it to be effective. For example, their Saturday Academy was required for parents as well. My mom learned a lot that she could utilize in supporting me through this process.

Then in the MFT program, I became more familiar with ecological theory. In order for individuals to change, we had to transform all of those things that are impacting individuals, whether directly or indirectly, so that includes their family. What I've learned in my practicum training experience is that sometimes it's not enough to just provide therapy. The therapy goes beyond what is happening in the therapeutic space in the room. It's also about how we're impacting parents and the community.

Is this similar to what you call the wrap-around model?

Yes, that entails working with the client at the individual level and placing them at the center of the work. They are a part of determining what their treatment looks like. But you're also looking at what's going on within the home. Did Mom lose her job? Did Dad lose his job? And if that's the case, then you're also advocating to help Mom and Dad get back on their feet. You're also linking families to community resources because once they're done with treatment, they will need to have a natural support system they can rely on.

Wrap-around takes on poverty from an ecological standpoint because we're also helping families become more resilient. We're empowering families, we're changing the way they interact generationally, and hopefully we're making things much stronger and changing the system. —R

USC ROSSIER EXPANDS WORLD MASTERS PROGRAM TO MEXICO

USC ROSSIER HAS PARTNERED with Universidad Iberoamericana Ciudad de México-Tijuana to expand the World Masters in Language Teaching program to a third international location. The dual-degree program launched in 2017 with partnerships at universities based in Hong Kong and in Seoul, South Korea. Students alternate their study at USC and abroad, giving them teaching experiences in two countries.

“This program will give us a platform to walk a new path toward equitable and just schools and societies that celebrate all students’ languages and cultural practices,” said USC Rossier Professor Jenifer Crawford, at far left, with officials from both universities at an event kicking off the partnership in January.



PHOTO COURTESY OF ELIZABETH PINEDA / IBERO

A Call to Action to Prevent Gun Violence in Schools

RON AVI ASTOR, a professor of educational psychology at USC Rossier and the Lenore Stein-Wood and William S. Wood Professor of School Behavioral Health at the USC Suzanne Dworak-Peck School of Social Work, has issued a call to action on gun violence, in partnership with 18 professors across the country.

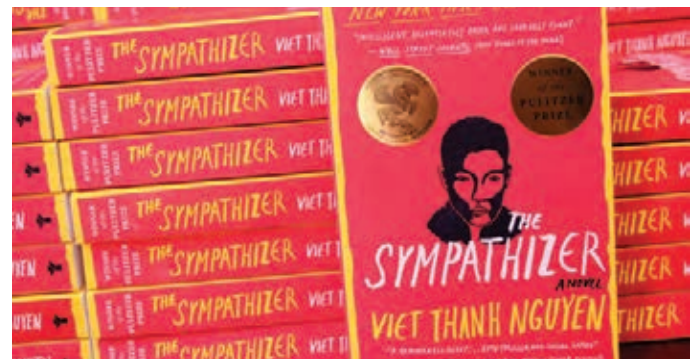
The group has proposed eight steps that it says will help prevent gun violence. The call to action follows the massacre at Marjory Stoneman Douglas High School, in Parkland, Fla., on Feb. 14.

“Prevention entails more than security measures and begins long before a gunman comes to school,” the faculty members write. “We need a comprehensive public health approach to gun violence that is informed by scientific evidence and free from partisan politics.”

More than 150 national organizations, colleges and universities, including the USC Rossier School of Education, have already endorsed the call to action, which you can read online at rossier.usc.edu/m/florida.

WHAT WE'RE READING:

The Sympathizer, by Viet Thanh Nguyen



INSPIRED BY our new mission statement — “To prepare leaders to achieve educational equity through practice, research and policy” — USC Rossier has launched a new schoolwide book club. We’re handing out copies of the book to faculty, staff and students for a meeting in April as part of an initiative we’re calling

“The Rossier Way,” which promotes the practice of equity in our day-to-day lives.

Nguyen, the Aerol Arnold Chair of English at USC Dornsife, received the 2016 Pulitzer Prize in literature and a 2017 MacArthur Foundation Fellowship. We are honored that he will be joining us for the first meeting of the book club.

NEW DEGREE PROGRAM SEEKS TO BREAK DOWN BARRIERS TO COLLEGE ACCESS

“We cannot expect to see progress in college access and success goals if enrollment leaders are not educated to break down barriers, promote entry, facilitate progress and monitor the effectiveness of their efforts.”

— Jerry Lucido, USC Rossier Associate Dean for Strategic Enrollment Services

USC ROSSIER HAS DESIGNED a new master’s degree in Enrollment Management and Policy to prepare students to help increase college diversity, access and success. The program launches in summer 2018 and will be delivered in an interactive online format with on-campus immersion experiences.



USC Rossier Among Top 10 Schools of Education Nationwide

USC Rossier is number 10 among U.S. graduate schools of education, according to the latest rankings of *U.S. News & World Report*, released in March.

NEW FACULTY ADD DEPTH TO USC ROSSIER'S K-12 SCHOLARSHIP

USC ROSSIER HAS ADDED two faculty members that will deepen the school's commitment to research on improving teaching, with an emphasis on math.



YASEMIN COPUR-GENCTURK has been named an assistant professor of teacher education. She has been with USC Rossier since fall 2016 and will continue to focus on teacher knowledge, teaching practices and teacher development, and how these areas relate to student learning. In March, she received the National Science Foundation CAREER award, which supports junior faculty who exemplify the role of teacher-scholars through research, education and the integration of education and research within the context of the mission of their organizations.



ADAM KHO WILL JOIN the USC Rossier faculty as an assistant professor in the fall. He is completing his PhD at Vanderbilt University's Peabody College, with a specialty in K-12 education policy studies and a minor in quantitative methods. His current research includes an evaluation of Tennessee's portfolio model for school turnaround, and a series of studies evaluating the effects of charter schools on student achievement and school segregation.

ALSO NEW THIS SUMMER, an online master's degree program in School Counseling for students who aspire to become school counselors in K-12 settings.



IN THE FALL, two USC Rossier professors will be appointed Dean's Professors, a rare distinction at USC arising from the nomination from a school's dean to the provost.

Estela Mara Bensimon will be the USC Rossier Dean's Professor in Educational Equity. She is director of the Center for Urban Education, which she founded in 1999. Earlier this year, she was appointed by Governor Jerry Brown to the Educational Commission of the States.

Adrianna Kezar will be the USC Rossier Dean's Professor in Higher Education Leadership. She co-directs the Pullias Center for Higher Education and directs the Delphi Project on the Changing Faculty and Student Success.

The pair are USC Rossier's first Dean's Professors; each will deliver a formal lecture this fall.

Also in the fall, Lawrence O. Picus will be installed as the Richard T. Cooper and Mary Catherine Cooper Chair in Public School Administration. He will continue as associate dean for research and faculty affairs.

And Gale M. Sinatra will become the Stephen H. Crocker Professor of Education, the fourth faculty member to hold this position. She has been a professor of psychology and education at USC Rossier since 2011 (see page 8).



Estela Mara Bensimon



Adrianna Kezar



Lawrence O. Picus



Gale M. Sinatra



“I aspire to be a superintendent because I know from experience that education is the great equalizer. Schools must work for ALL students, therefore my vision as an aspiring superintendent is to work tirelessly to promote equity and access so that gender, race and socioeconomic status are never barriers to college and career access.”

— Kenya Williams
2018 DSAG Scholarship recipient

Three students from the Doctor of Education in Educational Leadership (EDL) program took home scholarships as part of the annual Dean’s Superintendents Advisory Group (DSAG) awards banquet in January. Pictured are scholarship committee leader Rudy Castruita EdD ’82 (far left); Elizabeth Morales Leon, principal, Acacia Elementary School, Fullerton School District; Kenya Williams, assistant principal, Augustus F. Hawkins High School, Los Angeles Unified School District; Beth Rabel Blackman, principal, Heritage Elementary STEAM Magnet School, Tustin Unified School District; Dean Karen Symms Gallagher; and John Roach EdD ’88 (far right), who was this year’s recipient of the DSAG Hall of Fame award. Roach has served as an integral fundraiser for DSAG and reports that DSAG members have committed to finishing a \$1 million scholarship campaign. The endowment now totals just over \$600,000.

BUILDING ON A STRONG FOUNDATION

Naddia Cherre Palacios ME ’06, the CARE director/advocate at University of California, Riverside, has received a 2018 Doris Michiko Ching Award from NASPA, the organization of student affairs administrators in higher education. The award “honors student affairs professionals whose outstanding commitment to the profession includes development of programs that address the needs of students and creation of a campus environment that promotes student learning and development.” Palacios has conducted programming and training around issues of diversity, identity, access, social justice, sexual violence prevention and intervention.



“USC Rossier’s Postsecondary Administration and Student Affairs (PASA) program gave me the foundation that I needed to spearhead my career in student affairs. Through PASA’s practitioner-focused lens, I was able to get hands-on experience at the USC Center for Women and Men (now renamed Relationship and Sexual Violence Prevention and Services). My career trajectory began with this assistantship, and thanks to the PASA program, I’ve made lifelong friends — and colleagues — who I still lean on in the field of student affairs.” — Naddia Cherre Palacios ME ’06

“This is what a realistic option looks like.”



As an undergrad at UCLA, Sy Stokes produced a YouTube video that went viral. “The Black Bruins” featured a spoken-word poem encapsulating the frustrations of feeling marginalized in and out of the college classroom. Four years later, Stokes had graduated from UCLA (2015), earned a master’s in education from the University of Pennsylvania (2017) and is now a USC Rossier PhD student and research associate for the

USC Race and Equity Center. His latest spoken-word video is “Dear White Counselor,” one part sequel to “The Black Bruins” and another part prelude to the future. “It feels amazing to prove to the people who NEVER believed in you that they were WRONG,” he wrote on Twitter after posting the new video, “but it feels even better to prove to the people who have ALWAYS believed in you that they were RIGHT.”



You can find the videos at www.youtube.com/SyStokesGSW and follow him on Twitter at [@SyCStokes](https://twitter.com/@SyCStokes).

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ROSSIER SUPPORTERS



CTBC Executive Vice President Frida Bank Kourouyan (center, with scarf) and Vice President Mona Fontela (center, tan coat) with USC Rossier staff, students and USC CAC advisers at Fremont High School in Los Angeles.

INVESTING IN FUTURES

By Carla Wohl

CTBC Bank has been a critical supporter of the USC College Advising Corps —

SINCE 2014, CTBC Bank has generously invested \$300,000 in the USC College Advising Corps (USC CAC), and that investment has paid enormous dividends. USC CAC recruits and trains recent college graduates, many of them first-generation college goers themselves, and places them in underserved high schools as mentors to assist students with their college searches and applications. With the bank's support, USC CAC has expanded to include 47 advisers in 41 schools in the Greater Los Angeles area.

"We have tremendous pride that our support has provided a better future for 15,000 inner city students and their options for a college education," says CTBC Executive Vice President Frida Bank Kourouyan.

The program, overseen by the Center for Enrollment Research, Policy and Practice (CERPP), has achieved impressive results. Students who meet with a USC CAC adviser are 27 percent more likely to apply to college and 20 percent more likely to be accepted to college.

"It opens up opportunities for many high school students at a critical stage of their lives," says CTBC Vice President Mona Fontela. "That's why we're such huge supporters of the program."

CTBC Bank, which is one of the first Asian-American-run banks to operate both in the eastern and western United States, has a long history of commitment to the communities it serves. The bank's slogan is "We are Family." And now CTBC's generous leaders and employees are a part of the Trojan Family, too. —R



CELEBRATE THEIR SUCCESS, AND SEE THE IMPACT OF YOUR GENEROSITY

Create a scholarship fund for USC Rossier students and present the recipients of your scholarships with their diplomas.

For more information, or to make your gift today, contact the USC Rossier School of Education Office of Advancement at (213) 740-2188.

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Hattie Mitchell EDL '17, founder and CEO of the Crete Academy, a charter school in South Los Angeles dedicated to serving the needs of students and families impacted by homelessness.