

BERKELEY EDUCATOR

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Graduate School of Education • Fall 2019

STEAM EQUITY

NAF Future
Ready Scholars
Come to Berkeley
.....

Machine Translation
Can Help Students'
Course Choices
.....

Two NSF Grants
Support Science
Ed Research
.....



From the Dean



Greetings,

When we dedicate ourselves to educational research and practice, many of us aspire for the next generation's significant progress in well-being and a desire for a deeper evolution of humanity. We might not only envision a better future characterized by social, economic, cultural, and technological advances but also a stronger connection to each other across social backgrounds and communities.

Science, technology, engineering, arts, and math (STEAM) comprise disciplines that affect numerous facets of our lives. The need for continuous advancement in artificial intelligence, the precision of big data analyses in medicine and social science, and growth in green technology to staunch the rapid rise of global warming and climate change, to name a few, demand talent and critical skills. Projections now forecast that by 2020 in California, we will have a shortage of 1.1 million college degree-holders needed to power its workforce. If we are not forward thinking and rest on our laurels, this potential shortage will impact competitive industries, including many STEAM-related fields that propel California's and our nation's growth.

A disproportionate percentage of those with extremely limited access to the best education in these areas hail from socioeconomic backgrounds already underrepresented in STEAM, especially low-income African American, Latina/o/x, and Native American youth, in addition to female students across social backgrounds. A limited engagement of under-represented youth pursuing post-secondary education in STEAM fields will not only perpetuate inequitable gender and

racial-ethnic gaps in critical professions but also social and economic inequality. Opportunity gaps breed achievement disparities that drive attainment gaps.

At the UC Berkeley Graduate School of Education (GSE), we take the future and the preparation of all members of the next generation for innovation, creativity and change on earth quite seriously. Many of our faculty and students commit themselves to the eradication of educational inequality, which is both a symptom and a driver of economic and social divides. All students deserve a robust educational foundation and the chance to develop the critical skills needed to navigate college and professional workforces.

This current issue of the *Berkeley Educator* features several dynamic ways that the GSE and its faculty, students, and staff are currently engaged in STEAM-related training and advancements for both the present and future. It features the work of members in our School committed to staunching the spread of inequality into the next generation. I am grateful not only to my colleagues and our students but also to GSE alumni and friends who support our mission financially. Thank you!

At the Berkeley GSE, we remain in service of making our research and training relevant to the realization of a stronger, bolder, more innovative, and better tomorrow for all.

A handwritten signature in black ink, appearing to read 'Prudence L. Carter'.

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COVER PHOTO
Alissa Maravilla of Erma Duncan Polytechnical High School in Fresno holds a circuit board used in her solar science class. Maravilla was among 45 high school students attending a three-week residency summer camp at Berkeley hosted by the GSE. Photo by Daphne Hougard.

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Engaging Autistic Students Through Music

BY ELLEN LEE
Contributing Writer

A CLASSICALLY TRAINED violinist, Rachel Chen has performed in quartets, on stage with orchestras, and even in spontaneous jam sessions with street musicians.

Now Chen's musical background comes in handy as she studies the behavior and interactions of autistic individuals, in particular, stimming, or self-stimulating; and repetitive actions such as the flapping of hands, the continuous tapping of various objects, or the back-and-forth rocking of the body.

When she was 19, her younger brother was diagnosed as on the spectrum, which sparked her interest in studying autism. Autistic individuals are thought to have challenges in communicating with others. Chen's research delves into understanding autistic behaviors and how they occur in everyday circumstances, and challenging certain assumptions about the way that autistic individuals act. For one particular study, Chen spent hours recording and observing students in a drum circle. She documented their drum beats with musical notations, and combined the notations with discourse analysis to examine the students' beats and bodily movements.

As she mapped it, Chen made a few observations: First, if a person was drumming alone, the pattern was not repetitive



RACHEL CHEN (l) stands on the Magic Mat with GSE staff member Tara Kaiser. The musical sounds of the Magic Mat are activated when two people stand barefooted on the black plastic area, and then touch each other on the skin.

and incessant as some might expect, but rather would vary as needed. If a second student joined in the drum circle, the first student's drumming pattern shifted in response to the second student. Once the second student left the drum circle, the first student's drumming pattern returned to its original pattern.

Chen also observed that if two students were drumming together, their rhythms started synchronizing in a rhythmic dialogue.

That's significant, says Chen, because there are mixed attitudes about stimming, with some efforts to discourage or minimize it. Chen's research found that stimming can actually be a social behavior – a way for autistic individuals to interact and communicate with each other – rather than a solitary, isolating act.

"It was quite productive and creative, and not at all maladaptive," she said.

Her musical training – particularly her experiences improvising on her violin with other musicians – helped her notice the different rhythms in the drum circle. "It's all about listening, reading other people's movements, seeing how your sound can best fit in, and seeing how your sound can respond to others," she said about playing the violin with others. "I feel like that is exactly how the drum circle has evolved to students responding to each other."

Through a grant from the Barbara Y. White bequest, Chen teamed up with students in a School of Information class to develop another research project: the Magic Mat.

About the size of a long bath rug, the Magic Mat is connected to a circuit board and speakers. When two people stand on opposite sides of the mat and touch each other, it creates dynamic, computer-generated, musical tones. Gentle touches produce a more pleasant tone while forceful touches trigger a harsher sound. Chen took a version of the Magic Mat to a playgroup where it drew an enthusiastic response from kids and teachers alike. "I didn't have to tell them how to play with it," she said. "They explored it by themselves."

Next, she hopes to see how the Magic Mat could help autistic children playfully explore how to engage with others. "It's been such a fun project," she said. "I can't wait to study how kids interact with each other on the mat." ■

CHEN EARNED A BA AND MA in linguistics from Nanyang Technological University in Singapore. She is a fourth-year doctoral student studying special education through a joint program between the GSE and San Francisco State University. Her publications include, Hoey, E. M., DeLiema, D., Chen, R. S. Y., & Flood, V. J. (2018). "Imitation in children's locomotor play." *Research on Children and Social Interaction*, 2(1).

Machine Translation of Courses Could Assist Transfer Students

FEWER MISSED OPPORTUNITIES.

Better prepared transfer students. Very possibly an increase in college completion rates. That is the potential impact of Professor Zachary Pardos's latest research on how using big data techniques to analyze college courses can improve a transfer student's class selection.

What's happening behind the scenes is a complex data analysis that shows the effectiveness of using machine translation to examine course descriptions and historic enrollments. These analyses will serve as a tool to help students at 2-year colleges build their coursework, which will count toward their intended degree at a 4-year university.

The comparison of courses between community colleges and universities to see which courses in an associate's-degree program will count toward the desired bachelor's-degree program, respectively, is commonly called "course articulation." Course articulation is important for transfer students for several reasons, including transfer eligibility and avoiding the need to repeat a course. Administratively, current ways of conducting course articulation is time-consuming, costly, and possibly fraught with bias.

Just ask Alexandra W. Logue, former Executive Vice Chancellor and University Provost of The City University of New York (2008-2014), who wrote a book on the topic, *Pathways to reform: Credits and*

conflict at The City University of New York.

At many universities, decisions about course articulation can come down to a single faculty member, Logue said, and virtually all course articulation decisions involve some sort of faculty input.

"Zach's work is the first time that I know where there's been an opportunity to assess whether two courses are similar enough that the credits should transfer other than employing current faculty judgments," she said. "This is another tool that we could use that would give at least a method that does not involve time-consuming current faculty work."

Pardos's research could have huge implications for transfer students. According to national statistics, 81.4% of community college students want to transfer to a 4-year institution but after six years of starting at the community college, only 13% earn a 4-year degree.

While there are many factors impacting a transfer student's post-secondary education, insufficient course articulation is considered a significant obstacle toward degree completion.

Pardos's initial research targeted 184 degree satisfying courses at UC Berkeley that had no current articulations at neighboring Laney College, a community college in Oakland.

Pardos's team used different methods for comparing courses and tested them against a validation set (existing course articulations that have already been in use). Interestingly, they found that the set

of students who took a course, observed from years of historic enrollments, said something about the course that was useful for conducting the comparison. Using the courses' catalog descriptions, combined with enrollment-based features (data largely generated by means of prior faculty decisions), produced the most accurate course articulations.

This best performing method showed that if the model were to produce a set of five community college course articulation suggestions for each one of 10 chosen Berkeley courses, eight of those sets of 10 suggestions can be expected to contain an appropriate articulation course.

Pardos's research could help democratize course articulation, said Laney College President Tammie Gilkerson, whose college serves 16,000 students, 84 percent of whom identify as a person of color.

"I see it as a social justice issue, frankly," said Gilkerson, adding that big data can help illuminate successful pathways that students with social capital have already accessed. "I really think about it from the lens of how do we leverage this data to find these interesting solutions, and be fundamentally thoughtful about the way the data is used. I think it could really change outcomes for communities."

Pardos' research has already gained attention from colleagues. His paper, *Data-Assistive Course-to-Course Articulation Using Machine Translation*, co-authored by undergraduate student Haocheng Zhao at UC Berkeley, and doctoral student Hung Chau at the University of Pittsburgh, was named best paper at the 2019 Learning @ Scale conference.

The impact of this work will soon expand. The Heckscher Foundation for Children is funding a course articulation effort that began this summer with Ithaca S+R in collaboration with Pardos's lab and The City University of New York (CUNY) system. ■



The late GSE Professor W. Norton Grubb (1948-2015), founding Berkeley PLI Director and recipient of the 2012 Chancellor's Award for Advancing Institutional Excellence and Equity

The public service that I'm most proud of and that I hope will be my longest-lived legacy is the Principal Leadership Institute. My personal hope is that the PLI will keep expanding until it dominates school leadership and is celebrated in the wider world of education.

FOUNDED IN 1999 as a response to teacher and principal shortages across California, Gov. Gray Davis and the state Legislature mandated the creation of Principal Leadership Institutes at UC Berkeley and UCLA. Berkeley's PLI, housed at the Graduate School of Education, has since graduated 619 leaders for justice.



Rebecca Cheung, Berkeley PLI Program Director

We measure our true success by how our PLI alumni make long-lasting, equity-centered change in schools for young people, especially the most vulnerable and historically underserved. This has always been our ambition. It always will be.

PLI @ 20



Sumeyye Cardakli, Cohort 18, 9th Grade Math Coordinator, Berkeley High School

Ever since I stepped into the first PLI class, I began to truly understand the importance of equity. The tools I learned in my classes helped me to become a student-centered leader. PLI taught me how to soul-search and self-reflect. I can grasp the extent of my knowledge and personal biases. When approaching social justice issues, I now feel more confident in tackling them in my day-to-day professional life.



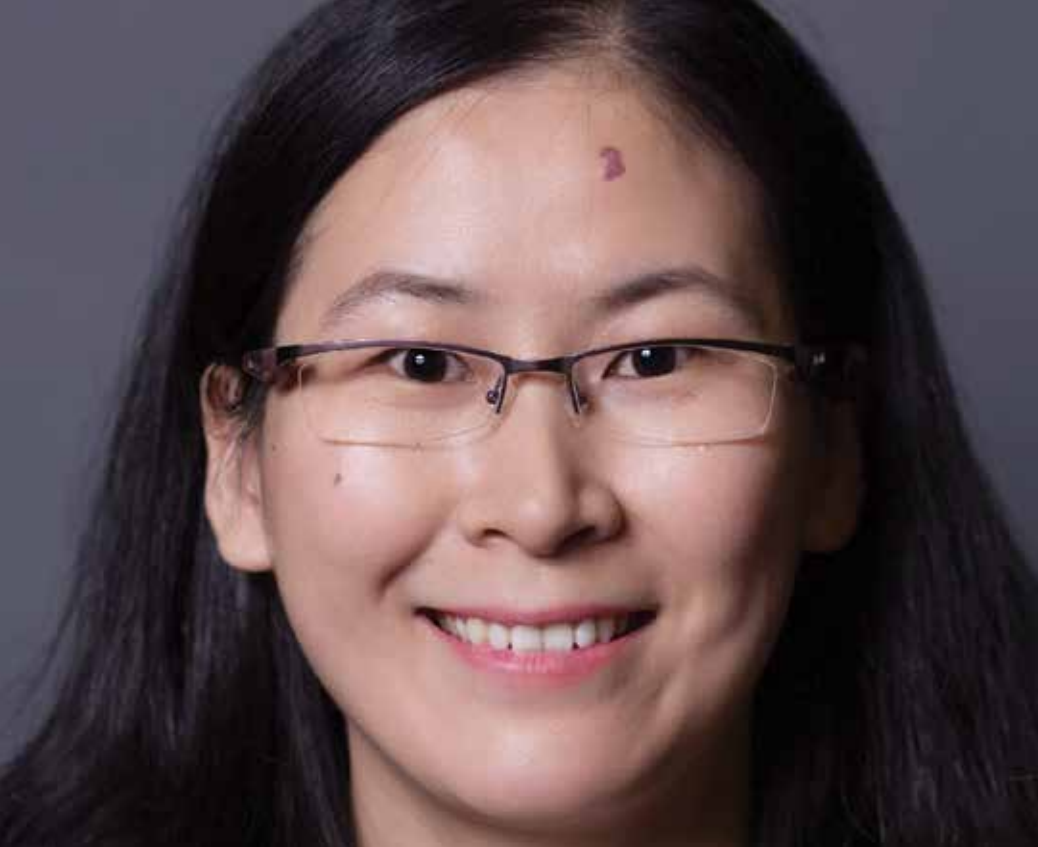
Luis Argueta, Cohort 13, Program Manager, California Education Partners

Going through the rigorous process of applying and graduating from this program emphasized that my individual leadership must always influence our organizations to understand and address equity and social justice collectively. By defining what my impact can have on others, I engage with my work with a clearer understanding of what it will take to make systemic changes in educational organizations. As I transitioned from the classroom to administration, it became evident that my own understanding and the call to act on behalf of equity and social justice are NOT normed methods of engagement in educational settings. Instead, I found people to be reinvigorated by a clear and concise perspective that was supported by a plan.



Sarah Glasband, Cohort 15, Director of Talent Development, Recruitment & Retention, Oakland Unified School District

Based on what I learned in our Data courses, I was able to spearhead the design and administration of the first OUSD Staff Retention Survey, which laid some of the groundwork for the School Board and unions to collaborate around the most critical issues to retain and develop staff across Oakland Unified, inclusive of all permanent employees. I cannot overstate the importance of collaborating in order to identify and improve metrics that are collectively prioritized as a way to ensure continuous improvement in the central office.



Chunyan Yang Joins GSE Faculty

BY ILENE LELCHUK
Contributing Writer

CHUNYAN YANG IS SO PASSIONATE ABOUT THE POWER of public education and the importance of school psychology that sometimes she tears up when discussing her career path.

“Public education can bring unimaginable growth and opportunity. I couldn’t imagine that without public education, I would have gotten to this point,” Yang, who grew up in rural China, said as the words caught in her throat. “Schooling is a public good, a core value.”

Yang has devoted her career to deep thinking and research about how school climate affects students’ and teachers’ sense of wellbeing and engagement in the face of bullying, stress, and other factors.

This fall, she brings her expertise to UC Berkeley as she joins the GSE faculty as an assistant professor.

Yang will lead a doctorate-level family socialization course this fall and serve as advisor to student researchers studying risk and resilience in children and adolescents across cultures.

It’s an exciting time to study school psychology, when psychologists’ roles on school campuses are expanding, Yang said.

It also is a challenging time, when bullying is entrenched as the most common type of school violence. Cyberbullying is on the rise and impacts children at younger ages.

“When schools are addressing bullying, the focus is often on reducing bullying incidents, which is important. It is also very important to help heal the students who are suffering from bullying. However, by far we have very limited knowledge and

practical strategies to help alleviate victims’ suffering, boost their resilience, and help them bounce back. This is an area I have been focusing on,” Yang said.

Yang comes to Berkeley from UC Santa Barbara, where she served as assistant professor in school psychology at The Gevirtz Graduate School of Education.

Yang mentored a dynamic group of graduate and undergraduate students in the Risk, Resilience, and Culture Research Group at UCSB and oversaw several projects. In one ongoing project, Yang is collaborating with a local non-profit community agency to help Santa Maria high schools develop and implement a multi-tier bullying prevention and intervention program and to explore factors impacting student and teacher resilience in the face of bullying, burnout, and mental health problems.

Yang plans to continue this work in the Bay Area.

She also brings with her a grant funded by the Society for the Study of School Psychology to track newly minted teachers during their first year and assess their feelings of wellbeing while looking for clues into what is causing California’s persistent teacher shortage.

It ties into her work developing a Multidimensional Teacher Victimization Scale to measure teachers’ perceptions about how often they experience violent behavior from students.

“I often approach my research questions from the perspectives across students, teachers, and parents,” said Yang. “If teachers

are feeling unhappy and unsafe, the students and their parents are not going to feel safe.”

Among her many published articles, the report titled “Bullying Victimization and Student Engagement in Elementary, Middle, and High Schools: Moderating Role of School Climate,” was one of the top 10 most downloaded articles out of more than 4,000 articles published in American Psychological Association journals in 2018.

This study, which drew on assessments from 25,896 students at 114 Delaware schools, found that kids on campuses with less bullying and more positive atmospheres are more engaged with schoolwork and school community.

The article also reported a seemingly counterintuitive finding: Creating a positive school climate doesn’t go far enough to help those kids who already suffered bullying.

“Although positive change on school climate could help reduce bullying, it could bring potential side-effects for victims. When victims see the school is perceived positively by the majority of other students, they might be more likely to blame themselves for being the only ones targeted, which could lead to higher distress and other maladjustment outcomes,” Yang explained.

“We need to pay particular attention to remaining victims who are easy to be overlooked in the context of positive change. It is also important to facilitate victims’ disclosure about their ongoing experience in safe and confidential ways, to help them form a more objective perception of the school climate, and to encourage support from former victims to students who are still suffering.”

Moving forward, Yang is excited to explore the Bay Area’s diverse communities and immigrant experiences related to bullying and school culture.

Coming to the East Bay is a sort of homecoming for Yang, who completed her advanced school psychology practicum at Albany Middle School. That’s where her interest in bullying and school climate began.

Long before then, however, Yang had witnessed victimization and understood the importance of resilience.

Yang grew up in a diverse rural province in southwest China, where the population consisted of ethnic Chinese like her

family, and minorities from Myanmar, Vietnam, and Indonesia. The government relocated many to communal farms in Yang’s region. Growing up on one of these farms, she witnessed the unique social-cultural dynamics in her community and learned about how people from marginalized groups overcame the trauma of forced emigration.

Yang credits her father for pushing her to become fluent in English so she would have better opportunities to pursue education in a larger world. After earning her BS in chemistry with a teacher credential from Central China Normal University, she headed to the University of Bristol in England for a masters in psychology research methods, and then to the University of Delaware for a doctorate in school psychology.

“My hope is that through instruction and research, I could encourage and help more students from underrepresented groups to become researchers and practitioners in the field of school psychology, as part of a larger effort to reduce the educational and mental health disparities in schools in California, the U.S., and around the world.” she said.

“In the field of school psychology, you have so many opportunities to work with youths and families from diverse backgrounds, to make connections with underserved populations, to learn their different cultural values and perspectives, and to help them find their resilience in the face of adversity,” Yang said. “You can make a real change. That’s why I love it.” ■

YANG’S RESEARCH INTERESTS FOCUS ON UNDERSTANDING HOW CHILDREN

and adolescents interact with their social contexts (e.g., school, family, and culture) to find their resilience in the face of a variety of risk factors, including bullying, teacher-targeted violence, and mental health challenges. She has been conducting research using multilevel and multi-informant approaches to understand the functions of malleable factors (i.e., school climate, social-emotional learning, school-wide practice, and cultural norms) in school-based prevention and intervention targeting the wellbeing and engagement of students, teachers, and families from diverse cultural, linguistic, and socioeconomic backgrounds.

Yang received her PhD in Education with a specialization in School Psychology from the University of Delaware; MSc in Research Methods in Psychology from the University of Bristol in England; and BS in Chemistry with teacher credential from the Central China Normal University in China. Prior to joining the faculty at the University of California, she worked as a school psychologist in the district-wide Multicultural Assessment and Consultation Team in Northern Colorado.

Yang was the recipient of the 2016 Outstanding Dissertation Award from American Psychological Association Division 16: School Psychology, and the 2019 Early Career Research Award from the Society of the Study of School Psychology. She is currently serving on the editorial boards of the *Journal of School Psychology*; *School Psychology*; and *School Psychology Review*.



Tesha Sengupta-Irving Joins GSE Faculty

BY DARA A. TOM

IN THE EARLY GRADE SCHOOL YEARS, MATH IS DESIGNED to be taught with colorful manipulatives (wooden blocks, magnets, etc.), puzzles, and games. Around 3rd grade, for too many students, it becomes drudgery, and labels such as being “good” or “bad” take hold. The rest is history.

But it doesn’t have to be that way, says Professor Tesha Sengupta-Irving, a mathematics education researcher and one of two new GSE faculty members this year. Her appointment started July 1.

“You’re not innately good at mathematics, or innately loving of it,” Sengupta-Irving said.

“All of us know, in mind and body, that to endure something like math is not the same as to enjoy it. As educators raising the next generation of youth who we hope will out-create, out-innovate, and out-imagine us, asking them to endure mathematics learning – or really anything, in school – seems patently misguided at best, and inhumane at worst.”

For Sengupta-Irving, whose first career was as an electrical engineer, mathematics isn’t just about numbers, but bringing understanding around the multiple layers of the discipline for teachers, and students who are learning it.

“I refute many of the dominant discourses about why kids should do mathematics or who can be good at mathematics, and try really hard to get closer to the narrative that kids bring, understand why they do what they do, in the hopes of changing the rubric of mathematics education more broadly.”

She’s up against decades of engrained thinking that strength (or weakness) in mathematics is a measure of intelligence and knowledge. Her research works to peel away this political legacy of mathematics education that is enmeshed with racism, classism and sexism.

“The launch of Sputnik in 1957 anointed mathematics and science in a way that made it inextricably tied to our global competitiveness and our ability to flex muscles on a global scale,” Sengupta-Irving said. “One’s ability to do well in mathematics ascribes respect, worthiness, and ‘smartness’ when none of those things should actually be ascribed to a person just based on their fluency in mathematics.”

Her research has shown that when teachers focus on the disciplinary practices of mathematics, such as reasoning, questioning, and problem posing, students can learn and enjoy learning, which doesn’t happen when teachers focus primarily on knowing mathematics (memorizing facts, figures, and algorithms).

Consider, for example, that while the Common Core Standards have eight mathematical practice standards, problem-posing isn't one of them. "Yet posing a problem, an interesting and challenging problem to pursue mathematically, is exactly what mathematicians are often embedded in as a practice," she noted.

"We don't ask kids to do that in school – pose a problem and then talk about it. We rarely ask them to be the authors of the disciplines. We ask them only to consume it. And I think that subjugated position of consumption, especially when what you're consuming feels racially apart, gender-wise apart, or class apart, becomes unbearable."

Combine that with what has become the discipline's role in workforce preparation (learning mathematics as an investment in children who are human capital for the labor market) and the result for too many students is an excruciating experience of the discipline.

"Mathematics itself can be something meaningful right now – in the now – meaning, for who the students are, and are becoming, in this moment," she said, adding that framing mathematics education in this way can make learning feel relevant and consequential to youth.

She knows it's possible to do this because she grew up enjoying mathematics, with teachers who would sing in class, were self-deprecating, or used humor in showing its beauty and relevance in shaping our social worlds. The daughter of college educated Indian immigrants, she also acknowledges her privileged upbringing in coming to see mathematics as something she could do and pursue. Perhaps that is what allows her to imagine an alternative for students in schools where such a future is made just beyond reach.

"I know that the way mathematics is experienced in many schools is as a weapon against minoritized children, for example through tracking and testing, and that is doing material and real violence to people, their families, and their communities," Sengupta-Irving said.

"The structural and interpersonal violence of mathematics is a human creation. If we can figure out how to get it right, and by right I mean rewrite the ways in which children experience the discipline, my hope is that more children will be describing it as joyful, and as expressing their desires, not just something to endure to get a good job."

Her views on mathematics education didn't start out this way. She was raised hearing the dominant narrative that mastery of the hard skills (mathematics, science, engineering) is the way a person secures their position in the United States, especially women. So, she studied engineering and went on to work in industry.

Her thinking began to shift while working as a tutor with incarcerated youth and adults who were working on their GEDs.

"I was with people who were motivated to do particular things with their lives, who saw mathematics as either an obstacle to that, or as a facilitator of that, and suddenly everything changed for me in terms of my relationship to the discipline," she said. "I could see the political, economic, and social reality of mathematics from the perspective of people who were trying to master it enough to get to that next level of whatever they wanted for themselves and their families."

In her ethnographic microanalytic work, she has shown how children embody perseverance as a collective enterprise, and how having agency over one's inquiry - in nature and purpose - better enlivens a child's sense of self and new possibilities in learning.

Additionally, in a recent paper with a colleague at Northwestern University (Shirin Vossoughi), she found immigrant girls of color embodying and talking about respect, dignity, and family in mathematics learning. They were describing disciplinary learning in a way that is wholly apart from neoliberal discourses that place a premium on competition, individualism, future marketability, efficiency and speed in mathematics learning.

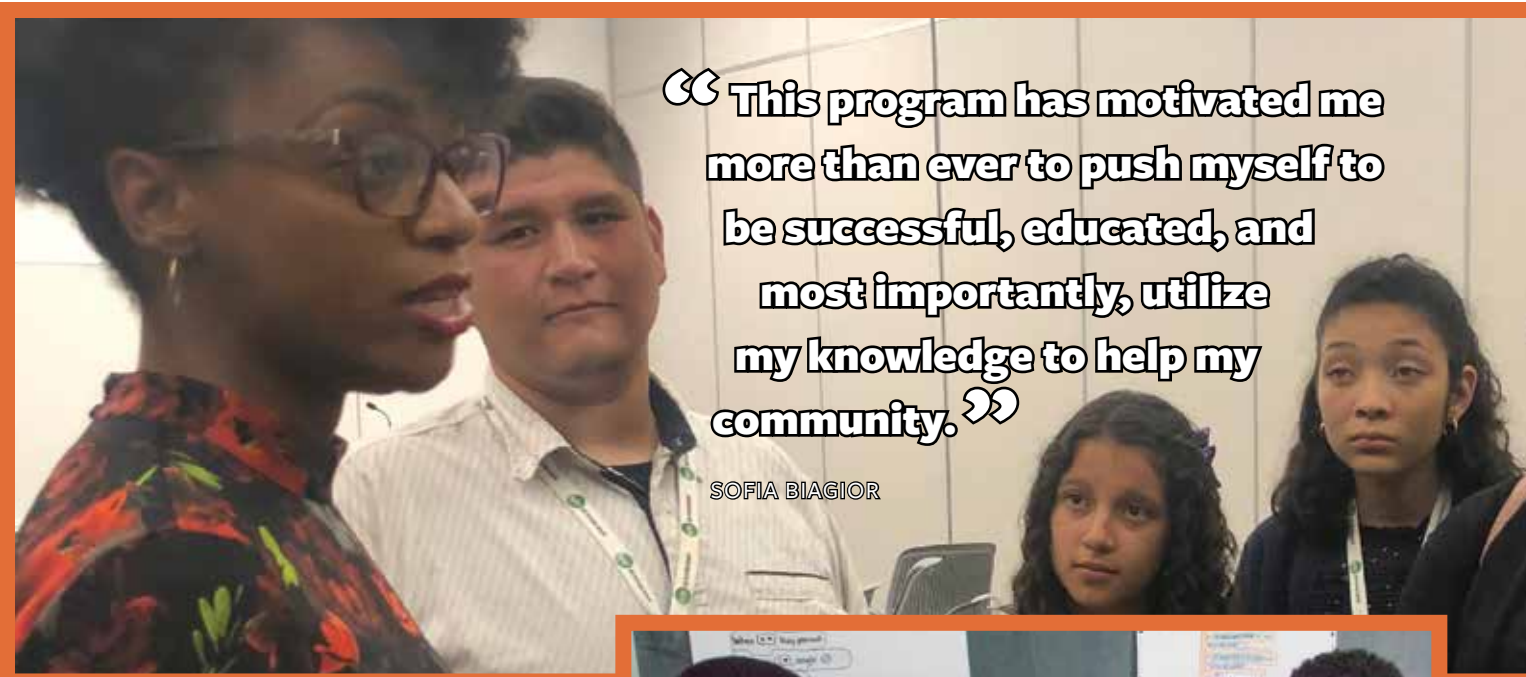
"There is a language for learning and design still to be read from the bodies and experiences of minoritized children," Sengupta-Irving said. "If we could capture that with more intention, that would improve mathematics education in public schools far beyond where it stands today." ■

PROFESSOR TESH SENGUPTA-IRVING WAS MOST

recently an assistant professor of mathematics education and learning sciences at Vanderbilt University. Prior to Vanderbilt, she was at UC Irving; and Assistant Director of Research at CONNECT: A Center for Research and Innovation in Elementary Education at UCLA.

She earned her PhD in Mathematics Curriculum and Teacher Education at Stanford University; her BS in Electrical Engineering, and minor in Japanese Studies at the University of Illinois, Urbana-Champaign. She also has her California Single-Subject Clear teaching credential.

Among her awards are an NAEd/Spencer Dissertation Fellowship (2008); Hellman Foundation Fellowship (2013); and Outstanding Reviewer, *Journal of Urban Mathematics Education* (2018).



“This program has motivated me more than ever to push myself to be successful, educated, and most importantly, utilize my knowledge to help my community.”

SOFIA BIAGIOR

Summer Program Builds College Readiness

BY WYLIE WONG
Contributing Writer

TEACHER COLLEEN SUTHERLAND AND HER STUDENTS stood several hundred steps away from the Campanile, but they were not there to admire the famous Berkeley landmark. Instead, they were busy peering down a maintenance cover.

“You can start your test. I would call this a vent,” Sutherland told the students equipped with air quality sensors, iPads and clipboards to test and record results for particulate matter.

“Put Ninja Turtle hole! That’s what I put,” answered one teenage girl in charge of tabulating the readings.

Meet the inaugural class of the NAF Future Ready Scholars Program, a group of 45 high school sophomores from Vallejo, Antioch and the Central Valley who spent three weeks

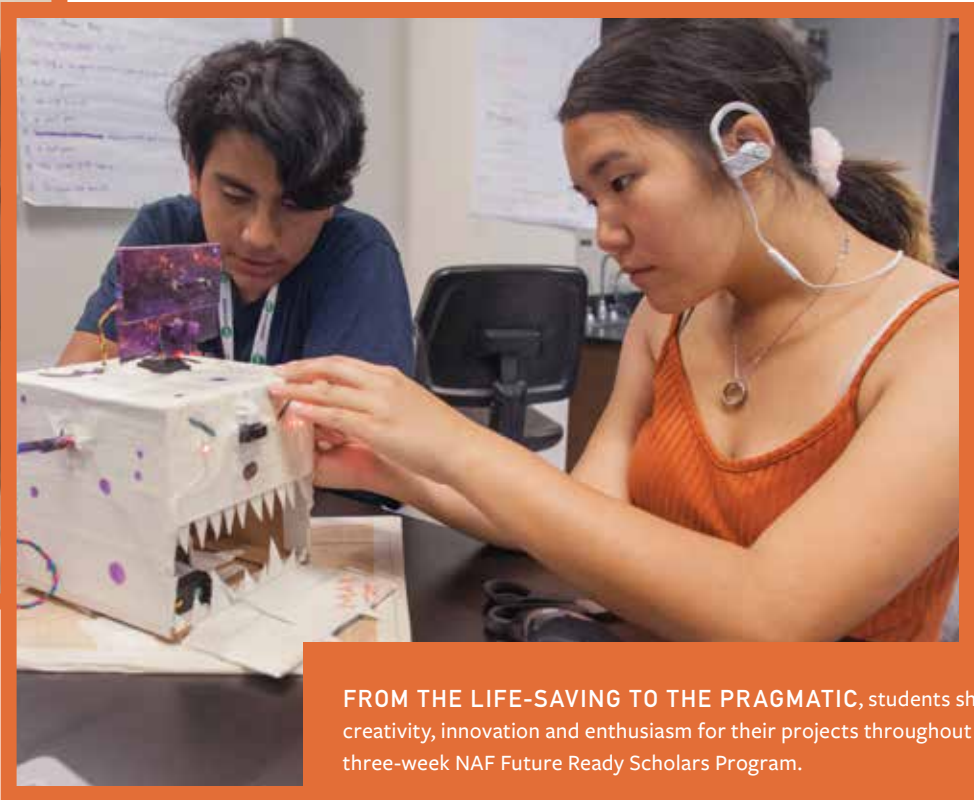


TOP: The Scholars follow-up questions after a presentation by Dr. Jennifer Cohen, a cellular and molecular biologist who is a lecturer at the Haas School of Business on equity, gender, and leadership. LEFT: Jesse Rojas (l) and Marrio Davis (r) work on coding for their robot. ABOVE: Luis Lara (l) and Mallie Yang (r) building their robot.

on campus this past summer taking science, technology, engineering and math classes, while also learning leadership and community collaboration skills.

The Graduate School of Education (GSE) launched the three-year program in collaboration with three educational organizations – a national nonprofit called NAF; Oakland-based SMASH; and Berkeley’s own Lawrence Hall of Science – to prepare students from populations that are underrepresented in STEM/STEAM fields for potential STEM/STEAM careers.

The tuition-free program, funded by an initial \$1 million donation from NAF founder Sandy Weill and his wife Joan, began its



inaugural summer residency and pilot cohort with students currently attending NAF academies in their local high schools. The majority of these students would be the first in their families to attend college. The GSE aims to cultivate their interest in STEM/STEAM, deepen and expand their skills and STEM/STEAM educational background, and prepare them for the rigors and reality of college.

“The program is designed to build on the existing talents of our scholars while exposing them to careers in STEM/STEAM fields. We are creating opportunities for them to strengthen their skills, confidence, and enthusiasm toward a possible career in a STEM/STEAM field,” said Jennifer Delgadillo Bevington, director of the Scholars program. “They are only 10th graders, but we are hoping this early exposure, skill building and the social-emotional component of the program will help them see this as a possible path in their lives.”

UNIQUE APPROACH TO STEM/STEAM

The program’s first cohort studied and lived on campus for three weeks. Scholars engaged in week-long classes across three domains: citizen science; coding; and solar science. They will return for another three weeks the next two summers and will be joined by a new cohort of sophomores in each of the next two years.

The GSE’s partnership with STEM/STEAM organizations makes the Scholars program unique, Bevington said. For the pilot year, students from NAF Academies were selected. NAF, formerly the National Academy Foundation, provides high schoolers with industry-specific curricula and work-based learning activities, including engineering.

FROM THE LIFE-SAVING TO THE PRAGMATIC, students showed creativity, innovation and enthusiasm for their projects throughout the three-week NAF Future Ready Scholars Program.

In the solar science class, students were tasked with creating a new concept or use for solar power. Ideas included a bike; a satellite phone for emergencies; a jacket to keep warm; and a mobile medical center that can be deployed in rural or off-the-grid areas, or used by disaster response teams. Mallie Yang proposed a solar SOS satellite phone.

“Say you are going to a desert or in an area with no (cell phone) reception, and you are by yourself, you can use this phone to call because it connects to satellite,” Yang said, as fellow students peppered her with questions.

The phone would have 6.5 hours of battery life and typically charge in four hours. With three battery ports, users attach solar panels to the bottom, speeding the charging time to one hour. Kenji Tea and Nolan

(continued on page 14)

Lawrence Hall of Science educators designed and taught the academic coursework for the Scholars program, while SMASH, a non-profit that offers summer college preparatory programs, managed dorm life and evening and weekend activities, including leadership, social, emotional and community-based life skills.

“It’s bringing each of our organizations’ strengths together to support and enhance the ecology of these students’ educational lives and increase the chances of sustained academic success. It’s a combination that’s very powerful,” said GSE Dean Prudence L. Carter.

(continued on page 14)



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“It’s bringing each of our organizations’ strengths together to support and enhance the ecology of these students’ educational lives and increase the chances of sustained academic success. It’s a combination that’s very powerful.”

GSE DEAN PRUDENCE L. CARTER

SCHOLARS IN ACTION

Season Nanez, 14, applied for the program for two reasons: enhance her resume for college applications and because she felt it would be fun to be on a college campus.

The program did not disappoint.

“I’m usually home every summer just sitting on the couch, eating junk food, watching Netflix, and it gets really boring. So I’m really enjoying this,” she said during an interview two weeks into the program. “We’re meeting new people and making great connections. We’re learning to be independent, and in our classes, we are learning things we would never have known before. Our peers will learn this later in life. But we got to learn it here.”

The classes are lively, interactive and full of discussion. In the citizen science class, students measured air quality throughout campus, from the UC Botanical Garden to construction sites at Giannini Hall, and Tolman Hall, which is the GSE’s former location and is being demolished. Students saw steam rising from a maintenance cover one morning and wanted to test its air quality, but the steam had disappeared by mid-afternoon.

Most students stooped over the maintenance cover with their

air sensors, but one kneeled and stuck her air sensor between the grates.

“I got a six,” one student said. “I keep getting zeros,” said another. Students measured for particulate matter smaller than 2.5 micrometers in diameter. Anything less than 10 is considered healthy, Sutherland said.

By week’s end, the citizen scientists said they learned about the effects of air pollution and how they could organize and make change in their communities through environmental justice activities.

“If I didn’t take that class, I would not have any clue what is in the air, what we are breathing in and what can cause us to have lung problems,” said Marrio Davis, 15.

As Sutherland’s class tested air quality on campus, another group was in a nearby classroom showing off their final coding projects: programmable, box-shaped robots that they turned into “space stations.” They decorated and named their space stations: Wall-E; Evil Queen; and Jalapeño Jr.

They used block-based programming to get lights to blink, doors to open and wheels to move them forward and backward.

Getting the lights to blink and doors to open and shut was difficult, said Brianna Peters. “There were times I wanted to throw it out the window,” she admitted, laughing.

“And then your space station was really going into outer space, huh?” teacher Sylvia Gonsalves quipped.

But like any good software developer, Peters and Li Ping Huang persisted. They troubleshooted and got their space station to work.

“There were a lot of malfunctions, and we had to reboot everything, but the sense of accomplishment after we finished the code was really fulfilling,” Huang said.

LEARNING LEADERSHIP AND LIFE SKILLS

Some students were admittedly homesick the first few days of the program. But the scholars bonded quickly through the new experience of living in the dorms from leadership and life skills-building workshops and activities on nights and weekends, said Miguel Valencia, SMASH’s residential director.



Fernandez designed a solar jacket that can be heated up in chilly weather, functioning similar to an electric blanket.

The jacket of course has 21st century functionality: temperature controls via an app. “The solar panels are flexible and durable, and the jacket itself is waterproof, windproof and stainproof,” Tea said.

“Ooooooooooh!” his classmates replied in unison.

Sofia Biagio enjoyed coming up with the idea of the mobile medical center, but it was the bigger, all-class project that proved inspiring.

“The solar suitcase I built with my classmates that will be sent to Northern Ghana to communities without electricity was my metaphorical lightbulb moment for how STEM education builds stronger societies,” Biagio said. “As a student from the Central Valley, I thoroughly appreciated the opportunity to visit somewhere (like Berkeley) that was beyond my horizons and personal depth of knowledge.

“This program has motivated me more than ever to push myself to be successful, educated, and most importantly, utilize my knowledge to help my community.”



For two hours a night, a team of SMASH resident assistants (RAs) held impactful learning workshops to help students increase their confidence and elevate their voices, including a group discussion on public speaking. Students pretended they were entrepreneurs on the “Shark Tank” TV show, where they pitched business ideas to investors in hopes of getting funded.

Students were given items to serve as their inventions, such as a cup of instant ramen; a billiard ball; and a box of tissue paper. They met for 20 minutes to develop their presentations, and then they pitched to the RAs, who played the role of investors.

The goal of the learning workshops is to create a safe space for students to be vulnerable, share experiences and develop trust. “I see them bonding and forming into a cohesive group, and I see great social-emotional growth happening from week to week,” Valencia said.

That bonding and cohesiveness carries over into the academic coursework. Students have become tight knit and help each other when they are stuck working on their hands-on projects, said Davis. In the solar science class, they built solar suitcases, which residents in developing countries use for power at night.

“It’s a group effort,” Davis said. “If I feel a classmate is struggling, I will come over and ask, ‘how are you doing?’ I might have gotten it, so I will say, ‘here I will help you connect this and that.’”

ENSURING STUDENTS ARE ‘FUTURE READY’

Bevington plans to keep the bonds strong throughout the 2019-2020 school year by reuniting the first cohort with educational activities before next summer’s session.

The GSE is also planning to offer STEM/STEAM professional development to educators in their schools.

When the inaugural cohort returns to the Scholars program the next two summers, they will be older and ready for more rigorous educational experiences, which is important, said solar science teacher Dr. Eric Campos.

Because college is increasingly competitive, students can get excluded from difficult introductory science courses. The goal for the next two years is to continue teaching them strong studying strategies and prepare them for the challenges of college so they can successfully pursue STEM/STEAM-related disciplines, Campos said.

“That will help bridge the opportunity gap and help with retention of students coming from historically underrepresented or underserved backgrounds who want to go into the sciences,” he said.

In the meantime, the program has already made a difference. Mallie Yang said that in solar science class, she learned how electricity works and now understands the physics of solar energy. “Before I never understood the difference between watts, amps and volts. I thought they were the same thing, and that class simplified it to the point where I could understand it,” she said.

Ace Vo and James Geronimo said they initially thought about going into medicine. Now, they are inspired to possibly study engineering.

“I’m having a lot of fun, meeting a lot of new people, and I hope to see them next year,” Vo said. ■

Linn Named Corey Chair

PROFESSOR MARCIA LINN IS THE FOURTH GSE PROFESSOR TO HOLD THE COREY CHAIR



BY MARCIA LINN

I AM DEEPLY HONORED TO BE NAMED the Evelyn Lois Corey Chair in Instructional Science. I especially want to thank my colleagues for their willingness to select me for this award.

I am thrilled to celebrate the generosity of Evelyn Lois Corey '36, who was a public school teacher in Oakland, by broadening and publicizing the research agenda in instructional science and STEM learning, with a focus on diversity and inclusion. The goal of the Corey chair resonates with my interests in improving teaching and learning with insights from instructional science.

I am using the resources of the chair to explore leading edge topics emerging from collaborations with local teachers. For example, the teachers would like more evidence concerning how best to prepare their students to improve, refine, redesign, and reformulate their views of controversial topics such as climate science, energy efficiency, and vaccine safety as new evidence emerges.

This is a timely goal as citizens grapple with conflicting claims about these topics. Teachers note that students critique music, fashion, and movies and would like to build on this practice to promote a critical stance toward science. We are collaborating on pilot studies and we anticipate that these pilot studies will enrich proposals for extramural funding.

To strengthen campus insights into instructional science and STEM, I also plan to use the chair resources to sponsor an annual Evelyn Lois Corey (ELC) Scholar who will interact with the community and speak at the GSE and SESAME colloquia. The ELC Scholar will bring a focus on equity and inclusion as well as bridge the STEM disciplines and instructional science. These activities are intended to increase interactions between students and faculty in the GSE and STEM depart-

MARCIA LINN IS A PROFESSOR OF DEVELOPMENT AND Cognition specializing in science and technology, and is a member of the National Academy of Education. Linn is also a Fellow of the American Association for the Advancement of Science (AAAS); American Educational Research Association (AERA); the American Psychological Association; and the International Society of the Learning Sciences (ISLS).

The Evelyn Lois Corey Chair in Instructional Science was established after Evelyn Lois Corey '36, a veteran public school teacher in Oakland, honored the Graduate School of Education with one of the largest individual gifts to the school: a \$1.9 million bequest in 1986.

The inaugural Corey Chair holder was the late-Professor Ann L. Brown, followed by Professor Andrea A. diSessa, who retired in 2015, and Professor P. David Pearson, who retired in 2018.

ments who share an interest in improving teaching and learning. ■

EDITOR'S NOTE: For more about Professor Marcia Linn's work, see related story on page 22. Her full biography can be found at gse.berkeley.edu/marcia-c-linn.

Scott Named Birgeneau Chair

PROFESSOR JANELLE SCOTT HOLDS APPOINTMENTS IN THE GRADUATE SCHOOL OF EDUCATION, AND THE AFRICAN AMERICAN STUDIES DEPARTMENT



JANELLE SCOTT'S RESEARCH EXPLORES THE RELATIONSHIP between education, policy, and equality of opportunity, and centers on three related policy strands: the racial politics of public education; the politics of school choice, marketization, and privatization; and the role of elite and community-based advocacy in shaping public education.

She earned her undergraduate degree in Political Science at Berkeley, and her doctorate in Education Policy from UCLA. Her work has appeared in several edited books and journals, including the *Peabody Journal of Education*; *Educational Policy*; *American Educational Research Journal*; and *Harvard Educational Review*. She is the editor of *School choice and diversity: What the evidence says* (2005, Teachers College Press).

GSE PROFESSOR JANELLE SCOTT, whose research examines the relationship between education, policy, and equality of opportunity, has been appointed the Robert C. and Mary Catherine Birgeneau Distinguished Chair in Educational Disparities.

Scott has been a faculty member at UC Berkeley since 2008 and a longtime leader of the Race, Diversity and Educational Policy Cluster at the Haas Institute for a Fair and Inclusive Society (HIFIS), initially co-chairing the Cluster with Professor Na'ilah Nasir.

The Birgeneau Distinguished Chair in Educational Disparities is named for retired UC Berkeley Chancellor Robert Birgeneau and his wife Mary Catherine Birgeneau, who were advocates for increasing supports and representation for faculty and students of color.

"The Chair allows us to honor that legacy while also looking to our current and future challenges related to race, opportunity, and education policy. It has been wonderful to be a part of HIFIS's development. I am honored to have this work formalized with the Birgeneau Distinguished Chair, and look forward to continued dynamic collaboration across departments at UC Berkeley," said Scott, who holds dual appointments in the Graduate School of Education, and the African American Studies Department.

She plans to continue developing the course Research Advances in Race, Diver-

sity, and Education Policy, which highlights the scholarship of faculty members in the Cluster, and draws from research at the cutting edge of theory and empirical investigation, she said.

"I hope to continue bringing speakers to campus whose work insists that we confront issues of racial segregation, privatization, and economic inequalities that shape the kinds of unequal school systems, schools, and classrooms we have across the country. We are also looking forward to convening meetings with researchers, practitioners, and community members to engage these issues."

As chair of the Race, Diversity and Educational Policy Cluster, Scott plans to elevate the cluster's work by fostering and further strengthening the multidisciplinary research that investigates and intervenes on educational inequality.

"As we argued in our 2017 HIFIS policy report, such work must be focused on K-12 schooling, and framed with an understanding that growing economic inequality manifests itself in education policy in core ways: hyper segregation of students by race, income, and language in increasingly underfunded districts.

"This disinvestment results in high rates of teacher turnover, and in local polices that do not serve children who deserve more, and who would otherwise thrive. Universalistic, race-blind approaches often mask the specific needs of counties, districts, and local schools. And public education is facing challenges from well-funded efforts to privatize teacher preparation, school district governance, and the operation of schools themselves.

"We must understand how these efforts are situated in the troubling history of racial segregation and economic inequity in public schools, even as we offer a vision for a more democratic, equitable, and excellent system of public schooling." ■

EDITOR'S NOTE: *The 2017 HIFIS policy report, "Responding to Educational Inequality," can be found at haas.institute.berkeley.edu/raceeducationpolicybrief.*

NSF Grant Funds New Research on Student Interactions with Science Data

WRITING DATA STORIES is a new project that seeks to reorganize how young people, especially linguistically and ethnoracially minoritized students, learn about and interact with data. The project will engage middle school students in exploring scientific datasets about earth and the environment using flexible online data visualization and analysis tools.

Typically, school data investigations use small datasets that students create themselves, or larger datasets that clearly illustrate simple relationships and are less connected to students' lives. Our goal is instead for students to author "data stories" that reorganize everyday and scientific conventions to position students themselves and the complex issues they care about at the center of each data investigation. In the process, students will be supported in learning to elicit support for their cause, critically reflect on their experiences, craft scientific arguments, and manipulate or wrangle large datasets.

At the core of this reorganization is a "syncretic approach" in which students deeply study everyday and scientific ways of knowing or doing that are traditionally in tension. This approach was developed specifically to support learners from nondominant backgrounds, including students identified as Dual Language Learners.

We are interested in bringing together both experience and data. It is common for people to dismiss personal experiences as subjective and suggest that empirical data are objective truth. Of course, neither of these are correct – experience is empirical, and data are subject to measurement error, sampling error, bias, and omission.

What's more, personal experience can expose problems with data, and data can help situate and contextualize personal experience. Consider the Flint, Mich., water crisis: Official data analyses contradicted resident reports for years with tragic consequences; citizen science efforts where residents collected their own data eventually exposed the city's neglect.

Writing Data Stories similarly seeks to put students' personal experiences and public scientific datasets into direct conversation. In

this way, students' everyday knowledge and practices have equal value to scientific knowledge and practices, inviting students more authentically into the practices of science as they learn them.

While data serve as a powerful form of evidence that is valued in science, data is certainly not the only way that people convince one another of something. For example, in our first iteration of the curriculum, we are exploring advertisements as an everyday genre. Advertisements use a variety of conventions – emotional appeal, aesthetics, humor, celebrity endorsement, and yes, statistics – to sell a product. They also raise important questions that we don't

“We are interested in bringing together both experience and data. It is common for people to dismiss personal experiences as subjective and suggest that empirical data are objective truth.”

often ask, but should, about data: What assumptions are made about a population? Who is represented, and who is missing? What counts as a norm, a difference, and an outlier? Why are certain attributes of a person (such as ethnicity, income, popularity, age) recorded, while others are not?

Scientific reports of data analyses are often data- and evidence-rich, but often do not address these questions. They also rarely contextualize their findings in ways that call readers to action, or help them understand the everyday and human impacts of issues – both things that advertisements do very well.

Writing Data Stories has just started, and will continue for three years. In this first year, we will work with a small group of partner teachers to develop curriculum, software, professional learning supports. In years two and three, we will expand to serve more classrooms and students as we revise and share our curriculum. Given the interdisciplinary nature of the project, we expect that it will inform research in science education, data science education, and literacy education. ■



WRITING DATA STORIES: Integrating Computational Data Investigations into the Middle School Classroom is funded by a \$2.3 million grant from the National Science Foundation and led by GSE Professors Michelle Wilkerson and Kris D. Gutiérrez, in partnership with William Finzer and Natalya St. Clair at the Concord Consortium; Hollylynn Lee at North Carolina State University; and Anthony Petrosino at the University of Texas, Austin. Students conducting the research are undergraduates Nancy Jagueri and Ashley Quiterio; and graduate students Bryce Becker, Nicole Bulalacao, Krista Cortes, Kathryn Lanouette, and Lisette Lopez.



Professor Geoffrey Saxe Retires



PROFESSOR GEOFFREY SAXE, WHO STUDIES COGNITIVE development with a focus on mathematical cognition, has retired after 21 years at the Graduate School of Education.

Saxe has a long history with UC Berkeley, starting with earning his bachelor's and doctorate degrees in Psychology in 1970 and 1975, respectively. He returned to the GSE as a full professor in 1997 after a postdoc in brain-behavior relations at Harvard University and then appointments as assistant, associate, and full professor at the Graduate Center/City University of New York and later at UCLA.

"I am grateful for the opportunity to serve as a GSE faculty member," Saxe said. "Wonderful colleagues and extraordinary graduate students have provided me a productive and fulfilling period of ideas and research. It's especially rewarding to follow the careers and lives of my former students, and I find it difficult to leave my role as an instructor and mentor."

He will continue as Professor of the Graduate School, advising his remaining doctoral students, and he will co-teach a seminar in the fall with Professor Elliot Turiel.

Over his career, Saxe conducted basic research in a variety of settings focusing on the interplay between cultural and developmental processes in mathematical thinking; settings included remote parts of Papua New Guinea, urban and rural areas of northeastern Brazil, and classrooms in the United States. Saxe's more applied research focuses on the design of improvements in mathematics education for U.S. urban schools. His recent project, *Learning Mathematics through Representations*, engaged Saxe and collaborators in the development of a number line-based curriculum on foundational topics in elementary mathematics. The project led to extensive research and numerous publications for both researchers and practitioners. The most recent article will appear in *Educational Researcher*, a flagship journal of the American Educational Research Association. Saxe and Joshua Sussman show that the curriculum supports strong learning gains for students who are English language learners as well as their English proficient peers.

In addition to many articles and chapters, Saxe authored several books. Saxe published a monograph on his research with young children and their families, *Social Processes in Early Num-*

ber Development (with S. Guberman and M. Gearhart, SRCD Monographs, 1987). Saxe's well-cited book, *Culture and Cognitive Development: Studies in Mathematical Understanding* (1991) was re-issued in 2015. *Cultural Development of Mathematical Ideas: Papua New Guinea Studies* (2012) introduces innovative theory and methods to study culture-cognition relations. The book has won awards from scholarly societies in the cognitive sciences, including American Psychological Association; American Anthropological Association; and Cognitive Development Society. Saxe was also awarded a presidential citation from the American Educational Research Association in 2010 for the theory and research that led to the book.

To support his research, he has received major grants from the National Science Foundation; the Spencer Foundation; the Institute of Education Sciences; and the former National Institute of Education. To support doctoral training at Berkeley, Saxe received and directed a \$5 million training grant from the Institute of Education Sciences to support PhD students in the GSE; the Graduate Group in Science and Mathematics Education (SESAME); and the Psychology Department. Saxe has also received recognition from scholarly organizations, including a Fulbright in Brazil at the Universidade Federal de Pernambuco; and residential fellowships at the Center for Advanced Study in the Behavioral Sciences at Stanford University; and the Rockefeller Center in Bellagio, Italy. In 2005, he was elected to the National Academy of Education. Saxe is past President of the Jean Piaget Society, and past Editor-in-Chief for the interdisciplinary journal, *Human Development*. ■

Read more about Professor Geoffrey Saxe's work
Learning Mathematics through Representations
sites.google.com/view/lmrberkeleyedu/home
Cultural Development of Mathematical Ideas: Papua New Guinea Studies (2012)
culturecognition.com

Professor Susan Holloway Retires



PROFESSOR SUSAN HOLLOWAY, WHOSE INTERDISCIPLINARY approach to research explores the conditions that support parents' childrearing goals and practices, emotional well-being, and parenting self-efficacy, has retired after 22 years at the Graduate School of Education.

Much of Holloway's research has examined the connections between educational institutions and families from non-dominant groups as defined by their position at the intersection of social class, race/ethnicity, immigrant status, and/or sexual preference. She has conducted a substantial amount of work in Japan, and has worked with colleagues from Italy and China.

"I have really loved the many small but powerful moments that occur while I am teaching or doing research. It's exciting to me when a new idea emerges during a discussion with members of my research group," Holloway said. "Another favorite moment is when I run the first analyses on a new dataset and see patterns starting to emerge."

She has appreciated her Berkeley GSE colleagues for helping craft a research agenda that puts social justice at the forefront, moving her toward an interdisciplinary orientation rather than being rooted exclusively in developmental and family psychology

"Whereas I used to focus on the specific ways in which parents prepare their young children to succeed in school, I became more interested in how parents' ability to do what is best for their children is affected by the proximal conditions of their lives, such as whether they have access to high quality child-care," she said.

Coming of age in San Francisco during the 1960s and 70s, Holloway witnessed political struggles over the rights of people marginalized due to gender and race and saw first-hand many changes to local social institutions and structures, including family life. She originally envisioned a career as a clinical psychologist but changed direction after discovering a penchant

for research. Teaching and conducting research at UC Berkeley has allowed her to explore the problems and promises associated with significant social change.

Holloway earned a BA in Psychology at UCSC; and an EdS and PhD at Stanford University. She was named an NAED/Spencer fellow in 1988, and has twice been a Fulbright Scholar (Japan, 1994; and Italy, 2015). She has published several books, including *Contested Childhood: Diversity and Change in Japanese Preschools* (2000, Routledge); and *Women and Family in Contemporary Japan* (2010, Cambridge University Press). She also co-authored the book *Through My Own Eyes: Single Mothers and the Cultures of Poverty* (1997, Harvard University Press).

She will continue at the GSE as a Professor of the Graduate School, advising eight doctoral candidates. She plans to continue her research on the experiences of LGB-parent families in Italy and has begun work on a book examining the social and political effects in California of the incarceration of Japanese-Americans during World War II. ■

Read more about Professor Susan Holloway's work
berkeleyedu.wixsite.com/hollowaygroup



Making STRIDES Toward Improving Science Instruction

PLANTS EAT DIRT. Heat causes climate change.

While these statements aren't entirely scientifically accurate, they can serve as the beginning of deeper discussions and explorations.

"Students might think that plants eat dirt, and that's not a bad idea because there is something that plants take out of the dirt," said Professor Marcia Linn. "If a teacher responds, 'No, they don't eat dirt,' then you as a student may be embarrassed and decide not to contribute again. You're shut down. But if someone said, 'You're right, they eat the nutrients *in* the dirt,' then it's a completely different response and you as the student might be excited."

Underlying the student's comment is an understanding that putting a plant in dirt is valuable, an important step in learning about plant growth. Encouraging a student's further scientific exploration of photosynthesis (or any scientific lesson) requires helping teachers to understand a student's line of thinking, and come up with a response.

Expertise in Science). STRIDES develops and provides teachers with analytics about how their students understand target science ideas and concepts.

By integrating natural language processing in a web-based curriculum to automatically diagnose students' written science explanations and arguments that appear in their essays and/or diagrams, STRIDES can help teachers quickly grasp the range of their students' thinking.

STRIDES couples these analytics with recommendations for instructional strategies that participating teachers have tested. These suggestions help the teacher decide how to respond to students' ideas and guide students to further their understanding, which fosters a learning environment where students' ideas are respected and valued as a starting point for further investigation. Sometimes a student's idea expressed in an essay may seem odd, however their idea can make sense in the context of a classroom discussion, said doctoral student Korah Wiley, who is working with Linn and research director, Libby Gerard, on STRIDES.

A \$2.6 million grant from the National Science Foundation is allowing Linn's research group to do just that with STRIDES (Supporting Teachers in Responsive Instruction for Developing

"STRIDES creates space for student ideas that are captured by the computer in text to be available for exploration as opposed to just labeling [them] as right, or wrong," Wiley said. "Teachers can see the diversity of ideas and figure out how all of these ideas can be explored, and how students can really learn from one another and develop their ideas."

In studying the environment, students may explain that littering or heat from cars and factories is causing climate change. Rather than immediately correcting these lines of thinking with the answer, it is an opportunity for exploration. The teacher may, for instance, prompt the student to test their ideas using an interactive model featuring relationships between, littering, gasoline-fueled cars, and climate change processes.

The analysis of students' developing ideas generated by STRIDES analytic tools also provides teachers with opportunities to reflect on and refine their practice. Teachers can use the data to customize instruction and reflect on the impact of their customization after teaching it.

This reflection process may occur almost immediately when the summary of student thinking is generated; a few days later when reviewing the lesson; and during professional development workshops. It's an ongoing process supporting teachers as they refine their practice based on what they learn from students' work. "All the teachers who participate in the workshops come from different schools. They are teaching the same units, but with really different populations of students. Having the time to discuss how they responded to their students' ideas about the same science topic and how it worked, leads to this exciting bank of ideas that STRIDES can share with new teachers. It creates a really rich array of customizations for responding to students' ideas," Gerard said. ■



Mahasan Offutt-Chaney Named NAEd/Spencer Dissertation Fellow

BY ERIN CHAN DING
Contributing Writer

AS A RESTORATIVE JUSTICE PROGRAM coordinator at her alma mater Berkeley High School, Mahasan Offutt-Chaney started wondering about how her everyday work intersected with educational policy.

She began asking, “How are some students in particular, like black students, over-policed and penalized and suspended in school? How are schools practicing punitive practices?”

This led to questioning how educational practices are influenced by larger social policies and such thoughts as, “How do we fix schools for low-income students if we don’t have a more robust social policy structures? How do we think about the political economy of education in order to influence policy?”

Says Offutt-Chaney: “We think about schools as implementing these punitive discipline practices, and we don’t really think about the larger policies that sanction some of those behaviors and practices.”

Offutt-Chaney has spent seven years diving into the intersection of punitive practices such as police officers on campus and rates of suspension, and of federal educational and social policy – while studying how these policies affect poor populations in the context of race – for her dissertation at UC Berkeley.

When the GSE doctoral candidate found out this spring she’s the recipient of a 2019 National Academy of Education Spencer Dissertation Fellowship (NAEd/Spencer; which comes with a \$27,500 stipend), Offutt-Chaney made plans to do additional archival research before finishing her thesis next year.

Her research delves into the implications of the three eras when there were significant shifts in federal educational policy: 1965-1969; 1980-1989; and 1993-1998.

Because her work focuses on social policy and federal education programs in those eras, Offutt-Chaney has visited a trio of presidential libraries: the LBJ Presidential Library in Austin, Texas; the Ronald Reagan Library in Simi Valley, Calif.; and the William J. Clinton Presidential Library & Museum in Little Rock, Ark. She’s also done research at the National Archives in Washington, D.C., and the Richard W. Riley Collection at the University of South Carolina. (Riley served as the U.S. Secretary of Education from 1993 to 2001.)

In the mid-1960s, due in part to the U.S. Supreme Court’s landmark decision, *Brown v. Board of Education*, the federal government began enacting the anti-poverty education program, Title I of the Elementary and Secondary Education Act in 1965.

Offutt-Chaney’s research is set against the backdrop of the common historical narrative framing 1960s federal education policy making; and by the 1980s,

buoyed by the *Nation at Risk* report, educational discourse shifted to outcomes and standards tied to federal money.

“My research intervenes into this history and looks at how federal policy makers also made school discipline and unruly behavior a central focus of the ‘Nation at Risk,’” she said.

“In the 1990s, we start to see more of what was happening in the ‘80s become crystallized under the Clinton administration, particularly as safe and disciplined schools became one of the goals of new federal reforms,” she said, noting that those efforts, combined with funding cuts to education and higher expectations for people in poverty, would become the driver for the No Child Left Behind Act of 2001.

“What some policymakers might term ‘educational opportunity programs’ have a discipline component that ultimately – like other anti-poverty programs – work to punish the poor,” she said.

Offutt-Chaney plans on beginning postdoctoral work at the Center for the Study of Race and Ethnicity in America at Brown University in Providence, R.I. She’ll teach there and envisions a book stemming from her dissertation research.

“It’s fun work to do academic stuff, in the sense that you can set your own schedule, you get to research things you’re interested in,” she says. “I’d like to do this for as long as I can.” ■

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DR. IBRAM X. KENDI (SECOND FROM LEFT), PROFESSOR OF HISTORY AND INTERNATIONAL RELATIONS AT AMERICAN UNIVERSITY, WAS THE FEATURED SPEAKER AT THE 2019 ANNUAL GSE DEAN'S FORUM. (PHOTO BY PEG SKORPINSKI)