



ANDREW BRANTLINGER is looking forward to working with inservice mathematics teachers in PGCPs and MCPS through different initiatives. He also is excited about the possibilities of (re)starting a STEM teacher pipeline initiative with PGCPs. And, finally, finishing some half-written papers with a number of TLPL doctoral students.



DANIEL CHAZAN is preparing for a long postponed sabbatical in 2020. He's looking forward to the chance to read more, write more, and re-energize. Sabbatical projects include: a book about innovative representations of instruction and teacher education; beginning to write about the Terrapin Teachers Initiative; and a new project on automatic assessment of students' concept images based on examples submitted in online environments.



LAWRENCE M. CLARK is working on three projects: 1) Mathletics. NSF funded; focus on middle school African American and Latino students; engagement and enrichment project: data fluency and statistical applications in sports contexts; exploring tensions between athletic identity and STEM identity development; 2) Implicit Perceptions Project: A Comparison of Preservice Teachers' Perceptions of Student Thinking, Student Ability, Student Mathematical Practices, and Teacher Practices in Racialized and De-racialized Depictions of Mathematics Classroom Interactions; 3) MSDE-funded UMD PDS 2025 Project - development of four 'demonstration' PDS schools in MCPS and PGCPs; development of a Mentor Teacher Academy; year-long internship and career ladder (Kirwan Commission recommendation).



IMANI GOFFNEY will continue working on two of her previously funded research projects from NSF and from a private foundation in Texas, focusing on equitable mathematics teaching practices in elementary and middle school classrooms. She is looking forward to completing a few manuscripts, drawing on data from this work. She also currently leads the elementary mathematics methods group who use her NSF funded curriculum. In addition to TLPL 711 Research on Mathematics Teaching, she will also be teaching a newly designed course for the Honors College entitled From Oakland to Wakanda- Reimagining American Public Education, with an emphasis on STEM Education.

DANA GROSSER-CLARKSON is looking forward to continue working in the Terrapin Teachers program and specifically



teaching Math 470 for the second time. She is using this course to help develop positive mathematics identities for our future teachers. Dana is planning to work with CfME doctoral students to explore several aspects of this course this spring.



CAROLINA NAPP-AVELLI will be teaching the first part of the two-course math methods series for the second cohort of the renovated CITE Program, CITE 2.0, as well as continuing the recruitment efforts for the third cohort of CITE 2.0. She will also supervise three MCert secondary math students and six undergraduates, in mostly middle school mathematics.



BEATRIZ QUINTOS will welcome a new cohort in the Master's in Middle Grades Mathematics. She will continue to work on the design of the first Study Abroad course in México with a focus on STEAM education and sustainability, as well as outreach and research to support elementary and middle school teachers of multilingual learners.



ANGELA STOLTZ will continue working with our Middle School Science and Mathematics interns in their coursework and field placements. She is also working to develop sustainability education initiatives such as the STEAM Education Study Abroad course in Mexico and icourses for the UMD 2020 Solar Decathletes. She will represent the College of Education as a UMD faculty lead for the university's 2020 World Solar Decathlon entry. She plans to establish a Design for Sustainability Center on campus.



JANET WALKOE is working to design and implement a set of fourth-grade math-computational thinking lessons, in which students program Sphero robots (sphero.com) to learn math and computational thinking concepts. Her interests in the project include teacher attention to children's multimodal and embodied thinking as they program the robots and children's learning of early algebra concepts. This work is a partnership with DC Public Schools and is funded by the Spencer foundation and the Department of Education. The second project explores the design and development of teacher PD to help support teachers in attending and responding to children's multimodally expressed ideas in middle school algebra classrooms.



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CENTER FOR MATHEMATICS EDUCATION (MathEd)

Recruitment and Retention of African Americans in the Pursuit of Doctoral Studies in Mathematics Education

by Daniel Chazan



In 2019, we celebrated the Centennial Anniversary for the College of Education at the University of Maryland and, in 2020, the centennial of the National Council of Teachers of Mathematics.

Marking the passage of time has its ambivalences. On the one hand, we are proud to be a part of mathematics education, an established profession that has a 100-year history in the United States and to be affiliated with such an established college of education. On the other hand, our history includes actions and policies that we seek deliberately to change. After all, 100 years ago, U.S. public schools were segregated with the support of the law, and almost no African Americans had earned doctorates in any field, let alone mathematics education.

Seeking to mark the changes that we have made over the last 100 years and will make in the future, this issue celebrates ways in which the Center for Mathematics Education at the University of Maryland has been at the forefront of creating opportunities for African Americans to study for doctorates in mathematics education and to serve and excel as faculty in higher education in the United States.

The University of Maryland has produced PhDs in mathematics education since the 1960s, if not before. From the records we have been able to unearth, beginning in 1970, 17 African American women have earned doctorates in the Center for Mathematics Education, with three more candidates currently enrolled. The following article covers this in more detail, including a quote from an interview with Martin Johnson on the recruitment of doctoral students of color.

We pursue a related theme about change over time by focusing our alumni spotlight on **Jacqueline Leonard** and her exploration of the mathematics education of five generations of women in her family.

The fall of 2019 brought a number of milestones for members of our community. First, a warm welcome to **Francesca Henderson**, our newest Fey-Graeber fellow and first-year doctoral student. Francesca comes to us from San Diego – welcome! Congratulations also to **Dr. Diana Bowen** (Assistant Professor of Mathematics Education University of the Virgin Islands), **Dr. Angela Stoltz** (Clinical Assistant Professor, University of Maryland), **Dr. Edward Nolan** (Master Teacher, Towson University), and **Dr. Darrian McCarter** (Assistant Principal, DC Public Schools) who defended their dissertations in 2019.

Congratulations also to **Willy Viviani** and his wife Marta on the birth of their son, Vito, and to **Kelly Ivy** and her husband, Mark Ivy, on their son, Kingston.

On a more somber note, please join in remembering **Dr. Karen Denise King** – a program director at the National Science Foundation and one of CfME's alumni – who passed away at much too young an age on December 24, 2019. There will be a number of events in Karen's memory in 2020. CfME will be naming one of its yearly colloquia in her memory. Contributions in Karen's memory to support the colloquia can be sent to the Center for Math Education Fellowship fund <https://ter.ps/KarenKing> and designated in her memory.

CENTER FOR MATHEMATICS EDUCATION

(CfME) is a nationally prominent center for research and teaching addressing the improvement of mathematics education in K-16 and informal settings. We promote innovation in teacher preparation programs and focused outreach efforts to local urban schools. The promotion of access and participation of minoritized students in mathematics education is a tangible CFME commitment.

COLLEGE OF EDUCATION
UNIVERSITY OF MARYLAND

CfME Doctorates: Celebrating African American Women

By Holly Leber Simmons

AS THE UNIVERSITY OF MARYLAND College of Education celebrates its centennial, and we continue to struggle with our racial legacies, we celebrate the African American women who have earned and are earning doctorates in mathematics education at the University of Maryland. Our graduates play important roles in our national efforts in mathematics education.

“Representation matters,” said Kelly K. Ivy, a fifth-year doctoral candidate in CfME. “Having more women of color studying math education lets other women of color and other girls know that it’s attainable, it’s something they can do, it’s an option.”

Ivy, a St. Louis native, is currently working on her dissertation proposal while raising a 17-month-old son. Throughout her studies, she has concentrated on blending math instruction with culturally responsive teaching, an ongoing interest of many of the CfME’s faculty, alumni, and current students.

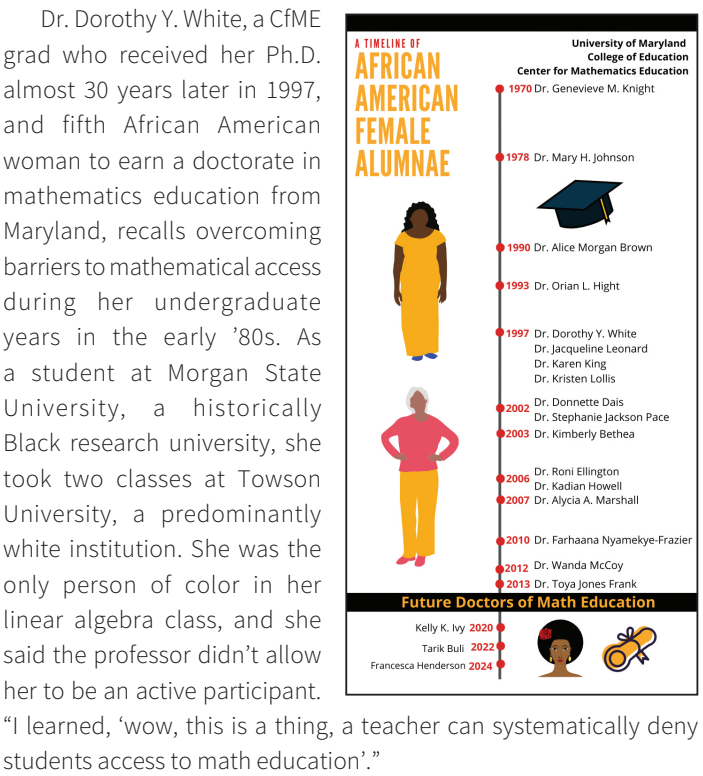
“You can teach math without context, but if you can find a way to develop it within the students’ culture, they are more likely to want to study it,” said Dr. Martin Johnson, professor emeritus, and a former director of the CfME. “Many of us believe that math should be relevant.” Dr. Johnson noted that many students want to know how math will be relevant to their lives – how are they going to use it?



Doctorate students Kelly K. Ivy, Tarik Buli and Francesca Henderson.

Beyond her dissertation, Ivy’s longterm goal is to create a professional development center for in-service teachers that would provide culturally responsive training and workshops. As she has pursued her studies, one of her mentors has been Dr. Mary Johnson, the second woman of color to receive her doctorate in math education at the University of Maryland, graduating in 1978 (no relation of Dr. Martin Johnson).

The first black woman to receive her doctorate from CfME was Dr. Genevieve Knight, who earned her degree in 1970. Dr. Knight is one of the cofounders of the Benjamin Banneker Association, a national nonprofit organization dedicated to mathematics education advocacy and to support teachers in “leveling the playing field for mathematics learning of the highest quality for African-American students.”



Dr. Dorothy Y. White, a CfME grad who received her Ph.D. almost 30 years later in 1997, and fifth African American woman to earn a doctorate in mathematics education from Maryland, recalls overcoming barriers to mathematical access during her undergraduate years in the early ’80s. As a student at Morgan State University, a historically Black research university, she took two classes at Towson University, a predominantly white institution. She was the only person of color in her linear algebra class, and she said the professor didn’t allow her to be an active participant. “I learned, ‘wow, this is a thing, a teacher can systematically deny students access to math education’.”

Today, Dr. White is the first and only tenured black female math educator at the University of Georgia. And, she points out, there are many universities where that number is zero. “There are places where there is a void for students to help them navigate that space [of becoming a faculty member in mathematics education],” she said. “There are a whole lot of experiences we lose out on if we’re not at the table. Diverse perspectives are important to have as we build math education for our kids.”

The College of Education and its Center for Mathematics Education (CfME) recently welcomed its 20th Black female doctoral student in mathematics education, Francesca Henderson of San Diego.

Henderson plans to focus her work on racialization in mathematics, focusing specifically on African American and young women – looking at how a student’s racial and ethnic identity impacts how the student learns, how the teacher teaches the student, and how the student navigates school.

“Your ethnicity, for many people, is going to be the first thing that people see. And with that comes a set of implicit biases. So that is going to have an impact on how you navigate your educational experience. If we want things to change, we need to diversify who’s in this space,” she said. “There’s this seemingly intentionality of leaving us out. And when I say us, I mean black women, I mean black people, I mean a lot of people of color and it’s just really time to change that because we need a seat at the table. We have a valuable voice.”

ALUMNI SPOTLIGHT: Jacqueline Leonard

A Career Educator Examines Where We Are Going by Looking at Where We Have Been

By Francesca Henderson and Dr. Beatriz Quintos



Dr. Jacqueline Leonard

Jacqueline Leonard currently serves as a full professor and the director of the Science and Math Teaching Center at the University of Wyoming. She is a career educator. She received her BA in elementary education at Saint Louis University, then taught mathematics for 15 years while earning two Master’s degrees along the way. She earned her first Master’s degree in teaching mathematical sciences from the University of Texas in Dallas and her second in theology from Southern Methodist University. She studied at UMD from 1994-1997, earning a Ph.D. in mathematics education after only three years of study and scholarship.

Dr. Leonard has served at five institutions across her illustrious career. She was an assistant professor at Temple University and Southern Illinois University, then earned full professor status in 2001 at Temple University, before moving to the University of Colorado in Denver.

Dr. Leonard is passionate about issues of culturally responsive pedagogy, equity, social justice, STEM education, and technology education. She has addressed these issues in works such as her book, *The Brilliance of Black Children in Mathematics: Beyond the Numbers and Towards New Discourse*. She further examines these issues in her article, “Mathematics Literacy, Identity, Resilience, and Opportunity Sixty Years Since *Brown V. Board*” (2017). This piece examines the history of five generations of women in one “African American family whose roots began in rural Mississippi in the 1860s, nearly one hundred years before *Brown v. Board*” (p.80) and extends into the present to a great-granddaughter learning through technology in a public school system with de-facto segregation. She shares the stories of Lou Ellen, Bernice, Belinda, Rita, and Zoe. Using these four Black women and one Black girl’s mathematical biographies as case studies, she highlights how the intersection of their Blackness and their womanhood impact how they were both able to and not able to access mathematics learning.

The Center for Math Education is excited to join the College of Education in reflecting on our history to inform the future. In this article, we look through the lenses of one of UMD’s esteemed alumnae, Jacqueline Leonard. She did what we hope to do: use the past to look toward a brighter future.

The stories of these women communicate resilience, struggle, and triumph. Both Lou Ellen and Bernice went through the education system prior to *Brown v. Board of Education* (1954). They had to balance family obligations, segregated society, and were often isolated in their education. Nevertheless, these women seize opportunities to advance their education by moving to larger cities and persisting through adversity. They also encouraged their descendants to value education. Belinda and Rita grew up during the desegregation era. In contrast to Lou Ellen and Bernice, Belinda and Rita were read to regularly as children, received help with their math homework, and viewed college as an attainable goal. Lou Ellen and Bernice’s persistence and educational success through their struggles, transformed their struggles to opportunities for their daughters. Belinda and Rita earned bachelor’s degrees, attended Ivy League colleges, and had success in their educational careers. Zoe, nine years old when the article was written, had even more educational opportunities than the women who came before her. She had support from her grandmother, her mother, and her school. Through the lives of these women across five generations, we see the impact of the socio-historical context as well as the power of these women’s resilience.

“What remains to be seen is whether the nation turns the corner...to deeply invest in the mathematics education of African American females.”

How can these histories inform how we move forward in mathematics education? These stories are significant because the threads of familial support, economics, and resources are vital for the progression of mathematical learning and retention. At the end, Dr. Leonard makes a critical call when she says, “What remains to be seen is whether the nation turns the corner...to deeply invest in the mathematics education of African American females.” (Leonard et al, 2017, p. 103). How can we thoughtfully engage, invite, and retain African American women in mathematics? Dr. Leonard is one of a small number of Black women who have earned doctoral degrees, and part of an even smaller subgroup of Black women to receive their Ph.D. in math education. In reflecting on our 100-year history, we look to the future, with our current doctoral students thinking deeply about this charge and carrying on the legacy of African American women in mathematics.

CFME INTERNATIONAL COLLABORATIONS

By Lucia Davila and Beatriz Quintos

CAROLINA NAPP-AVELLI, clinical assistant professor in the Center for Mathematics Education, and YOLANDA YAXÓN, an indigenous Mayan and Guatemalan mathematics education leader, broke many borders to present at the National Council of Teachers of Mathematics (NCTM) Annual Meeting. Carolina Napp-Avelli and Yolanda Yaxón have worked virtually for over two years to generate change in the school where Yaxón works in Guatemala, in particular for a mathematics education that empowers girls. Their presentation “*Global Lessons from Rural Guatemala on the Empowerment of Women and Girls through Mathematics*,” included Yaxón’s story. Born in a remote rural community in Sololá, Guatemala, she had to work every morning at a tortillería making tortillas and go to school in the afternoons. She did her homework at night and worked during the weekends. She was able to see her family only a few days at the end of every month.

After years of hard work, as she says, “*With my sacrifices and my parents’ support, I made it!*” Yaxón graduated as a bilingual and intercultural elementary education teacher with a specialty in mathematics and computer skills. Yaxón now works at a girls’ leadership academy as a math teacher. She teaches students from similar backgrounds and home environments. Their shared experiences create a strong connection.

“They are the new generation who will bring change to their families and their community,” Yaxón said of her students.



Yolanda Yaxón, Carolina Napp-Avelli, Alix Van Zandt, Richard Scott, Chadd McGlone, Enrique Ortiz, Eduardo Basurto y Eduardo Mancera at the NCTM Annual Meeting.

Their work is leading a cultural shift toward empowering women. Yaxón is now a mathematics leader, thanks to T2TGlobal and the nonprofit MAIA.

CfME faculty members continue to work with T2TGlobal. Andrew Brantlinger returned for the fourth time to Guatemala to collaborate with teachers in a middle and high school. Beatriz Quintos returned to Galapagos for the fourth year of professional development. Furthermore, CfME faculty are piloting a Study Abroad course in Guanajuato, México in STEAM Education for Sustainability.

DR. JULIUS DAVIS



DR. JULIUS DAVIS was a postdoc in CfME with Dr. Lawrence Clark during the 2011-2012 academic year. He is now an associate professor of mathematics education at Bowie State University in the Department of Teaching, Learning, and Professional Development where he is the program coordinator for the Masters of Arts in Teaching.

For critical scholars interested in the education of black youth, as well as practicing teachers who want to know more about culturally relevant pedagogy, the work of Dr. Julius Davis lies right at this intersection. While his research is focused on racial equity and Black teachers and students, he also actively partners with schools and districts to provide informative professional development for culturally responsive STEM teaching.

After receiving his doctorate at Morgan State University in Baltimore, Dr. Davis chose to join the CfME so he could continue his research, which focused on serving Black students in urban

areas. He was particularly interested in continuing his research in Baltimore schools. Unexpectedly, however, due to the politics of gentrification in Baltimore, the school he was originally working with closed. He ended up developing a new line of research with the center, which focused on Black male math teachers through the Case Studies of Urban Algebra I Teachers research project.

His work with the CfME also allowed him to gain experience teaching more mathematics education courses. He taught with Dr. Clark before taking over his own courses, which he found helpful experience for teaching at the collegiate level. In particular, he appreciated the opportunity to develop collaborations with his colleagues. He found the collaborative nature of his work at the center to be an enhancement overall to his professional experience. Being able to work across the center with doctoral students and faculty on projects such as a summer research camp, an AERA symposium, and a special issue of Teachers’ College Record were opportunities for which he was especially grateful. The mentorship, support, and guidance that he received played an integral role in helping him develop and understand his role as a faculty member and researcher. The relationships he formed at the center are ones he still maintains today and he appreciates being able to continue to collaborate with the people he met through the CfME.

~ Kristyn Lue and Margaret Walton