MATH MATTERS

let's start off with the people who have left and those who are coming on board. Johnsonsuccessfully moved on to a tenure track position at Morgan State University. Hollenbeckwent back to full time teaching at River Hill HS in Howard County (though he still teaches a course a semester for us), and moved on to work for the department and the dean's office. To take on some of the responsibilities that were left vacant, was hired on as a PDS coordinator for secondary mathematics, and , a graduate of the University of Arizona, and a graduate of Northwestern University, will be joining us as clinical faculty.

I was promoted to full professor. and all completed their PhDs. completed his MA, won an award from the college, and has joined our doctoral program. In addition, is our newest Fey-Graeber fellow.

The college reorganized and we are now a part of the within the The CfME fits into a larger ecology of STEM education efforts on campus, including efforts on undergraduate education, teacher education, outreach, research, and more. The CfME will increasingly move to center its activities around its research agenda.

We continue to explore and to work more closely with colleagues in science and technology. and I have grants from MSDE to investigate the creation of coursework for elementary STEM certification. With support from the Center for Teaching Excellence, we've brought together a group of faculty fellows from Engineering, the College of Computers, Mathematics, and the Natural Sciences (CMNS), and Education to consider what STEM means, what elementary teachers are like as learners, and how we might create coursework and programs. The new MSDE STEM standards seem to open up possibilities for innovative instruction in schools, including in mathematics. It is exciting to consider the role that mathematics might play in such endeavors.

Our MAC-MTL grant will be ending in the fall of 2013 and the research projects are reaching their publication phase. The Case Studies project has a special issue coming out in 2013 in the Teachers College Record. It will be on the web shortly. The Quant project has articles in review in several leading math ed journals.

continues to be a priority. Our second PGCPS cohort of elementary certified teachers interested in middle grades math and our third MCPS cohort will graduate next year. We have a new MCPS cohort launching this coming year, and Beatriz Quintos and I were successful on an ITQ grant with support for 40 PGCPS teachers to take 6 credits to prepare for the Common Core Standards with a focus on numbers.

We have continued to explore new pathways for . This past year we were active in recruitment and this year a cohort of Middle Grades MCERT Math and Science will be launched, as well as a cohort of undergraduates seeking the same certification. We continue to explore support for teacher candidates: Noyce grant application was successful and the first cohort of Noyce scholars has been chosen. We continue to work toward the institutionalization of the MSMaRT program.

So, as you can see, it was a busy and productive year with lots of change. We're looking forward to another such year in 2012-2013.

Daniel Chazan

I spent the past year redesigning our elementary math methods courses around core practices that particularly embrace mathematics as a necessary tool for global competency. As I work to implement this new design, I am also exploring web-based personal learning networks and the use of social media for helping pre-service teachers make professional global connections. The redesign effort has afforded me the

My recent research interests and projects have consisted of developing a framework of mathematics teacher knowledge that incorporates teachers’ knowledge of students’ experiences inside and outside of the mathematics classroom and the ways these experiences position students to see themselves as competent mathematics learners. I am using data from various research projects (including the Center for Mathematics Education’s Quant project and Case Studies project) to build the teacher knowledge framework and develop artifacts of practice that can be used in teacher education and professional

University of Maryland’s Elementary STEM Certification

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Speed cameras, satellite imagery, solar panels, wireless internet connections, portable digital music players, artificial hearts, hybrid cars...

We live in an age in which technology has seamlessly saturated virtually all aspects of our daily lives and it has thus become increasingly crucial that our schools prepare all of our children with the technological savvy necessary to function productively in modern society. This means preparing them with the knowledge, skills, and habits of mind essential to not only become democratic citizens able to participate in the technologically-driven decisions that affect their individual lives, but to be able to take part in the innovative workforce necessary for our nation’s domestic economic prosperity and competiveness in the global market.

It is being increasingly recognized that such preparations must be explicitly addressed within the classroom particularly in what has become known as an integrated approach to STEM (science, technology, engineering, and mathematics) education. As a former elementary school teacher, I strongly feel that progress in the enhancement of STEM education requires not only curricular restructuring but also teacher professional development and this is why I am so excited to be a part of the University of Maryland’s Elementary STEM Certification program.

With support from MSDE, faculty across the colleges of Education, Mathematics, Natural Sciences, and the i–School are coming together in an effort to redesign content courses to meet the needs of certified elementary teachers seeking specialization in STEM, as well as to create a new concentration in STEM for pre-service teachers. The program will integrate technology and design principles to create a coherent set of courses that will bridge the content knowledge and pedagogical expertise to create an atmosphere of excellence and equity in the local schools. Furthermore, in order to bridge the world of the University with that of elementary schools, the project’s advisory group includes researchers from UM, district leadership, and exceptional STEM teachers from both Prince George’s County Public Schools and Montgomery County Public Schools.

The impact technology and innovation is having on modern society means it is becoming increasingly crucial for members of the education community to prioritize STEM education. The University of Maryland is taking up the charge in this effort by expanding and enhancing the pedagogical STEM content knowledge and skills of pre-service and in-service teachers to the benefit of all our students.

Become Prepared for Middle-Grades Teaching

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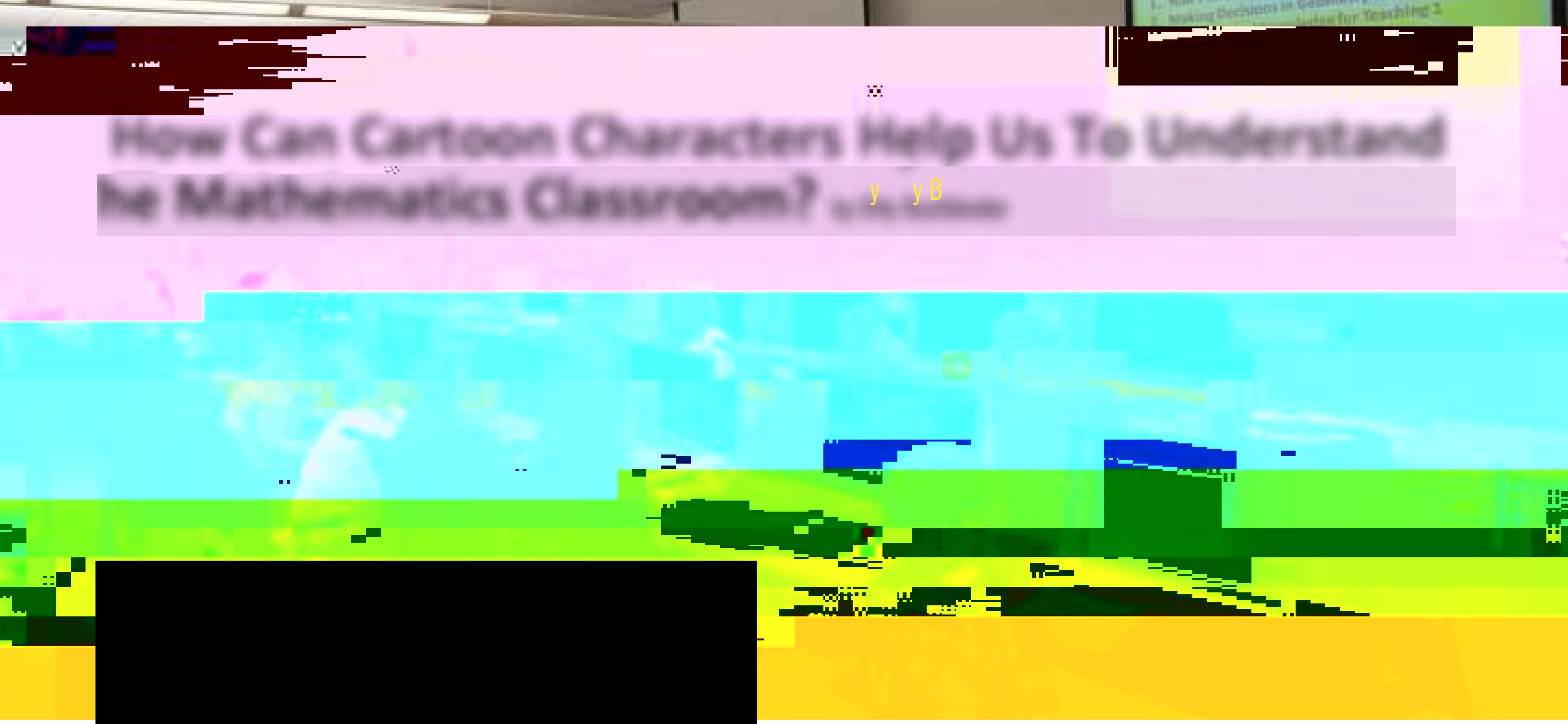
The State of Maryland now requires certification for middle-grades level teaching (Grades 4-9), and UMD offers unique middle school mathematics and science programs to prepare candidates for this certification. The demand for highly qualified middle school science and mathematics teachers is great, and I’m thrilled to return to Maryland, after a two-year absence, to coordinate these new programs.

Several years ago, Rick Hollenbeck and I, in collaboration with other faculty and staff in the department, designed an undergraduate major in middle school mathematics and science. This program was approved by the University and by the State, and this year we have our first students (freshman and sophomores) to select this as their major. One novel feature of the middle school major is an early field experience in middle schools during the sophomore year. This field experience is paired with a new course (EDCI 297), is designed to help pre-service teachers gain insight into the structures of schools, develop awareness of the backgrounds, needs, and expectations of students, and consider ways to make connections with local communities.

In the Master’s Certification program (MCERT), candidates with an undergraduate degree can earn a Master’s degree and certification in middle school math or science (or both). In both the Master’s and undergraduate programs, in addition to courses in mathematics and science teaching methods, candidates take a new year-long methods course, Interdisciplinary Middle School Teaching Methods, designed to help prospective middle school teachers plan for and help their students to engage in learning across traditional disciplinary boundaries.

How Can Cartoon Characters Help Us To Understand he Mathematics Classroom?



but researchers involved in the ThEMaT (Thought Experiments in Mathematics Education) project believe that cartoon characters can be useful in understanding mathematical practices in real classrooms.

The LessonSketch.org website, which was created by the University of Michigan in cooperation with the University of Maryland, is a free on-line environment that uses cartoon representations of interaction between teachers and students in mathematics classrooms. This environment presents unique opportunities for teacher education and for research as well. LessonSketch has a collection of classroom stories, in the form of animations, representing both customary and non-standard teaching. Some animations include several alternative scenarios for the same story, showing how classroom events might unfold depending on different instructional moves by the teacher.

We In addition, LessonSketch has a variety of tools which allow the users to create cartoon slideshow, tailored for specific needs, as well as to pose questions about the slideshows, ask for comments or invite others to compare several possible actions and rank-order them. These features allow for creating a whole experience involving rich media representations of teaching.

This spring, the ThEMaT project team invited over 60 middle and high school teachers from several counties in Maryland to participate in a multi-day event focused on LessonSketch experiences. By interacting with animations and slideshows depicting classroom interactions on LessonSketch,
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The MSMaRT Program Continues to Expand and Make a Difference

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> ***"I was looking for a program that would allow me to make the transition into the classroom easier and sooner than going to traditional school, because I already have two master's degrees. I wanted to teach…because teaching has shaped who we are, and I wouldn't be who I am without teachers."***

The Maryland Science and Mathematics Resident Teacher (MSMaRT) Program continues to grow with each passing year. Last year, we worked with Prince George's County Public Schools to prepare 10 teachers for middle school mathematics and science classrooms. This year, we are working to prepare 12 math and science teachers that will make an impact on students in middle school classrooms. The MSMaRT Program recruits individuals with a mathematics or science background who are looking to change careers and make a difference in public school classrooms. Our resident teachers have backgrounds in pharmacy, engineering, finance, and more. Don't listen to me! Just read what one of our candidates said, "I was looking for a program that would allow me to make the transition into the classroom easier and sooner than going to traditional school, because I already have two master's degrees. I wanted to teach…because teaching has shaped who we are, and I wouldn't be who I am without teachers." Currently, the MSMaRT Program is recruiting individuals to be a part of our third cohort, and so far, we are thrilled with the quality and quantity of people who want to become middle school math and science teachers.