2012

ANNUAL REPORT

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Introduction

Established March 1, 2006, the KCM (Kentucky Center for Mathematics) supports diverse teacher and student populations across the commonwealth. The work of the KCM is guided by the following five objectives:

Clearinghouse
The center acts as a clearinghouse for information about professional development programs for teachers that addresses mathematics diagnostic assessment, intervention programs, coaching and mentoring programs, and other instructional strategies.

Collaboration
The center collaborates with Kentucky's public and independent postsecondary institutions and other organizations to develop teachers' mathematical knowledge with a focus on improving student achievement.

Development of Teacher Leaders
The center provides teacher training to develop teacher leaders and teaching specialists in primary programs who have skills in diagnostic assessment and intervention services to assist struggling students or those who are at risk of failure in mathematics.

Advising
The center advises the Kentucky Education and Workforce Development Cabinet, the Education Professional Standards Board, the Council on Postsecondary Education, the Kentucky Department of Education, the Kentucky Board of Education, and the Committee for Mathematics Achievement regarding improving student achievement in mathematics in the commonwealth.

Dissemination
The center disseminates information to teachers, administrators, and policymakers on mathematics education and improving student achievement.

The KCM utilizes research-based strategies to facilitate improvement in teaching practices, which in turn leads to improved student achievement in mathematics. The KCM maintains a broad and comprehensive focus on mathematics education and educators, ranging from early childhood to adult education. At the heart of the KCM's mission is the recognition that mathematical proficiency is a critical component through all stages of a student's life, leading to college and career readiness. This annual report contains highlights of the KCM's statewide work, July 1, 2011 to June 30, 2012.

Professional Development Offerings

Between July 1, 2011 and June 30, 2012, the KCM's (Kentucky Center for Mathematics) Primary Mathematics Intervention Program provided eight different types of formal professional development experiences, all intended to grow primary grades teachers' abilities to most effectively assess and advance student number knowledge, with an eye on expected learning progressions. The courses listed here, preceded by the number of participants for each, were held in different Kentucky locations, including Hazard, Bowling Green, Lexington, Louisville, Highland Heights, Bardstown, and Marion.

99	KCM Preconference Day
13	Assessing Number Concepts
40	Add+Vantage MR (Math Recovery) 1 Refresher
25	Add+Vantage MR 2 Refresher
4	Delving into Differentiation
45	SNAP (Student Numeracy Assessment Progressions)
50*	KNPI (Kentucky Numeracy Project Intensive), including Add+Vantage MR 1 and 2
7*	MRIS (Math Recovery Intervention Specialist) Course

The numbers above without an asterisk represent experienced mathematics intervention teachers who continued their learning during 2011/2012. Of the 57* first-year intervention trainees attending either KNPI or MRIS, 44 earned the distinction of officially becoming "KCM Intervention Specialists." This means they each successfully completed very rigorous requirements: 10 days of training, three collegial team meetings, weekly online meetings, study of professional literature, written reflection, recording and sharing video, assessment project, and case study. Whereas in the past first-year intervention cohorts were predominantly comprised of mathematics intervention teachers from schools receiving Mathematics Achievement Funds, during 2011/2012 the majority of novice trainees were from other groups. Thanks to the collaborative efforts and sponsorship of the Kentucky Valley Education Cooperative, the Central Kentucky Education Cooperative, and the Northern Kentucky Cooperative for Educational Services, the new cohort included educators from various backgrounds/roles, including mathematics intervention teachers, special education teachers, classroom teachers, and mathematics leaders.

Regional Coordinators

The nine KCM Regional Coordinators, funded through KCM contracts and working in affiliation with the eight state universities and one educational cooperative, logged field work and service as follows:

3	Family education events
20	Meetings with education leaders
47	Meetings with statewide math leadership networks, including several presentations
176	Online meetings supporting teachers
45	Sessions working with students
230+	Days of in-person group training
140+	Coaching & mentoring visits to classrooms

In June 2012 three of the nine KCM Regional Coordinators became Add+Vantage MR Champions and SNAP Facilitators, growing the KCM's internal leadership capacity to seven qualified professional development providers.

ELEMENTARY

During the 2011/2012 school year, 110 MAF (Mathematics Achievement Fund) schools from 69 counties each received $43,666.22 from the KDE (Kentucky Department of Education) for salary, materials, training and travel of the primary grades mathematics intervention teacher. The 2011/2012 MIT (Mathematics Intervention Teacher) Handbook and KDE Assurance, containing the official MAF/KCM guidelines and requirements, are posted on the KCM Archive webpage. Whereas the data collected for 2011/2012 has not yet been analyzed, a sample of the extensive existing evidence of success is shown in the graphs below. The table (lower right) shows the number of MAF grant awards currently funded. The table above that (mid-page right) lists the level of experience (and, thus, expertise) of the MAF MITs, seven of whom served at two schools. In addition to working with students, MITs led over 1300 hours of professional development for other teachers, strengthening their own knowledge while maximizing the benefits of the MAF! Although MITs directly serve approximately 2,750 students per year, through collaboration and leadership, they indirectly serve about 22,000 additional students.

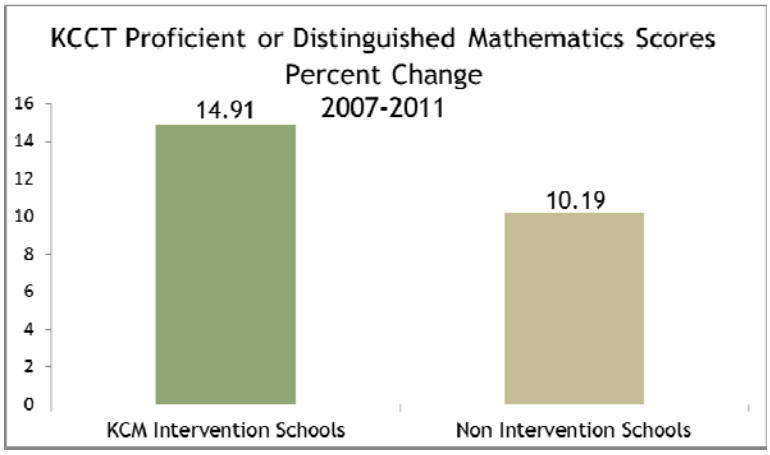


Figure 1: Increased School-wide Growth

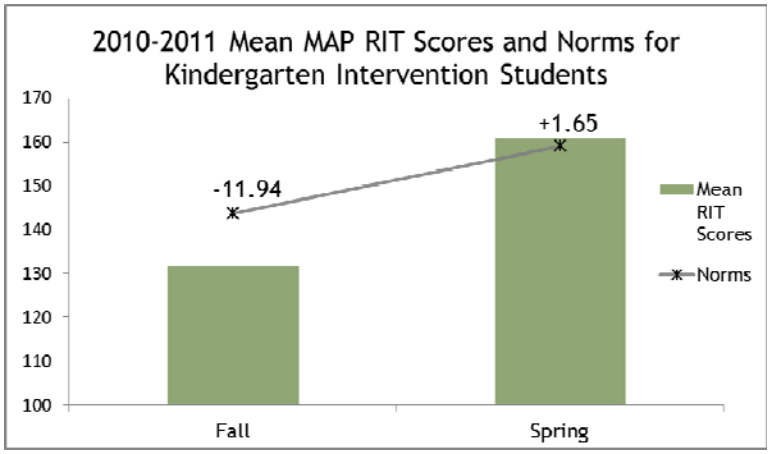


Figure 2: Increased Student Achievement

Years of Intervention Experience among 103 Mathematics Intervention Teachers (MITs) Serving during 2011/2012 at 110 Schools Receiving Mathematics Achievement Funds

# of MITs	Year of Mathematics Intervention Practice
20	First Year
18	Second Year
11	Third Year
17	Fourth Year
18	Fifth Year
19	Sixth Year

# of MAF Grants		
2006	2007	2008
45	45+41=86	86+ 27=113*

*3 schools closed, leaving 110

The Kentucky Numeracy Project

In November 2009 the KCM began to build the KNP (Kentucky Numeracy Project), an outgrowth of the Primary Mathematics Intervention Program, in response to critical need of MITs (Mathematics Intervention Teachers) who wished to support each other and spread their acquired expertise and passion for developing numeracy to all teachers in order to benefit all Kentucky students. The KCM's vision for the KNP is to capture, refine and organize the exemplary pedagogical tools created and/or used by successful MITs and regional coordinators and to provide a variety of professional development experiences to facilitate teacher growth toward more effective assessment and teaching of numeracy. Hence, the KNP has become an evolving system of resources and professional development opportunities for teachers working to improve and deepen the number knowledge of primary grades students. Between July 1, 2011 and June 30, 2012 approximately 700 educators accessed the free, but restricted, KNP resource page 3000 times, making a total of about 4300 hits since the site was launched February 7, 2011. As of June 30, 2012, the KNP online resources included:

- The KNPIG (KNP Intervention Guide), a growing collection of differentiated learning experiences, aligned to the Common Core State Standards for Mathematics and Add+Vantage Math Recovery developmental levels, has been used by Kentucky teachers to target and address student need related to in-depth understanding of and skill with all aspects of number and progress toward advanced strategic reasoning.

- The KNP Webinar Series, recorded during live online PowerPoint presentations facilitated by the KCM senior director, a KCM regional coordinator, and an experienced MIT, include important introductory considerations for the teaching and learning of early number and operational thinking, tips on how to access and navigate the KNP Intervention Guide, and photographs and instructions for implementing specific learning experiences.

During 2011/2012, the KCM also worked toward improving and growing the KNP system with these soon-to-be released components:

- The Fluency Assessments will provide a bi-weekly progress monitoring tool for measuring and documenting (across 18 weeks) the depth of student understanding and skills necessary for strong foundational fluency. The Fluency Assessments will include measures for addition and subtraction and multiplication and division, as well as fractions, with recommended targeted learning activities. Vetting for reliability and validity is imminent.

- Many MITs recorded and submitted classroom video which will soon be embedded into the KNPIG.

- The Center for Applied Informatics at Northern Kentucky University made valuable contributions to the KNP through beautiful graphic design work and skillful programming to improve accessibility for teachers through a tablet-friendly online interface.

Enacting Effective "Response to Intervention" in Primary Grades Mathematics

The KCM (Kentucky Center for Mathematics), in an effort to improve the understanding and implementation of early mathematics RtI *(*Response to Intervention), partnered with a faculty member from Eastern Kentucky University to participate in the exclusive national workgroup, *Teaching Mathematics to Students within the RtI Process: Building a Research Community*, sponsored by the Council for Exceptional Children and the National Council of Teachers of Mathematics. The KCM completed the proposed work commitments to design, implement, study, and share a professional development offering, EERTI (Enacting Effective Response to Intervention in Primary Grades Mathematics).

The EERTI professional development sessions were planned and facilitated by the KCM Senior Director, with assistance by postsecondary faculty members from Northern Kentucky University, Eastern Kentucky University, and the University of Louisville. 44 attendees, comprised of teams including special education teachers, classroom teachers, mathematics intervention teachers, and RtI coordinators, from 10 Kentucky school districts (Estill, Powell, Rowan, Elliott, Morgan, Crittenden, Scott, Mercer, Lewis, Gallatin), attended six days of in-person professional learning experiences held in Lexington, Kentucky (with four attending the one-day session held in an alternate location in Bowling Green, Kentucky). Many of the participants also engaged in additional collegial, student-centered problem-solving during the weekly online follow-up meetings. EERTI agendas, notes, and resources are posted on the KCM Forum, Elementary Grades, RtI public webpage, which had approximately 800 viewings between October 1, 2011 and June 30, 2012. Here is a sample of the typical participant reflections, indicating a new awareness of student thinking and need that will improve the teacher's ability to deliver targeted intervention instruction while strengthening his/her implementation of effective mathematics instruction for all students:

> *"I realized that I have to teach math differently than I learned it in school for my students to truly understand what they are doing. They can do the procedure all day long, but they have no clue what or why they are doing it."*

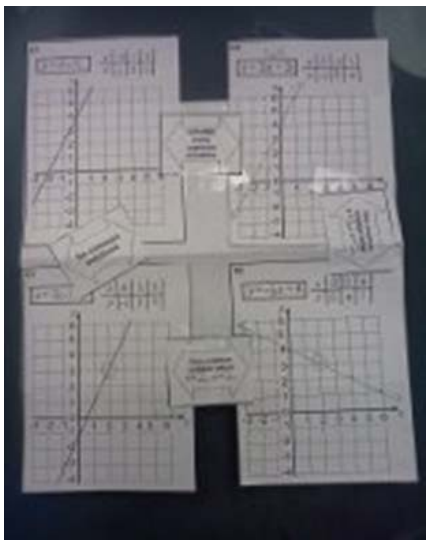
The KCM Senior Director presented the highlights of this innovative professional development program at the National Council of Supervisors of Mathematics annual conference, the National Council of Teachers of Mathematics annual conference, both in Philadelphia, April 2012, and at the national workgroup's culminating symposium on mathematics RtI, Reston, Virginia in May 2012. Plans for 2012/2013 include scaling up the professional development offering, further research and publication.

Student interview — a practical training activity

Mathematics Design Collaborative

Beginning in 2010, the Pritchard Committee, with funding from The Bill and Melinda Gates Foundation, initiated a pilot mathematical project, *The Mathematics Design Collaborative for Middle and High School Instruction*. This project is a research-based initiative led by the Shell Centre at the University of Nottingham and Ann Shannon & Associates. Through challenging FALs (Formative Assessment Lessons) students work individually and in groups to develop a solution to a mathematics task. Many of the tasks involve making connections between concepts and representations and linking them to create a network of mathematical relationships.

For example, pictured right is part of a poster students created during the *Classifying Linear Systems of Equations* FAL. In the lesson, they first make connections between representations of linear relationships by filling in any missing information in the table, graph or equation. Next, they consider the graphs two at a time and use any of the representations given to help them make a decision about the type of solution the system of equations would have. Students who decide a system has one solution might have arrived at that decision by overlaying the graphs and noticing a point in common, or they may have noticed a common point in the table representations. The activities are designed to give teachers a window on various approaches students are using (or not using) and to uncover misconceptions.



Sample student work

Teachers are provided training on how to help their students "struggle productively" with concepts, requiring them to learn how to use more advanced thinking during their problem solving. FALs provide two-or-three-day experiences for deep application of research-based assessment for learning strategies, leading to improved teaching practice and use of formative assessments throughout the year and on a day-to-day and minute-to-minute basis. In addition, implementing FALs deepens teachers' pedagogical content knowledge through analysis of both the lesson design and the mathematics it engenders in students.

In 2011/2012, KCM staff planned professional development sessions, observed classrooms in which the FALs were implemented, co-led after-school professional development sessions and wrote detailed reports. They facilitated four two-day sessions in each of Kenton and Boone Counties, one session in Jefferson County, and assisted with an Integration Grant Professional Development for teachers new to the Mathematics Design Collaborative in Lexington. Approximately 300 middle and secondary teachers were served. More information on the Shell Center Lessons can be found here: www.mygroupgenius.org/mathematics/.

See Blue Mathematics Clinic

The P20 STEM (science, technology, engineering, and mathematics) Education Innovation Lab, which began in Fall 2010, seeks to develop new contexts, connections and experiences for thinking, learning and researching STEM subject matter and pedagogies in P20 environments. With the help of funding from the Kentucky Center for Mathematics, the See Blue Mathematics Clinic sought to help middle school and high school students become more college and career ready through three outreach activities: (1) See Blue Mathematics Clinic; (2) Family Math Night; and (3) See Blue STEM Camp.

seeblue. Mathematics Clinic

The See Blue Mathematics Clinic was held in Fall 2011 at Jessie Clark Middle School and in Spring 2012 at both Jessie Clark Middle School and Henry Clay High School in Fayette County. The goal of the clinic was to help struggling mathematics students increase their mathematical knowledge in order to meet college and career readiness goals and, simultaneously, to help pre-service mathematics teachers gain more knowledge and exposure working with struggling mathematics students. Drs. Christa Jackson (co-Principal Investigator), Margaret Mohr-Schroeder and Craig Schroeder provided instruction for five weeks to pre-service teachers; the following 11 weeks were spent at the identified schools working with struggling mathematics students once a week for one and a half hours. A majority of the students felt more confident about mathematics after having attended the clinic; no students reported negative effects of the clinic. All students surveyed and interviewed and all pre-service teachers who participated wanted to see the clinic continue and wanted more weekly sessions to be added.

Family Math Night was held on April 26, 2012, at Jessie Clark Middle School. The goal of the night was to bring students and their families together to play mathematical games to show that mathematics can be fun and a regular at-home family activity. Over 476 middle school students and their families attended the event that lasted two hours. For more on the night please see: www.fcps.net/news/features/2011-12/math-night.

Family Math Night

Participants of See Blue STEM Camp

This year, the See Blue STEM Camp was held at the University of Kentucky for the first time. The one-week camp for middle school students was started two years ago by co-Principal Investigator Dr. Craig Schroeder. Seventy middle school students (incoming grades five-nine) from all across the state of Kentucky came on-campus for five days June 11-16 to gain more exposure to the STEM disciplines and to increase their interest in STEM careers. One-half of each day was spent with a STEM expert and the other half of the day was spent with Mr. Mark Evans (Robotics Instructor at Jessie Clark) and Dr. Bruce Walcott (College of Engineering) doing LegoRobotics Challenges, including the Green City Challenge. Preliminary data show that all students had a greater interest in STEM by the end of the week as compared to the beginning. Students also reported gaining more exposure to women in the STEM fields and reported that LegoRobotics was their favorite part of the camp. Preliminary parent reports indicate that their child(ren) were excited at the end of each day of camp, coming home and talking openly about their STEM activities. The See Blue STEM Camp was highlighted on Innovate Kentucky's website: www.innovateky.com/see-blue/.

Through the Kentucky Center for Mathematics funds, the See Blue Mathematics Clinic and its initiatives have been able to reach out to the Fayette County region and impact over 550 middle school and high school students and their families. The hope is to be able to continue this work and expand its reach to help show the positive impacts STEM can have on a community and improving their abilities to become more college and career ready.

Mathematics Content Leadership Network

The NKCES (Northern Kentucky Cooperative for Education Services) Math Content Leadership Network meetings are planned and co-facilitated by NKCES, the KDE (Kentucky Department of Education), the Kentucky Center for Mathematics, and an Assistant Professor of Mathematics Education at Northern Kentucky University. Approximately 60 participants were present at the summer academy and at each of the monthly sessions that took place from September 2011 through June 2012.

In addition to leading some segments of the large group meetings, a KCM staff member led the middle school breakout sessions. Focus areas for the sessions included: 1) selecting mathematical tasks with high cognitive demand; 2) implementing tasks so that high cognitive demand is maintained; 3) using anticipated student responses to orchestrate a mathematical discussion; 4) working through Formative Assessment Lessons, analyzing student work, and creating feedback questions; and 5) using resources to sequence big ideas about ratio and proportion (and other topics) and connect them to the Common Core State Standards and instructional tasks.

Collaboration with Kentucky Educational Television

From December 2011 through May 2012, the KCM (Kentucky Center for Mathematics) partnered with KET (Kentucky Educational Television) to provide expert written synopses, annotations and discussion questions to accompany more than 70 videos of Kentucky adult educators. The annotated videos are now available via the PBS's (Public Broadcasting System) Teachers' Domain website: www.teachersdomain.org.

The 70 videos, examples of "Math Best Practices," were created in 2010 as a partnership between KET, KYAE (Kentucky Adult Education) and the KCM. The goal of this project was to provide resources for adult educators interested in implementing inquiry-based curricula and strategies in their centers. Three adult educators were selected by the KCM and were filmed by KET as they taught mathematics lessons. Half of the lessons were presented in an inquiry-based fashion, while the other half were taught in a more traditional, lecture-based fashion. The resulting videos were used in professional development training with adult educators.

The New GED/KET Mathematics Prep Initiative

In 2012, KCM entered into a partnership with KET to assist with the design, review, item writing and evaluation of the mathematical components for KET's new Mathematics Prep GED (General Education Development) initiative. The GED test is undergoing its biggest overhaul since the credentialing test began in 1942. The revised GED test, which is to be released in 2014, will measure knowledge and core skills that more closely reflect CCSS (Common Core State Standards). Based on the CCSS, the new GED test is expected to be more difficult than the current version. There will also be new rules, including changes to time limits and testing locations. The KET Mathematics Prep GED initiative, which will continue through 2013, focuses on creating online course material utilizing multimedia that will prepare students for the new GED test. Both KCM faculty and staff are involved in providing consultation and support for this project.

Adult Education Mathematics Coaching

In the winter and spring of 2012, a member of the KCM staff served as a mathematics coach for a learning community consisting of adult education program directors and instructors. This project, in collaboration with KYAE and Morehead State University, was a continuation of KYAE's Common Core Standards Professional Development. The KCM coach attended four days of training sessions and two days of face-to-face sessions with the learning community. The KCM also provided online support for the instructors' work of unpacking the standards and aligning resources.

(2009) Senate Bill 1 Workshops for the Postsecondary Community

Kentucky Council on Postsecondary Education

The CPE (Council on Postsecondary Education), in collaboration with the CCLD (Collaborative Center for Literacy), the KCM (Kentucky Center for Mathematics), the KACTE (Kentucky Association of Colleges of Teacher Education) and the P-20 College and Career Readiness Lab at the University of Kentucky, developed information workshops about Senate Bill 1 (2009). Between April 2011 and November 2011, the workshop was offered in Bowling Green, Covington, Georgetown, Hopkinsville, Lexington, Louisville and Williamsburg; in addition two online webinars were held during this period. More than 350 members from the public and private postsecondary community attended the workshops and webinars. The culminating event for this initiative was a national forum, Architecture for Implementing the Common Core Standards: Strategies, Partnerships and Progress, held in Louisville from February 27-29, 2012. In attendance at the event were more than 300 higher education leaders and faculty from 17 states as well as representatives of top educational organizations such as the Bill & Melinda Gates Foundation and the National Governor's Association.

AIKCU (Association of Independent Kentucky Colleges and University) Webinar Series

The Kentucky Center for Mathematics completed a three-part webinar series for mathematic educators at institutions within the Association of Independent Kentucky Colleges and Universities. This webinar series highlighted statewide endeavors, including Noticing Numeracy Now and the Kentucky Numeracy Project, to inform and coordinate elementary mathematics teacher preparation at independent postsecondary institutions.

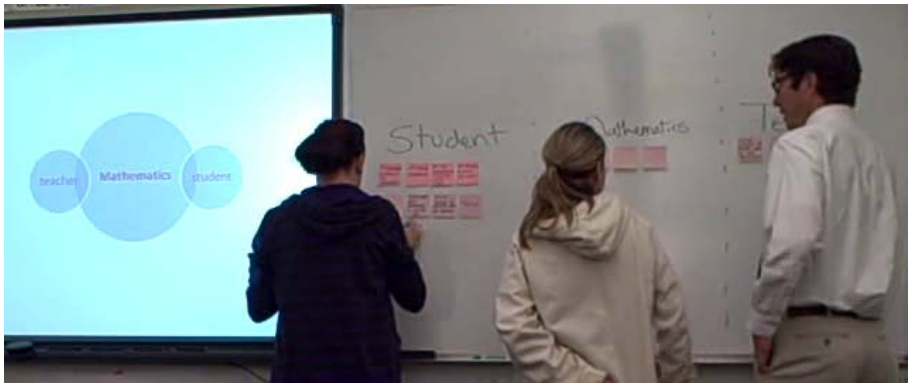
Adult education instructors hard at work, learning together

N3 (Noticing Numeracy Now)

The N3 (Noticing Numeracy Now) project is a collaborative effort to refine elementary pre-service teacher preparation in the area of mathematics. Founded by the Kentucky Center for Mathematics in 2009, this collaborative consists of representatives from the following postsecondary institutions:

- Murray State University
- Morehead State University
- Northern Kentucky University
- University of Kentucky
- University of Louisville
- Western Kentucky University

The N3 project is aimed at developing the *Professional Noticing* capacities of pre-service elementary teachers in the area of early numeracy. *Professional Noticing* is an emerging framework for the development of responsive teaching practices and consists of three component skills: 1) *attending* to children's activity; 2) *interpreting* children's activity; 3) *deciding* upon effective instructional steps (Jacob, Lamb, & Philipp, 2010). This collaborative has created a video-intensive instructional module aimed at increasing pre-service teachers' effectiveness in responding to the mathematical needs of their students.



Pre-service elementary teachers working with a collaborative member on N3 module activities

Funding and Measures

In the summer of 2011, the N3 project was funded by the *National Science Foundation* via the TUES (Transforming Undergraduate Education in Science, Technology, Engineering, and Mathematics) program. Having developed the module prior to receiving funding, in this first year of funded activity, a proprietary *Professional Noticing* measure was constructed and the module was administered at several sites. Additionally, nationally accepted measures of teacher knowledge and attitudes were administered pre/post module to measure changes in these areas.

Findings

At each of the implementation sites, pre-service teacher *Professional Noticing* capacities increased by a statistically significant amount in each component (attending, interpreting, and deciding) – see Figure 1.

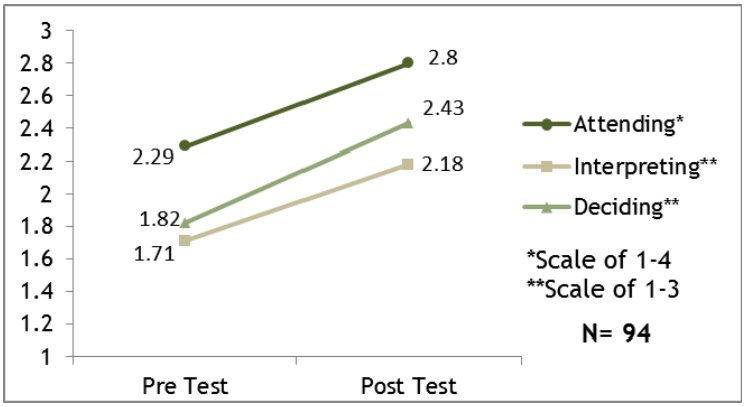


Figure 1: Results

Dissemination

In 2011/2012, collaborative KCM members presented findings from this project at several prestigious national and regional conferences including: AERA (American Educational Research Association) annual meeting: Vancouver, BC (2012); AMTE (Association of Mathematics Teacher Educators) annual meeting: Forth Worth, TX (2012); NCTM *(*National Council of Teachers of Mathematics) regional meeting: St. Louis, MO (2011).

Collaborative members presenting N3 results at 2012 meeting of the American Educational Research Association in Vancouver, BC

Jacobs, V. A., Lamb, L. L. C., & Philipp, R. A. (2010). Professional Noticing of Children's Mathematical Thinking. *Journal for Research in Mathematics Education, 41,* 169-202.

STEM (Science, Technology, Engineering, and Mathematics) Projects

The KCM (Kentucky Center for Mathematics) and NKU (Northern Kentucky University) have collaborated to create three programs funded by the NSF (National Science Foundation). Since the projects began, the KCM continues to support these projects with funding for faculty release time, administrative support and funding for promotional materials. More information on the projects can be found here: www.stem.nku.edu.

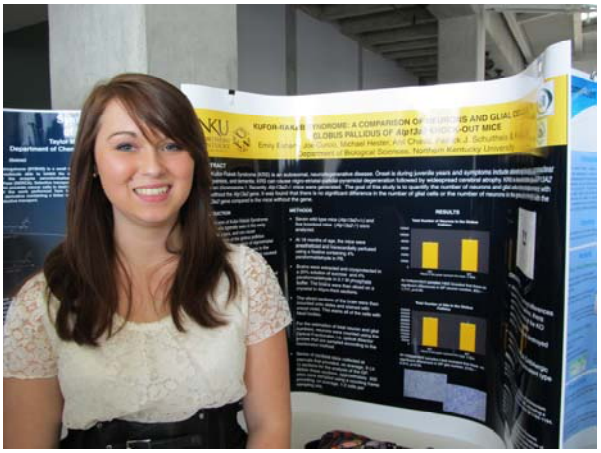
The **PRIME (Preparing Regional Increases in Mathematics Educators)** program is an effort to increase the number of secondary mathematics teachers and impact high need school districts. The program provides services that help recruit, support, and retain highly qualified mathematics educators through training, professional development, ongoing support, resources, and scholarships. Specifically, the program offers NOYCE Scholarships to highly qualified students who are preparing to be secondary mathematics teachers. The scholars participate in monthly professional development activities, such as attending conferences, engaging in teacher panels, and other informational sessions that contribute to the effectiveness of their future teaching careers. The program is in its third year; there are twelve current NOYCE scholars and six NOYCE scholar graduates. *This material is based upon work supported by the National Science Foundation's Robert Noyce Teacher Scholarship Program under Grant No. 0934709.*

NOYCE Scholars

FORCE (Focus on Occupations, Recruitment, Community, and Engagement) is a project that seeks to strengthen the recruitment and retention of STEM (Science, Technology, Engineering, and Mathematics) majors at NKU (Northern Kentucky University). A multipronged approach, involving both academic and community building strategies, is being used. Significant impacts have come from the engagement of STEM Ambassadors, upper-level students majoring in STEM disciplines, who: collaborate with faculty members to lead peer-learning sessions in courses considered risk points for majors; organize and recruit students for STEM-focused activities; and assist in recruiting high school students to an NKU STEM program.

Additionally, the FORCE project includes a UR-STEM (undergraduate research in STEM) program that provides paid research opportunities for rising sophomores, students at risk of leaving STEM, and undeclared students potentially interested in a STEM major. Since the FORCE project began in the Fall 2009, there has been an increased sense of community within and across the STEM disciplines as well as increases over 10% in enrollment and graduation rates. *This material is based upon work supported by the National Science Foundation under Grant No. DUE-STEP-096928.*

UR-STEM activity



SOAR Scholar presents research poster

Project SOAR (Scholarships, Opportunities, Achievements and Results) recruits, retains, educates and will graduate academically talented students who have financial need and who will enter the workforce or graduate school in a STEM related field. SOAR awards 19-21 renewable scholarships to incoming freshman who declare a STEM major at NKU. Project SOAR involves much more than funding a STEM major's education, including faculty mentors, a year-long freshman seminar, a learning community, an opportunity for residential students to live together, high quality enrichment activities, opportunities for research, internships, travel to conferences, co-op experiences, and academic support such as peer mentoring and tutoring. SOAR is an intellectually rigorous program that gives students the support to excel. Freshman completing the first year of the program have earned, on average, a GPA that is at least 10% higher than other freshman STEM majors. First year retention rates for SOAR students range from 74% to 84% compared to the overall NKU freshman retention rate which remains near 66%. Most importantly, 58% of the 2009 SOAR cohort will graduate with a STEM major in Spring 2013. The four-year graduation rate for the 2009 SOAR graduates is anticipated to be well over three times that of both STEM majors and other non-STEM majors. *This material is based upon work supported by the National Science Foundation under Grant No. 0806915.*

Conference participants

The KCM (Kentucky Center for Mathematics) hosted an annual conference on March 8th and 9th (with a pre-conference day on March 7th) at the Hilton in downtown Lexington. The theme, *Improving Mathematical Practices*, allowed speakers and participants to expand their knowledge and understanding of the Standards for Mathematical Practice from the Common Core State Standards for Mathematics.

390 attendees represented early childhood education, K-12 (kindergarten through grade 12) schools, and private and public postsecondary institutions. Additionally, there were 74 speakers and 11 renowned national and international featured speakers who presented 84 sessions. Conference attendees overwhelmingly reported speakers strongly addressed the Standards for Mathematical Practice.

KCM-trained MITs (Mathematics Intervention Teachers), whose work is funded by the Mathematics Achievement Fund, had a prominent presence and demonstrated their leadership abilities. MITs and KCM Alumni members (including previous KCM Coaches) led nearly 25% of conference sessions.

Conference participants said:

> *"This was the best conference I've been to in a long time."*
>
> *"Great quality presentations."*
>
> *"This was a great opportunity to sit down with math instructors across the spectrum of math in this state."*
>
> *"It was excellent! [I] can't wait to share with my district!"*
>
> *"The information received was applicable and ready for use upon return to school."*

Conference Speaker

Files and handouts made available to the KCM by conference presenters and video-recordings of the featured sessions are stored on the KCM website and will indefinitely be available to conference participants. This archiving of conference artifacts supports sustained collegial and individual professional learning by facilitating ongoing opportunities to review, share or experience past conference offerings.

KCM Budget

Personnel	
KCM Personnel	$698,455.00
Other Personnel	$16,195.00
Subtotal Personnel	$714,650.00
Contractual	
Regional Coordinators, evaluators, and other trainers	$656,813.00
Conference	$42,874.00
Operating	
Training supplies, refreshments, and space	$75,920.00
General office expenses	$79,711.00
Subtotal Operating	$155,631.00
Subtotal KCM Expenses	$1,569,968.00
Pass-through reimbursement	-$128,220.00
Total Expenditures FY 2011-2012	$1,441,748.00
Grant funding received	
Mathematics Design Collaborative	$21,248.00
Mathematics Content Leadership Network (NKCES)	$3,250.00
GED Mathematics Prep Initiative (KET)	$6,503.00
Mathematics Best Practices (KET)	$4,101.00
Adult Education Mathematics Coaching	$3,194.00
Subtotal Grants	$38,296.00

"KCM Personnel" expenses included salaries and benefits. "Other personnel" indicates other faculty or staff not directly hired or funded by the KCM, but who help with projects throughout the year. A large portion of "Contractual" funds support the KCM's Regional Coordinators. Contractual funds also include center and data evaluations, the "See Blue Mathematics Clinic," and professional development contractors. Included in "General office expenses," the KCM incurred a one-time office renovation expense. "Pass-through" reimbursement includes monies collected for trainings throughout the year and the annual conference fee.

These pages reflect samples of the evaluation, completed by a faculty member from the University of Kentucky, focused on the KCM's (Kentucky Center for Mathematics) work, in accordance with four of the center's objectives: clearinghouse, collaboration, advising and dissemination.

Clearinghouse

The KCM is actively involved in professional development. The KCM plays two roles in professional development in the state: initiating and assisting. Some activities are creative, innovative, and even cutting-edge. The KCM has adequately fulfilled the role of being a key player in professional development in the state, by using the expertise of its staff to advise, initiate, and assist key professional development efforts that have the potential to create real impact on the landscape of professional development in mathematics education in Kentucky. The KCM website, a clearinghouse medium, does meet the minimum standards for quality and maintenance of any education website; however, improvements for design and content are recommended. Given the small number of staff members in the KCM, the overall statistics indicate strong, effective, and fruitful effort of the KCM in fulfilling the mission of clearinghouse.

Kentucky's Commissioner of Education visits a Math Achievement Fund School

Kentucky Numeracy Project Intervention Course

Collaboration

Between July 1, 2011 and June 30, 2012 the KCM established new collaborations with 13 various educational institutions. Some of the collaborations show promise for sustainable impact or change. The distribution of KCM efforts appears to be appropriate across the educational spectrum.

Advising and Dissemination

The KCM has three state-level education agencies that are key partners in the operation of the center: the Kentucky Council of Postsecondary Education, the Kentucky Department of Education and the Kentucky Education and Workforce Development Cabinet. According to interviews with representatives of these groups, the KCM is highly accessible and responsive to needs. The interviewees were highly satisfied with their communication with the KCM. State education agencies frequently utilized KCM resources and staff to provide insight and information on the development of statewide policy. Comments from representatives allude more to the assistance rather than the inspiration of the KCM in educational reforms or innovations at the state level.

KCM Conference

The KCM's dissemination activities included sixty-one presentations, twelve good news articles, six "press releases" and five scholarly publications.

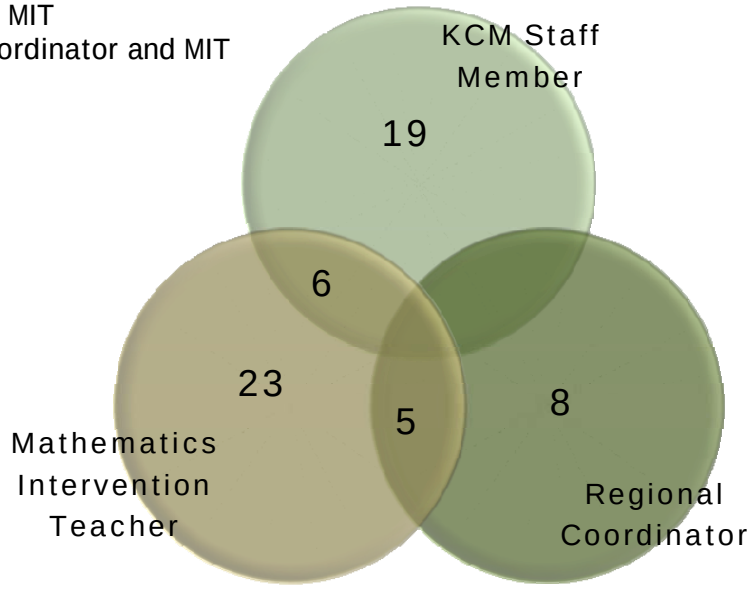
2011-2012 KCM Presentation Summary

Number of presentations:

61 provided by KCM staff or affiliates
27 included a KCM staff member/other
34 included a MIT (Mathematics Intervention Teacher)
13 included a Regional Coordinator
6 provided by KCM staff and MIT
5 provided by a Regional Coordinator and MIT

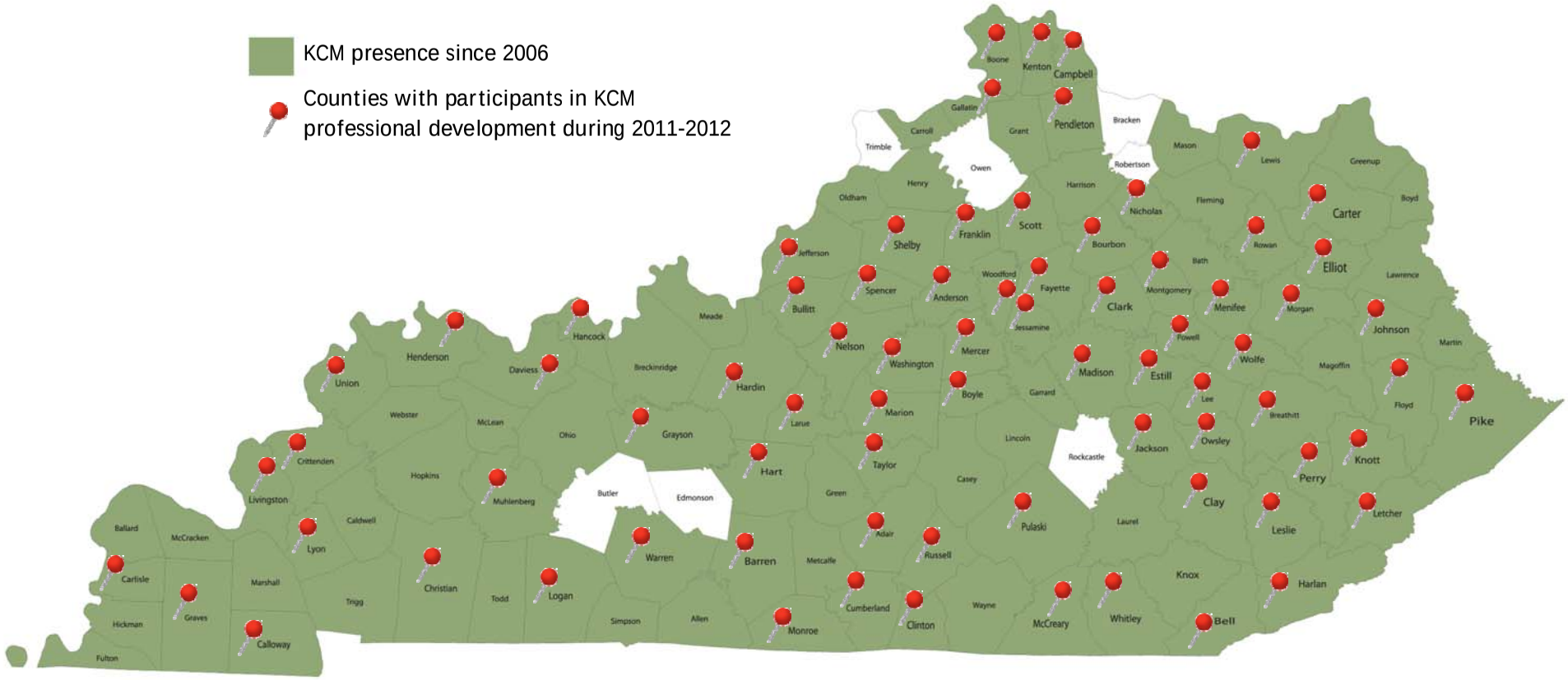
Location of presentations:

1 local
8 national
6 regional
46 state



Xin Ma (June 2012). "Year One External Evaluation of the Kentucky Center for Mathematics." University of Kentucky.

KCM Presence Map



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