



SUMMARY OF ITEM FOR ACTION,
INFORMATION, OR DISCUSSION

TOPIC: P-20 Update

COMMITTEE: Education Policy and Student Life

DATE OF COMMITTEE MEETING: March 3, 2015

SUMMARY:

P-20 Outreach includes work with K-12 schools, community colleges, Maryland workforce and industry, and other higher education stakeholder groups.

USM has led collaborative work in the following areas:

- Maryland College and Career Readiness Standards (MCCRS) and PARCC Assessments
- College Completion and Lumina Project Outcomes
- STEM Pipeline from K-12 through College (MSP)²
- STEM Workforce, including Cyber Security (BHEF)
- Quantitative Literacy and Maryland Mathematics Reform Initiative (MMRI)
- Teacher Preparation and Professional Development (JCR Report and Task Force)
- Climate Change Education (MADE CLEAR)

A brief summary report is included for each of the above areas of work in this packet. Many of these projects are ongoing, and the Board of Regents will receive reports that include recommendations when the work is ready for Regents' endorsements.

The presentation at the meeting will highlight the outcomes of the STEM Pipeline Project and Quantitative Literacy.

ALTERNATIVE(S): This is an information item only.

FISCAL IMPACT: This is an information item only; there is no fiscal impact associated with this item.

CHANCELLOR'S RECOMMENDATION: This is an information item only.

COMMITTEE RECOMMENDATION: Information Only

DATE: March 3, 2015

BOARD ACTION:

DATE:

SUBMITTED BY: Joann A. Boughman

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**Common Core State Standards &
Partnership for the Assessment of Readiness for College and Careers (PARCC)**

Project Work Period	<ul style="list-style-type: none"> • 2010-present
Principal Partners	<ul style="list-style-type: none"> • National Governor’s Association • U.S. Education Delivery Institute and Louise Feroe, Common Core Postsecondary Collaborative Engagement Manager • Allison Jones, Vice President for Postsecondary Collaboration, Callie Riley, Senior Policy Associate for Postsecondary Engagement, and Lynn Brabender, Program Associate at PARCC, Inc. • Douglas Strader at the Maryland State Department of Education (MSDE) • The PARCC Higher Education Leadership Team is led by Nancy Shapiro, Associate Vice Chancellor of Academic Affairs and Special Assistant to the Chancellor on P-20 Issues at the University System of Maryland (USM).
USM Project Managers	<ul style="list-style-type: none"> • Tiffani Williams and DeWayne Morgan

About PARCC

The Partnership for the Assessment of Readiness for College and Careers (PARCC) is a group of 12 states¹ committed to building a next-generation assessment system for elementary and secondary schools that is based upon the Common Core State Standards (CCSS). Of the thirteen states, twelve are part of the Governing Board, which make the strongest commitment to PARCC and its activities and therefore have the most decision-making authority. Maryland is one of 12 Governing States. The chief state school officers of the Governing States serve on the PARCC Governing Board, while higher education leaders serve on the Advisory Committee on College Readiness (ACCR). These groups are charged with decision-making on behalf of the Partnership on major policies and operational procedures. This demonstrates the commitment of K-12 leaders and higher education to collaborate on the development of the PARCC assessments.

Maryland Role

As a Governing State, Maryland has representatives on the PARCC Leadership Team. Maryland’s K-12 Leadership Team is led by Douglas A. Strader, Director, Planning and Assessment Branches at the Maryland State Department of Education. The Higher Education Leadership Team is led by Nancy Shapiro, Associate Vice Chancellor of Academic Affairs and Special Assistant to the Chancellor on P-20 Issues at the University System of Maryland (USM). The other leads for the involvement in higher education in PARCC are Tiffani Williams, Program Specialist and DeWayne Morgan, Project Evaluator also at USM, and Kathy Barbour, Vice President for Academic Affairs and Economic Development at Chesapeake College.

Timeline

Academic Year	Activity
2012-2013	First year pilot/field testing of the assessment and related research and data collection
2013-2014	Second year pilot/field testing of the assessment and related research and data collection
2014-2015	Full operational administration of PARCC assessments
Summer 2015	Set achievement levels, including college-ready performance levels

Challenges

- Considering preparation for teachers, pre-service and in-service, to be able to teach the CCSS and help their students perform on the PARCC assessments

¹ The 13 Participating States and Governing States (those in bold are governing states) are: **Arkansas, Colorado, District of Columbia, Illinois, Louisiana, Maryland, Massachusetts, New Jersey, New Mexico, New York, Ohio**, Pennsylvania, and **Rhode Island**.

- Connecting the current initiatives in the state regarding college preparation, access, and completion to Common Core and PARCC
- Determining how colleges and universities will utilize scores from the assessment
- Common Core pushback in many states threatens the progress of both consortia

Major Activities and Accomplishments

- In the spring of 2012 USM requested that the Governor's P-20 Leadership Council commission the formation of the P20/PARCC work groups in English, mathematics, and teacher preparation in anticipation of the workload needs associated with creating assessments that are aligned with the CCSS.
 - These groups have over 120 members from K-12 and higher education, with representatives from two-year, four-year, public and private institutions across the state.
 - The members were nominated by chief academic officers and work to serve as liaisons between the Maryland PARCC leadership, institutions of higher education, and on committees to review PARCC assessment items and content.
 - The spring of 2012 also marked the first convening of these work groups and state visit from PARCC.
- In fall 2012, USM was awarded a grant from the National Governor's Association for \$65,000. This was used to convene meetings of the P-20 PARCC work groups, as well as provide stipends to faculty voluntarily participating in a wide range of PARCC initiatives.
- Also in fall 2012, each of the three P-20 PARCC work groups (math, English, and teacher preparation) conducted a meeting to have preliminary discussions regarding the potential implications of Common Core and PARCC.
- On May 6, 2013, USM partnered with PARCC to conduct their second state visit to Maryland to update higher education stakeholders on PARCC's progress and forthcoming releases. This meeting involved numerous calls and interactions with NGA and the US Education Institute and their representatives, namely Travis Reindl and Louise Feroe. These interactions served mainly to create and finalize the agenda for the meeting in order to best accomplish dissemination goals.
 - Over 70 individuals were in attendance, the majority from the P-20 PARCC work group membership.
 - This meeting included presentations from the Chancellor, Maryland Higher Education Commission (MHEC), Maryland State Department of Education (MSDE), the Governor's Office, PARCC and the Governor's Workforce Investment Board. This meeting also marked the formation of the Maryland Common Core Postsecondary Collaborative.
- In July 2013, Maryland sent a state team of 5 individuals to PARCC's Postsecondary Convening. This was an opportunity for our representatives to not only learn more about PARCC progress but also to create an action plan for the state. The team was able to review a timeline and chart various initiatives and efforts in Maryland against the PARCC timeline. It was a crucial piece in beginning to chart the state's next steps.
- On October 22, 2013, USM hosted another statewide meeting of the PARCC Work Groups. These groups, consisting of faculty and administrators dedicated to engaging around the Common Core and PARCC, met to discuss how these initiatives will impact their campuses and their particular role. This was a great step forward in beginning to prepare for the implementation of full curriculum of Common Core this year and forthcoming assessment.
 - Over 90 individuals were in attendance and they received a presentation from the System on PARCC updates, as well as a presentation from a representative from the University of Maryland, Baltimore County, where a Provost's taskforce has been formed to address Common Core and PARCC.
- On May 6, 2014, USM hosted another statewide meeting of the PARCC Work Groups via webinar. Over 40 faculty representatives logged in to hear updates about PARCC.
- In June 2014, Maryland again sent a state team of 4 individuals to PARCC's Postsecondary Convening. This was an opportunity for our representatives to learn from best practices in other PARCC states and hear updates from across the consortium. The team was able to again create a timeline and chart various initiatives and efforts in Maryland against the PARCC timeline. This allowed the team to plot out future policy decisions needed in higher education to accept scores from students taking the assessment.
- The initial grant award from PARCC (via the U.S. Department of Education) closed on September 30, 2014.
- In the winter of 2014, PARCC (in contract with Pearson) embarked on a number of validation studies. The Maryland Higher Education Leadership Team nominated 26 Math and ELA faculty to participate in the Postsecondary Educator's Judgment Study, which ended on January 31, 2015. This study offers an opportunity for faculty to provide insight on an entire set of assessment questions, judging how a first year student might perform on a given item. This study will be crucial to setting performance standards for the assessment.

Lumina Summary (February 2015)

In 2009 the Lumina Foundation for Education awarded each of six states a five-year, \$1,000,000 grant to support college completion. USM lead a Maryland collaborative and won one of the six state grants. This grant has been aimed at improving higher education productivity outcomes such as reducing time-to-degree and increased effectiveness and efficiency. The funding ended in November 2014, and a final report to the Lumina Foundation was submitted in December 2014.

Project Goals

- Increase and reward completion: Engage the Governor’s P-20 Leadership Council in the state’s higher education productivity agenda through advocating for policies that help the state meet its college completion goals within available resources.
- Generate and reinvest savings: Support cross-institutional collaboration across all public and independent colleges and universities in targeted effectiveness and efficiency (E&E) areas, both academic and administrative.
- Educate and train in affordable ways: Redesign “bottleneck” undergraduate courses (e.g., general education and developmental courses in which a large majority of students fail to earn a C or better) at two-year and four-year institutions across the state to improve student learning and to reduce the average cost per course. Reinvest cost savings to support additional redesign projects and other student completion-related priorities.

Maryland conducted an internal evaluation of the course redesign projects. Overall, the Productivity Grant helped bring about important academic changes across the 19 sub-grantees. There was an average increase of 12.5% in pass rates compared to traditional courses, an average student cost savings of 20% compared to traditional delivery models, and an average institutional cost savings of 28% compared to traditional business practices. The following subsections detail key takeaways from this grant work.

Broad Goals of Lumina Course Redesign Projects

- Improve student learning outcomes
- Increase student retention and decrease time-to-degree
- Reduce costs both for the student and the institution, freeing up institutional resources for other academic priorities
- Develop the internal capacity of faculty and departments to continue the redesign process
- Promote a culture of educational innovation
- Foster and support innovations in blended and online learning
- Pursue partnerships to increase support for campus-based course redesign projects

Proof of Concept

What factors contribute to sustaining and scaling a redesign culture on a campus?

- Student success and satisfaction
- Faculty fellow expert contributions and leadership
- Demonstrating cost effectiveness
- Changing campus/departmental culture
- Ongoing communication with all campus stakeholders about the redesign's progress
- Strong continuing project leadership
- Continuous quality improvement
- Pervasive, well-supported technology—an ongoing resource
- Explicit attention to faculty workload issues
- Team approach to implementation of the redesign

Additionally, USM co-hosted with MHEC a capstone convening—*STRIDE TO 55: The Practice and Policy Journey to Completion and Academic Transformation*. *Stride to 55* was held on November 7, 2014. This convening brought together education leaders and policymakers from across Maryland to share how degree completion efforts and policy changes are transforming learning experiences. Discussions centered on how state, federal, and philanthropic organizations are work together to increase postsecondary attainment and enhance student learning. The convening highlighted best practices and policies and discussed strategies for scaling, challenges and opportunities in sustainability, and ways to more efficiently transform the education landscape for current and future generations of learners. A video produced for this event can be found at <https://catalytica.box.com/s/f4kj34wbmomre9gfdwm4>.

(MSP)² is an integrated set of programs for science teachers, high-school students, and college science majors.

Partnership

Lead partner: Bowie State University

Other partners: Prince George's Community College • Prince George's County Public Schools • Towson University • University of Maryland, College Park • University System of Maryland

Principal Investigator: Prof. Anisha Campbell (UMCP and BSU)

Project Director: David May, USM

K-12 Project Coordinator: Felicia Martin, PGCPSS

Participants

PGCPS elementary and middle-school teachers: 380

PGCPS high-school teachers: 60

PGCPS high-school students: More than 300

Undergraduate science majors: 111

Funding

- \$12.4 Million from the National Science Foundation
- NSF's Math Science Partnership (MSP) program

Program

(MSP)² comprised four different strands of activity for the different populations:

1. Elementary and Middle-School Teachers: Professional development in science and scientific inquiry

- Led by science faculty at UMCP and PGCC, and science specialists at PGCPS.
- Program includes Summer Institutes as well as school-year followup meetings, and are Designed around principles of teaching and learning through scientific inquiry.
- Subjects of Summer Institutes: Chemistry, Earth and Space Science, Life Science, Environmental Science, Physics, and a multi-subject institute focused even more on scientific inquiry.

2. High-School Teachers: Learning communities focused on the Nature of Science

- Science teachers engage in summer research experiences with UMCP, TU, and BSU faculty.
- Led by TU, the teachers then participate in year-long professional learning communities focused on teaching the Nature of Science.

3. High-school students: Dual enrollment in science

- Students take challenging science courses through innovative early college/dual enrollment programs developed collaboratively by PGCPS with BSU and PGCC.
- Two types of programs were implemented:
 1. Summer residential program at BSU's campus (courses include college Biology and Chemistry as well as other enrichment courses)

The Minority Student Pipeline Math Science Partnership

2. School-year courses in area high schools taught by PGCC faculty (courses include Environmental biology and Forensic biology)

4. Undergraduate science majors: Learning about teaching

- Science students at UMCP and BSU were given opportunities for undergraduate teaching experiences (with 100 PGCCPS science teachers to mentor them)
- Science students at UMCP learned more about science teaching by participating in the pilot Maryland Learning Assistants Program at UMCP.

Outcomes

Teachers:

- Elementary and middle-school teachers **gained knowledge of key science content** after every summer institute.
- High-School teacher participants have a **more developed understanding of the Nature of Science** and have made important changes to their inquiry-oriented instruction.

Elementary students:

- Science **pass rates on the Maryland State Assessments have increased** in PG County over the past several years. The **increases are twice as large** for schools with participating teachers than for schools without, both in 5th grade and 8th grade.
- Schools with **more participating teachers showed larger increases** in MSA science pass rates.
- Students have also **sustained their interest in science** more than their peers.

High-school students:

- PGCC and BSU awarded **more than 3,000 college-credit hours** to 331 students.
- Of those who continued with enrollment at PGCC, **21% entered a STEM-related degree program** at some point. This is a higher proportion than the 14% of PGCC students who are enrolled in STEM programs at any given time.
- Of those STEM students, **76% remained in STEM for over one year and/or are still in STEM today.**

College science majors:

- Several participating science majors have gone on to pursue teaching careers, and most report significant gains in their understanding of the teaching and learning of science.

Sustainability

Teacher professional development:

We now have many necessary components: A model for successful PD, a professional staff of trainers in PGCCPS, and partnerships with higher education. Funding is not as consistent.

Dual enrollment:

- PGCCPS and PGCC now have a Dual Enrollment Committee that is using our findings to increase opportunities in the county.
- Recent Maryland legislation (SB 740) now makes it much easier for students to take dual enrollment courses in all subjects.

Recruiting science majors into teaching:

BSU now has 5-year BS/MAT programs in mathematics and biology teaching.



The Minority Student Pipeline Math Science Partnership

2008-2014 • *Strengthening the science pipeline in Prince George's County*

Summary of Outcomes

The Minority Student Pipeline, or *(MSP)²*, was an integrated set of programs for science teachers, high-school students, and college science majors. Partners include BSU, TU, UMCP, Prince George's County Public Schools, Prince George's Community College, and the USM Office.

THE PROGRAM

Elementary and Middle Schools

Professional development in science and student-centered approaches for teaching science, for teachers of grades 4-8.

High Schools

Dual-enrollment (early college) courses for students, and teacher learning communities focused on the Nature of Science.

Colleges and Universities

Structured opportunities for undergraduate science majors to learn about teaching.

THE PARTICIPANTS

380

Elementary and Middle-School Teachers

331

High-School Students

60

High-School Teachers

111

Undergraduate Science Majors

THE OUTCOMES

Increased Student Achievement

Scores on the science portion of the Maryland State Assessments **increased twice as much** in schools with participating teachers.

Maintained Student Interest

Students of participating teachers were **more interested in science** than their peers after instruction.

Students are Prepared for College

Many students **entered STEM programs** in college and are still there today.

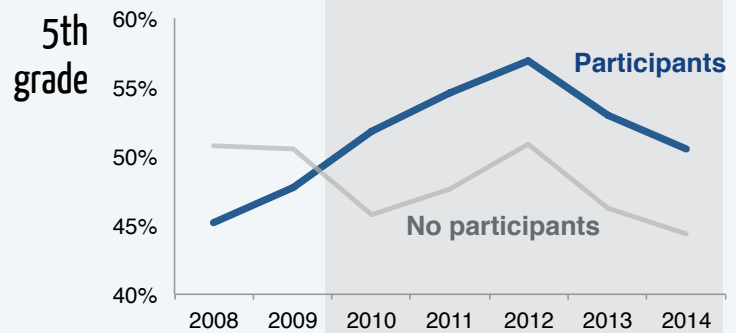
KEY EVALUATION FINDINGS

Participating teachers helped increase their schools' test scores faster than other schools were able to increase them.

Elementary schools with participating teachers consistently had MSA science pass rates

6-7% higher

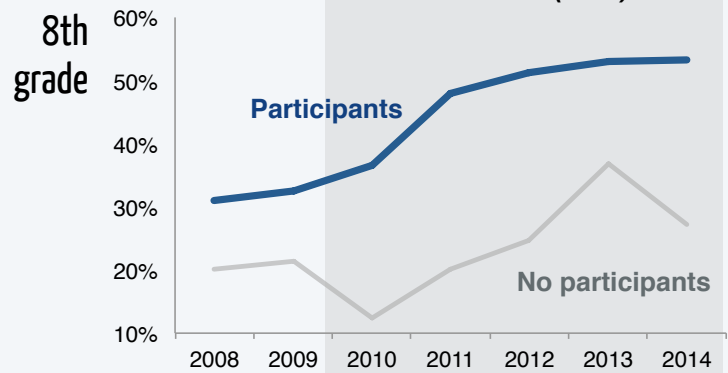
during the (MSP)² program.



Middle schools with participating teachers usually had MSA science pass rates

24-28% higher

during the (MSP)² program.



Their students maintained higher interest in science than those of other teachers after a year of instruction.

The same trend appears in three different questions probing interest, including this one:

When you start working, would it be fun and interesting to have a science-related job?



Dual-enrollment students went on to study STEM in college in large numbers.

3,000 college-credit hours were awarded to the 331 students by BSU and PGCC.

21% of those who continued with enrollment at PGCC entered a STEM-related degree program.

76% of these students remained in STEM for over one year and/or are still in STEM today.

BHEF Summary (February 2015)

In partnership with the Business Higher Education Forum (BHEF), the University System of Maryland (USM) has engaged in three areas of work with grant funds from the Sloan Foundation. Those three areas are as follows:

1. Creating the USM/BHEF Undergraduate Cybersecurity Network. This Network is based at the University System of Maryland, and members include representatives from higher education, industry, and government to serve as thought leaders in the development of the project. USM and BHEF established a memorandum of understanding that sets forth goals, operating principles, and an action plan for moving forward. This Network seeks to serve as the intellectual hub of undergraduate cybersecurity throughout the state, and provide a model of regional cooperation among the academic, business, and government sectors.
2. Administering mini grants to four USM institutions—Bowie State University, Towson University, University of Maryland, Baltimore County, and University of Maryland. The mini grants help support development of current work in cyber on each campus. Each institution received \$12,000, and each institution matched and/or provided an in-kind contribution. These mini grants provided incentive funds to the four partner institutions to seed the development of high-impact interventions in undergraduate cybersecurity, such as the redesign of introductory-level cybersecurity courses; student internships focusing on the first two years of college; cohort and peer learning programs with mentoring opportunities for students, particularly women and underrepresented minorities; and tighter articulation of cyber programs with two-year colleges.
3. Conducting a multi-year, mixed methods research study to better understand how undergraduate students progress to graduation and how specific majors prepare students for their career. Findings and recommendations from the recently completed study are described below.

Research on student internships and pathways to careers:

BHEF, through a grant from the Sloan Foundation, has been working with the USM to support research in workforce/university partnerships, with special attention to internships and career pathways. Using multiple research methods (surveys, interviews, and focus groups with students, faculty and career services professionals) USM researchers have been exploring how undergraduate students progress to graduation and how specific majors prepare students for their career.

Researchers found that there is a lack of connection between academic learning and real-life problems. According to researchers from the Higher Education Research Institute (2012), only about half (55%) of faculty report using real-life problems in their teaching, yet research from the American Association of Colleges and Universities (2013) found that three out of four employers report that they want more emphasis on applied knowledge in real-world settings. Only two out of every five graduating seniors feel that their professors provided them with the

opportunity to apply classroom learning to "real life" issues. Although getting a good job was the major reason many students go to college, upon graduation only two out of five felt that their preparedness for employment after college was a major strength. Moreover, there is a mismatch between what faculty are trying to instill in college students and what employers expect.

Several recommendations emerged from the research:

- *Recommendation 1:* Find more ways to build interaction between industry and faculty with industry and promote a culture of engagement in career pathways. Examples of this include involving industry on academic curriculum advisory boards and promoting increased use of faculty of practice (industry professionals turned faculty who focus on teaching), so students have more exposure to individuals who can connect theory to real-world application.
- *Recommendation 2:* Students should engage with industry early and often, and institutions may want to consider making co-curricular experiences like internships a requirement for graduation. They should, however, remove any fees associated with registering the experience as that could discourage students from reporting these co-curricular experiences.
- *Recommendation 3:* Include co-curricular experiences launched out of the career into the academic experience in a more formalized manner. Career services offices are an untapped potential resource, which could serve as a critical junction point in connecting students and faculty with industry. Institutions may want to consider a more formal and intentional integration of the resources of career services offices into the academic experience to foster a more well-rounded co-curricula environment.

These recommendations are consistent with major recommendations from the Maryland P-20 STEM Task Force (2009), co-chaired by Chancellor Brit Kirwan and June Streckfus, Executive Director of the Maryland Business Roundtable.

Quantitative Literacy and the Maryland Mathematics Reform Initiative (MMRI) February 2015

Counting on Our Future: Redefining Quantitative Literacy in Maryland

On October 31, 2014, USM led a state-wide conference (*Counting on Our Future: Redefining Quantitative Literacy in Maryland*) aimed at exploring ideas about what quantitative literacy skills students need for Maryland's future economic success. Reinforcing the our role as the State's leader for P-20 collaboration, USM reached out to the rest of Maryland's education community, as well as national organizations, to host this important event. These organizations included Maryland State Department of Education, Maryland Higher Education Commission, Maryland Association of Community Colleges, and Maryland Independent College and University Association, Towson University, Morgan State University, St. Mary's College of Maryland, the Abell Foundation, and the American Association of State Colleges and Universities.

Attendees: 164 P-20 teachers, administrators, and policy leaders; American Association of State Colleges and Universities

Proceedings: The keynote speaker, Dana Center Executive Director Uri Treisman, offered national research on how students learn mathematics, as well as national efforts and strategies that have been developed to improve student success in mathematics and subsequent mathematics-dependent courses. Over the course of the conference, participants generated the idea that students in Maryland mathematics courses should have access to:

1. Multiple pathways aligned to specific fields of study;
2. Acceleration that allows students to complete a college-level math course in one year;
3. Intentional use of strategies that help students develop skills that are directly linked to their courses; and,
4. Curriculum design and pedagogy based on proven practice coupled with a context sensitive improvement strategy.

Throughout the day, there were many calls to make changes to those COMAR regulations that hinder educators in P-12 schools as well as higher education from being innovative and effective at meeting the needs of the 21st century Maryland students and workers.

Outcomes: Chancellor Brit Kirwan gave closing remarks and observed that the conference facilitated the P-20 collective recognition of stumbling blocks for students at each point in the education continuum and opened the doors of communication between institutions and segments to think creatively about how to improve how students learn mathematics. As a result, USM has begun leading work on the Maryland Mathematics Reform Initiative (MMRI). The MMRI's work is progressing in two phases. In Phase I, USM is convening a General Education Mathematics Pathways workgroup that is charged with reviewing current COMAR general education language and developing new language for the general education mathematics requirements. In Phase II, USM will lead working groups to build frameworks for pathways for quantitative literacy that will fulfill the revised General Education COMAR requirements.

Maryland Mathematics Reform Initiative (MMRI)

The primary goal of the Maryland Mathematics Reform Initiative is to align gateway mathematics course sequences with academic programs of study. The Steering Committee met for the first time on December 1, 2014. The MMRI Co-leads (Dr. Kirwan, Dr. Lowery, Dr. Sadusky) have selected individuals to serve on a Workgroup that will, after deliberations, make recommendations to the Steering Committee. The first meeting of the Workgroup has been scheduled for February 18th.

The examination of what might be necessary for students to achieve the quantitative literacy and reasoning knowledge in their chosen area of study, and whether or not Algebra II will be required for some students to adequately prepare for their major will be part of the consideration. USM is open to investigating this further. That said, the work will also need to consider how this will impact alignment with the newly adopted Maryland College and Career Ready Standards.

USM is convening the MMRI workgroup to set the agenda and objectives for the workgroup meeting to focus discussions and encourage sharing of information, approaches, problems and possible solutions. The discussions will tee up core questions around quantitative reasoning and alternate mathematics pathways; and identify critical actions and resources needed to implement the MMRI recommendations. The major outcomes anticipated for the MMRI are (1) examine Maryland's current general education mathematics requirement with hopes of creating a shared general education policy that meets the needs of our 21st Century society and (2) create multiple pathways for students to acquire the mathematics literacy necessary to be successful in their courses of study and careers.

Charge to the Workgroup:

The General Education Math Pathways Workgroup will meet three times during Spring 2015 semester to:

- Review current COMAR language pertaining to General Education Mathematics requirements.
- Review two alternative revisions to COMAR proposed by the M4CAOs and the Statewide Mathematics faculty group.
- Collect and review information from campus-based faculty on the mathematical and quantitative competencies required by Social Sciences, Arts and Humanities, Professional Studies (including teacher education and Nursing) and Business.
- Review current course offerings across two-year and four-year institutions that fulfill expectations for quantitative literacy across multiple disciplines.
- Develop a new definition of what constitutes a general education mathematics for proposed COMAR revision.
- Develop a charge for "Pathways" working groups to build frameworks for pathways for quantitative literacy that will fulfill the revised General Education COMAR requirements.

Teacher Education JCR Report: Response to the 2014 Joint Chairmen's Request

The Joint Chairs requested a report assessing how Maryland teacher education programs are adapting their programs to align with the Maryland College and Career Ready Standards (MCCRS) to ensure that future teachers are prepared with both the depth of content knowledge and the pedagogical strategies to prepare students for success in college and careers. The Joint Chairs also requested that the Colleges of Education report on their progress in aligning with the new CAEP standards, which are both different and more rigorous than the prior National Council for Accreditation of Teacher Education (NCATE) standards. To determine the readiness of the Maryland teacher education programs to meet these new challenges, USM convened a stakeholder workgroup and prepared a survey that was distributed to all higher education institutions with Maryland Approved Programs and all community colleges with Associate of Arts of Teaching programs.

Twelve four-year institutions participated in the JCR survey in the fall of 2014, including six University System of Maryland institutions, five MICUA institutions, and St. Mary's College of Maryland. In addition, eight of the 16 community colleges responded. The responding institutions account for over 80% of the new teachers graduating from Maryland universities according to data presented in the 2012 Teacher Staffing Report (MSDE).

The results of the survey were mixed but generally positive. Almost all two-year and four-year institutions responded that they have had a long-term emphasis on critical thinking and decision making—those learning outcomes are, by definition, a large part of the undergraduate general education mission in Maryland. The responding institutions also reported strong alignment with their field experience/internship programs, since those field placements are required to be in established Professional Development schools, where MSDE had invested significant resources to infuse MCCRS and PARCC into the curriculum and has invested in professional development for both principals and teachers. A number of universities and colleges listed areas of strength with respect to alignment to MCCRS, including: curriculum revision of required courses including content, technology and assessment; faculty development both at the campus level and at the state-level through MSDE and USM sponsored workshops and conferences; and enhanced internship experiences and collaborations with schools involving bringing expert, master and mentor teachers to provide professional development for teacher educators.

Report Recommendations:

Charge the Teacher Education Task Force to:

- Re-evaluate the 1995 Redesign of Teacher Education and the Institutional Performance Criteria in light of MCCRS.
- Develop recommendations for higher education institutions that will support a shared model of accountability, including a reduction of the regulatory burden and control costs.

- Identify initial and potential long-term opportunities within the higher education community to improve teacher preparation.
- Develop a model for collaborating and partnering using shared resources to enhance pre-tenure teacher induction.
- Propose best practices for professional development that will more fully engage both P-12 and higher education institutional expertise.
- Suggest innovative methods for recruiting teacher candidates and for rewarding teacher achievement and career ladders.

Needed Resources:

The JCR Workgroup recognizes that while there is limited availability for additional funding, priorities would include:

- Support for Professional Development Schools, where experienced professionals and novice teachers work together to successfully implement MCCRS.
- Support for data collection that bridges the information gap between preparing teachers and hiring teachers, so that relevant data can be shared between higher education and K-12 schools.
- Support for edTPA, a performance based assessment for new teachers.
- Support for quality mentors who provide the most direct supervision and instruction to novice teachers.



MADE CLEAR

Maryland and Delaware Climate Change Education Assessment and Research

Phase II Interim Report: 9/30/2014 – 12/31/2014

1. *List of significant activities related to implementation. Ideally, this list will include information on dates of events, number and type of participants, and an indication of the purpose of the event.*

Please see the table below for specific information on major MADE CLEAR programs during this quarter.

K12 sector: Significant efforts during this quarter were in the areas of planning and presenting follow-up professional development sessions for the 2014 - 2015 MADE CLEAR Climate Science Academy teachers, and planning content and logistical structures for blended professional development for the next Academy cohort, including in-person and virtual on-line sessions. MADE CLEAR is coordinating planning with climate education programs that will be offered by partner institutions in Delaware and Maryland. Planning is also underway for a program to prepare selected Master Teachers to conduct professional development programs in climate science for their colleagues.

Higher Education sector: A workshop to train preservice educators (undergraduate students preparing to enter the teaching profession) in climate science and pedagogy was piloted this quarter. Planning for the workshop incorporated information gained from past MADE CLEAR programs and drew on expertise from across the MADE CLEAR project. Planning is underway to revise and offer this model program at Salisbury University in Maryland and the University of Delaware.

Informal Climate Change Educators community of practice: Members of the MADE CLEAR ICCE community of practice met for two days in Lewes, DE to share ideas, construct climate education materials, learn about reflective practice, and plan action on specific initiatives in workgroups. Sessions included on-line data resources, an interview with Dr. Dana Veron of MADE CLEAR about communicating science, and a model field study related to sea level rise. A small group of ICCE members also met independently to plan climate education activities for programs with resident students.

Learning sciences sector: Major activities during this quarter include members of the MADE CLEAR Learning Sciences team visiting classrooms to prepare for and carry out observations and data collection related to research questions. Two MADE CLEAR research proposals were accepted for presentation at the 2015 NARST Annual International Conference in Chicago, IL. Dr. McGinnis and Emily Hestness of MADE CLEAR submitted an invited book chapter on the University of Maryland Learning Science's Research Team's use of drawings to understand pre-service teachers' conceptions of climate change, titled "*Using Drawings to Examine Teacher Candidates' Moral Reasoning About Climate Change*," J. R. McGinnis and Emily Hestness. This is an invited chapter for the book "*Drawings as evidence in science education*," edited by Phyllis Katz. Boston: Sense Publishers.

MADE CLEAR partner **Maryland Public Television** uploaded 100 additional vetted resources to the Resources section of the Teacher Resource website at <http://madeclear.thinkport.org/>

MADE CLEAR Principal Investigator Dr. Boesch and Project managers met with Dr. Henry Johnson of **Maryland State Department of Education** to confirm plans for integrating climate science into teacher professional development programs across Maryland and to explore opportunities for climate science education and certification for preservice teachers, and using climate topics to model science and engineering skills as part of Next Generation Science Standards requirements.



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2. *A brief 1-2 paragraph highlight (written for a public audience) describing one thing you've accomplished this quarter that you think is most noteworthy and potentially worth NSF promotion.*

Recognition of MADE CLEAR by the White House Office of Science and Technology Policy

MADE CLEAR is pleased to report national recognition of the project during this quarter. In response to “[A call to action](#) to advance climate education and literacy” issued by the White House Office of Science and Technology Policy (OSTP) on October 22, MADE CLEAR sent OSTP information about the MADE CLEAR project and our upcoming events and programs. The [Recommendations to the President](#) published by the State, Local, and Tribal Leaders Task Force on Climate Preparedness and Resilience on November 17 included a call for climate education. This is the first time education has been explicitly included as a component of national responses to and preparation for climate change. MADE CLEAR was the only climate education project highlighted in the [report](#), on page 45. The description of the MADE CLEAR project that was included in the report is copied below.

MADE CLEAR Maryland and Delaware

The Maryland and Delaware Climate Change Education, Assessment and Research (MADE-CLEAR) program is supported by the National Science Foundation as a member of the Climate Change Education Partnership, through a grant awarded to the University System of Maryland. MADE-CLEAR addresses Maryland and Delaware's shared regional climate change concerns and aligns with the States' STEM education emphasis. Its primary goal is to build partnerships among state universities, public schools, informal science education institutions, Federal agencies, and the private sector to support climate education. Currently, MADE - CLEAR is advancing climate science as a part of the curriculum in K-12 classrooms, informal science education programs, and university courses; developing new pathways for teacher training and development in climate science education; engaging in research on how students learn climate content; and enhancing public outreach on climate policy and science.

On December 3, the White House Office of Science and Technology Policy launched a new [Climate Education and Literacy Initiative](#) to help connect American students and citizens with science-based information about climate change. On that day, the White House OSTP hosted a Roundtable discussion at the White House. MADE CLEAR Principal Investigator Dr. Boesch represented the project at the Roundtable, which provided an opportunity for leaders from the public, private, academic, nongovernmental, and philanthropic sectors to discuss opportunities and new steps for providing students and citizens with the skills they will need as community leaders, city planners, and entrepreneurs, to address a changing climate.

We anticipate additional opportunities for recognition and interaction with the White House OSTP.

3. *A brief summary of the greatest and/or least-anticipated challenges thus far and what, if any, course corrections have you made?*

In recognition of the need to assess progress in Year 3 of the MADE CLEAR project and plan for the second half of the project, an all-team meeting was convened on December 8 to review project goals, stated objectives, and outcomes. This team-wide effort provided an opportunity to initiate the process of confirming what each sector will accomplish in the remaining two and a half years of the project, and articulating how progress and achievements will be measured.

This is a challenging task, as we want to achieve our ambitious project goals and focus our efforts for the remainder of the project on the most effective and valuable actions and programs. During January and February, Project Managers will be working with Principal Investigators and groups of MADE CLEAR team members to define metrics that can be used to demonstrate achievement of each goal and objective.



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Major MADE CLEAR Programs Oct – Dec 2014				
Date	Topic	Participants	Number attending	Comments
4 Oct	Mechanisms of Global Warming; Working with Models in the Classroom	2014 MC Climate Academy cohort	23 teachers 7 staff	In person session; included presentations by 2013 cohort members
25 Oct	Climate science and model lessons on climate	Preservice teachers from TU and DSU	11 students 8 staff	Pilot for climate science training for preservice educators
30 Oct	Using the internet & data sources to support student learning	2014 MC Climate Academy cohort	17 teachers 6 staff	On-line session; included presentations by 2013 cohort members & practice using online data
15 Nov	Students present and revise climate lessons, working with mentors	Preservice teachers from TU and DSU	10 teachers 10 staff & mentors	Mentors included teachers from 2013 & 2014 Climate Academy
19 Nov	Using proxy data to understand Earth's past climate	2014 MC Climate Academy cohort	17 teachers 5 staff	On-line session; included presentations by a climate scientist and 2013 cohort member
3 & 4 Dec	Construct climate education materials; training on reflective practice; workgroup meetings; sharing ideas	MC Informal Climate Change Educators Community of Practice	25 ICCEs 8 staff	Included data & technology session and model field study, as well as research on building and sustaining a community of practice
8 Dec	Review and revise project objectives and metrics	MADE CLEAR team members	24 MADE CLEAR team members	Defined metrics and outcomes will be included in Strategic and Implementation Plan
15 – 18 Dec	Climate literacy in the classroom	AGU attendees	(number will be in annual report)	MADE CLEAR presentation at AGU meeting