

Who We Are

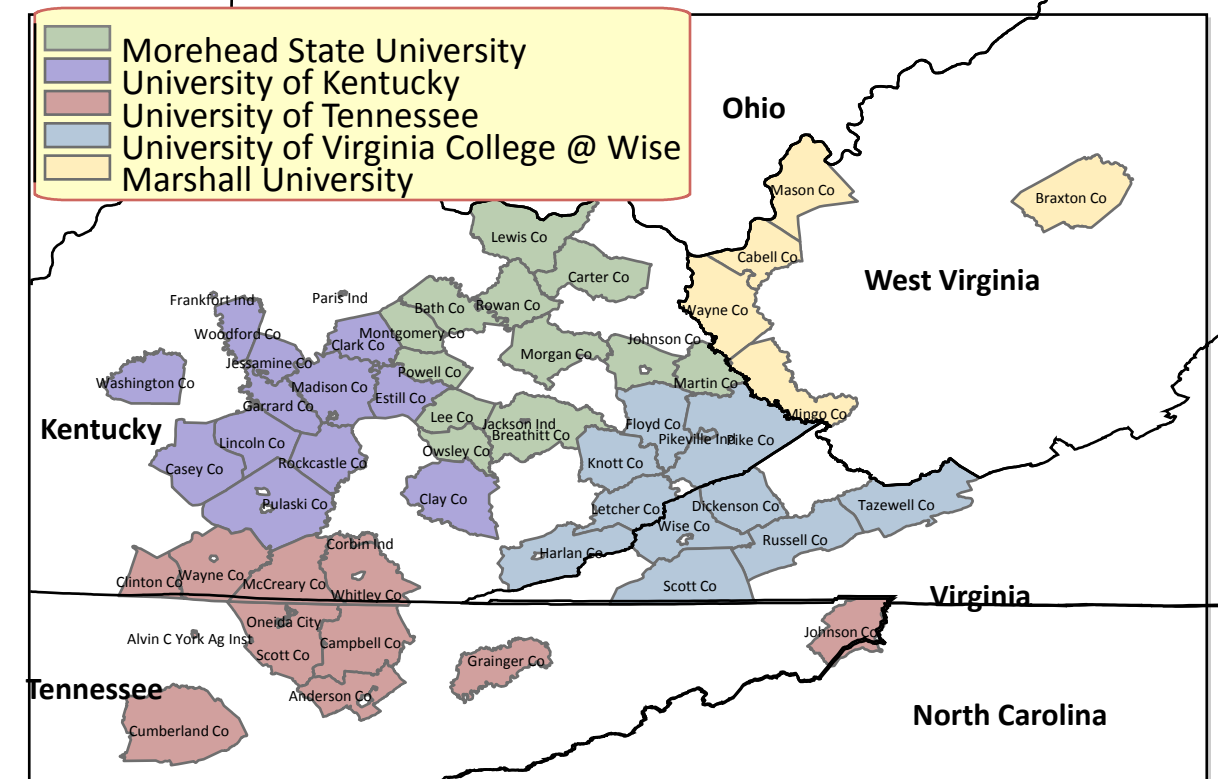
- NSF Comprehensive MSP Program
- \$25 Million Grant with 4 Supplements
- 4 States
- 56 School District Partners
- 10 University and Education Partners



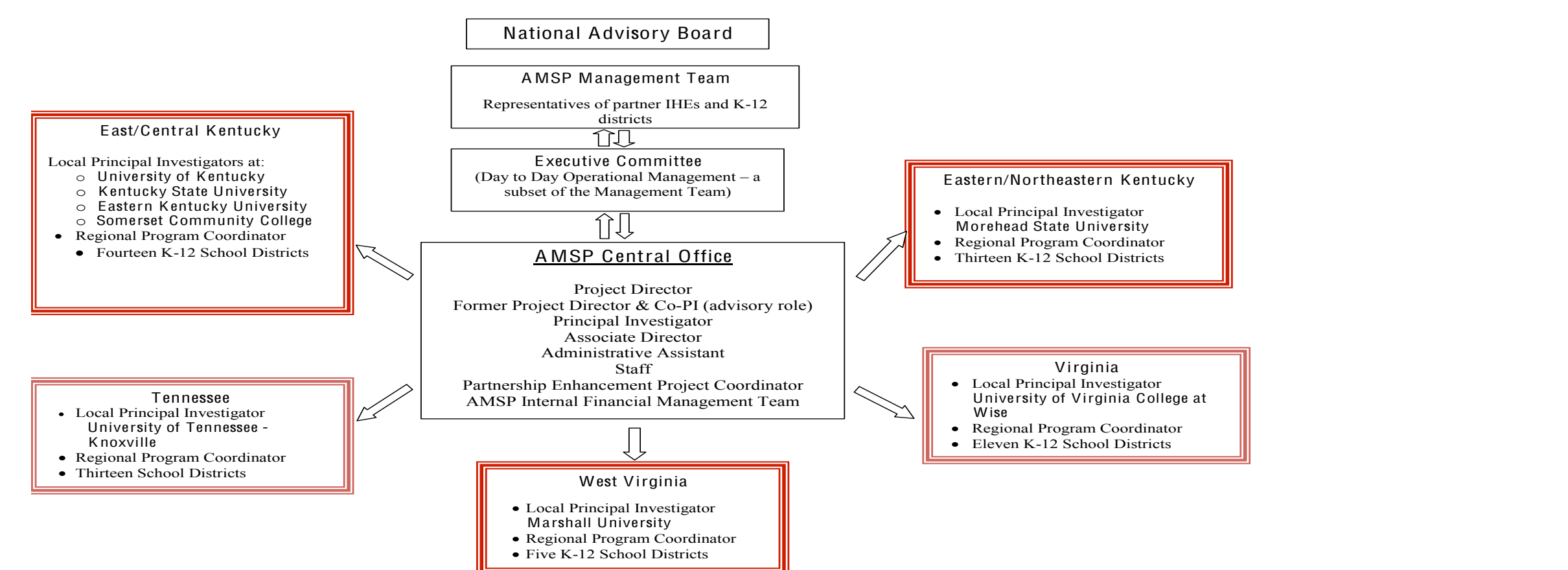
IHE and Education Partners



Central Appalachian K-12 District Partners Location of Regional Program Coordinators



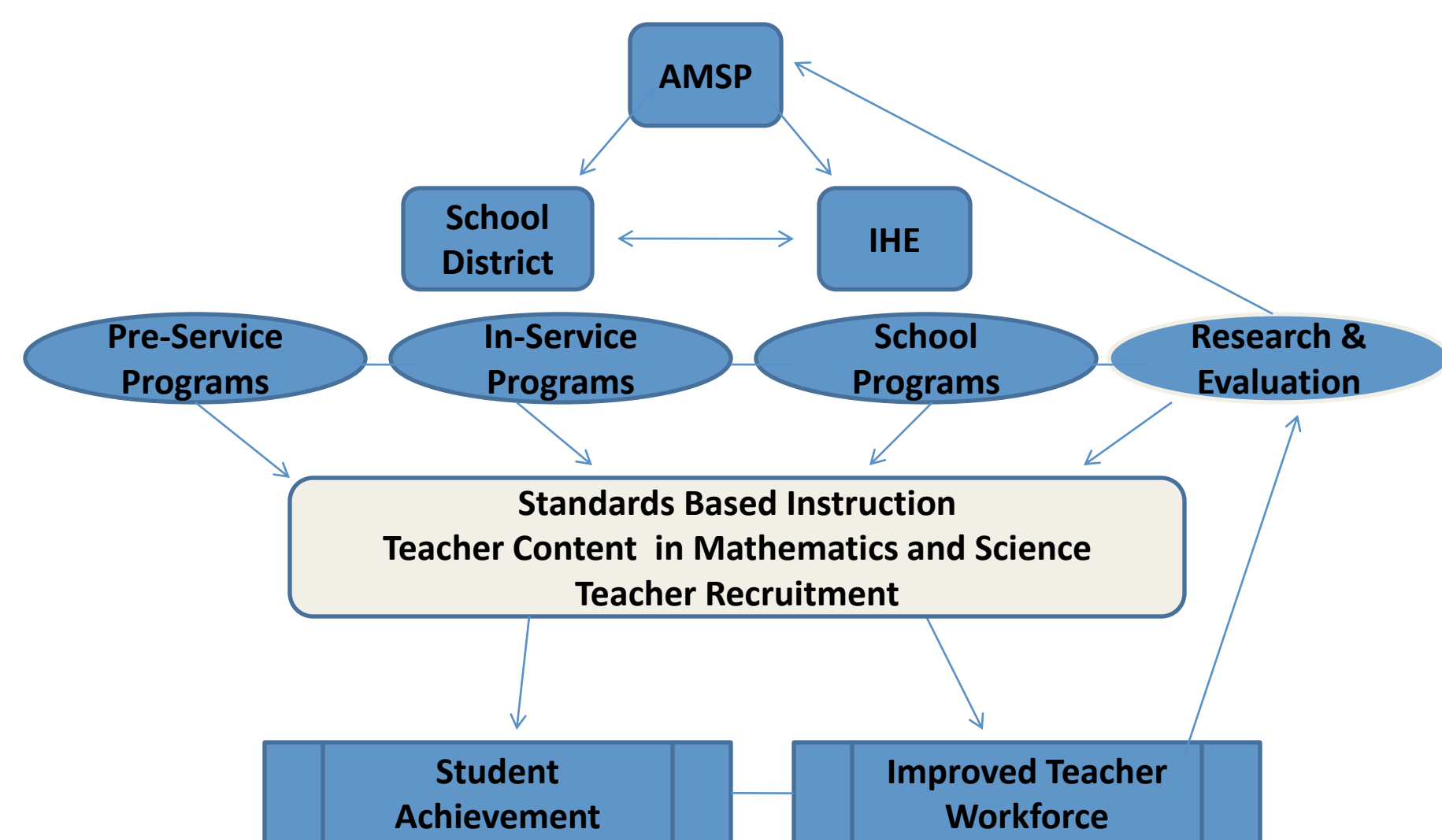
Organizational Component of AMSP



AMSP Goals

- 1) To eliminate the achievement gap in science and mathematics for preK-12 students in the central Appalachian region and
- 2) To build an integrated preK-16 education system which ensures the selection, development, and support of a diverse, high-quality mathematics and science teacher workforce.

Programmatic Components of AMSP



AMSP School Improvement Activities Addressing Goals Through Lines of Investment

| Pre-Service Teacher Enhancement | In-Service Teacher Enhancement | School Improvement and Program Enhancement | Research |
|--|--|--|---|
| Course Development <ul style="list-style-type: none">Mathematics<ul style="list-style-type: none">GeometryProbability & StatisticsMathematics for Elementary TeachersMathematics for HS TeachersCommunicating Mathematics/Technology Science <ul style="list-style-type: none">Elementary Physical ScienceElem. Earth/Space ScienceElem. BiologyMS Physical ScienceMS Earth/Space ScienceHS BiologyHS Chemistry <ul style="list-style-type: none">Teacher Recruitment<ul style="list-style-type: none">UTA/ExplorersExcel Teacher InductionFaculty Development | Teacher Institutes <ul style="list-style-type: none">Mathematics<ul style="list-style-type: none">MS GeometryProbability & StatisticsCommunicating MathematicsElementary MathematicsMathematics for HS Teachers Science <ul style="list-style-type: none">Elem. Physical ScienceElem. Earth/Space ScienceElem. BiologyMS Physical ScienceMS Earth/Space ScienceHS BiologyHS Chemistry <ul style="list-style-type: none">Mentored ImplementationGraduate CoursesDistance Learning Courses | Leadership Development <ul style="list-style-type: none">Principal DevelopmentCounselor DevelopmentLeadership InternsParent/Community Engagement/Support Baseline Improvement Sites <ul style="list-style-type: none">K-12 Student Opportunities Regional Program Coordination <ul style="list-style-type: none">Outreach Professors – Mathematics and Science Partnership Enhancement Project Program (PEP) | Funded Projects <ul style="list-style-type: none">Program EvaluationStudiesDissemination of Findings |

Appalachian Mathematics and Science Partnership

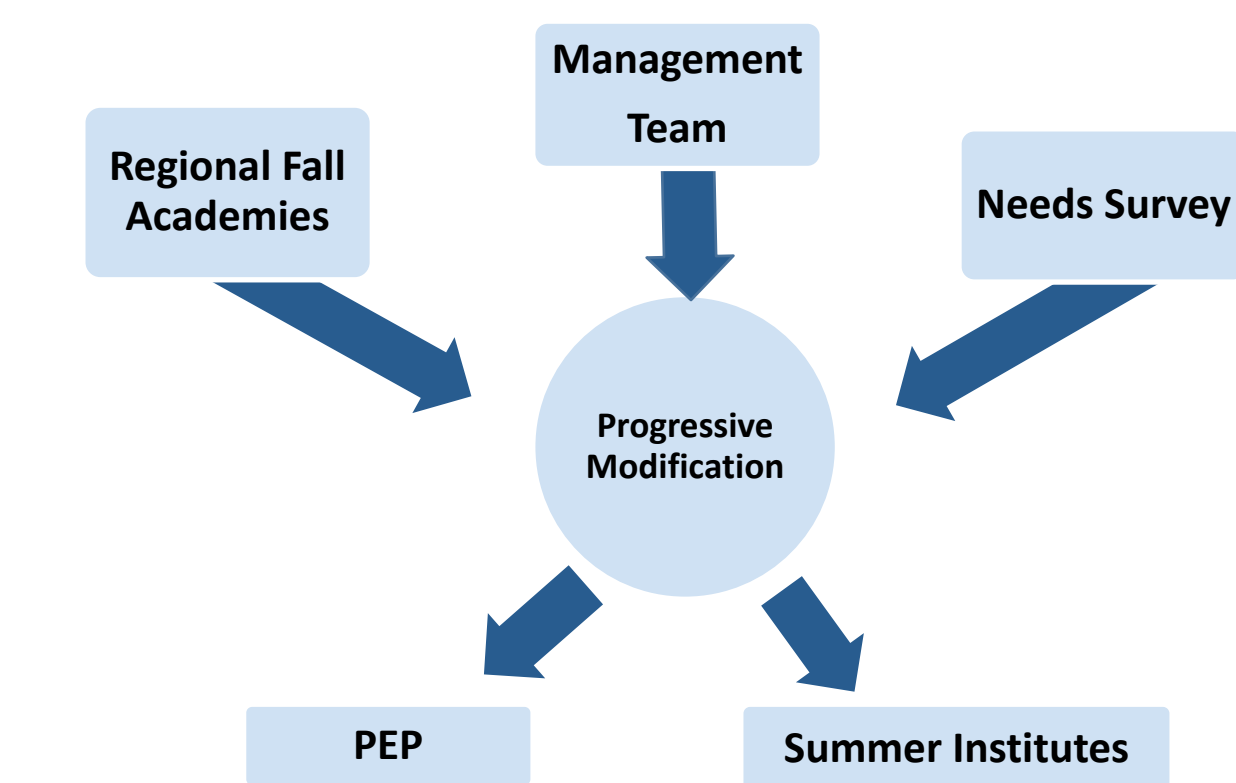
John H. Yopp, Project Director
Wimberly Royster, Co-PI
Jeffrey Osborn, Outreach Engagement Professor
Barbara Shoemaker, PEP Coordinator

Challenges Met

Managing a comprehensive project to enhance Math and Science in four Central Appalachian states –

- Addressed by:
- Creation distance education,
 - Creation of the Regional Program Coordinators (increasing contacts at school level from 240 contacts to 825 contacts the first year),
 - Management system representing levels of responsibility from K-12 and IHE partners which provides true partnership status,
 - Activities such as summer institutes, fall academies and planning meetings conducted at partnering K-12 schools and IHEs.

Listening and Responding to Partners



Creating Strong and Effective engagement partnerships with K-12 districts and IHE faculty –

- Addressed by:
- Including the K-12 and IHE faculty partnership in pre-service, in-service, school improvement and research from planning of activities to implementation.
 - Creating a special category called Outreach Engagement Professor
 - Creating a unique PEP model.

Sustaining successful initiatives after cessation of the AMSP grant-

- Addressed by:
- Acquiring continuous support from the University of Kentucky Administration for an institute to continue AMSP best practices.
 - Obtaining foundation support to expand successful AMSP programs.

Creation and Sustained Funding of an Institute at the University of Kentucky

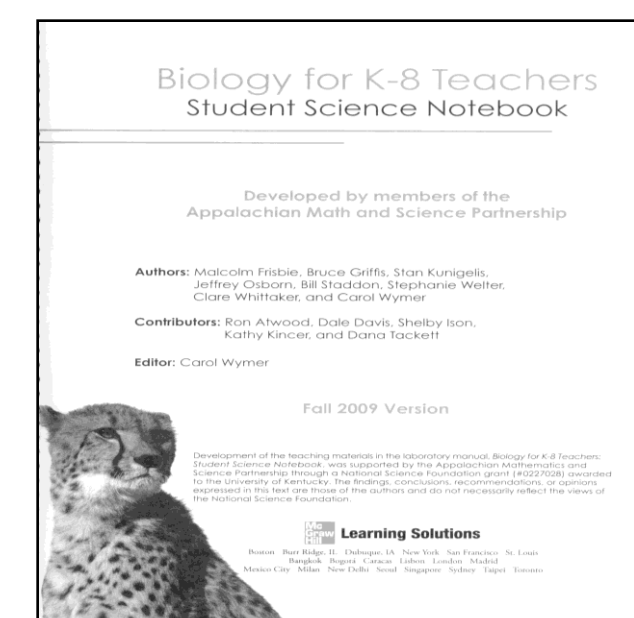
Sustainability of the AMSP IHE K-12 Network, its Outreach Professors and best practices through the foundation and financial support of an institute and the success in obtaining progressive increases in the external support.



- Best practices from the AMSP and other projects in STEM Education Reform are incorporated into the mission goals, and programs of the Partnership Institute for Mathematics and Science Education Reform (PIMSER, www.uky.edu/PIMSER)
- Serves the K-12 school districts in Kentucky through faculty engagement and outreach in science and mathematics education assistance, research and financial support.
- PIMSER administration consists of a Director, (AMSP Project Director), an Advisory Board (Deans of Arts and Sciences, Education, and Engineering, disciplinary and education faculty, and K-12 representative) and a core support staff. The Outreach Engagement Faculty (50% appointments) uniquely created for the AMSP K-12 and IHE faculty partnerships. PIMSER reports to the Provost and is financially supported by the University and Administration.
- The Partnership Enhancement Project (PEP) Model has been adopted for Statewide Expansion.

Indicators of Success

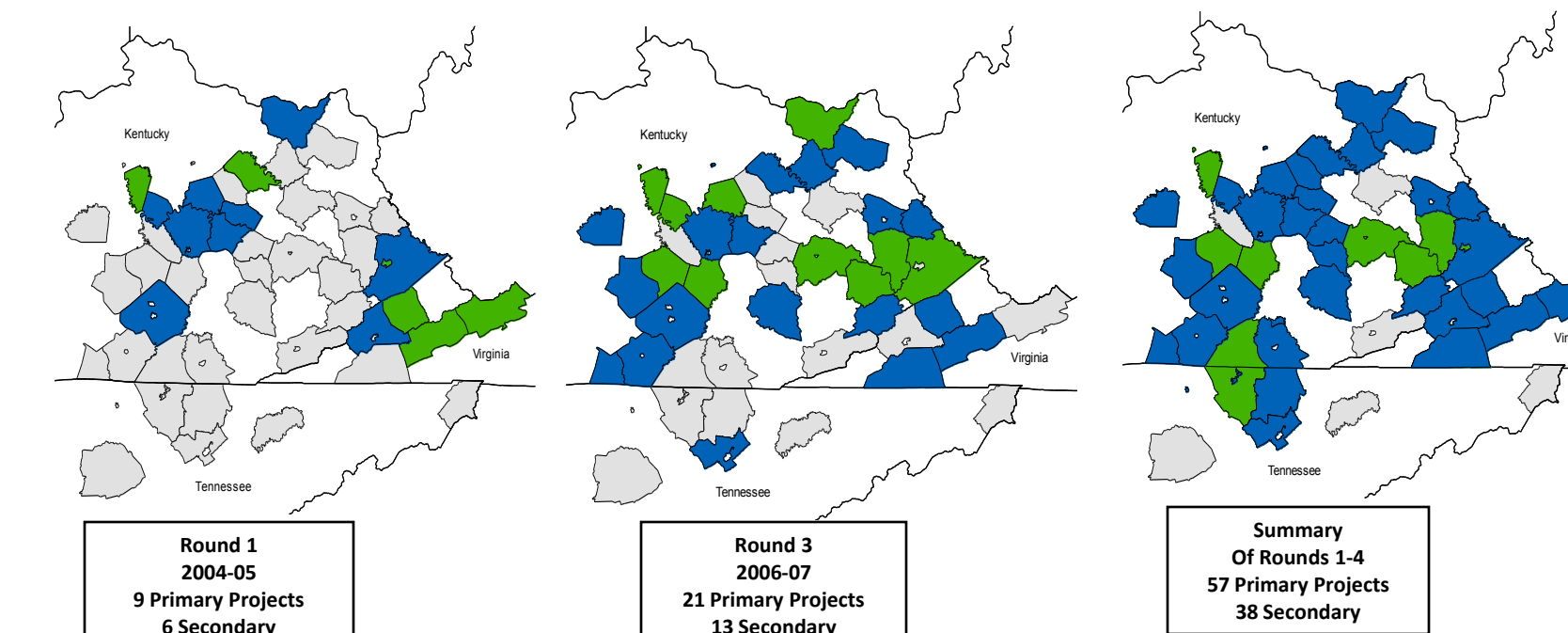
Adoption of the challenging pre-service content courses in mathematics and science created by higher education and K-12 faculty partners, for example the published Biology K-8 book below



The adoption, support and funding of AMSP best practices by business, agencies and foundations, i.e., AT&T, GE, and Toyota USA Foundation Grants.



Increasing demand by K-12 partners for teacher identified math & science education needs to be met by IHE/K-12 Engagement Partnerships: The Partnership Enhancement Program (PEP)



NSF Awarded a Supplemental Grant to Increase the Scope of this Program

IHE “Faculty” Partners Have Been Positively Affected By Engagement Partnerships with K-12 Teachers and Schools

Survey Details
Conducted Jan/Feb 2007
157 Faculty Members
–69 at research institutions
–88 at comprehensive/private institutions
–70 math
–39 science
–22 education
–26 other/unknown
Individual Question Response Rate: 26.7% to 36.9%

Conclusions

- Influence on individual professors slightly greater than on their departments
- Individual and departmental influences highly correlated, especially between departmental course content and individual factors

AMSP Influence >= Somewhat

88% – Changed the instructional materials and/or content used in their courses
86% – Influenced their teaching methods
73% – Changed the instructional content of courses in their department
71% – Changed the teacher preparation curriculum at their institution

Master Teacher – NSF MSP Supplement

A two-year program of mentored professional and leadership development that creates highly skilled Master Teachers of Mathematics and Science to serve as expert resources in high-need K-12 schools in central Appalachia. AMSP Master Teachers work directly with AMSP IHE partner faculty mentors and Regional Teacher Partners trained through previously funded NSF Appalachian Rural Systemic Initiative (ARSI) Master Teacher Program. To pursue their own individual plans of professional and academic advancement, faculty mentors assist the teachers in the development of instructional content and Regional Teacher Partners facilitate a professional learning community designed to prepare Master Teachers for leadership roles in the schools.



Marshall University Outreach Professor working with math and science teachers in Mingo County, WV.

Access to Algebra

Access to Algebra, a distance learning program that provides high quality Algebra instruction to high school students and their teachers as a professional development component. After initial development at one school it is being institutionalized by school districts and adopted by other universities in the state. An online placement test for college readiness utilizes the technology developed by the Access to Algebra program and is likewise being adopted by other institutions in Kentucky.

Reducing the Student Achievement Gap in K-12 Mathematics and Science

| Grade Level and Subject | ARSI Participation (with hrs of AMSP Participation) | Hours of AMSP Participation | % of Teachers Participating in AMSP |
|--------------------------------|---|-----------------------------|-------------------------------------|
| 4 th Grade Science | 4.35*** | 0.08*** | 0.25* |
| 5 th Grade Math | -0.49 | 0.04*** | 0.57*** |
| 7 th Grade Science | -4.52 | -0.16 | 0.28*** |
| 8 th Grade Math | 7.90 | 0.16 | 0.01 |
| 10 th Grade Science | 3.77** | 0.04*** | 0.78*** |
| 11 th Grade Math | 4.70** | 0.04** | 0.32* |

*-Statistically significant at the 10% confidence level.
**-Statistically significant at the 5% confidence level.
***-Statistically significant at the 1% confidence level.

AMSP NSF Supplement at Marshall University, Huntington, WV

AMSP-MU mission is to create a regional partnership that embraces the AMSP lines of investment. AMSP-MU selected the PEP concept as the most effective means to create the desired partnerships to improve and enhance mathematics and science in both the university and K-12 school partners. District leadership teams (DLT) were formed in each county partnered with content area University Outreach professors to develop the PEP that best fit the school districts needs in STEM education. To involve the University further, the Outreach professor brought pre-service teachers and graduate students into the initiative.

Principal “Take-Away” Finding

- P-20 STEM Education Reform cannot be achieved without engagement-based Partnerships.
- An essential Partner in these Partnerships is the K-12 teacher workforce.



“At a time when local expertise and individual teacher knowledge have been disconnected, devalued and even dismissed, the AMSP has taken a decidedly different stand – seeking out, honoring and cultivating the local voice. One of their operating assumptions was that a top down theory of action would not take root in the mountains of Appalachia. By most accounts, the AMSP was on to something. People respond when they feel heard and respected.”

External Evaluation Report, June 2007
Inverness Research Associates

What we would like to know from the other MSPs?

What have other universities in MSP done to include K-12 engagement content faculty in promotion, tenure and the reward program?

What has been done in participating universities to organizationally and financially sustain their best practices?