

2010 MSP Learning Network Conference

Appalachian Math and Science Partnership

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Who We Are

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

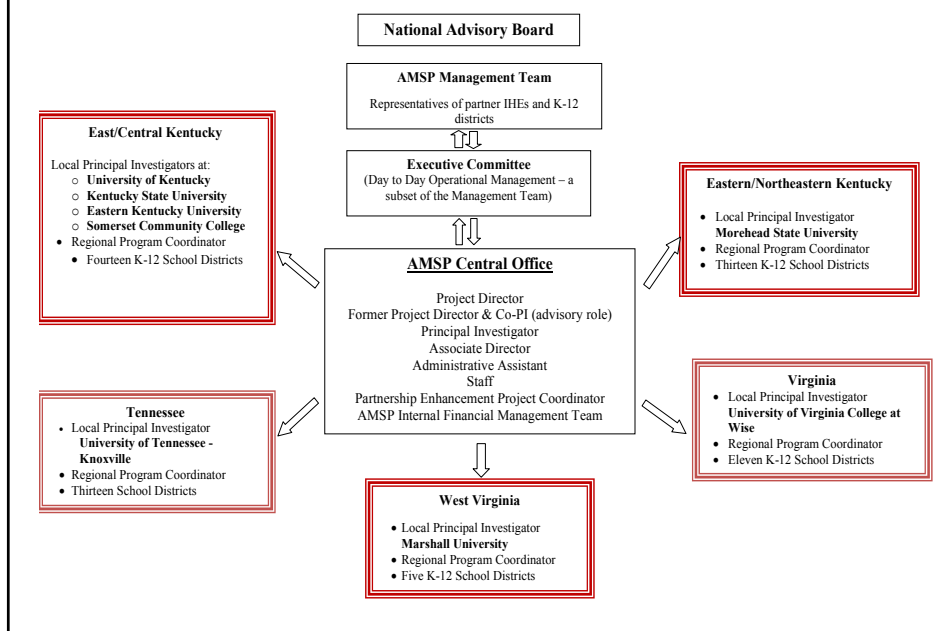


IHE and Education Partners



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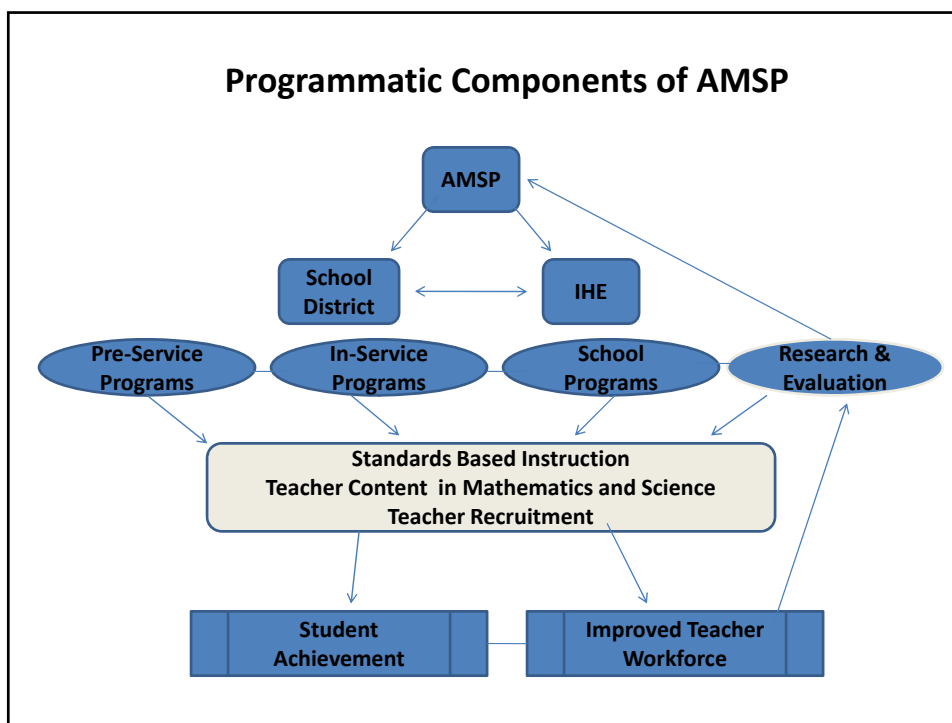
Organizational Component of AMSP





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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 <u>Mathematics</u> <ul style="list-style-type: none"> Geometry Probability & Statistics Mathematics for Elementary Teachers Mathematics for HS Teachers Communicating Mathematics/Technology <u>Science</u> <ul style="list-style-type: none"> Elementary Physical Science Elem. Earth/Space Science Elem. Biology Teacher Recruitment <ul style="list-style-type: none"> UTA/Explorers Excel Teacher Induction Faculty Development	Teacher Institutes <u>Mathematics</u> <ul style="list-style-type: none"> MS Geometry Probability & Statistics Communicating Mathematics Elementary Mathematics Mathematics for HS Teachers <u>Science</u> <ul style="list-style-type: none"> Elem. Physical Science Elem. Earth/Space Science Elem. Biology MS Physical Science MS Earth/Space Science HS Biology HS Chemistry Mentored Implementation Graduate Courses Distance Learning Courses	Leadership Development <ul style="list-style-type: none"> Principal Development Counselor Development Leadership Interns Parent/Community Engagement/Support Baseline Improvement Sites K-12 Student Opportunities Regional Program Coordination Outreach Professors – Mathematics and Science Partnership Enhancement Project Program (PEP)	Funded Projects Program Evaluation Studies Dissemination of Findings

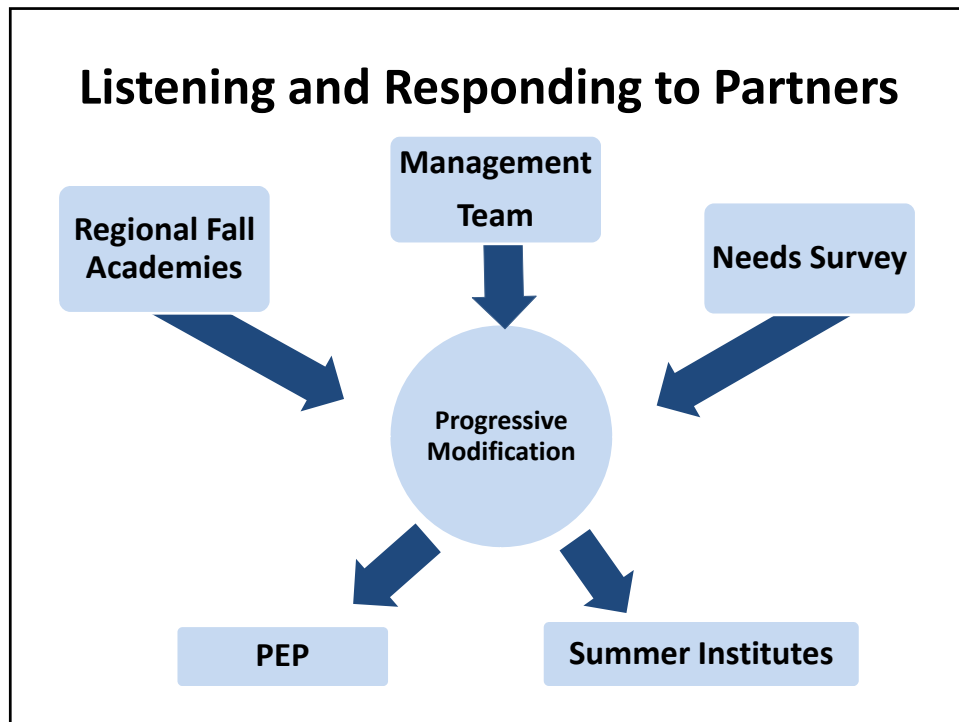


CHALLENGES MET

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.



**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.

Developing sustainable initiatives to achieve the program goals

Addressed by:

- Hiring mathematics and science **outreach engagement** content tenured faculty with nationally established reputations

Sustaining successful initiatives after cessation of the AMSP grant.

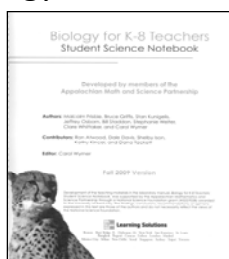
Addressed by:

- 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.



INDICATORS OF SUCCESS

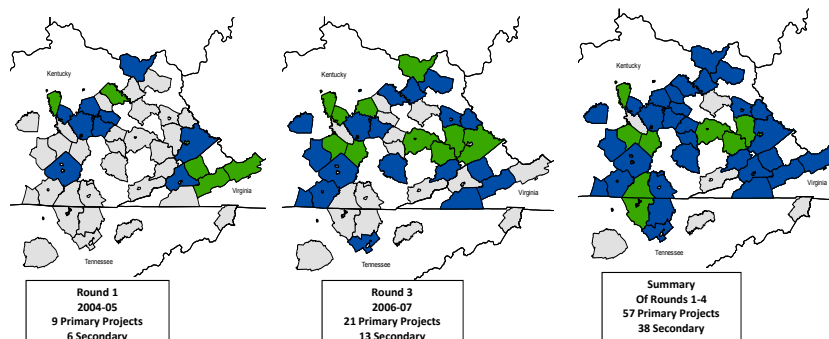
Adoption of the challenging pre-service content courses in mathematics and science created by higher education and K-12 faculty partners, for example the published Biology K-8 book below.



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

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 hours 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.			

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%

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

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

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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.



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

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.

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.



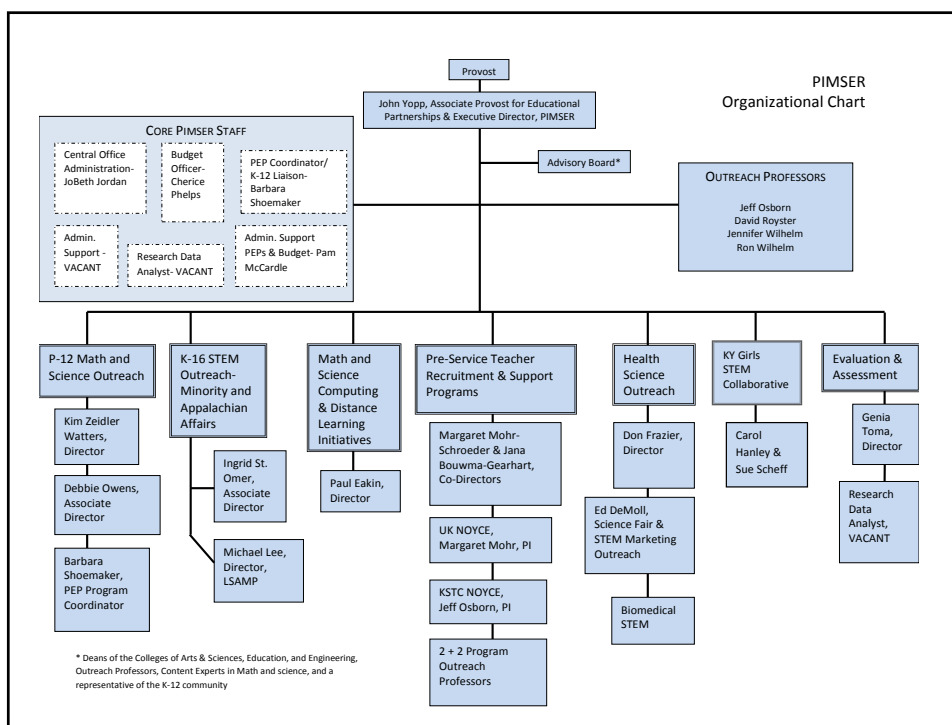
<http://www.uky.edu/pimser/>

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.



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?**