

NSF Robert Noyce Project at Newberry College – REMAST

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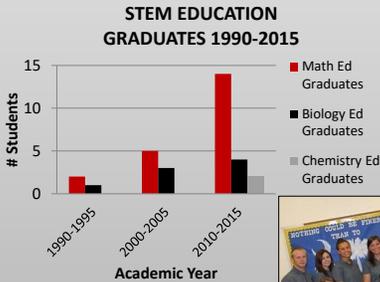
REMAST

RECRUIT + ENGAGE MATH AND SCIENCE TEACHERS

REMAST Phase II (2015-2020) Goals and Status

RE-MAST Phase I (DUE – 0934802) 2009-2015

Goal: More than double the number of STEM secondary teachers certified by Newberry College over a five-year period.
Grant Investigators: Christina McCartha, Laura Lanni, Charles Horn, Renee Stubbs, Cynthia Aulbach, Master Teacher; John Luedeman, Project Evaluator.
Student Scholars: 5 Biology, 2 Chemistry, 13 Math
Graduates: 18, of which 15 have completed teaching commitment
Professional Development: 3 campus events each semester, opportunities for conference attendance.



- 1) Recruit 9-16 additional STEM majors into teaching
- 2) Provide educational support for REMAST scholars
- 3) Provide professional development (PD) opportunities for mentors, scholars, scholar graduates (Teaching Fellows), and grant personnel
- 4) Pursue an innovative research agenda related to math and science teaching.

- 1) 13 REMAST Scholars recruited to date: 2 current Scholars, 8 Teaching Fellows in high need districts in STEM classrooms- 3 math, 4 biology, 1 chemistry; Goal Met!
- 2) Ongoing: education courses and experiences, informal education opportunities – on-campus and off-campus
- 3) Ongoing: Bi-monthly PD sessions and State, Regional, and National conference attendance : 66% of all REMAST personnel involved since 2010 attended at least one Professional Development meeting or conference during the most recent school year (2018-2019)
- 4) No Cost Extension: STEM Teaching Research



Phase II Data

Research Questions & Methods

Research Questions

- 1 - How does research-focused, multi-level leadership development increase math and science teacher persistence and effectiveness?
- 2 - How does participation in a research-focused, multi-level professional learning community (PLC) increase math and science teacher persistence and effectiveness?
- 3 - What leadership development is possible and appropriate for math and science educators when focused on research and working at pre- and in-service levels.
- 4 - What aspects of research-focused, multi-level leadership development have the most impact on math and science teacher persistence and effectiveness?

Measures

- 1 - Collect 1 video with lesson plan per student per year (EQUIP & in house assessment). A video lesson is scored using the Electronic Quality of Inquiry (EQUIP) protocol, with evaluation in four categories: summative views of instruction, discourse, assessment, and curriculum; a score of 1-4 given to each category. The scores from each category is then averaged to compute the Teaching Fellow's overall score. The closer the score is to 4, the more advanced the teacher appears.
- 2 - Collect pass/fail ADEPT data from Teaching Fellows (Completed by their third year). ADEPT certification is required for South Carolina continued instruction.
- 3 - Professional Development (PD) as undergraduate in REMAST (2013-Records); PD after graduation through REMAST; yearly personal survey

Results & Conclusions 2018-2019

Question 1

- Year 1 Base-line Data (2015-2016) collected for 6 RE-MAST participants that chose to participate in the study.
- Year 2 Data (2016-2017) collected for 7 RE-MAST participants that chose to participate in the study.
- Year 3 Data (2017-2018) collected from 9 participants.
- Year 4 Data (2018-2019) collected from 9 participants in the study. This brought the total number of participants with at least 2 years of data to 12.
- Year 5 (2019-2020) we project to collect data from at least 12 participants with 10 participants having data for 3 or more years.

Question 2

- An indicator of RE-MAST graduates' success and effectiveness in the classroom has been the ability to pass Praxis and 3rd year certification markers (ADEPT*).
- The overwhelming majority of our program completion in-service teachers have stayed in the field. In terms of overall persistence in the field, 21 of our 26 graduates are teaching in their fields, for an 84% retention rate (this includes data from fellows not participating in the broader study). Of those not teaching, 3 are pursuing careers related to education.
- Teaching Fellows' year-to-year performance on EQUIP has shown improvement by about 0.25 points on a 4 point scale. The greatest improvements were seen on the Curriculum section of EQUIP (an increase of an average of 0.53) which evaluates the lesson's "content depth, learner centrality, integration of content and investigation, and students' organizing and recording of information." However, assessment subs cores remained steady, indicating an area that still needs work. We have begun to provide Fellows with peer-modeled example lessons in Professional Development of the subsections of EQUIP, as they model Inquiry-based learning more broadly.

Question 3

- We have included more field experience opportunities before student teaching at the secondary level. Opportunities have been provided for Scholars as supplemental instructors (SI), Science Olympiad judges, lab assistants, tutors, and leaders during informal science activities.
- Scholars have been provided on-line practice PRAXIS tests in their area of content and teaching pedagogy.
- Our leadership development efforts with our Fellows have focused on providing them PLC activities to present at conferences as the lead discussant as well as mentor current scholars and discuss their classroom protocol at the college's professional development meetings.

Question 4

- The majority of our Teaching Fellows attended professional conferences during their time as Scholars, and continue to take advantage of conference opportunities provided post-graduation. Additionally, the Scholars and Teaching Fellows that attend our college professional development sessions are those that choose to participate more fully in the research aspect of the grant. Thus, seeing members of the team and each other on a regular basis appear to positively correlate with maintaining enthusiasm.
- We continue to get positive feedback from our Fellows and Mentors about their participation in local REMAST Professional Development meetings as well as National and Regional meetings, and the usefulness of these meetings when they apply knowledge to topics in the classroom.

REMAST Phase II Scholars

Scholar Preparation for the Classroom (2018-2019)

Formal Education Opportunities

- **Methods Courses** with experienced STEM teachers
- **Mayterm Course:** Technology and content literacy courses taught with a secondary STEM focus
- **Teaching Opportunities:** Scholars served as Laboratory Teaching Assistants, Supplemental Instructors, Tutors, and assisted with Homeschool Chemistry Days

Continuing Education Opportunities

- REMAST participants attended bi-monthly Professional Development Meetings
- **Conference Opportunities** Participants attended and presented at conferences on teaching, technology, and in their content area

Informal Education Opportunities

- **Community Outreach** Open House, Homeschool Chemistry Days, SC Science Olympiad (SCSO)
- **Praxis Content Exam** preparation



REMAST Phase II – Year 5

REMAST Fellows & Scholars in Action



Teaching Fellow	GPA Graduation	EQUIP-Y1	EQUIP-Y2	EQUIP-Y3	ADEPT*	Praxis* Pedagogy	Praxis* Content
1	2.85	1.51	1.8	NC	Passed	5.73	19.85
2	3.95	2.075	2.588	3.475	Passed	15.29	3.57
3	3.94	1.65	1.6875	NC	Passed	12.1	14.38
4	3.62	1.325	1.65	NC	Passed	3.82	5.34
5	3.20	1.825	NC	NC	Passed	10.83	4.58
6	4.00	2.925	2.625	NC	Passed	10.83	0
7	3.97	1.5	2.2875	2.3625	Passed	17.83	10.63
8	3.73	1.5875	1.388	3.7	Passed	15.29	3.7
9	4.00	3.1375	3.7	NC	Passed	10.19	20.61
10	3.54	2.325	NC	NC	Passed	12.1	2
11	3.85	1.45	NC	NC	NA	0	11.49
12	3.24	2.35	NC	NC	Passed	1.9	0

*Praxis scores reported as percentage over the passing score obtained by the test-taker.