Integrative STEM for Pre-service teachers

inSTEP

2014-2016

NASA Cooperative Agreement Notice (CAN)
Space Grant Innovative Pilot in STEM Education

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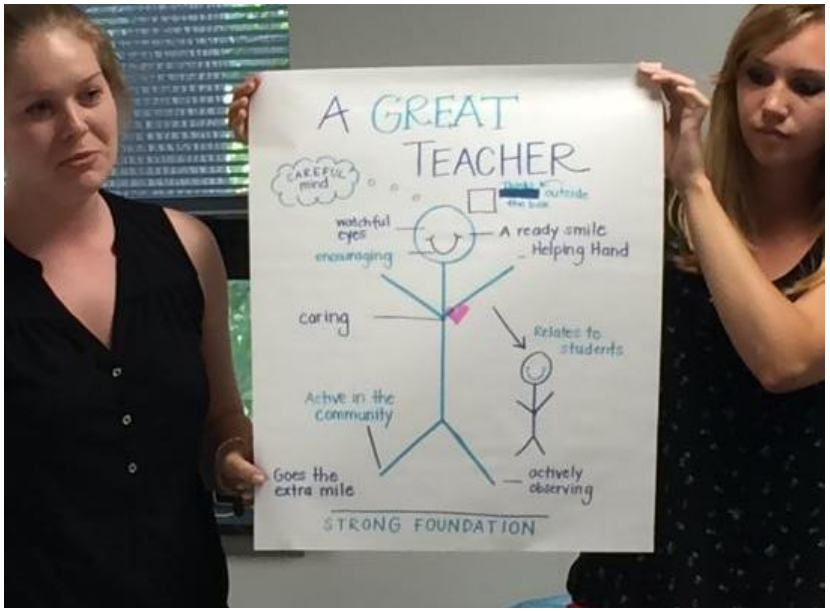
What do new teachers need most?

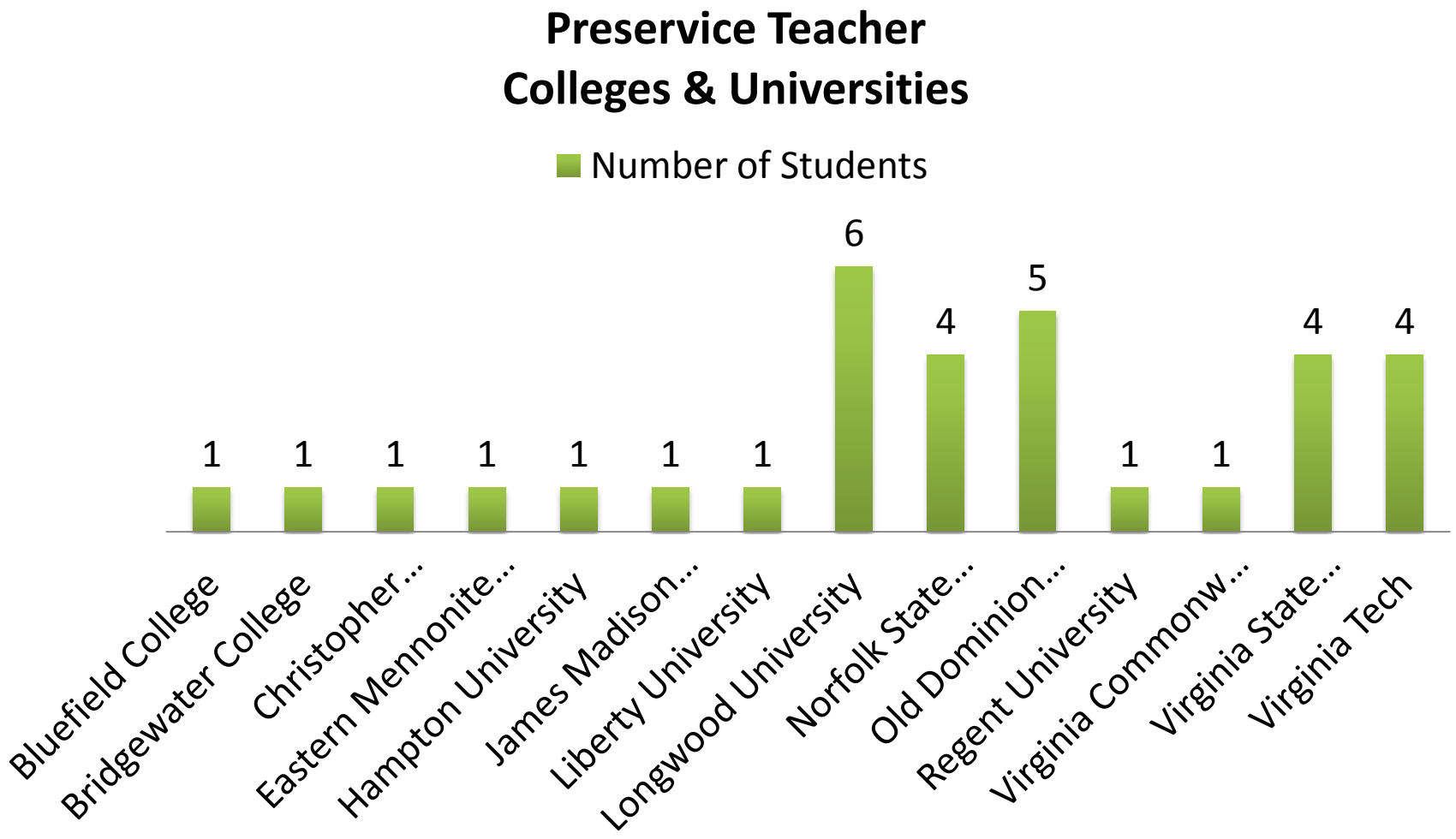
Greater preparedness and evaluation for the "real world" classroom



- "It's one of the harsh paradoxes of teaching: the schools least prepared to support new teachers—that is, low-income, low-performing facilities—are the ones where most new teachers are sent."

NEA, 2012

Student Data



30 NASA funded + 2 funded by non-NASA support, n = 32

Goals and SMART Objectives

- Increase the number of **female and underrepresented minorities** who are retained and complete teacher pre-service programs with the intention of teaching in grades 4-8.

Goal, n=30	Outcome
at least 50% (15) will be females	80% female (24)
at least 26% (8) will be underrepresented minorities	40% minorities (12)

Goals and SMART Objectives *Cont'd*

- Prepare pre-service teachers to effectively **use integrative STEM ED** to increase **students' understanding of STEM**, specifically in **Earth Systems Science**.
- Develop pre-service teachers who achieve mastery of pedagogy needed to confidently teach STEM topics.

Results Self-Reported STEM Knowledge & Pedagogy Competencies

Competency	Outcome
Science	+33%
Technology	+102%
Engineering	+472%
Mathematics	+19%

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5 Main Components

Content - STEM & Earth Systems Science

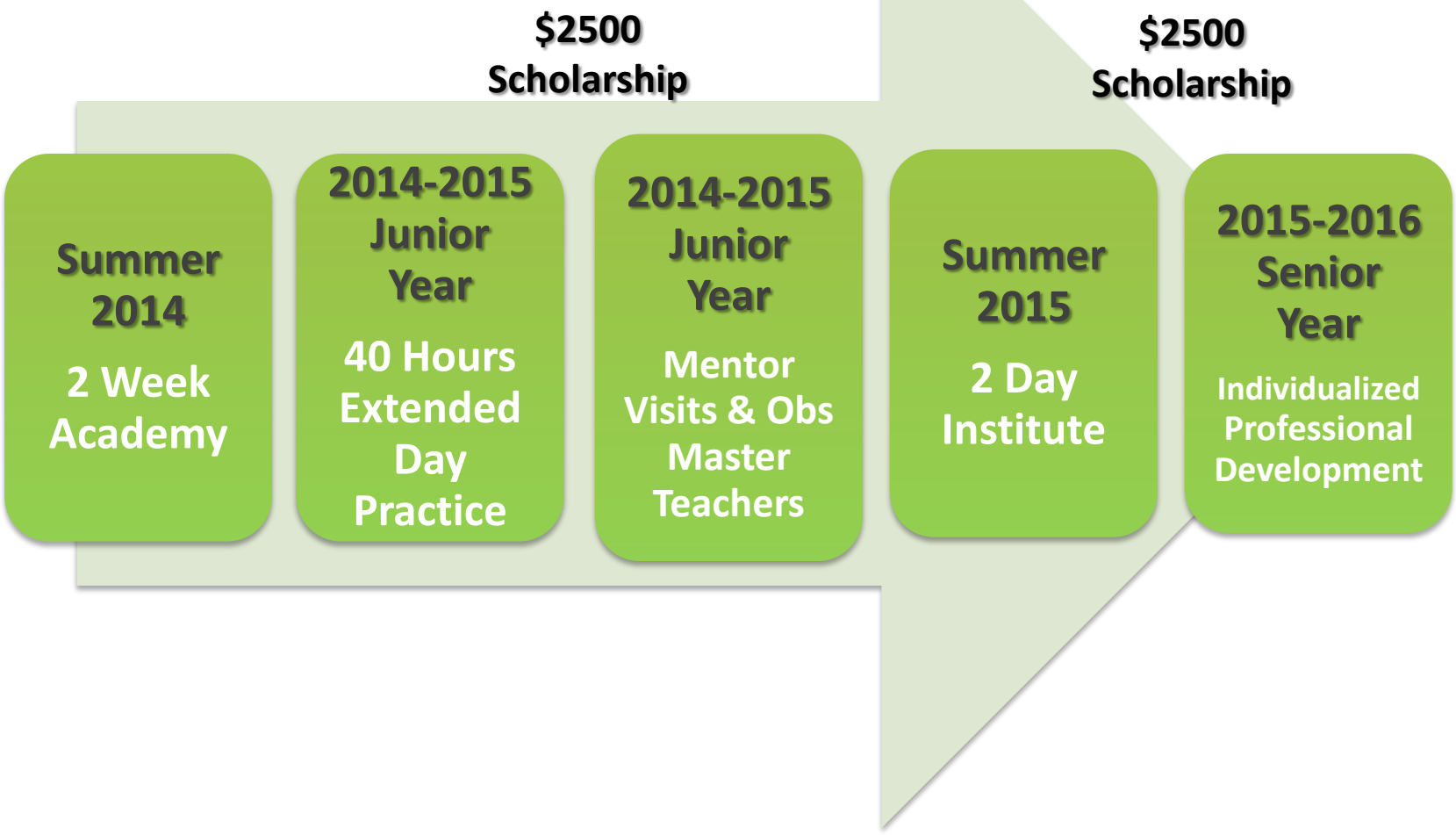
Mentorship - 4 + 1 Master Teachers

Pedagogy - iSTEM & Positive Behavior Intervention, Supports

Practice - Extended Day Implementation with at-risk students

Professional Development- Reflection and individualized professional development

Program at a Glance
2 Year Program



Summer Institute
Snapshot of Week 1: July 6-July 12

Day	Key Idea
Sunday	Arrive & Setting the Stage for the Program Ahead
Monday	Integrative STEM Education
Tuesday	Energy & Matter
Wednesday	Earth Moon Sun System
Thursday	Earth Systems Science
Friday	Exploring NASA Missions: SMAP and GPM & GLOBE Protocols
Saturday	First Robotics

Summer Institute
Snapshot of Week 2: July 13-July 17

Day	Key Idea
Sunday	First Robotics
Monday	Integrative STEM Breakout Working Groups
Tuesday	Remotely Operated Vehicles
Wednesday	Achievement and Socio Economics Culturally-responsive pedagogy
Thursday	Wrap Up

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Extended Day Partners

Birdneck Elementary School	Math Science Center
Cooper School of Technology	Mentor4U
Danville Science Center	VA Beach Parks and Recreation
Destination Imagination at Prince Edward School	Virginia Air and Space Center/ Virginia Beach Public Schools
First Lego League Club of Lynchburg	VT Engage
Franklin Housing Authority	VT YMCA
Harrisonburg Boys & Girls Club	Wade Center
Little England Cultural Center	YMCA Petersburg