

Project Description

Goals

- Develop a sustainable Professional Learning Community model for high school science teachers, pre-service science teachers, and college/university science faculty.
- Enrich science teacher knowledge in order to improve instruction to better enable students for success on the Maryland Science High School Assessments (HSAs).
- Engage college faculty in enriching their teaching and pedagogy in order to improve the quality of undergraduate science courses and increase student retention in the sciences.

Strategies

- Multiple programs, focused on support for inquiry teaching:
- Teacher- and faculty-designed professional development and associated curriculum guides for 350 high-school science teachers
 - Learning communities of science faculty to reform undergraduate courses
 - Research experiences for teachers with embedded inquiry-focused learning community

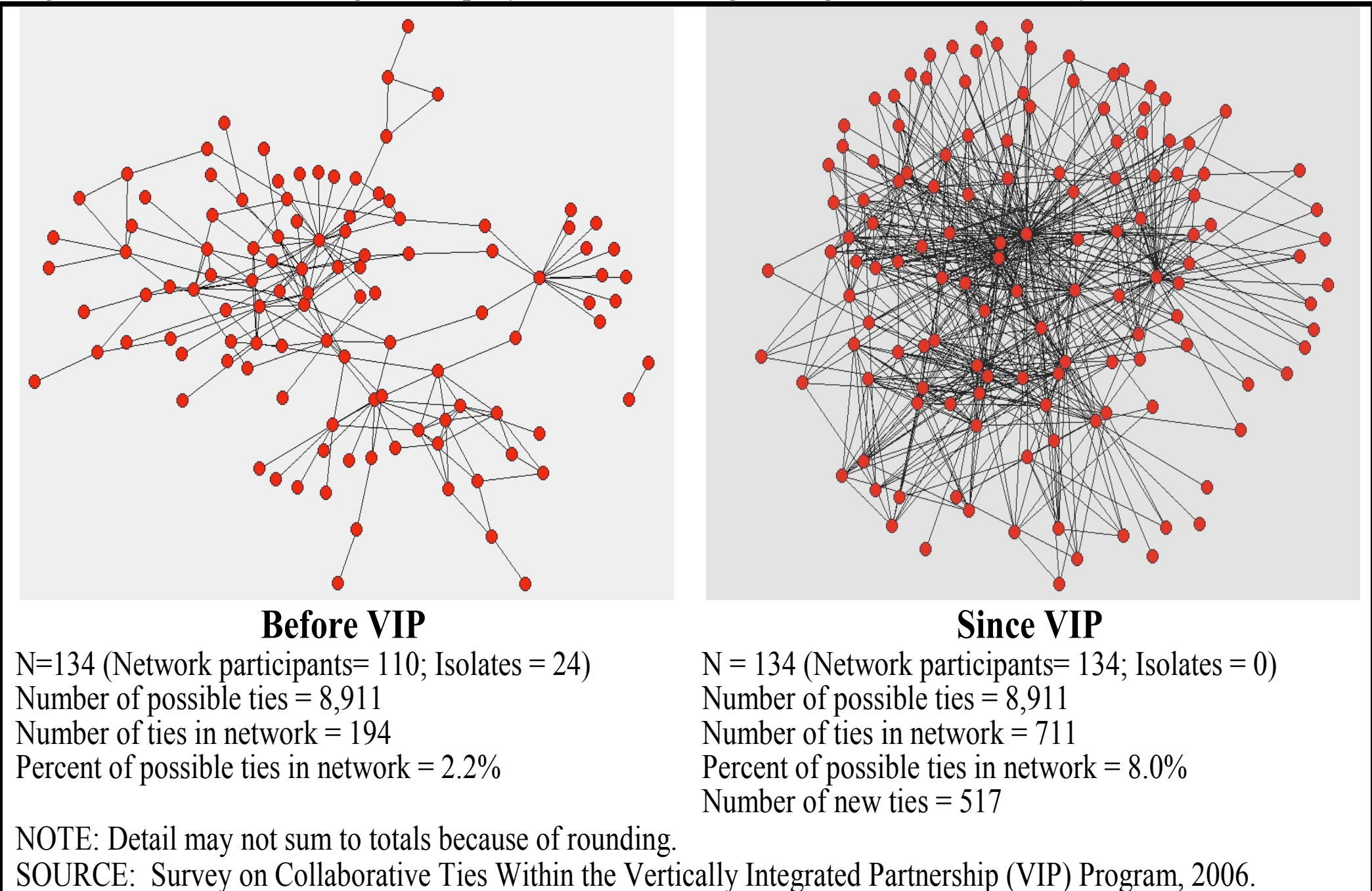
Indicators of Success

Increased collaboration among science teachers and faculty on improving instruction

Since the inception of VIP, the number of professional collaborations among participating K-12 teachers and IHE faculty has increased dramatically. A study was conducted to measure this increase; it employed social network analysis to examine VIP’s evolving collaborative structure, including the emergence of new professional connections among teachers and faculty.

Informed by program goals and activities, VIP networks were examined in four core program-related areas: inquiry-based teaching and learning, mentoring relationships, exposing undergraduates to science teaching as a career option, and planning and managing VIP activities. A survey was conducted in which participants were asked to identify with whom they collaborated meaningfully in these areas before the inception of the VIP program and at a point midway through its fourth year. All areas showed large increases both in the numbers of collaborations among participants, and in the numbers of “vertical” partnerships – those that were between a K-12 teacher and an IHE science faculty member (see Table 1).

Fig. 1. Networks on sharing new inquiry science teaching strategies or materials: before and since VIP.



Student achievement rises after teacher professional development, then drops back down.

The influence of VIP K-16 grant-related professional development on student achievement as shown by common final exam scores and final grades is not obvious because of the number of extraneous variables that could not be accounted for in the analysis. In spite of this, Fall Semester exam scores and final grades in most courses did show signs of improvement in years corresponding to focused professional development given to each teacher cohort (i.e., to teachers of each core course). For example, Chemistry exam scores averaged 68% in the Fall Semesters immediately following chemistry professional development summer programs, but only 63% before the intervention and 66% afterwards. This trend is especially true of test scores on science process skills. English language learners and to a lesser extent special needs students benefited somewhat from the professional development extended to teachers in those areas throughout the grant cycle. By contrast, Spring Semester exam scores and final grades did not show any detectable influence of professional development.

Indicators of Success

VIP K-16 Accomplishments	
Outcome	Number
Curriculum guides in core science courses	44
New high-school science courses	2
Cohort Conferences (one-day PD)	24
Week-long Summer Institutes	5
Master Science Teachers	37
MCPS ExPERT Teachers	45
IHE faculty	100
New or reformed undergraduate science courses	30
Undergraduate teaching or research fellows	68