



SUSTAINABILITY OF THE NSF- FUNDED GK12 PROGRAM



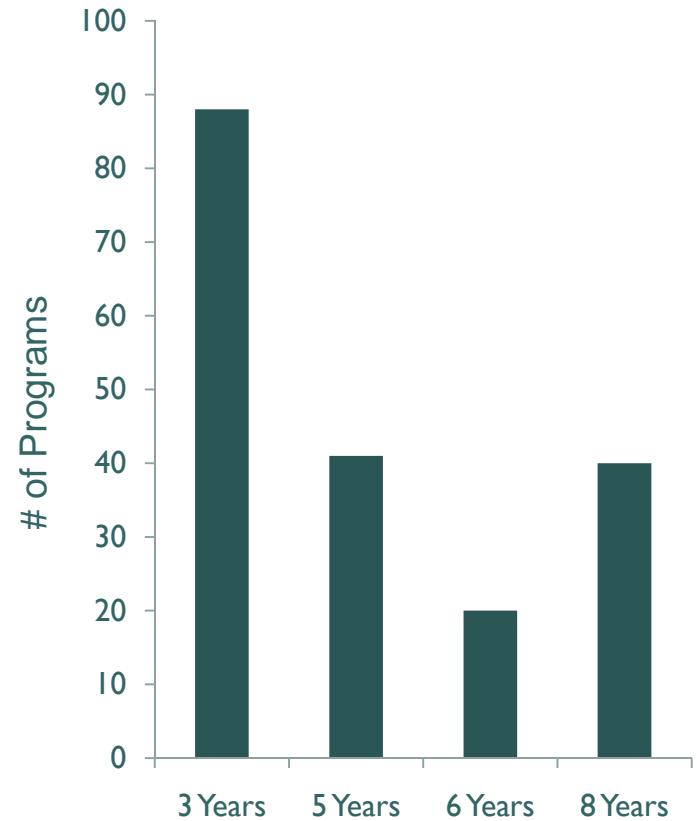
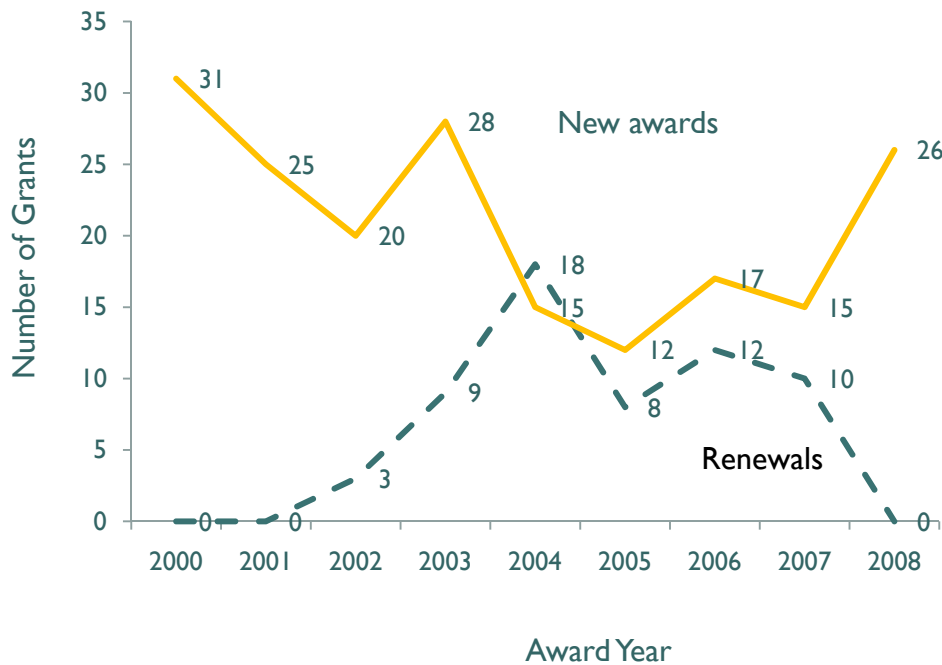
A Study of Funded Projects from 1999-2008

Virginia L. Shepherd, Ph.D.
Vanderbilt University
Annual GK12 Directors Meeting, March, 2009

Overview of GK12 Program

- ▶ The NSF GK12 program started in 1999-2000 with 31 funded sites
- ▶ There have been 189 awards to universities in 46 states, the District of Columbia, and Puerto Rico
- ▶ From 1999-2002, PIs could apply for 3-year grants, with the possibility of one three year renewal.
- ▶ In 2003, a Track I/II system was initiated, allowing universities to apply for an initial Track I grant for 3 years, and a competitive renewal (Track II) award for an additional 5 years
- ▶ In 2007, the program was changed to a single submission of 5 years only, with no renewals. Projects eligible in 2007 for Track II awards were allowed to submit applications for a one time only 3-yr Track II renewal
- ▶ Based on these criteria, we have analyzed our results for 3-yr, 5-yr, 6-yr, and 8-yr awards

Program Number by Year



Goal of Study

- ▶ To determine sustainability of programs post-NSF funding
 - ▶ Definition of sustainability:
 - ▶ *Programs that have sustained components or activities developed during their GK12 award that involve graduate student [or undergraduate student] participation*
 - ▶ *Methods used to collect data: email surveys, phone interviews, and internet searches*
-

Survey Questions

- ▶ Has any aspect of your GK12 program been or will be continued after termination of the NSF funding? If so, could you send a brief description of those activities, and where the funding for continuation has come from
- ▶ If activities have not continued, would you send a brief reply stating this
- ▶ Survey sent to PIs of all past and current projects*
 - ▶ *Some recent awards were not available at the time of our email distribution; we will be sending these out shortly

of email responses: 92 of 189

Internet Sources

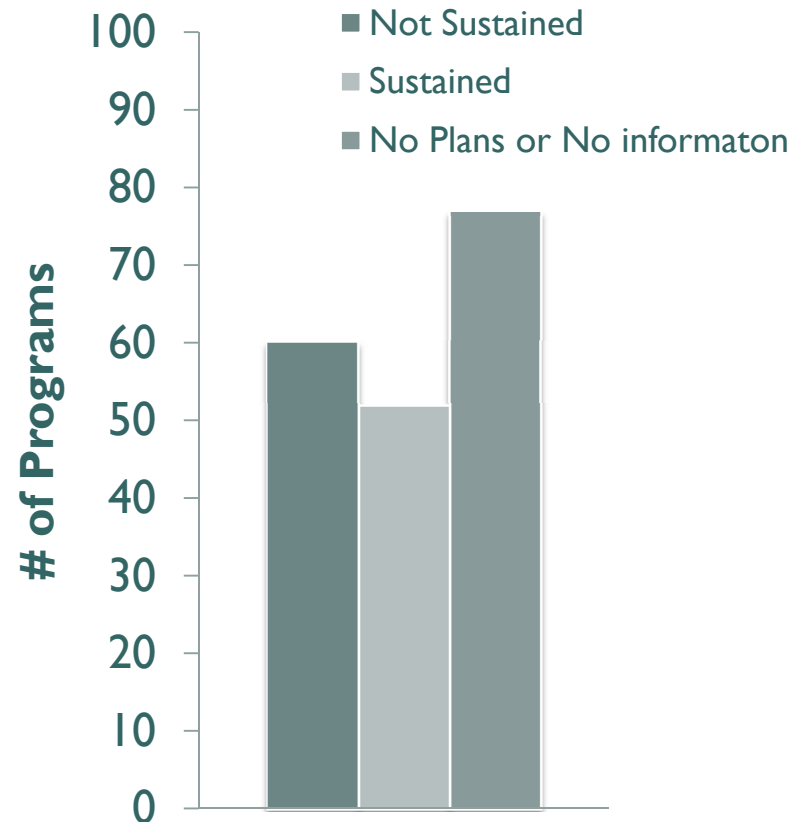
- ▶ NSF.gov: search of archived, completed and ongoing awards
 - ▶ GK12 locator site: <http://www.nsfgk12.org/>
 - ▶ Individual project websites
-
- ▶ A complete listing of all of our data for all sites can be found on our website: www.vanderbilt.edu/cso
-

Sustainability Categories

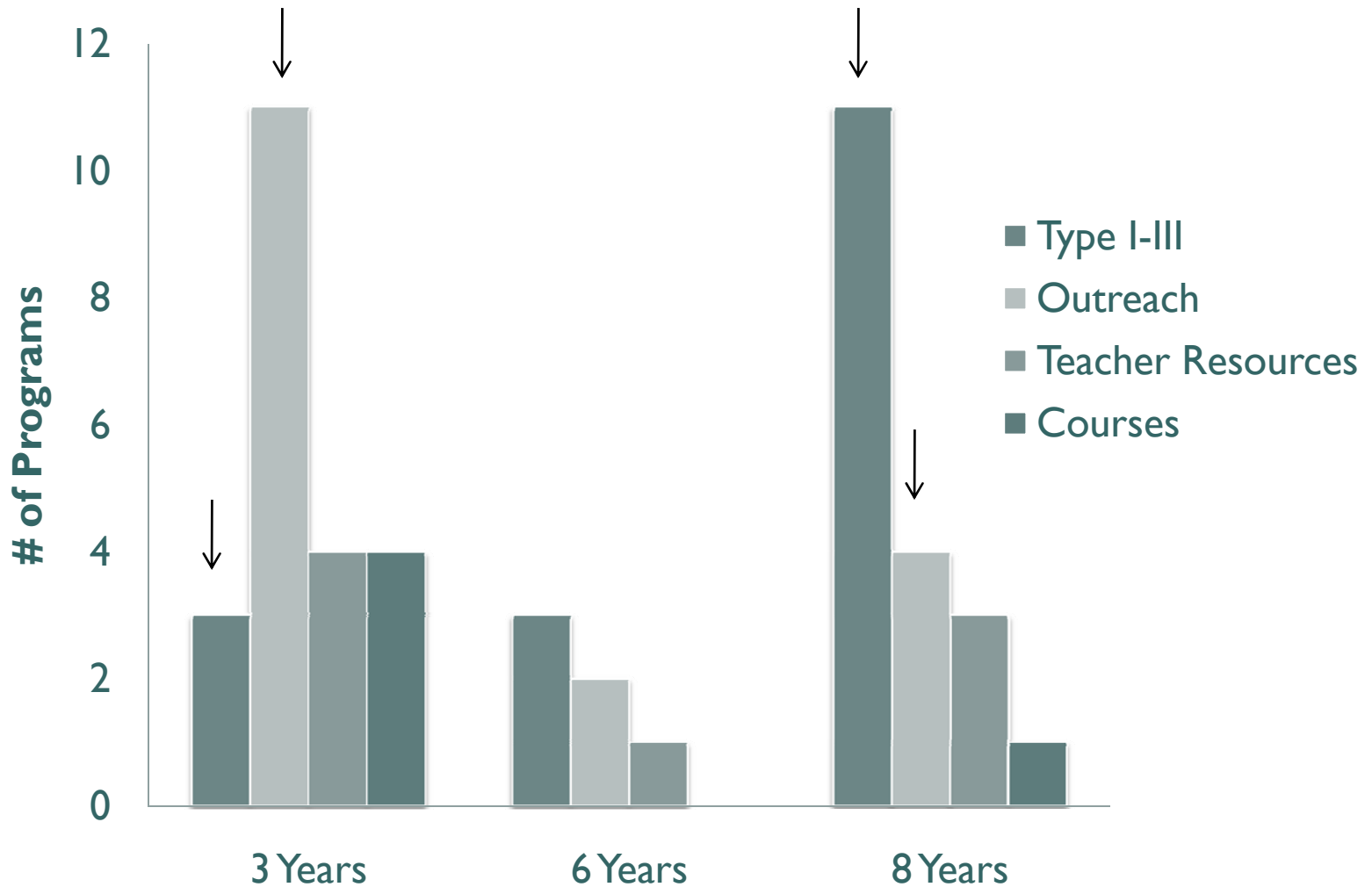
- ▶ Sustained model of fellows in classrooms
 - ▶ Type I: fellow receives full university stipend and spends 1-2 days teaching with a partner teacher
 - ▶ Type II: fellow receives a “topping up” award of \$4-10K for several hours per week in the classroom
 - ▶ Type III: service learning courses that require graduate student teaching in K-12 classrooms
 - ▶ Teacher resources
 - ▶ General outreach activities
 - ▶ Graduate level courses and/or certificate programs
-

Sustained, Non-Sustained and Ongoing Programs

- ▶ We found 60 programs with no stated or apparent sustained activity (21 by email; 39 by web search)
- ▶ Of the 52 programs that have sustained GK12 activities, 18 are post-NSF funding (3 Type I/II, 15 other)
- ▶ Of the 77 ongoing programs, 30 responded that no plans were in place yet



Correlation of Categories of Sustained Programs with # of Years of Funding (2000-2007)



Key Features of Type I-III Programs

Feature	Type I	Type II	Type III
Student Stipend	Typical university stipend	\$4K-10K topping up award	-0-
Time in Classroom	1-2 days per week	5-7 hours per week	30-50 hours per semester
# of Fellows	1-10	2-10	



Type I Fellowships (12 Programs)

- ▶ **University of UTAH West Program (3 years)**
 - ▶ Second year post NSF funding
 - ▶ Ten 10-month, \$18K fellowships in 2008-2009 funded through university, school system, foundation, and federal grant monies
 - ▶ **University of Louisville (6 years)**
 - ▶ Corporate and university pledges to fund 5 fellows
 - ▶ Working closely with university development officer
 - ▶ **Boston University (8 years)**
 - ▶ Three “shared support” fellows/year with funding from the Provost, Colleges, and faculty research \$
 - ▶ Fellows spend less time in classroom than original NSF GTFs
-

Type II Fellowships (6 Programs)

▶ University of South Carolina (8 years)

- ▶ II Fellows are paid a \$10K supplement to work one day/week in a middle school classroom.
- ▶ University funds support fellow stipends, a part time coordinator, and a faculty member to teach an education course
- ▶ School district partner contributes \$10K

▶ Georgia Tech (8 years)

- ▶ Fellows receive a \$7K supplement for 7 hrs/week
 - ▶ Infrastructure is institutionalized within university
 - ▶ Supplements in non-NSF years will be covered through research centers, research grants and non-GK12 federal grants
-

Combined Type I/II Fellowships (4 Programs)

- ▶ **University of Florida SPICE program (8 years)**
 - ▶ 4 Type I fellows funded at \$24K/year by deans of 4 colleges
 - ▶ Type II fellowships (topping up awards) for second year fellows to spend 2 days/month in the classroom
 - ▶ Teacher stipends from the school system
 - ▶ **Ohio State University (Olesik)(8 years)**
 - ▶ Five Type I fellows assigned to the Metro School
 - ▶ Additional Type II fellows funded through enhancement scholarships \$4500 from university funds
 - ▶ **University of AL Birmingham (6 years)**
 - ▶ 4 Type I fellows funded through an ITEST grant
 - ▶ 20 Type II fellows at \$5K per year and 7-9 hr/week commitment
-

Type III: Service Learning

- ▶ **University of the Pacific (3 years)**
 - ▶ Third year of a two unit class for second year pharmacy students who provide hands-on activities in elementary classrooms
 - ▶ A web-based training module is being created to train students at U Pacific and other universities (Arizona, Washington St)
 - ▶ **Northeastern University (8 years)**
 - ▶ Service learning courses for undergraduate and graduate students have been established that require 30 contact hours per semester
-

Outreach Activities

- ▶ Outreach activities that involve graduate students:
 - ▶ Family science nights; tours; tutoring; science clubs; summer programs; science fair judging
 - ▶ Outreach Examples:
 - ▶ UTMSI - Summer Field Science Program for students in grades 3-8
 - ▶ Vanderbilt: Otis Program (Outreach to Inquisitive Students) - Volunteer fellows lead a weekly “pull out” science enrichment program for 7/8 grade students
 - ▶ NC State: Family STEM nights – 10/year at local schools and churches
-

Teaching Resources

▶ TeachEngineering Digital Library

- ▶ Developed at Duke, UC-Boulder, and WPI
- ▶ Teacher tested, standards-based engineering content for K-12 teachers
- ▶ Broader impacts have funded fellows to continue development and field-testing of new units
- ▶ TeachEngineering has expanded to several other universities

▶ University of Idaho

- ▶ The GK12 program has provided non-disposable equipment for partner classrooms
 - ▶ A website is being maintained with archived lesson plans and activities
 - ▶ Teachers have developed connections with university faculty for classroom visits and equipment loan
-

Courses / Certificate Program

- ▶ **Medical University of South Carolina**
 - ▶ Four new graduate courses that will become a certificate programs for graduate students
 - ▶ **University of Kentucky**
 - ▶ The math department now has a required math course – MA601 – dedicated to learning to teach math at the undergraduate level
-

Funding Requirements for Sustainability

- ▶ Program Coordinator
 - ▶ Fellow stipends/tuition costs
 - ▶ Supplies/incidental costs
 - ▶ Teacher stipends
 - ▶ Evaluation
-

Funding Sources

Funding Source	Number of Sites
University	
Provost	11
Graduate School	2
College Deans	6
Academic Departments	1
Individual Faculty	5
Campus Center/Institute	2
Private Foundations/Local Organizations	4
Local Business	2
Local School System	4
Non-GK12 External Grants	9*

*NSF (Broader Impact, REU/RET, MSP, I3, IGERT, ITEST); HHMI; NIH

Vanderbilt Program

- ▶ We are beginning our 10th year and are two years post NSF funding
 - ▶ Our partners include 4 universities (2 private doctoral, 1 public doctoral, and 1 private masters), a large urban school district (Metropolitan Nashville Public Schools)
 - ▶ Since our inception we have had the same coPIs, but have worked with 3 different school system directors and a variety of new university presidents, provosts and deans
 - ▶ Participants have included 80 teachers, 86 graduate fellows, 30 undergraduate fellows, and 30 schools
-

VU-MMC-TSU-Fisk-MNPS Type II Model

- ▶ Ten fellows are selected from all science and math departments/year
 - ▶ Ten teachers are selected from all 38 MNPS middle schools
 - ▶ Fellows are paid \$5000 per year, and teachers receive \$1500 per year
 - ▶ Fellows and teachers spend two weeks in a summer planning workshop and two full days during the school year in further planning
 - ▶ Fellows and teachers team-teach hands-on lessons for one full day per week
 - ▶ Fellows participate in a 2-hr monthly seminar
 - ▶ **The primary source of funding is the School System, with additional money from participating universities
-

Additional Sustained VU Activities

- ▶ **OTIS Program: Outreach to Inquisitive Students**
 - ▶ Fellows spend 2 hrs per week leading a “pull out” science program for gifted students
 - ▶ **Volunteer SCP**
 - ▶ Fellows spend 1+ hrs per week at no stipend
 - ▶ Activities include science fair judging, family science nights, occasional classroom visits
 - ▶ **Activities coordinated by the Center for Science Outreach**
 - ▶ **Ongoing evaluation in collaboration with the VU School of Education and MNPS**
-

Reasons for Non-Sustainability

- ▶ Lack of university or other sources of monetary support
 - ▶ University does not value the program
 - ▶ Transfer or retirement of PI
 - ▶ Changes in school system or university administrative leadership
 - ▶ Limited graduate student population
-

Summary

- ▶ Programs with longer funding periods (6-8 years) were more likely to be successful in sustaining GK12 program components
 - ▶ Shorter funding period (3 yrs) led to more outreach activities
 - ▶ Longest funding resulted in sustained Type I-II programs
 - ▶ Sustainability was found more often in programs that had well developed plans and had negotiated with their university or other funding sources early in the grant period
-

Recommendations for Sustainability

- ▶ Buy-in from all partners is important
 - ▶ Sustainability plan should be developed as grant is being written OR early in implementation phase
 - ▶ PIs need to look for multiple sources of funding including departmental and general university funds, private industries, and local school systems
 - ▶ [Utah: Grad Sch, Coll of Sci, Coll of Mines and Earth Sci, VP Acad Aff, Lakeview Charter School, NSF MSP, Salt Laker Education Found
 - ▶ Universities should develop models that best fit with their local support and structure
 - ▶ Suggested models that appear most likely to lead to sustainability:
 - ▶ Graduate students working in classrooms (Type I-III)
 - ▶ Graduate education courses with teaching focus
 - ▶ Development of resources for teachers
 - ▶ Professional development programs for teachers with graduate student involvement
 - ▶ Creation of university centers to coordinate sustained GK12-like activities
-

Recommendations/Questions for NSF

- ▶ Is 5 years long enough to attain sustainability?
 - ▶ Can we request/require that programs outline their sustainability plans and ideas on their website or on the NSF website?
 - ▶ If there is more than one program on a single campus or with the same school system, should a criterion of funding be to show evidence of collaboration and planning?
 - ▶ Some universities have struggled to get the university to sustain more than one program per campus
 - ▶ CUNY has an umbrella program - College Now – that is planned to institutionalize both previous and current GK12 programs
-