Outreach and communication: building effective internal partnerships

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Joint Mathematics Meetings
San Diego
Workshop for Department Chairs and Department Leaders
January 9th, 2018
Outline

1. A few pictures
2. My Background
3. Why Outreach?
4. Breakout Activity #1
5. Existing Networks Supporting Mathematics Outreach
6. Useful To Do Lists
7. Breakout Activity #2
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Figure: Girls and Mathematics Summer Program - Temple University
Figure: MathCounts Summer Program
Figure: USA Science and Engineering Festival - 2010
Figure: Philadelphia High School for Girls - 2017
**Education**

- Research Expertise: Harmonic Analysis, Partial Differential Equations, Geometric Measure Theory
- Thesis advisors: **Carlos Kenig** and **Mikhail Safonov**.
Education

- 2000 University of Minnesota, Ph.D. Mathematics; M.S. Industrial Mathematics.
- Research Expertise: Harmonic Analysis, Partial Differential Equations, Geometric Measure Theory
- Thesis advisors: Carlos Kenig and Mikhail Safonov.

Profession

- 45 articles and co-author of 3 research monographs
- Sloan Dissertation Fellowship
- Michler Prize from the AWM
- Von Neumann Fellowship at the IAS and Fellow of the American Mathematical Society
- K. Ott (Bates College)
- H. Awala (Wake Forest University)
Administrative Experience

- Undergraduate Director, University of Virginia
- Associate Director, IMA, University of Minnesota
- Association for Women in Mathematics, Executive Committee
- Educational Board of ICERM, Brown University
- American Mathematical Society Council
- Chair, Temple University
My Background

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Outreach Experience
- Girls and Mathematics Summer Program (10 editions, more than 500 students - University of Virginia, University of Minnesota, Brown University, Temple University)
- Temple’s Mathematics Circle (5 years - about 150 students)
- MathCounts Summer Training
- Temple’s Sonia Kovalevsky Mathematics Day (6 years - about 300 students)
- USA Science and Engineering Festival (5000 students)
- Philadelphia Science and Engineering Festival
- GETT (Girls Exploring Tomorrow’s Technology)
Dr. Seuss...

You have brains in your head.
You have feet in your shoes.
You can steer yourself
any direction you choose.
You’re on your own.
And you know what you know.
And YOU are the guy who’ll decide where to go.
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Key findings in international comparative studies:

- Trends in International Mathematics and Science Study
- Program for International Student Assessment

sparked calls for improvement in public schools to help United States keep pace in the global economy.
Mathematics Outreach Programs for Girls

- show the middle/high school girls that the study of mathematics too often regarded as difficult and not appropriate for girls can be exciting, beautiful and useful
- introduce the middle/high school girls to a variety of career opportunities for which sophisticated mathematical ability plays a key role
- emphasize the strategic role mathematics plays for success in STEM careers
- build confidence in the girls mathematical knowledge through quality instruction
- provide participants with a support group
- provide participants with competent mentors ultimately shaping the way the girls view themselves and their mathematical interest and ability.
Breakout Activity # 1: Please take 15 minutes to discuss and record existing outreach efforts in your department. A few additional questions to consider are:

- Who are the organizers?
- Who are the instructors?
- Are you aware of the local/state/university rules about working with minors?
- Is your development office aware of this work?
- Is your dean aware of this work?
- Do you have an online application process?
- Do you have a basic plan for emergencies?
- What does the application process consist of?
Existing Networks Supporting Mathematics Outreach

- MathCounts: https://www.mathcounts.org/
- USA Science and Engineering Festival: https://usasciencefestival.org/
- Regional Science Festivals
- National Association of Mathematics Circles: http://www.mathcircles.org/
- MAA https://www.maa.org/programs-and-communities/outreach-initiatives

1. Dolciani Enrichment Grants
2. Tensor Grants for Women and Mathematics
3. Tensor-SUMMA

- Corporations: ExxonMobil, Lockheed Martin, Dell, 3M
- Private Foundations
Useful To Do Lists

Before:

- select an instructor leader
- fix a date
- reserve rooms
- review and update application material
- draft formal letter for instructors (expectations and compensation)
- recruit instructors (all departments), graduates and undergraduates
- guide the clearances process
- build a tentative schedule of the event
- make teaching assignments with due dates for material
- schedule training session(s) for instructors
- advertise within university
- advertise with all partner schools
- schedule photographer for the event
- design and order event t-shirts if applicable
- ask instructors for special items to be ordered for their sessions
- prepare acceptance messages and prepare waiting list messages
Useful To Do Lists

Before:

- select participants from application pool (think about diversity)
- sign in/sign out sheets and emergency contact information packets for each room
- feedback forms for students, parents and instructors
- prepare email message with details for the event (drop off, pick up, schedule, lunch information)
- prepare participant folders with paper and front tag (with room, t-shirt size, grade)
- design and print certificates of participation for each attendee
- design and print certificates for Individual competition winners
- buy prizes for individual competition winners
- recruit university official for opening remarks
Useful To Do Lists

After:

- email group picture and brief description of event to dean, department chairs, my own department, office of development, parents, media and communication office
- update the archive of material with the new presentations/activities
- email parents and teachers
- write brief summary including number of participants, schedule, instructors, rooms utilized, feedback
- nominate best instructors for awards (departmental, college, university wide, national)
- encourage instructors to present their outreach work at conferences (local, MathFest, JMM)
- write down what worked best
- write down what did not work well
- thank sponsors
- write/assign the writing of the grant report if applicable
Things to keep in mind:

- the event should teach *all* participants new mathematics (make sure everyone is challenged and everyone is following)
- select exciting/inspiring topics
- the event should be engaging, encourage questions, participation and discussion
- involve postdocs
- good intentions are not enough, one needs to be strategic
- it’s best to create a replicable model
- sustainability issues
- create a departmental, college and university culture which values this type of engagement
Breakout Activity #2: Please take 15 minutes to discuss and record outcomes of a successful outreach program in your department along with its sustainability challenges. A few questions to keep in mind are:

- does your department have a culture which encourages this type of involvement?
- what are the funding sources available to you?
- what internal partnerships have you built around outreach?
- how do you use outreach as a mean to bring visibility to the department and the profession?
- how do you use outreach as a mean to support the professional development of your students and faculty?
- are you successfully involving alumni?
- are you cooperating with your Teaching center, if applicable?
And will you succeed?
Yes! You will, indeed!
(98 and 3/4 percent guaranteed.)