First Findings from the INCLUDES Grant
***Best Practices for Graduate Programs*[1]**

An NSF INCLUDES grant[2] titled *Women Achieving Through Community Hubs in the United States (WATCH US)* was awarded to a group of mathematicians[3] and social scientists[4] to study strategies to increase the percentage of women entering and succeeding in graduate school in the mathematical sciences. The WATCH US group has recently completed a two-year study with the aim of determining what ideas, both large and small, can be implemented to improve the success and persistence of women, including those from under-represented groups. The study included collecting data and holding discussions with stakeholders as well as past participants in various enrichment programs. This document provides ideas for departments interested in increasing the success of diverse students in their graduate programs.

Key Actions that graduate programs can take to help women and others succeed:

1. Create a community among your graduate students and faculty:
    - Assign graduate student office space purposefully.
        - Arguments can be made for keeping first-year graduate students together or for integrating them in with the more experienced students. Be deliberate about which approach your department chooses to follow.
    - Encourage a collaborative culture rather than a competitive one.
        - Celebrate the milestones that every student should achieve.
    - Organize study groups for classes/qualifying exams at the department level
        - Student-organized study groups tend to exclude students who do not share certain traits with the organizers; departmentally-organized study group opportunities allow all students to feel welcome to join.
2. Create a sense of belonging.
    - Ensure role models, including female faculty and faculty of color.
        - It is difficult for some students to imagine succeeding when they don't see anyone who looks like them who has succeeded.
    - Have diverse speakers in all seminar and colloquium series.
        - Move away from issuing all invitations to members of a narrow circle of collaborators.
    - Have speakers talk about their lives and mathematical paths with students.
        - Allowing students to understand the individuals behind the mathematics will help students to envision themselves as successful mathematicians.
    - Consider potential along with prior achievement in graduate admissions processes.
        - Consider offering a way for a dedicated student to "catch up" if there are holes in their transcript.
    - Use broad criteria for excellence in admissions and hiring decisions.
        - Research shows that female job-seekers are much less likely than their male counterparts to apply for positions for which they don't meet all of the stated requirements.

3. Provide a safe and welcoming environment.
    - Make sure there is good lighting and that there are secure places for students to work in evenings and on weekends.
        - Students shouldn't need to sacrifice their safety to succeed in your program.
    - Make sure women's concerns are heard and taken seriously.
        - Students are often unwilling to speak up, and so when they do, you should expect what they are saying to have validity.
    - Make sure stereotypes are not perpetuated.
        - Don't pigeonhole faculty, staff, or students into certain roles based on gender, race, or ethnicity.
4. Advocate for a Growth Mindset: Mathematicians are made not born.
    - Faculty and speakers should give examples of how they struggled through difficulty.
        - Giving students insight into how successful mathematicians have struggled will allow them to imagine themselves succeeding through their struggles as well.
    - Allow students the opportunity to take undergraduate courses without stigma.
        - A student may have holes in their transcript not due to innate ability but due to having been in an undergraduate program that did not offer these courses, or to having decided late in their undergraduate career to focus on mathematics.
    - Graduate faculty should believe in the potential of all graduate students (not a weed-out model).
        - Send a message that the department wants and expects every graduate student to succeed.
5. Work towards buy-in from all faculty.
    - Articulate why diversity and inclusion are important.
        - Be able to clearly state why your graduate program aims for diversity and inclusion. Members of diverse groups will be able to tell the difference between programs that are truly invested and those that are not.
    - Having a department chair and a director of graduate studies who are committed to these goals is important, but not enough.
        - In order to achieve institutional change, a critical mass of the faculty must be committed to these goals.

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[1] http://WomenDoMath.org

[2] National Science Foundation; OMA-MPS Multidisciplinary Sciences #1649365 (2016-2018).

[3] Mathematical team: Ruth Haas (Smith Postbac Program, President-elect AWM); Deanna Haunsperger (Carlton Summer Math program, President MAA); Ami Radunskaya (EDGE, President AWM); Judy Walker (Nebraska Conference for Undergraduate Women in Mathematics; AMS Board of Trustees).

[4] Hill, P.W., and Whitney, C. (August 2018) NSF INCLUDES WATCH US Qualitative Research Methodology Report and Preliminary Findings: Mathematics Stakeholders Interviews. Prepared for the NSF INCLUDES Design and Development Launch Pilot WATCH US Program. https://www.womendomath.org/watch-us/