

Tensor Women and Mathematics Program - Project Report

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Project Co-directors' Name(s) Anna Bargagliotti (3rd round), Alissa Crans (2nd), Lily Khadjavi (1st)

Project Institution Loyola Marymount University (LMU), Los Angeles, CA 90045

Project Title Women and Mathematics for Future Teachers

Brief description of the project activities/mathematical topics covered

The 3rd round (2nd round) of funding from the Tensor-MAA Women and Mathematics grant program each supported the mentoring of another woman faculty in the teaching of a college-level course on women and mathematics in Fall 2012 (2010). Funds remaining from the 1st round supported dissemination and provided resources for instruction and outreach. The interdisciplinary course, Women and Mathematics, examines the lives of women mathematicians throughout history, engages students in mathematical topics related to the work of these women (e.g., conic sections, functions, number theory, modular arithmetic, Euler's theorem for polyhedra, difference tables, elementary group theory), and addresses gender equity issues in mathematics education from K-12 through the doctoral level, in academia, and in mathematics-related careers. Common themes emerge from examining the lives of women mathematicians past, some of which remain relevant today. The lives of modern women mathematicians, especially women of color, are examined as well. The course encourages students to adopt a more expert view of mathematics as a study of patterns (rather than of numbers), provides them with an opportunity to "do math" in a supportive environment, and prepares them to discuss the current national situation regarding women's ability and participation in mathematics. The course emphasizes three mathematical themes (math is the study of patterns, inductive and deductive reasoning play distinct and critical roles in developing (new) mathematics, and a single mathematical concept can have multiple representations that serve to illuminate or justify its properties). Future teachers enrolled in the course learn about role models for women doing mathematics, gain knowledge of equitable classroom practices, and resolve to incorporate these into their teaching. They also have the opportunity to reach out to teachers, future teachers and younger students at conferences and workshops with the message that women can do math.

Project Dates 2007-2013: During this time period there were 3 rounds of funding, the course was taught 4 times [2008, Dewar & Khadjavi; 2009, Khadjavi; 2010, Dewar & Crans; and 2012, Dewar & Bargagliotti], and various dissemination activities occurred.

Impact (numbers and levels)

1st generation impact: 3 LMU women faculty (Bargagliotti, Crans, and Khadjavi) mentored by team teaching the course with the course originator (Dewar)

2nd generation impact: Direct results of efforts by the 4 faculty result in:

49 LMU students complete the course (2008 – 10, 2012)

200 Junior high girls at EYH career day learn about women and math from students in the course

2 LMU students, not from the course, also help with EYH Career Day workshops

55 Undergraduates at PCUMC (Pacific Coast Undergraduate Mathematics Conference)
learn about women and math from students in the course

70 Teachers and Future Teachers reached at a Future Teacher Conference

8 Professional Presentations to a total of 125 others at the following venues:

2013 LMU STEM Education Research Seminar – Talk

2013 Lilly West Conference on College Teaching – Workshop

2013 JMM – Poster

2012 SoCal Women in Mathematics Symposium – Talk

2012 RUME Conference – Paper

2012 JMM – Paper & Poster

2011 JMM – Paper

3 Articles published (see bibliography)

3rd generation impact: We have documented that, as of 2012, at least 200 secondary students and 20 elementary students have learned about women and math from just 3 of the former students now teaching in Los Angeles schools who are using information or materials from the course.

Future of the project Now that the course originator (Dewar) is retiring, as a result of the team-teaching, 3 junior LMU math faculty (Bargagliotti, Crans and Khadjavi) are prepared to teach the course and to incorporate the material into other courses. Every effort will be made to continue to invite past and new “graduates” of the course to present a “Women and Math” workshop at the local Expanding Your Horizons career day. No additional funding is required for this.

Evaluation The overarching goals of mentoring three junior faculty in teaching the women and math course, making course materials available on-line, and educating future K-12 teachers about women and math in such a way that they can pass their knowledge on to their students have been largely achieved as the “Impact” numbers described above indicate. The course website (<http://myweb.lmu.edu/jdewar/wam>) is now updated with a new introduction, a copy of this report, and revised versions of two bibliographies, one for the contemporary women mathematicians poster and one for the research project topics from the Fall 2012 course.

Bibliography (Publications Resulting from the Course/Grant)

Dewar, J. (2012). A Gender Equity Study of K-12 Classrooms Raises Questions for Collegiate Mathematics. *AWM Newsletter*, 42(6), 15-17.

Dewar, J. & Vig, R. (2012). Future Teachers' Intentions for Gender Equity: How Are These Carried Forward into Their Classroom Practice? In (Eds.) S. Brown, S. Larsen, K. Marrongelle, and M. Oehrtman, *Proceedings of the 15th Annual Conference on Research in Undergraduate Mathematics, 2012*, Portland, Oregon. Available at http://pzacad.pitzer.edu/~sbrown/RUME/RUME_XV_Volume_1.pdf

Llanes, E. (2011) Number's Don't Lie. *Attic Salt: LMU Honors Program Interdisciplinary Journal*. Los Angeles: Loyola Marymount University Honors Program, 20-22.