

Preview of Award 1259860 - Annual Project Report


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Federal Agency and Organization Element to Which Report is Submitted:	4900
Federal Grant or Other Identifying Number Assigned by Agency:	1259860
Project Title:	Scholarships-Creating Opportunities for Applying Mathematics
PD/PI Name:	Yu-Ju Kuo, Principal Investigator Frederick A Adkins, Co-Principal Investigator
Recipient Organization:	Indiana University of Pennsylvania
Project/Grant Period:	07/01/2013 - 06/30/2016
Reporting Period:	07/01/2013 - 06/30/2014
Submitting Official (if other than PD\PI):	Yu-Ju Kuo Principal Investigator
Submission Date:	04/24/2014
Signature of Submitting Official (signature shall be submitted in accordance with agency specific instructions)	Yu-Ju Kuo

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Accomplishments

* What are the major goals of the project?

- Increase recruitment for the M.S program in Applied Mathematics at IUP through efforts focused on state universities in Pennsylvania, regional colleges, and regional conferences
- Expand recruitment of STEM undergraduates from regional community colleges
- Improve retention of undergraduate students majoring in mathematical areas at IUP
- Increase numbers of science undergraduates pursuing a mathematics minor and taking advanced applied mathematics courses to enhance their preparation for the workforce and further studies
- Strengthen students' leadership abilities, technical skills, and aptitude for life-long learning
- Improve the awareness of minority and gender issues in the STEM fields
- Enhance the academic environment and student culture

* What was accomplished under these goals (you must provide information for at least one of the 4 categories below)?

Major Activities:

Detail of the following activities are listed in the section of "what opportunities for training and professional development has the project provided?"

- Community Building, Career Counseling, and Academic Support
- Support & Mentoring of Students by Faculty and other professionals
- Provide conference travel support

Specific Objectives:

More students seeking math related degree or minor
Engage more students in practical training like internships or research
High retention for cohort

Significant Results:

Increase the number of graduates earning a mathematics minor from 21 In 2011-2012 to 28 in Spring 2014.

Increase the number of cohort students participating in internships or research activities (8 in Summer 2012 to 9 in summer 2013).

We have high retention within the scholarship cohort as shown by all students continuing in their STEM degree programs. All undergraduates, but 2,

met renewal requirements between Fall 2013 to Spring 2014. All graduate students, except 2, met renewal requirements.

Four undergraduate and four graduate students attended national conferences to present their research results in the fields of chemistry, geoscience, and mathematics. Three students participated in the COMAP Mathematical contest in Modeling and their submission was declared as meritorious winner. One student in the M.S. in Applied Mathematics program obtained a student-trainee position at NASA IV&V in summer 2013 and will serve as a mentor for another undergraduate who receive an internship position for Summer 2014 at the same facility.

Key outcomes or
Other achievements:

From the Fall 2013 semester evaluation:

- 100% indicate that participation in the scholarship group increase connection with other mathematics and science students
- 95% indicated the monthly meetings improved their commitment to continue their academic programs
- 89% indicated the monthly meetings improve their motivation to work hard and succeed in classes

*** What opportunities for training and professional development has the project provided?**

- For scholarship cohort: Each semester, three of the four monthly meetings are completely led by students. All students have a reading project and work with group members to give a presentation in which they share what they learn from the reading. In addition, some of the second year students design and run 30-45 minutes on the topics they choose. Recently, the topics have been focusing on job-related skills, such as interview techniques, resume reviews, strategies for improving on performance appraisal, etc. Students are required to complete the training through the Collaborative Institutional Training Initiative which includes courses on ethical conduct of research. Students also register for MentorNet, an online mentoring service.
- Workshops: All workshops are announced to the entire IUP community through email and through the daily campus bulletin.
 - Fall 2013: Introduction to Matlab I and II
 - Spring 2014: Introduction to R I and II
- Invited Speakers: Six speakers gave presentations on their cutting edge research in different areas of applied mathematics and statistics or shared their work experience with students. Presentations are advertised and open to the entire IUP community.
 - Fall 2013: i. Dr. Veena Mendiratta, Practice Leader, Alcate-Lucent, gave three presentations on September 30, 2013, and met with several students for lunch. ii. Jeremy Yagle, NASA Student Trainee and M.S. in Applied Mathematics, gave a presentation on Oct. 23, 2013, sharing his experience as a graduate co-op in the NASA Independent Verification and Validation (IV&V) program. iii. Dr. Nate Ritchey, Dean of College of R. Benjamin Wiley Arts and Sciences, Edinboro University, gave a presentation, titled "How Mathematics Can Save Your Life" on November 4, 2013.
 - Spring 2014: i. Dr. Rafael Matos, President-Elect of the Military Operations Research Society, gave three presentations on February 21, 2014, and had lunch with several students. ii. Bill Noel, MS Applied Mathematics '12, gave a presentation on March 28, 2014, and shared with students about his career as a web analyst. iii. Marcus Fisher, Associate Director, NASA IV&V Program, will visit IUP on April 25, 2014, give two presentations, and meet with students for lunch. (as a college colloquium speaker)
 - Students will participate in the Second Student Presentation Day, 3:00-5:00 p.m., Thursday, May 1, 2014.

*** How have the results been disseminated to communities of interest?**

In January 2014, co-PIs attended the Joint Mathematics Meetings (JMM) in Baltimore give oral presentations to share their experience in writing and running a S-STEM program and participated in the graduate school fair to recruit students. In addition, the annual report and evaluation result are posted on the program website for people who are interested in running a similar program.

*** What do you plan to do during the next reporting period to accomplish the goals?**

- Continue to recruit and retain STEM students, particularly community college transfers.
- Invite speakers with minority and diverse backgrounds.
- Enhance cohort monthly meetings by having students investigating applied mathematics models.
- Offer training workshops and professional development activities.

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Products

Books

Book Chapters

Conference Papers and Presentations

Scott Rega (Student's research activity was supported or supervised by faculty members outside of the SCOAM program.) (2014). *Airport Simulation and Optimization of Passenger Flow using Arena*. 2014 Joint Mathematics Meetings. Baltimore, MD. Status = PUBLISHED; Acknowledgement of Federal Support = No

Yu-Ju Kuo and Rick Adkins (2014). *Establishing an interdisciplinary cohort to increase females and minorities in mathematics*. 2014 Joint Mathematics Meetings. Baltimore, MD. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Charles Culbertson (Student's research activity was supported and supervised by faculty members outside of the SCOAM program.) (2014). *Exploration of Magnetic Coupling through Dicyanamidobenzene Anion Bridge in Dinuclear Metal Complexes*. American Chemical Society National Meeting. Dallas, TX. Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Anthony Filiziani (Student's research activity was supported or supervised by faculty members outside of the SCOAM program.) (2014). *Image Enhancement Algorithm for Under-Water Images*. Joint Mathematics Meetings. Baltimore, MD. Status = PUBLISHED; Acknowledgement of Federal Support = No

Kaitlyn Selfridge et. al. (Student's research activity was supported or supervised by faculty members outside of the SCOAM program.) (2013). *Making meaningful connections by incorporating videos into your lessons*. PCTM. Seven Springs, PA. Status = ACCEPTED; Acknowledgement of Federal Support = No

Jon Wayland (Student's research activity was supported or supervised by faculty members outside of the SCOAM program.) (2014). *Modifications of Watershed Segmentation in Digital Image Processing*. Joint Mathematics Meetings. Baltimore, MD. Status = PUBLISHED; Acknowledgement of Federal Support = No

Theresa Scarnati (Student's research activity was supported or supervised by faculty members outside of the SCOAM program.) (2014). *Patient Specific Modeling of Cerebral Blood Flow Velocity*. The Joint Mathematics Meetings. Baltimore, MD. Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Elizabeth Stimmell (Student's research activity was supported or supervised by faculty members outside of the SCOAM program.) (2013). *Synthesis, Characterization, and Electrochemical Studies of Water Soluble Ruthenium Based Metal Complexes*. PASSHE Undergraduate Research in STEM. Slippery Rock, PA. Status = ACCEPTED; Acknowledgement of Federal Support = No

Daniel O'Hara (Student's research activity was supported or supervised by faculty members outside of the SCOAM program.) (2013). *Title: Accommodation by Varying Strain Regimes along the Northern Luzon Arc (Coastal Range, Taiwan) – Insights from Focal Mechanism Strain Inversions*. American Geophysical Union 2013 Fall Meeting. San Francisco, CA. Status = ACCEPTED; Acknowledgement of Federal Support = No

Jeremy Yagle (Student's research activity was supported or supervised by faculty members outside of the SCOAM program.) (2014). *Using Boundary Following Algorithms to Identify User-Defined Mountain Bike Trails in Topographic Map Images*. 2014 Joint Mathematics Meetings. Baltimore, MD. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Inventions

Journals

Licenses

Other Products

Other Publications

Patents

Technologies or Techniques

Thesis/Dissertations

Websites

Scholarships—Creating Opportunities for Applying Mathematics (S-COAM)

<http://www.iup.edu/page.aspx?id=94513>

This website provides information about the scholarship program, including lists of scholarship recipients, activities every semester, evaluation survey results, and annual reports.

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Participants/Organizations

What individuals have worked on the project?

Name	Most Senior Project Role	Nearest Person Month Worked
Kuo, Yu-Ju	PD/PI	1
Adkins, Frederick	Co PD/PI	1
Alarcon, Francisco	Faculty	0
Burch, Kimberly	Faculty	0
Chrispell, John	Faculty	0

Dahma, Alf	Faculty	0
Donley, Ed	Faculty	0
Radelet, Dan	Faculty	0
Stoudt, Gary	Faculty	0
DeStefano, Alisa	Other Professional	0
DeStefano, Frank	Other Professional	0
Husenits, Mike	Other Professional	0
Marshall, Lori	Other Professional	0
Shavelly, Deanne	Other Professional	0
Ritchey, Nate	Consultant	0

Full details of individuals who have worked on the project:

Yu-Ju Kuo

Email: yjkuo@iup.edu

Most Senior Project Role: PD/PI

Nearest Person Month Worked: 1

Contribution to the Project: Carry out overall administration and interaction with NSF and other organizations; Maintain S-COAM records and applicant records; Develop recruitment material; Coordinate recruitment and advertising activities; Develop and update project website; Screen applicants for eligibility; Select scholarship recipients and determine required math courses for recipients; Review students' progress; Serve as a primary academic mentor for S-COAM; Develop & update advising and curriculum guidelines; Coordinate external speakers and workshops; Coordinate annual scholarship banquet; Develop surveys and distribute them to students from Qualtrics, a web-based survey software; Research, select, order, and authorize purchase of supplies and materials

Funding Support: NSF Award No. DUE 0966206

International Collaboration: No

International Travel: No

Frederick A Adkins

Email: fadkins@iup.edu

Most Senior Project Role: Co PD/PI

Nearest Person Month Worked: 1

Contribution to the Project: Develop recruitment material; Coordinate recruitment and advertising activities; Develop and update project website; Screen applicants for eligibility; Select scholarship recipients and determine required math courses for recipients; Review students' progress; Serve as a primary academic mentor for S-COAM; Develop & update advising and curriculum guidelines; Coordinate external speakers and workshops; Develop surveys;

Funding Support: NSF Award No. DUE 0966206

International Collaboration: No

International Travel: No

Francisco Alarcon

Email: falarcon@iup.edu

Most Senior Project Role: Faculty

Nearest Person Month Worked: 0

Contribution to the Project: Provide office spaces for scholarship students and funding for students to have lunch with invited speakers.

Funding Support: None

International Collaboration: No

International Travel: No

Kimberly Burch

Email: kjburch@iup.edu

Most Senior Project Role: Faculty

Nearest Person Month Worked: 0

Contribution to the Project: served on scholarship review committee

Funding Support: None

International Collaboration: No

International Travel: No

John Chrispell

Email: John.Chrispell@iup.edu
Most Senior Project Role: Faculty
Nearest Person Month Worked: 0

Contribution to the Project: served on scholarship review committee

Funding Support: None

International Collaboration: No
International Travel: No

Alfy Dahma

Email: alfy@iup.edu
Most Senior Project Role: Faculty
Nearest Person Month Worked: 0

Contribution to the Project: served on scholarship review committee

Funding Support: None

International Collaboration: No
International Travel: No

Ed Donley

Email: hedonley@iup.edu
Most Senior Project Role: Faculty
Nearest Person Month Worked: 0

Contribution to the Project: served on scholarship review committee

Funding Support: None

International Collaboration: No
International Travel: No

Dan Radelet

Email: dradelet@iup.edu
Most Senior Project Role: Faculty
Nearest Person Month Worked: 0

Contribution to the Project: served on scholarship review committee

Funding Support: None

International Collaboration: No
International Travel: No

Gary Stoudt

Email: gsstoudt@iup.edu
Most Senior Project Role: Faculty
Nearest Person Month Worked: 0

Contribution to the Project: served on scholarship review committee

Funding Support: None

International Collaboration: No
International Travel: No

Alisa DeStefano

Email: aldestef@iup.edu
Most Senior Project Role: Other Professional
Nearest Person Month Worked: 0

Contribution to the Project: reviewed students' financial need eligibility for compliance with scholarship requirements

Funding Support: None

International Collaboration: No
International Travel: No

Frank DeStefano

Email: frank.destefano@iup.edu
Most Senior Project Role: Other Professional

Nearest Person Month Worked: 0

Contribution to the Project: provided consultation on recruiting graduate students and distributed informational brochures on scholarship

Funding Support: None

International Collaboration: No

International Travel: No

Mike Husenits

Email: M.H.Husenits@iup.edu

Most Senior Project Role: Other Professional

Nearest Person Month Worked: 0

Contribution to the Project: Provide support for recruiting undergraduate students, in particular community college transfers

Funding Support: None

International Collaboration: No

International Travel: No

Lori Marshall

Email: lmarshall@iup.edu

Most Senior Project Role: Other Professional

Nearest Person Month Worked: 0

Contribution to the Project: provided administrative and clerical support including software purchasing, travel reimbursement, and mail sorting

Funding Support: None

International Collaboration: No

International Travel: No

Deanne Snavely

Email: snavely@iup.edu

Most Senior Project Role: Other Professional

Nearest Person Month Worked: 0

Contribution to the Project: Provide support for reception for speakers, promote scholarship opportunities

Funding Support: None

International Collaboration: No

International Travel: No

Nate Ritchey

Email: npritchey13@gmail.com

Most Senior Project Role: Consultant

Nearest Person Month Worked: 0

Contribution to the Project: Evaluate the program and provide an assessment report

Funding Support: N/A

International Collaboration: No

International Travel: No

What other organizations have been involved as partners?

Name	Type of Partner Organization	Location
Institute for Operations Research and the Management Science	Other Nonprofits	Catonsville, MD
Mentornet.net	Industrial or Commercial Firms	CA
Military Operations Research Society	Other Nonprofits	Arlington, VA
Society of Industrial and Applied Mathematics	Other Nonprofits	Philadelphia, PA

Full details of organizations that have been involved as partners:

Institute for Operations Research and the Management Science

Organization Type: Other Nonprofits
Organization Location: Catonsville, MD

Partner's Contribution to the Project:
 Other: Speakers Program

More Detail on Partner and Contribution:

Mentornet.net

Organization Type: Industrial or Commercial Firms
Organization Location: CA

Partner's Contribution to the Project:
 Other: provide mentors for students

More Detail on Partner and Contribution:

Military Operations Research Society

Organization Type: Other Nonprofits
Organization Location: Arlington, VA

Partner's Contribution to the Project:
 Other: Speakers program

More Detail on Partner and Contribution:

Society of Industrial and Applied Mathematics

Organization Type: Other Nonprofits
Organization Location: Philadelphia, PA

Partner's Contribution to the Project:
 Other: Visiting Lecture Program

More Detail on Partner and Contribution:

Have other collaborators or contacts been involved? Yes

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Impacts

What is the impact on the development of the principal discipline(s) of the project?

In 2013-2014, there are a total of 60 students majoring in mathematics, 71% increase from 2009-2010. The number of students graduating with a mathematics minor is 28, 400% increase from 2009-2010. At least 5 students are continuing to graduate schools in mathematics, geoscience, and chemistry in Fall 2014. Even though many factors contribute to this result, the S-COAM program has clearly increased the number of students in various mathematics courses.

The number of newly admitted and matriculated graduate students has remained steady since Fall 2009; more of our graduates are pursuing Ph.D. programs.

In Spring 2014, S-COAM organized the second *Student Presentation Day* for the Mathematics Department. This forum showcased student projects and research work from across the department.

What is the impact on other disciplines?

- S-COAM also sponsored IUP Undergraduate Scholar Forum and the Women in Mathematics, Science, and Technology Program by providing "Best Computational Science Poster Award" for each event.
- Scholarship recipients' participation in research, internship, conferences:
 - Fall 2013: 4 undergraduates from mathematics, chemistry, and geoscience gave presentations at conferences.
 - Winter 2014: 4 students in the M.S. in Applied Math program gave presentations and one undergraduate gave a poster presentation at the 2014 JMM.
 - 5 graduate students and 4 undergraduate students received financial support to attend regional, state-wide, or national conferences in between July 2013 and April 2014.
- Co-PIs determine math course requirements for each student after carefully reviewing each individual's academic schedule and mathematical background. Each recipient is required to take additional mathematics courses and participate in at least one workshop/colloquium per month from departments in the College of Natural Science and Mathematics.
- In monthly meetings, the cohort activities include: orientation name games, mock interviews, resume critiques, practice and critique of oral presentations, and 3-minute self-introduction. Dr. Stocker and Dr. Donley offered R and Matlab workshops, respectively. All scholars gave group presentations based on mathematics modeling readings from COMAP Mathematics Modeling Competitions and the famous visualization book, *The Visual Display of Quantitative Information* by Edward Tufte.
- Dr. Veena Mendiratta, Dr. Rafael Matos, and Mr. Marcus Fisher gave interdisciplinary presentations.

What is the impact on the development of human resources?

Outcome for Undergraduates

- All undergraduate recipients, except 2, met the GPA requirement (>3.0) and mathematics courses requirements for Spring 2014 renewal.

- One undergraduate student in the cohort graduated in Dec. 2013.

Outcome for Graduate Students in the M.S. in Applied Mathematics program

- All graduate recipients, except two, in Fall 2013 met the GPA requirement (>3.2) for Spring 2014 renewal.

Workshops created for the scholarship cohort were open to the university community.

- For R workshops: there were 3 faculty members and 13 students (4 not in the S-COAM program).
- For Matlab workshops: there were 2 faculty members and 23 students (16 not in the S-COAM program).

Speakers invited to campus provided new perspective on the use of new technology and career development.

What is the impact on physical resources that form infrastructure?

Students personalized the office area which resulted in greater utilization and collaboration.

What is the impact on institutional resources that form infrastructure?

Groups of graduate and undergraduate students are working on projects from NASA IV&V.

Students in the college are invited to be student members of SIAM.

What is the impact on information resources that form infrastructure?

SIAM Journal on Applied Mathematics was subscribed through the grant providing electronic access to the university community.

What is the impact on technology transfer?

Nothing to report.

What is the impact on society beyond science and technology?

- **Students will improve their communication and networking skills through participation in the monthly activities with mentors and peers.**
 - Monthly cohort meetings include activities like: orientation name games, mock interviews, resume critiques, 3-minute self-introduction, and practice and discussion of oral presentations. The cohort also shares two office spaces, Stright Hall 205 and 219.
 - A scholarship banquet will be held on May 2, 2014.
- **Students will explore workforce and career options.**
 - Invited speakers, Dr. Veena Mendiratta, Jeremy Yagle, Dr. Rafael Matos, Bill Noel, and Marcus Fisher had either career related presentation or open forum to answer questions from students regarding their career.
 - Three students participated in the 2014 COMAP contest gave a presentation to share their experience and their results in April, 2014.

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Changes/Problems

Changes in approach and reason for change

We started including sophomores in cohort in order to have a bigger impact on improving retention.

Actual or Anticipated problems or delays and actions or plans to resolve them

Due to the drop in the number of admission applications to the M.S. in Applied Mathematics program, we continue working on recruitment for more graduate students.

Changes that have a significant impact on expenditures

Nothing to report.

Significant changes in use or care of human subjects

Nothing to report.

Significant changes in use or care of vertebrate animals

Nothing to report.

Significant changes in use or care of biohazards

Nothing to report.

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Special Requirements

Responses to any special reporting requirements specified in the award terms and conditions, as well as any award specific reporting requirements.

Nothing to report.

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