THE LEGACY OF R.L. MOORE Newsletter

No. 6 June 2012

INSIDE

"To Understand Is to Invent"

The developmental psychologist, Jean Piaget, gave the above title to one of his books, and it appears as the web-site epigram of the **Center for Mathematical Inquiry** at the University of California, Santa Barbara.

The following is adapted from a recent report by Professor Bill Jacob, a member of the mathematics department at UCSB. The center, which has been in existence since 2004, has helped to expand the Inquiry-Based Learning (IBL) aspects of work at UCSB and to provide a means of fostering new directions. As at the other three IBL centers supported through the Legacy of R.L. Moore Project (see side note p. 2), UCSB allows discovery, or reconstruction through rediscovery, to be a part of the learning experience in undergraduate mathematics.

This past year the Center has sustained its basic programs and has continued to grow in its IBL course offerings both in Math and the College of Creative Studies. The restructured California Math Project site at UCSB was launched with Dr. Chris Ograin as director.

Please see *To Understand,* p. 2.

How to Network

The **Academy of Inquiry Based Learning** (AIBL) is an association whose membership ranges from graduate students and new IBL teachers through to widely experienced national leaders and administrators (e.g. retired faculty, foundation staff), with the mission of disseminating inquiry-based learning teaching methods in mathematics courses. The 2011–12 academic year has been a busy and exciting time for AIBL.

In the spring, AIBL unveiled a new membership website. The website address is *www.inquirybasedlearning.org*. Membership is free and members can search for IBL mentors, join discussion groups, and share materials and experiences via the website. The

Please see *Network*, p. 3.

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During 2011-12 the basic IBL course offerings ran as in prior years. For our IBL calculus sequence, **Linear Algebra, Differential Equations, Multivariable Calculus**, Visiting Assistant Professor Elizabeth Thoren incorporated a student driven Wiki-Textbook Project, where the students collaborated on a vector calculus textbook. Dr. Thoren came to us from the University of Texas at Austin where, as a graduate student, she gained experience in IBL through assisting with and teaching courses associated with the IBL center.

Mathematics for Elementary Teaching is the basic IBL mathematics content course for pre-service elementary teachers, where undergraduates engage in inquiry to deepen their understandings of the big ideas of K-6 mathematics and study elementary school children work in inquiry-based classrooms. Professor Jacob has created an instructor's manual for the course.

In the **Abstract Algebra** course, Professor Jacob does all of his teaching either in the Moore Method or in a modified Moore method format. The vast majority of the students in the course are in their junior year and for many of them it is their first Moore method course.

Problem Solving and Mathematics Teaching, is a key component of the mathematics teacher training program at UCSB. Professors Jacob and Lager (Education) received a three-year National Science Foundation grant ($150,000) to research and develop this course.

Centers for Inquiry-Based Learning are associated with mathematics departments at:

University of California, Santa Barbara

University of Chicago

University of Michigan, Ann Arbor

University of Texas at Austin

Brian Katz (Augustana College) and Elizabeth Thoren, speaking at the 2011 Legacy conference on Wiki technology.

Education graduate student, and credentialed high school math teacher, Catherine Gaspard worked as a TA for the course.

Mathematics education graduate student Dr. Kyunghee Moon has been assisting Professor Jacob and the two have submitted a research paper on students' concepts of the Cartesian Connection. Dr. Moon has since started work as an Assistant Professor of Mathematics at the University of West Georgia. This, together with Dr. Thoren's example, show the key role graduate assistants have in extending the influence of an IBL center.

The summer **Mathematics for Elementary Teaching** course was located on site at the Harding Laboratory Summer School so that students could spend time in classrooms where children use IBL materials. All 120 entering UCSB credential candidates were able to visit classes and see IBL mathematics during the session.

External support:

In addition to the funding given through the Legacy of R.L. Moore Project, the Wharton Foundation and the Santa Barbara Foundation have also given recent support. Both provide professional development for teachers to use IBL with K-8 students at area schools.

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website also allows AIBL to communicate with its members via email and provide information for IBL related activities.

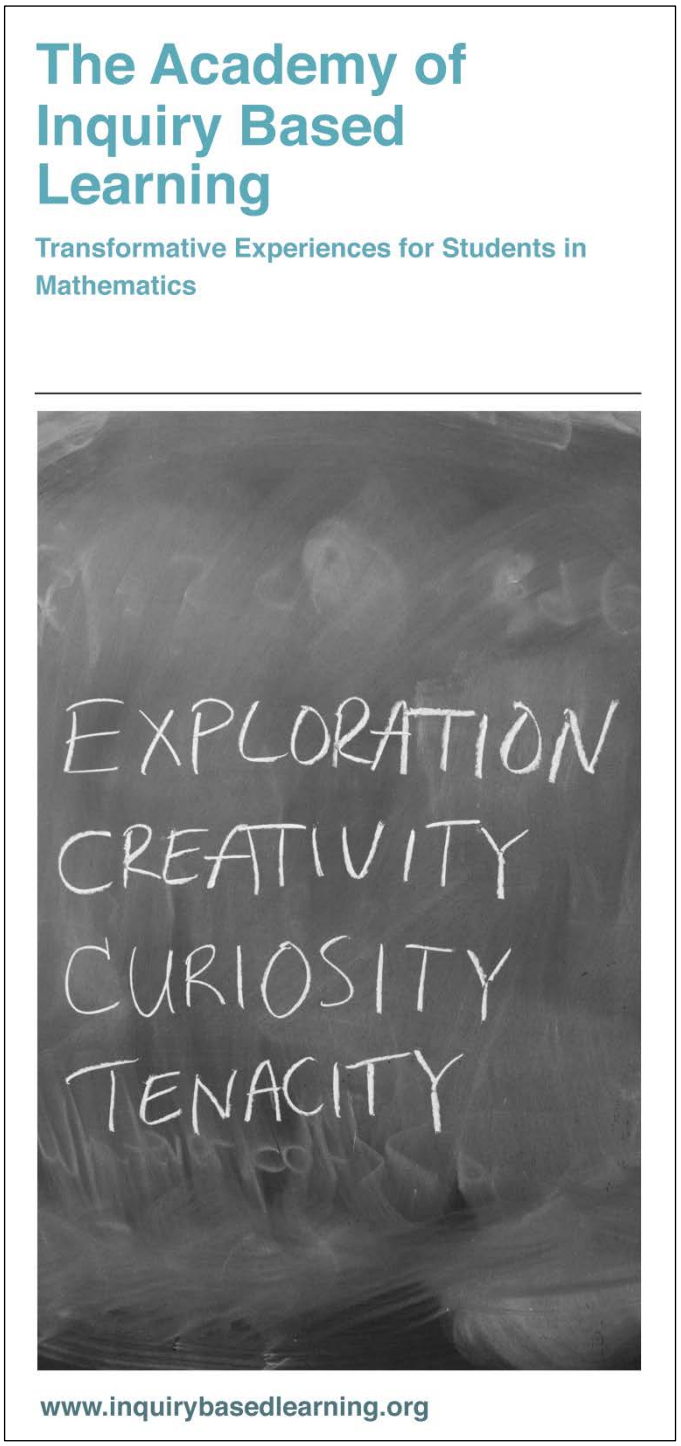
The AIBL **mentoring service** has continued as it has for the past several years. New IBL users are supported by an experienced mentor and a mentoring group, organized regionally and/or by course. The mentoring network continues to grow and has been a core support system for new IBL users.

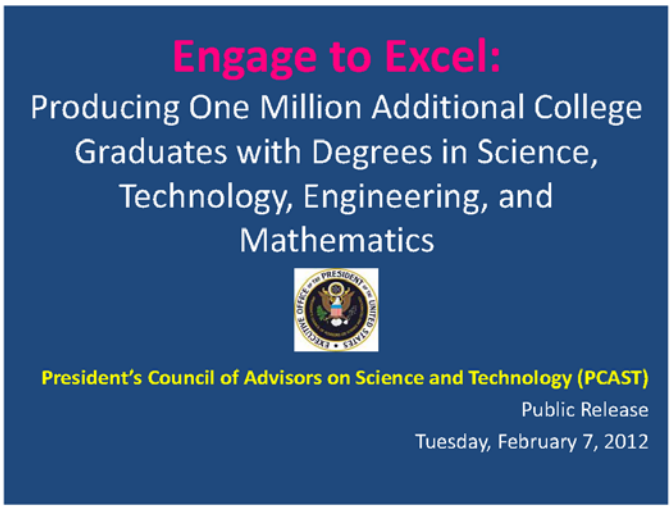
In the fall and spring of 2011 AIBL awarded approximately $100,000 in small grants to new and experienced IBL instructors. Projects ranged from new instructors teaching courses traditionally taught via IBL (e.g. Topology, Analysis, and Number Theory) to developing courses for prospective elementary school teachers to the development of courses such as Combinatorics, Advanced Mathematical Computations and Groebner Bases, and Knot Theory.

The **small grants program** has been a highly successful project that supports new IBL instructors teaching courses for the first time and experienced IBL instructors intending to develop course notes for publication or IBL dissemination at their institution.

The Academy has also been active in outreach activities. AIBL supported travel for IBL **speakers**, such as Mike Starbird, to visit campuses and share IBL information and application. Also, Stan Yoshinobu presented a talk and mini-course on IBL at the MAA Pacific Northwest Section Meeting at the University of Portland.

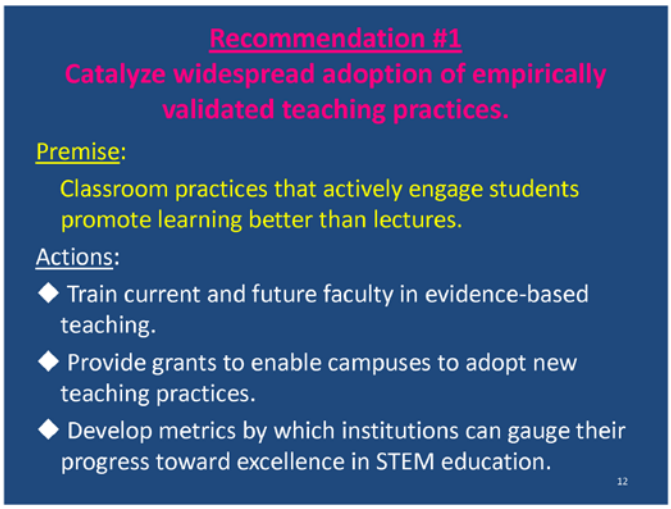
Lastly, in the fall of 2011, AIBL started blogging. Follow trends in IBL teaching, teaching tips, and IBL user insights at The IBL Blog (theiblblog.blogspot.com).





The Mathematical Association of America has recently responded to this report, two of whose five recommendations are excerpted here.

The MAA's letter, available at *maa.org,* refers to its partnership with EAF and AIBL "to promote IBL and to provide both materials and the supportive network that is needed for those who would implement it."



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