



4
IBL
centers

12,000 students

Nine Years and Counting: *Some numbers from four inquiry-based learning centers*

Starting in 2004, Mr. Harry Lucas, Jr., and the Educational Advancement Foundation (EAF) have supported inquiry-based learning efforts at four universities. Based on a review and estimates taken from annual reports and other data, the IBL Centers clearly made an impact on their campuses, namely the universities of California - Santa Barbara, Chicago, Michigan - Ann Arbor, and Texas at Austin.

Collectively the basic statistics, shown on the next page, show that significant numbers of instructors and students have been involved over the nine academic years of IBL Center work (fall, 2004 to spring, 2013). The data is drawn from annual reports, a survey that helped set base lines from 2007-08, and an external assessment project that also helped to confirm a base number of 19 students for individual IBL classes.

Please see *Nine Years*, p. 2.

Some News Items from the Past Year

INSIDE

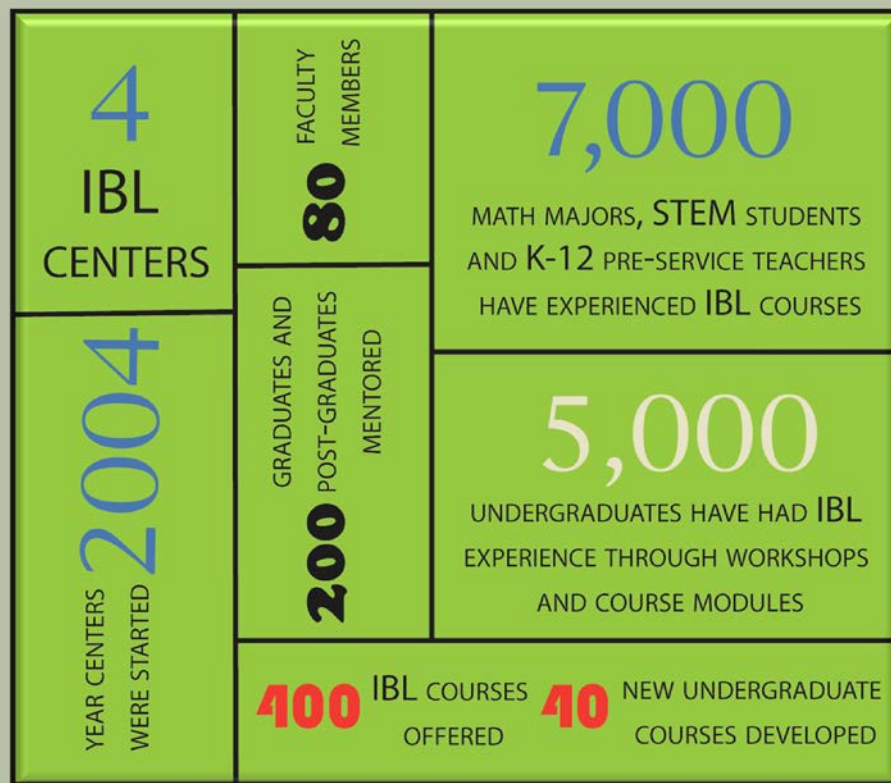
Two New Books on
Analysis and Crea-
tivity Respectively

Westfield University's project team, *Discovering the Art of Mathematics*, received a four-year, \$550,000, grant from the Transforming Undergraduate Education in Science Program of the National Science Foundation. This supports the team's work on using IBL in Mathematics for Liberal Arts courses. See www.artofmathematics.org.

Michael Starbird, director of the University of Texas at Austin IBL Center, has been selected as one of the twelve inaugural members of the University of Texas System Academy of Distinguished Teachers. This will develop into an advocacy group that will promote dialogue and facilitate the dissemination of best pedagogical innovations across the U.T. System.

Please see *News*, p. 3.

Nine continued from p. 1



Originally, a Request for Proposal, seeking to create a single national IBL center, was invited from selected universities. Given the strong approaches and high quality of the proposals, the decision was made to support all. Each university has brought unique approaches to providing IBL programs. All have extended efforts beyond teaching undergraduate mathematics majors, to positively impact STEM and Education students.

In addition, workshops and outreach efforts have influenced regional education institutions, local school districts and K-12 teachers and students. The Centers have increased their national impact by producing the Academy of Inquiry Based Learning (AIBL) and

contributing articles to the Journal of Inquiry Based Learning in Mathematics (JIBLM).

Clearly, the overall IBL Centers' impact has been deep and widespread. All of the Centers have increased students' exposure to IBL and produced new practitioners at both the undergraduate and graduate levels. As we approach a decade of support, this marks an excellent time to acknowledge past achievements and plan ways to expand IBL efforts more broadly.

The Educational Advancement Foundation is currently investigating ways of extending the funding sources for maintaining and enhancing these key projects.

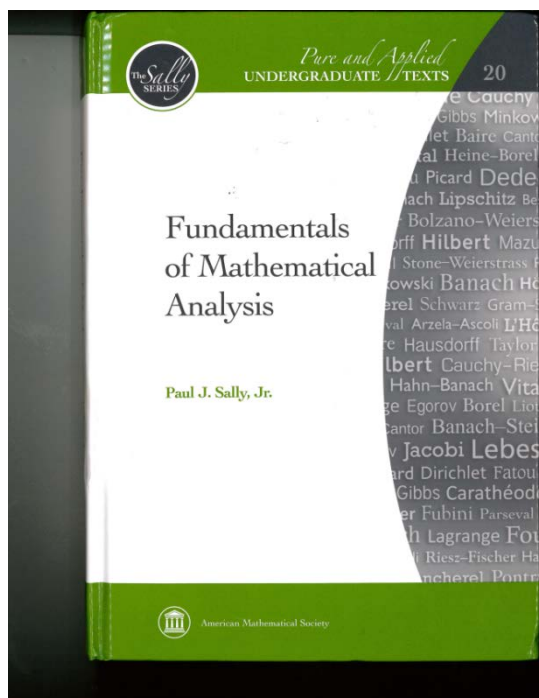
News continued from p 1.

Under the leadership of Paul Sally and John Boller, **Chicago University** will be hosting a workshop, “The Many Ways of IBL,” 17–21 June 2013. This is the last of a series of workshops funded by an NSF Collaborative Research grant. The previous ones were at Austin, Santa Barbara, and Ann Arbor.



The Chicago workshop will include the opportunity to observe four classes of professional development for K-5 teachers led by Ken Gross of the **Vermont Mathematics Initiative**.

Featured Publications



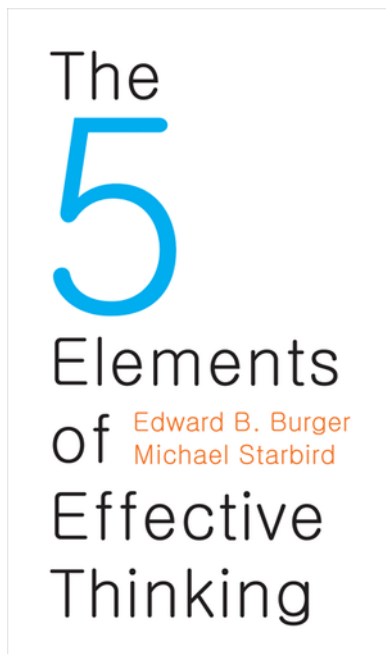
Fundamentals of Mathematical Analysis
Paul Sally, Jr.
American Mathematical Society, 2013.

Three features especially distinguish this book from many other books of a similar nature and which are important for the use of this book as a text. The first, and most important, feature is the **collection of exercises**. These are spread throughout the chapters and should be regarded as an essential component of the student's learning. Some of these exercises comprise a routine follow-up to the material, while others challenge the student's understanding more deeply.

The second feature is the set of **independent projects** presented at the end of each chapter. These projects supplement the content studied in their respective chapters. They can be used to expand the student's knowledge and understanding or as an opportunity to conduct a seminar in Inquiry Based Learning in which the students present the material to their class.

The third really important feature is a series of **challenge problems** that increase in impossibility as the chapters progress.

(From the Preface.)



The basic methods for thinking more clearly, more innovatively, more effectively are fundamentally the same in all areas of life and those methods of effective thinking can be described, taught, and learned. They are not inborn gifts of a special few. That is the basic tenet of this book.

The five learnable habits that are explained in detail with real-life examples are:

- Understand deeply;
- Make mistakes - fail to succeed;
- Raise questions - be your own Socrates;
- Follow the flow of ideas - look back, look forward;
- Change - transform yourself.

The authors:

Mike Starbird heads the IBL Center at the University of Texas at Austin (see p. 1 for a recent honor).

Ed Burger is a mathematics professor at Williams College and will become President of Southwestern University 1 July 2013.

Princeton University Press, 2012.

"Education is what survives when what has been learned has been forgotten."
—B.F. Skinner, quoted in *The 5 Elements*.

A Gift to the Future

The Foundation is grateful for recent contributions from individuals. Such gifts help to shape our response to the urgent need to improve student performance in science, technology, engineering, and mathematics. Guided inquiry, as part of the total learning environment, improves students' creativity and problem solving abilities. Your support will help us increase the impact of our existing programs and extend efforts to new initiatives.

During the year 2013 **all gifts will be matched one-to-one** by EAF up to a total match of \$100,000.

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