

# SIGMAA-QL NEWSLETTER

## OCTOBER 2009



### SENCER SUPPORTS QL

JACKIE DEWAR, LOYOLA MARYMONT  
UNIVERSITY, LOS ANGELES

Mathematicians interested in Quantitative Literacy should consider the opportunities and resources offered by SENCER (Science Education for New Civic Engagements and Responsibilities <http://www.sencer.net>) — a comprehensive faculty development and science education reform project funded by the National Science Foundation. SENCER aims to engage student interest in mathematics and science by supporting the development of academic programs and undergraduate courses that teach “to” basic science and mathematics “through” complex, capacious and unsolved public issues. SENCER offers a number of resources, including model courses, background papers suitable for classroom use that explore significant science related issues, a “house calls” program that matches SENCER consultants with institutions, a free on-line customizable assessment tool called the SENCER-SALG or Student Assessment of Learning Gains (see <http://salgsite.org>), and the annual SENCER Summer Institutes that provide learning and networking opportunities through a rich mix of plenary sessions, workshop and concurrent sessions. The 2010 SENCER Summer Institute is scheduled for July 29 – August 2, 2010 in University of North Carolina in Asheville, NC.

SENCER supported the revision of a quantitative literacy course at Loyola Marymount University in Los Angeles, CA and features the revised QL course as an emerging model course on their website (<http://www.sencer.net>). This course, Quantitative Literacy Through Community-Based Group Projects, developed by Jackie Dewar, Suzanne Larson and Thomas Zachariah, incorporates semester-long group projects involving local community issues that students can investigate using the rather modest set of mathematical tools taught in course (number sense, elementary statistics, mathematics of finance). The purpose was to help these students become more confident and adept at using mathematics to understand and address

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### A DIFFERENT APPROACH TO HOMEWORK AND GROUP WORK IN QR COURSES

RICHARD J. MAHER, LOYOLA UNIVERSITY  
CHICAGO

Changing how homework is assigned and used, coupled with group work, can lead to improved student understanding and performance in courses such as (generic titles) STATISTICS or QUANTITATIVE LITERACY. The course ground rules passed out at the beginning of the term state that for homework students should do as many problems as they wish from a list of problems with solutions available in the book’s appendix. They also receive a second list of problems — shorter than the first — of problems that do not have solutions available. In this case, students periodically receive solution/hint sheets. The course ground rules also note that some problems cover material not discussed in class. Finally, the students are told that most, if not all, of the problems for the in-class examinations will be taken directly from or adapted from these problems.

The textbook must have an appendix or, better yet, a CD or website, that provides detailed solutions to a significant number of problems. A number of texts meet this need. In my case, for STATISTICS I have used **Statistics** by Freedman, Pisani, and Purves and **Seeing through Statistics** by Utts, while for QUANTITATIVE LITERACY I have used *For All Practical Purposes* by COMAP. I typically give four in-class exams plus a final each semester. In-class exams use text problems for most, if not all, of the test questions; these exams are closed book/closed notes, etc. There are from 175 to 200 problems available for each exam. Problems may be taken directly from the text — the numbers might be modified or the problems rephrased — or problems similar to those in the text might be used.

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### LETTER FROM THE CHAIR

CINNAMON HILLYARD, UNIVERSITY OF  
WASHINGTON, BOTHELL

It’s been an exciting year for quantitative literacy and the SIGMAA-QL! I’ll summarize some of these moments in a minute, but wanted to start off by thanking an amazing group of officers. They’ve organized conference sessions, eased us through a transition in the list-serv, kept our website active, and kept me on track, just to name a few.

I’d especially like to thank Semra. She’s been our valiant Secretary/Treasurer for the past three years, keeping us organized and within budget. Just to give one of many examples of her skill, she emailed me in July about getting things in good shape for the new officer in February ... what planning! We will miss her, but greatly appreciate her work for the SIGMAA-QL.

There have been a number of SIGMAA-QL sponsored events at the annual meetings during 2009. In January, we sponsored a contributed paper session asking persons to share their work integrating QL into the disciplines. Eight presentations filled this session at the Joint Math Meetings. We also had our annual business meeting where we introduced our newest officer, Stuart Boersma, chair-elect, and discussed other ideas for promoting QL.

In August, we cosponsored, with SIGMAA TAHSM, a poster session on First Day of Class Activities at Math-Fest. We had five excellent posters for this session that was very well attended. This was followed by a lunch attended by over 15 SIGMAA-QL members and their guests. As always, this proved to be a great way to share ideas and make new contacts in the QL world.

There were also multiple other events across the year that illustrated the significant impact of our SIGMAA. One

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## SIGMAA-QL ELECTIONS:

VOTE AT <[HTTP://WWW.MAA.ORG/VOTING/SIGMAA\\_QL/](http://www.maa.org/voting/sigmaa_ql/)>

### CHAIR-ELECT

**Eric Gaze** is the new Director of the Quantitative Reasoning Program at Bowdoin College. He is a member of the Mathematical Association of America's Special Interest Group on Quantitative Literacy (SIGMAA-QL). He is a charter member of the National Numeracy Network (NNN), and currently serves on the Board of Directors for this organization. Current research projects include a textbook, *Numeracy, A Quantitative Literacy: Communicating with Numbers*, and writing a monthly column for the NNN's website, Ratiocination. Eric is very interested in infusing quantitative literacy across the curriculum and sees this as the next major challenge for colleges and universities. He remains committed to the professional development of K-12 teachers' quantitative literacy through a masters program in numeracy, based on the one he helped establish at Alfred University.

**Andy Miller** is an Associate Professor of Mathematics at Belmont University in Nashville, TN. Since 2006, he has been part of a "Mathematics of Social Justice" group. As part of that effort, he has developed course materials that apply mathematics to pressing social issues, including income inequality and consumer debt. Most recently, he taught a new course at Belmont called Quantitative Literacy and the Consumer Credit Crisis. He continues to be interested in the role that quantitative literacy plays in the decisions that individuals make about personal, social, and political concerns.

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## CREDITS

SIGMAA-QL officers went out and collected the information for this Newsletter and sent the items to Aaron Montgomery who used Adobe's InDesign to lay out the material. The fonts used are 10 point Times for the regular text and 12 point Charlemagne for the titles. Feel free to send in photos, stories or leads and we will try to fit them into the newsletter. This year we are a little short and having more people work on it would certainly help us get back up to the almost epic size of the 2008 Newsletter.

### SECRETARY/TREASURER

**Gizem Karaali** studied electrical engineering and mathematics as an undergraduate in her native Turkey before coming to the US. She briefly attended the program in Logic and Methodology of Science at UC Berkeley before starting the PhD program in mathematics. After completing her degree, she worked for two years at the University of California, Santa Barbara, and then started her current position at Pomona College, where she is an assistant professor of mathematics. Her scholarly interests lie in mathematics pedagogy and quantitative literacy, and her mathematical research field is representation theory. While teaching lower division mathematics courses, she actively integrates quantitative literacy ideals into her courses and has written about some of her experiences for NNN's journal *Numeracy*. More generally, she continues to search for and create platforms for scholarly conversations about the mathematical profession. She has been a member of SIGMAA-QL with the intent to participate in the ongoing discussions to find better ways to promote QL. She is looking forward to working with the other SIGMAA-QL members and officers to serve this very lively community. Gizem Karaali is a Project NExT fellow / sepia dot.

**Donna LaLonde** has been a member of the Washburn University faculty since 1991. During her tenure, she has also served in a variety of administrative roles including Associate Dean of the College of Arts and Sciences, Associate Vice President for Academic Affairs, and Dean of the University Honors Program. She is currently focusing on mathematics and science education including teaching two classes of 6th grade science. Her interest in Quantitative Literacy developed from work with both pre-service and in-service mathematics and science teachers. It has extended to an interest in exploring the quantitative skills and knowledge required to be a principled citizens. Her teaching responsibilities include both major and general education courses. What is consistent across this range of her experiences is a focus on being able to clearly articulate the desired learning outcomes and to measure whether or not the students met the outcomes.

## NEW QUANTITATIVE LITERACY TEXTS

The second edition of **Case Studies for Quantitative Reasoning: A Casebook of Media Articles** is now available from Pearson Custom Publishing (ISBN: 978-0-558-19880-0). Written by Bernard L. Madison, Stuart Boersma, Caren L. Diefenderfer, and Shannon W. Dingman, this book addresses many QL topics by examining how they are used in the context of newspaper articles. Containing twenty-four in-depth case studies with student study questions as well as brief introductions to such topics as percent and percent change, measurement and indices, linear and exponential growth, graphical interpretation, and risk this book can be used by itself or as a supplement for existing QL textbooks. Additionally, <http://www.cwu.edu/~boersmas/QRCW> provides a variety of teaching resources including sample solutions, a variety of syllabi, and an interactive page where instructors can post comments and advice for each case study.

**Teaching Quantitative Reasoning through Game Theory: Models of Conflict and Cooperation** will be released this month by the American Mathematical Society (ISBN-10: 0821848720). This book is written by Rick Gillman and David Housman. It is a "game theory text for general undergraduate students. As a textbook, it provides a new and distinctive experience for students working to become quantitatively literate."

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## CURRENT OFFICERS

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Chair: Cinnamon Hillyard  
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## SENCER

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real world problems and challenges they might encounter. (See <http://myweb.lmu.edu/tzachari/sencer.html> for more details about the course.) Examples of other mathematics courses recently developed with SENCER support include Introductory Statistics with Community-Based Projects by Cindy Kaus of Metropolitan State University and Ordinary Differential Equations — Mathematical Modeling in Real World Situations by Victor Donnay of Bryn Mawr College. Unfortunately, to date, many more science than mathematics faculty have taken advantage of the opportunities afforded by SENCER. Previously, the SENCER Summer Institute often coincided with MathFest, but that won't be the case in 2010. Anyone interested in developing a course that demonstrates how mathematics can address the problems and challenges facing today's world should monitor the SENCER website (<http://www.sencer.net>) in October for the call for participants for the 2010 SENCER Summer Institute.

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## ELECTRONIC RESOURCES

SIGMAA-QL members can use the SIGMAA-QL listserve by mailing messages to <[sigmaa-ql@enterprise.maa.org](mailto:sigmaa-ql@enterprise.maa.org)>. This list-serv is monitored by the Secretary/Treasurer. All members should have been signed up for this service when they became SIGMAA-QL members, and may opt-out of receiving messages. If you are having trouble (either because you are or are not receiving emails), please contact the current Secretary/Treasurer.

Anyone can access the SIGMAA-QL web site at <<http://www.maa.org/sigmaa/ql/>>. It contains news and resources associated with QL. Please send news, announcements, resources, photographs, and anything else related to Quantitative Literacy to the current Webmaster for inclusion on the web site. If you have trouble accessing the web site, please let the current Webmaster know.

In addition to the resources provided by SIGMAA-QL, there are a number of valuable resources that can be found at the National Numeracy Network's website <<http://serc.carleton.edu/nnn/index.html>> including access to the online journal *Numeracy*. You can also find information at the StatLit website <<http://www.statlit.org/>>.

## APPROACH

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Students must show all work and explanations must be in complete, well-written sentences. The final examination — closed book/closed notes — consists of problems from other sources. The second component of this approach involves group work. After the first week of class, students are assigned to groups for the rest of the term. Seven or eight days each term are devoted to group work, where students work on one or two problems that have more depth than typical text problems. These problems allow students to see how quantitative reasoning concepts are applied. The combined group work grades count slightly more than one in-class examination.

The results have been very positive. In-class examination grades typically improve as the semester progresses and final exam grades are higher than they were in the past. The number of A's has not changed significantly but the number of D's, F's and W's have decreased dramatically. Complaints on student course evaluations about having to take a mathematics course — Loyola's Core Curriculum requires a course involving quantitative reasoning — essentially have vanished. Finally, the students have performed quite well on embedded final exam questions intended to evaluate their understanding of quantitative reasoning concepts.

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## EVENTS AT 2010 JMM

Please join us at the Joint Math Meetings in San Francisco, CA. Our Annual Meeting for SIGMAA-QL will be 5:00 – 6:00 p.m. Friday, January 15, 2010. We will conduct business and announce the new chair-elect and secretary/treasurer. SIGMAA-QL is also sponsoring a Contributed Paper Session Quantitative Reasoning and the Environment from 8:00 – 11:00 am on Friday, January 15, 2010.

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## CONTRIBUTE!

Tell us what you have done or are doing and we'll include it in the *SIGMAA-QL Newsletter* (email submissions to the Chair). We are also looking for photographs for the website and the newsletter. We are hoping to be able to compose the Newsletter shortly after MathFest and send it out in September so submitting prior to the end of August would be ideal. Items for the Newsletter should be of a "newsy" nature whereas authors of more scholarly contributions should Consider *Numeracy* (published by the National Numeracy Network) for their inclusion.

## LETTER

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of the highlights for me was the National Numeracy Network's annual meeting being held in May at my campus, the University of Washington Bothell (<http://serc.carleton.edu/nnn/news/09anmtg/index.html>). With over thirty attendees, we had two days to discuss best practices of QL and share ideas. We had a fabulous keynote address by Ellen Peters, a senior research scientist at Decision Research. She spoke about how numeracy skills impact decisions, especially those related to healthcare issues. Her research adds some important findings to those of us working in QL education. The conference also had a poster session of NSF projects related to QL and multiple contributed papers on teaching QL. Without the support of the MAA and the SIGMAA-QL, this conference would not have been as successful.

In addition to the JMM, MathFest, and NNN meetings, there were also multiple other things supporting QL and involving many of our members and officers. This included important, ongoing work by SENCER (see the related article in this newsletter), the annual meeting of the Northeast Consortium for Quantitative Literacy (NECQL-XIII) at Smith College (<http://www.smith.edu/qic/NECQLXIII.html>) in March, and the release of two more issues of the journal *Numeracy: Advancing Education in Quantitative Literacy* (<http://services.bepress.com/numeracy/>). Our work in QL is definitely moving forward!

Finally, I'd like to end with an invitation to all members to get involved in any way they find interesting. We are always looking for ideas for sessions at the annual meetings and organizers for those sessions. We are also looking for ways to have a presence at more of the MAA regional meetings as well as more interdisciplinary conferences. So, if you have an idea, please let any of the officers know. We will do everything we can to support you in your work.

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