SIGMAA-QL Newsletter

MAA Special Interest Group on Quantitative Literacy Volume 6, October 2011

The QL Crisis: $2x \vee \neg 2x$

Education is not the filling of a pail but the lighting of a fire. **— William Butler Yeats**

by Eric Gaze

US Secretary of Education Arne Duncan's speech April 15, 2011 to the National Council of Teachers of Mathematics (NCTM) contains the line: "Algebra is the key to success in college." found at: `http://www.ed.gov/news/speeches/math-teachers-nation-builders-21st-century`. This is in stark contrast to the NCTM President Michael Shaughnessy's message in February 2011 titled: "Endless Algebra — The Deadly Pathway from High School Mathematics to the College Mathematics", found at: `http://www.nctm.org/about/content.aspx?id=28195`. This is a good example of two well meaning advocates looking at the same data: of the 4,012,770 cohort of 2001 9th graders only 1,303,050 were college ready in fall 2005 and only 166,530 were expected to graduate with a STEM degree this past May 2011, and arriving at radically opposed positions. The paltry 166,530 STEM degrees lead Secretary Duncan to conclude we are experiencing a STEM crisis and need to increase the numbers of STEM graduates through "increasing the rigor of what is taught in the classroom" (i.e. algebra). Mike Shaugnessy, however, looks at the other 3,846,240 students for whom the "tunnel of repetitive algebra" paid no dividends and sees a QL crisis and asks for a better mathematical experience for these students. Secretary Duncan's claim that "Most factory workers need to understand Algebra II or even some trigonometry to operate complex manufacturing electronic equipment." seems hard to believe for those of us who have taught factoring trinomials and solving radical equations to uninterested classes.

How to reconcile these two positions? At first glance this seems to be another manifestation of the "math wars" between skills drills and constructivist instruction; and that in seeking to address the QL crisis we only worsen the STEM crisis. I would argue that this is not the case, and that the QL community is not seeking to eradicate algebra, but rather to improve the way it is taught. First let's look at Secretary Duncan's rationale for declaring algebra the key to success in college. He cites the statistic that students completing Algebra II in high school are twice as likely to graduate from college. Unfortunately the logic here is plagued by the same confounding variable as the argument that AP courses are the key to success in college. Namely that smarter students are more likely to complete Algebra II and/or AP coursework, and thus more likely to be successful in college. The College Board has been very successful in employing this flawed argument to appropriate millions of dollars of federal funding for more AP coursework, cramming students into AP courses and paying for their tests regardless of the outcome.

The similar argument with regard to algebra, cram as much algebra as possible into them and if at first you don't succeed . . . remediate, is finally being questioned. Most notably the Carnegie Foundation for the Advancement of Teaching is leading an initiative to create alternatives (Statway and Quantway) to the traditional algebra developmental math track at community colleges. They justify this with the statistics that roughly 60% of 6 million community

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college students each year enter the algebra-centric developmental math track and approximately 2/3 of these (2.5 million) never finish. Algebra has become a wasteland of de-contextualized symbol manipulation and formulaic memorization, a wasteland where dreams of higher education and a better life wither and die. The QL community appreciates the severity of the STEM crisis and do not see addressing the QL crisis (creating quantitatively literate citizens) as being at odds with creating more scientists and engineers. In some sense they are two sides of the same coin. The QL community seeks to create a curriculum that fulfills quantitative reasoning needs of all, providing meaningful engagement in mathematics that will simultaneously develop quantitative literacy and spark an interest in STEM fields.

Secretary Duncan states that "One of the best gifts math teachers can give their students is to teach them how to solve complex algebraic equations." Why? He cites a common rationalization of the current algebra curriculum: in learning abstract symbol manipulation students are laying the foundation for more general problem-solving and reasoning skills. I would counter that the best gift *any* teacher can give a student is to teach them how to think. Period. To posit that factoring trinomials and solving for x in the abstract will lead to problem solving in the concrete seems tenuous at best. Jeffrey Bennett's excellent new book, *Math for Life*, highlights how this approach of moving from the abstract to the concrete is a complete reversal of educational theory dating back to the Greeks. Cognitive psychologists talk of the need for a schema, or concrete contextual grounding from our experience, in order to learn. The schema anchors our knowledge in a way that allows us to build on it. Abstract symbol manipulation provides no such anchor, only hopeless bewilderment for most of our students. I am not arguing that algebra is bad or useless, just that our current method of teaching algebra is flawed. Indeed James Gleick points out in his book, *The Information*, how thought is intimately wrapped up in symbols and the alphabet. Symbolic representation literally is a pre-cursor to thought, allowing for analysis and development of reasoning skills and logic. We have become so enamored with our language of symbols that we have lost sight of the fact that algebra is a tool for use in reasoning not an end in itself. It is time to put algebra back in its rightful place. Yes the mathematics curriculum needs to build skills but not at the complete expense of any contextual understanding, a balanced approach is needed. Context needs to provide scaffolding for learning and context should drive the teaching of mathematics. Currently the mathematical content drives the context. Mike Shaughnessy points out that the current "layer cake of algebra-dominated mathematics" exists solely to prepare students for calculus, and he offers 4 concrete alternative pathways:

1. Data analysis, combinatorics, probability and numerical trends/modeling.
2. Statistical thinking and decision making.
3. Linear algebra.
4. Multivariate applications of calculus and statistics.

I would add a fifth strand to be interwoven in all focusing on quantitative reasoning, building and developing critical middle school mathematics topics that currently are abandoned in high school but serve as the foundation for numeracy. In addition these pathways all would necessarily require algebra to be embedded in the context of the material. In conclusion I would like to offer the obvious statement: To learn is to think and this requires studying! This refers back to the quotation at the beginning from Yeats. Jeffrey Bennett's book, *Math for Life*, contains the same quote and the following advice for solving the math education dilemma:

1. Recruit and retain outstanding teachers.
2. Inspire students to study harder.
3. Provide a solid foundation of math skills by incorporating mathematics in all subject areas.

I was struck by the similarity of these with Thomas Friedman's suggestions for education reform in his book, *The World is Flat*. He says the most important educational outcome for students in today's rapidly changing knowledge economy is to "learn how to learn." He stresses that curiosity and passion trump raw intellect, and that we need to develop right brain thinking seeking synthesis across disciplines. To accomplish this we need great teachers, because great teachers inspire us. In order for teachers to light this fire they also must possess curiosity and passion for learning. Thus it is not just students who would benefit from a context-rich meaningful mathematics curriculum, but also teachers, forming a powerful feedback loop throughout the curriculum.

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ICEM-4: A Recounting

4th International Conference on Ethnomathematics Towson, Maryland, July 25–30, 2010

by Pat Kenschaft

In summer 2010, the International Conference on Ethnomathematics (ICEM-4) met in the United States for the first time. More than 80 people from 20 countries and 20 states gathered at Towson University, Maryland, to consider the interface of culture and mathematics, primarily reporting the mathematics developed by indigenous cultures.

Ethnomathematics and QL have a fascinating relationship. Ethnomathematics explores the mathematics developed away from the dominant Western mathematical tradition, and QL tries to connect that tradition to the culture in which we live, exploring how mathematics can serve our needs and interests.

I find myself reflecting about the emphasis of my subculture (which I suspect is that of many readers) on patterns of time and money. My mother considered wasting time a sin, and while both she and I could sometimes overdo this, I am grateful for her patterning me to think about how I plan time, surely an aspect of QL. My family discusses money far more than many American families, contemplating together how we can maximize our happiness and security by managing money, and using patterns to decide how much we can give and to save. We wish other families and governments would look more consciously at patterns of money management, surely an aspect of both QL and our own ethnomathematics. Many cultures have survived without money, but it is crucial to ours and likely to remain so.

However, many cultures have developed amazing mathematics without money or a written language. Linda Furuto, Assistant Professor at the University of Hawaii, told about navigating the Pacific Ocean from Asia to California sailing on double-hulled canoes. Thousands of years ago her ancestors knew they needed trigonometry and other mathematics with no written language. She now takes week-long trips on replicas of these vessels, and takes her students onto them for an hour of explanation of the ancient techniques.

Bus conductors in India charge hoards of passengers the appropriate fare, varying according to where they get on and off, with no help from either a computer or written records. They study the skill for years, but mathematics educator Nirmala Naresh said that after shadowing them for four months, she couldn't possibly do it.

Hendrick Pinxten from Belgium described a seven-year-old Navaho boy taking 50 sheep to his uncle with only the help of a dog, finding the way using rock formations and sun angles, a journey that would take three hours by car. He said that one of his friends asked if we do such people a service by teaching them literacy. How will they fit into our culture? Might they be better off preserving and living in their own?

I heard talks about stone masonry in Portugal, games in South Africa, and weaving in Malaysia and Ghana. Respect for oral languages was apparent. Not all of the research was of indigenous cultures. Papers have been written about the ethnomathematics of current street children, who run now in every large city of the world and need to develop their own way of coping with time and money.

Ron Eglash, Professor of Science and Technology Studies at Rensselaer Polytechnic Institute, demonstrated some of his free software (`http://www.csdt.rpi.edu`), which uses simulations of cultural artifacts such as seen in fractals in African design, iteration in Native American beadwork, and least common multiples in Latino drumming.

You can learn more in the April/May, 2011, issue of the MAA Notices, complete with some photos, or at `http://nasgem.rpi.edu/`.

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Dr. Kenschaft is the author of *Change is Possible: Stories of Women and Minorities in Mathematics*. It is published by the American Mathematical Society and is available from their website, at `http://www.ams.org/notices/200502/fea-kenschaft.pdf`

What's Happening in Mathematics and Social Justice?

by Andy Miller

In the summers of 2006 and 2007, I was a participant in two remarkable workshops held at Lafayette College (Easton, PA) and Middlebury College (Middlebury, VT), respectively. Titled "The Mathematics of Social Justice," these workshops brought together mathematics educators, mostly at the college level, in order to discuss and jointly develop course materials tying mathematics to issues of social justice. The purpose of this short article is to share my personal perspective on working in this area, give some brief updates on recent happenings in the field, and, I hope, inspire others to join in this effort.

Why Mathematics & Social Justice?

The idea of using education in general and mathematics in particular to promote social justice has a long history: see, for example, the works of Paulo Freire (*The Pedagogy of the Oppressed*), Robert Moses (*Radical Equations and the Algebra Project*), Eric Gutstein (*Reading and Writing the World With Mathematics*), and the RadicalMath organization (`http://www.radicalmath.org`). In 2006, however, prior to the first workshop, such ideas were new to me. I had done volunteer work of various sorts and was concerned by many things I saw in society around me, but I had never considered connecting this aspect of my personal life to my professional life. My participation in the two conferences expanded my vision of what mathematics education can be, and I am now committed to the idea of promoting social justice (or at least the awareness of social justice issues) in the classroom whenever possible. Through the use of social justice applications, I hope to:

- *Develop students' mathematical and quantitative reasoning skills.* No matter the context, helping students learn math is a primary objective, of course. Together with readers of this newsletter, I'm interested in my students learning quantitative skills that will help them in their lives after college. For the majority of students I teach, these skills do not include solving a differential equation or reducing a matrix to row echelon form. Most social justice applications require tools and ways of thinking that will benefit my students in their lives as citizens and decision-makers. In particular, social justice applications often present opportunities for students to search for and draw conclusions from real-world data sets.

- *Increase interest in mathematics.* Most of the students I teach would rather be somewhere else than in a mathematics classroom. By using social justice applications, I hope to interest students in the course and show them that mathematics has applications beyond the more often cited subjects in science and engineering.

- *Increase students' sense of civic engagement and confidence.* I would like to think that students who leave my classes are better equipped for citizenship than when they entered. Social justice applications allow me to waken and broaden their civic imaginations, challenging them to ask whether the world is as it should be. In addition, social justice applications are natural fits with service-learning and community-based learning, pedagogies which push students towards civic action.

- *Support the mission of my university.* The mission statement of Belmont University says that we are aiming to equip students to "engage and transform the world with disciplined intelligence, compassion, courage, and faith." Before getting involved developing curricula in the intersection of mathematics and social justice, I did not usually see my college mathematics courses as working towards this mission. Now, however, I have found a way that I can teach mathematics and at the same time aim to provide a transformational experience to my students. Many other writers highlight this aspect of social justice education: it is a way for our colleges and universities to engage with their communities and serve society more deeply than merely training students for their future careers.

As you can see from this list, educators in quantitative literacy and in the mathematics of social justice share many goals and aims. As we celebrate the

10th anniversary of the seminal book *Mathematics and Democracy*, this should come as no surprise.

Recent Developments in Mathematics of Social Justice

I'd like now to share some examples of recent work in mathematics and social justice. By no means does this list attempt to be exhaustive, and I apologize if I've overlooked good work that you or someone you know has done. That being said, I think the list below should serve as an indicator of the range of the work in the field and also the high level of interest in these applications.

- In late 2009, the AMS published a new textbook on game theory, *Models of Conflict and Cooperation*, by Rick Gillman and David Housman. Gillman and Housman wrote their textbook at a level appropriate for an introductory mathematics course, and it includes many applications of game theory that could fit into the social justice category (e.g. negotiation, arbitration, fair division). The authors have also given several MAA mini-courses discussing how they use the material to provide a "path to quantitative literacy."
- The 2010 Joint Mathematics Meetings had a large number of sessions connected to mathematics and social justice, including:
  - A contributed paper session on "Mathematics, Equity, Diversity, and Social Justice." Two example talks: Maria Fung from Worcester State University talked about her course "Exploring Data for Social Change," which uses data sets (such as census data and FBI crime statistics) and social problems to teach introductory statistics. Jack Bookman from Duke University gave a talk called "Mathematics as a Subversive Activity." He shared strategies for fitting social justice ideas into even very rigid syllabi by employing a pedagogy that encourages students to think critically and independently and question authority.
  - Project NExT sponsored a panel discussion on "Mathematics and Social Justice." The panelists—Eric Hsu, San Francisco State University; Shandy Hauk, WestEd; and Lisa Marano, West Chester University of Pennsylvania—talked about projects ranging from the Emerging Scholars Program, which aims to increase the success of disadvantaged students in calculus, to the effects of culture in the classroom to descriptions of individual courses.
  - There was an AMS-MAA-MER-sponsored contributed paper session on "Climate, Sustainability, and the Curriculum." Again, I'll give a sampling of the speakers: Tom Pfaff of Ithaca College spoke of the pioneering work he has done in using sustainability topics in introductory calculus (see `http://www.ithaca.edu/tpfaff/sustainability.htm`, reviewed later in this issue). Deborah Hughes Hallett shared examples of how a wide variety of climate change topics can support the learning of core calculus ideas such as rates of change, averages, graphs, and differential equations.
  - SIGMAA-QL and SIGMAA-EM jointly sponsored a session on "Quantitative Reasoning and the Environment." Amongst many other speakers, Ben Fusaro of Florida State University talked about how he and his students have used simple math to provide usable metaphors to lobbyists.
- In December 2010, the *American Mathematical Monthly* published an article by Frank Farris called "The Gini Index and Measures of Inequality." In the article, Farris describes the Gini index, a popular measure of the distributional equity of a resource (usually income). He also proves several theorems giving alternative interpretations of the Gini index, showing that social justice applications can appear even at advanced mathematical levels.
- Many educators have enjoyed using the Gapminder (`http://www.gapminder.org/`) and American FactFinder (`http://factfinder2.census.gov`) websites to explore data sets on a variety of topics. A recent addition to this category of site is the World Top Incomes Database (`http://g-mond.parisschoolofeconomics.eu/topincomes/`) . This site provides access to a long history of income data for countries around the world; you can also generate some nice graphics on-site.
- The 2011 Joint Mathematics Meetings included

a session titled "Proving Hardy Wrong: Math Research with Social Justice Applications," organized by Eva Curry (Acadia University). G.H. Hardy once complained that applications of math only "accentuate the existing inequalities in the distribution of wealth, or more directly promote the destruction of human life." This panel aimed "to help raise the profile of research with applications that Hardy would have considered positive rather than harmful, and to organize interested members of the mathematical community to support greater funding for and dissemination of such research." One of the panelists was Gizem Karaali (Pomona College). She and her collaborators have written two papers studying fairness and efficiency in the problem of matching students to schools in public school districts, attempting as much as possible to respect student preferences. Both papers are available on arXiv. The papers are "Coalitions and Cliques in the School Choice Problem" (`http://arxiv.org/abs/1104.5474`) and "A Cost-Minimizing Algorithm for School Choice" (`http://arxiv.org/abs/1010.2312`). Following the panelists' remarks, there was a spirited discussion. It was clear that the interest level in the crowded room was very high.

- At MathFest 2011, John Curran and Andrew Ross, both from Eastern Michigan University, presented a mini-course on a roleplaying game they have developed for use in an introductory mathematics class. The game, called "Ways and Means, 1935: Debating the Social Security Act through Math," places students in the roles of U.S. senators in 1935. Their task is to make quantitative arguments based on historical data to determine the shape of social security legislation. Curran and Ross are primarily concerned with using the game to foster quantitative literacy, but there is a clear social justice angle with connections to contemporary political problems.

- As noted on the SIGMAA-QL website, there are a number of conferences throughout the year that bring multidisciplinary audiences together to discuss educating for social justice and civic engagement. For example, this October, the AAC&U is sponsoring a conference on "Educating for Personal and Social Responsibility: A Twenty-First-Century Imperative." Each summer, the organization Science Education for New Civic Engagements and Responsibilities (SENCER) runs a Summer Institute for teams of faculty from institutions wanting to connect science, technology, and mathematics education to civic engagement. Finally, Project Kaleidoscope (known as PKAL and now working in partnership with the AAC&U) occasionally holds events connecting science education to civic action.

The Future of Mathematics & Social Justice

What's next? Clearly, I and others in the field of mathematics and social justice will continue to develop curricula, use them in our own courses, and share them with others at conferences. I believe, however, that more is possible. The remarkable number of sessions on mathematics and social justice at the 2010 Joint Mathematics Meetings, together with the high level of interest I witnessed at those sessions and related sessions at subsequent conferences, attest to the fact that there is a large community of willing participants in this work and a hungry audience.

If you use social justice applications in your mathematics classes, I encourage you to share your work broadly: Talk about your work with your college's office of service-learning or community engagement. Join the Mathematics for Social Justice Google Group and send a message describing what you've done to that list or to the SIGMAA-QL mailing list. Build a webpage. Develop a mini-course for your MAA section meeting. Speak at a session at the Joint Mathematics Meetings or MathFest (there's almost always a relevant session).

In addition to these individual efforts, I would like for us as a community to dream bigger. I believe that there is enough polished work for a more formal expression of our ideas: perhaps an MAA Notes volume, a collection of modules (a la the COMAP modules), or even a textbook. I also think we could be developing mini-courses for the national meetings (JMM and MathFest) as well as PREP workshops for the summer. Some have suggested forming a SIGMAA devoted to mathematics and social justice. There are also a number of interdisciplinary conference and grant opportunities with organizations like AAC&U, PKAL, SENCER, and the Lilly Conference on College Teaching. We should also be thinking about assessing the impact of our work: Do social justice applications help students learn mathematics? Do they increase civic engagement? Which

applications and activities work better than others?

I intend to actively explore these ideas in the near future, but I can't do it alone! If you have other ideas or would like to collaborate, let me know or put the word out on the Mathematics for Social Justice or SIGMAA-QL mailing lists. I look forward to hearing some great ideas!

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Reviews & Announcements

Sustainability Calculus & Statistics: A Web Resource

Pfaff (2011)

Educating about sustainability (climate change, resource depletion, human health and equity, etc) provides an excellent context for improving quantitative literacy while teaching Calculus and statistics.

To this end Tom Pfaff of the Mathematics Department at Ithaca College has posted college mathematics classroom materials that address sustainability issues. Here you will find data sets for use in calculus projects that cover a variety of typical topics, including differentiation, computing tangent lines, and integration. The materials for teaching statistics including data from the climate simulation provided by NARCCAP (North American Regional Climate Change Assessment Program), and a collection resources and graphs that an instructor might find useful for incorporating sustainability issues. Topics incorporated into the projects Pfaff has developed include confidence intervals and regression. All these materials are freely available at `http://www.ithaca.edu/tpfaff/sustainability.htm`.

Lastly, materials are being developed by Prof. Pfaff and his colleagues at Ithaca to add a multidisciplinary component to sustainability education and make students aware of the complexity of dealing with today's problems. These materials, whose development is being supported by the NSF, are becoming available at the portal for this project: `http://www.ithaca.edu/mse/`.

The Millennium Ecosystem Assessment (MA), initiated in 2001 by the United Nations, has involved the work of more than 1,360 experts worldwide. The report summary stated, "The bottom line of the MA findings is that human actions are depleting Earth's natural capital, putting such strain on the environment that the ability of the planet's ecosystems to sustain future generations can no longer be taken for granted." The United Nations proclaimed 2005-2014 as the decade of sustainability education. This call to action offers a valuable opportunity to incorporate QL in a setting usually restricted to more conventional mathematics and statistics. Tom has found that students generally react favorably to this synthesis; many find the application of Calculus concepts to a problem that most have heard about offers extra motivation to learn the material. On the welcome page he quotes a student as saying "for once a math class used real world information for their questions/problems instead of just pulling numbers out of nowhere and expecting we understand them ." Tom welcomes feedback at `tpfaff AT ithaca.edu` and is interested in ways to expand his content and reach of his materials.

About Mathematics

Rising, Schoaff, & Moore-Russo. (2011)

How do we address concerns about innumeracy among college majors in non-science subjects? That is the challenging question Gerald Rising, Eileen Schoaff, and Deborah Moore-Russo answer in a new mathematics textbook under development for college liberal arts students, *About Mathematics*.

The focus is on numerical concepts rather than technique. For example, an important goal of the Calculus chapter is to have students understand what is going on in the processes of differentiation and integration. In teaching about money, the authors want students to know when and how to use amortization and how the amortization formula was derived rather than to memorize the resulting equation or to apply by rote that formula. The text expects students to confirm the often unexpected results of

probability calculations through experimentation.

Although this text differs in many other ways from standard texts for this audience, the major difference that allows students to avoid bogging down with details derives from a series of over a hundred calculator programs we have designed. Students use these programs to carry out computation and to provide the basis for experimentation. This is not, however, a programming course: the students access canned TI-84 calculator programs at appropriate times.

I offer two examples of what these programs provide. First, again from the calculus chapter, the students meet the idea of the definite integral as the limit of the sum of internal rectangles with the calculator carrying out the computation for increasing numbers of those rectangles. Bypassing those complex computations allows the student to focus on what is happening.

The models chapter addresses an old problem posed by Fred Mosteller: You have $20 and an opportunity to play roulette until you either lose your money or double it. You can either bet your full stake on one spin or play $1 at a time. Which would you choose? (You might pause here to choose yourself.) It turns out that the chance of winning on one spin (and so doubling the value of the bet) is about 47% (9/19), but the chance of doubling your money on a series of $1 spins is reduced to about 11%. Faced with this unexpected difference, students run a program that carries out this experiment for them and they can see results that confirm this outcome.

It is our belief that the question that motivated development of this text is better answered for this audience by addressing central ideas rather than practicing detailed computations. Few of them will solve an equation once they leave our institutions; but all of them should have some understanding of the mathematical enterprise and its basic ideas.

About Mathematics has undergone trials in two classes with rewarding student response and is now being reviewed for publication. Anyone interested in further information about it should visit the website, `www.buffalo.edu/~insrisg/AboutMathematics.html`, and anyone interested in participating in further pre-publication classroom trials should contact Gerald Rising at insrisg AT buffalo.edu.

Bibliography

Pfaff, Thomas J. (2011) Tom Pfaff's Sustainability Page, Department of Mathematics, Ithaca College, Ithaca, New York (visited September 2011), `http://www.ithaca.edu/tpfaff/sustainability.htm`.

Rising, Gerald, Schoaff, Eileen, & Moore-Russo, Deborah (2011) *About Mathematics* Manuscript under review.

Recent and Upcoming Events

Joint Math Meetings 2011

January 6–9, New Orleans, Louisiana

SIGMAA-QL sponsored an *AMS-MAA-MER Special Session on Mathematics and Education Reform: The Role of QL in the High School Mathematics Curriculum*. Listing of presentations with abstracts and slides available at `http://sigmaa.maa.org/ql/meetings.php`.

15th Annual Meeting of the Northeast Consortium on Quantitative Literacy, 2011

March 19, Boston, Massachusetts

A record of this meeting is currently available at `http://quantitativereasoning.net/necql/`.

MathFest 2011

August 3–6, Lexington, Kentucky

SIGMAA-QL sponsored a session: *Quantitative Reasoning and Literacy: Pedagogical Strategies*

Appalachian College Association Summit

October 14–15, 2011, Asheville, North Carolina

QL Talks by Bernie Madison, Caren Diefenderfer, Len Vacher & friends, Milo Schield, Eric Gaze, Phyllis Mellinger, Cinnamon Hillyard, Neil Lutsky, Mija Van der Wege, Corri Taylor, and more. See `http://acaweb.org/events/summit/` for details.

National Numeracy Network Annual Meeting, 2011

October 15-16, Asheville, North Carolina

Sat/4:30-6:00 pm	Session for NNN inquirers
Sat/8:00 -10:00 pm	Brainstorming and Planning
Sun/8:45-11:45 am	Annual Board Meeting
Sun/1:15-3:15 pm	Brainstorming and Planning

This annual NNN Meeting will be held in conjunction with the Appalachian College Association Summit. Further information is available at `http://acaweb.org/events/summit/National%20Numeracy%20Network/`.

QL in the Media Contest

2011, Everywhere!

The SIGMAA-QL *QL in the Media Contest* is accepting entries until December 1. Learn how to enter at `http://sigmaa.maa.org/ql/contest.php`. Go to the same link to vote for your favorites during the month of December, and winners will be announced at JMM in Boston, with fabulous prizes!

Joint Math Meetings 2012

January 4–7, Boston, Massachusetts

The general meeting web site is at `http://jointmathematicsmeetings.org/meetings/national/jmm2012/2138_intro`.

SIGMAA-QL is sponsoring two contributed paper sessions:

QL and Decision Making Friday, January 6, 8:00–10:55 AM in Hynes 202.

Motivating Statistical and Quantitative Learning Through Social Engagement (jointly with SIGMAA-Stat-Ed) Saturday, January 7, 8:00–10:55 AM in Hynes 203

The annual SIGMAA-QL business meeting on Friday Jan 6 5-6 PM will include guest speakers Lisa Schwartz and Steven Woloshin from the Dartmouth Center for Medicine and Media speaking on Health Literacy. Location is to be announced.

16th Annual Meeting of the Northeast Consortium on Quantitative Literacy, 2012

Saturday, April 14, Skidmore College, Saratoga Springs, New York

For further information as plans develop, contact Gove Effinger at effinger AT skidmore.edu.