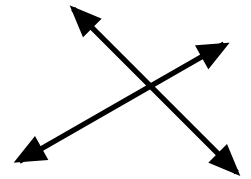# RC ML

Intersection Points

"where research and practice meet"

The Newsletter of the Research Council on Mathematics Learning

Visit us on the Web at: <http://www.unlv.edu/RCML/>

The Research Council on Mathematics Learning seeks to stimulate, generate, coordinate, and disseminate research efforts designed to understand and/or influence factors that affect mathematics learning.

PRESIDENT'S COLUMN
Sheryl Maxwell, President

REFORMATTING

During the summer, the virus plague, known as Worm Blaster, hit many home computers as well as the university systems. The computer network at the University of Memphis was infected during mid-August causing havoc. To make it worse, this happened during my preparation week – you know, that frantic week just before classes start. The impact was frustrating since the entire university had to take the computers off-network to repair the damage done and then re-connect them individually as they became "cured." Professors were unable to print documents they were preparing for handouts on the first day of classes. Other email communication was at a stand still. The devastating virus affected mostly Windows products; however, since I have both a Macintosh computer at home and work, I was still able to create course structure documents, first assignments, and modify previously taught courses. My problem became that only hard copies could be shared with others rather than through my normal computer attachment mode. This disruption impeded me from communicating with my colleagues in my preferred way especially with those whom I am collaborating with in several of the courses we teach.

This incident caused me to reflect about the courses I teach. All of us have encountered times when in order to combat the raging virus and to eliminate its effect on our computers, the inevitable solution was that our computer's hard drive had to be reformatted with the basic information reinstalled. We recognize that only then will the computer be running well with the virus gone. Wouldn't it be nice if we could so easily "reformat" our teaching lives when we notice the increased missed opportunities, regrets, and pesky failures? One simple push of the button, and then -- presto! -- all of our errors, omissions, and illnesses would be gone. Wouldn't that be great?

In a very real sense we can choose to "reformat" our teaching through the reflective process that we advocate. No, our "operating system" of our personality, our gifts, and our abilities are not removed or destroyed. We are left with our capacity to choose, to think, and unfortunately to err again. But we can reformat those ways we aren't proud of, replacing them with refined practices, and hopefully move forward with new vigor, new hope, and a renewed belief that we are effective individuals in mathematics education. I can start to reform my ways with a more positive attitude

MUSINGS
Rama Menon

Making Mathematics Relevant
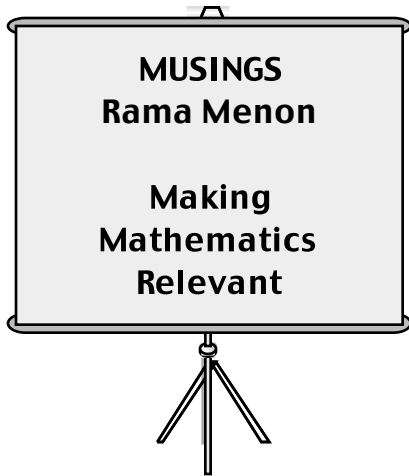
Some years ago, I was involved in collaborating on a study that provided school-to-work opportunities for young offenders/juvenile delinquents who were in an urban setting. Until then, I was unaware of the disproportionate amount of money spent per incarcerated individual, as opposed to the money spent per child in school. I realized then that economically, if not morally, it made sense to save even one child from prison. One finding that stood out was that these young offenders were more interested in work-related information, not just the usual academic subjects taught in school. This brings me to the title "Making mathematics relevant" for the "Musings" column in this issue of *Intersection Points*.

While the mathematical purist might disdain utilitarian/consumer mathematics, mathematics teachers are often hard-pressed to answer the student's question, "When are we ever going to use this?" This question is all the more important for high school students, as they are thinking of working (at least part time), getting a car, etc. Going back to the young offenders alluded to earlier, it was clear that they were eager to know as much as they could about renting an apartment, expenditure on utilities, buying/leasing a car, auto insurance, etc. They were interested in these, because these were of relevance to them. Hence, they were prepared to do mathematics related to these topics. Indeed, one young offender was so interested in gardening and landscaping that he became eager to use fractions and other mathematical topics related to his interest!

This is a clear case of using mathematics in the context of the student's interest. While many of us have taught fractions, and percent, and other related topics, we usually teach the topic first (isolated from real life applications, as opposed to trivial or artificial

situations), and then discuss its applications. Even if we had used a supposedly problem solving approach, we would be reluctant to give students problems, unless they have had a reasonable facility in computing with fractions and percents. In other words, we would be uncomfortable in giving a problem that necessitated the learning of some math topics *during* the solution of the problem. But if we reflect on the number of workshops we have attended, we would realize that the most useful ones were the ones where we needed to know something for our immediate use, and not ones that we go away from with a lot of notes, but seldom use later on.

Another relevant context might be the dangers of charging indiscriminately to a credit card. In spite of our (adult) supposed mathematical maturity, very few of us realize that if we just keep repaying, monthly, the minimum amount of about 2% of the charges (i.e. $20), a $1000 charge at an interest of 13% p.a., WITHOUT charging any more on the card, the debt would only be paid off in 6 years, and we would have paid close to $440 in interest! And, if we keep charging to the card more than 2% every month, but only repay 2%, we will NEVER be able to repay the credit card charges in full. Indeed, it is not uncommon for adults to run up credit card debts up to about $40,000, little realizing that it would take more than 25 years to pay off the debt, at more than $800 a month—and that is WITHOUT charging anything further on the cards!

It would be good for high school students to be able to compute these figures when they learn about compound interest and credit card usage, so that they will not be blissfully ignorant of using credit cards indiscriminately. Conversely, students should be able to see how compound interest can work to their advantage, so that a little amount saved would grow to a sizeable amount later. For example, not many students would know the rule of 72 for interest compounded annually, and that a 25 year old investing a little over a *one-time $10,000*, at 10% annual compound interest, would be almost a millionaire by the time age 65 is reached! For the more mathematically inclined student, a proof of the rule of 72 could be explored.

MARK YOUR BALLOTS!
Virginia Usnick

As an insert to this issue of *Intersection Points*, you will find the ballot for the Fall 2003 elections. The slate includes candidates for President-Elect, Vice-President for Conferences, Treasurer, and two seats on the Conference Committee. Questions regarding RCML were presented to each of the candidates. You can access their responses via the RCML Web site at <www.unlv.edu/RCML>. Vote and mail your ballots with a postmark no later than 5 December 2003 to Ginny Usnick at the address on the ballot.

'Musings,' continued

Another context-rich problem could be about speed limits, and why they do or do not make sense. For example, 30 mph is considered extremely slow by most people—especially youngsters—but they would be surprised if they converted that rate to feet per second, and realize that it works out to about 44 feet per second. It would be an eye-opener to work out the distance traveled during the time it takes to react to a situation, apply brakes, and come to a complete stop, under different road and traffic conditions. Such problems could then easily be extended into stopping distance and related functions/formulas that use equations (such as quadratic equations), and how police might be able to figure out, in the case of auto accidents, the approximate speed at which a vehicle was traveling, given the length of the skid/tire marks on the road.

I am sure readers have used or can come up with many other relevant mathematical problems. I am just suggesting that we math teachers/educators might want to make a concerted effort to use contextually rich and relevant problems, to motivate students, even when they have not become completely facile in the "prerequisite" mathematical computations.

'President's Message' continued

and by making improved choices, so that my teaching is what I desire it to be. Specifically, I've resolved to regularly work on discourse about mathematics teaching and learning in my classroom. In the past I've used a variety of tasks that elicit, engage, and challenge my students' thinking; but that's only the beginning of what I could do. I should promote more classroom discourse, enhance student involvement, thereby creating a positive learning environment that may encourage each student's mathematical power to flourish. Last week I tried an approach I learned at a professional development seminar, called silent dialogue, that allows the quiet members of a class to be heard. The individuals are initially paired and respond to a prompting question by writing one or two remarks on large easel paper with a different colored marker. Then, the other member of the team responds to his/her peer's written comment. The written dialogue continues until that conversation no longer is flourishing. Class members circulate to other dialogue sheets and enter into "conversations." All members of the class become equal participants, voicing unique ideas about a topic. The interaction of students was interesting; their responses were thought provoking; the quality of the discourse was enhanced. What a challenge to continue to work on discourse in my classroom.

What are things you might change in your classroom? How will you reformat your ways and refine your practices?

> **Check out RCML and renew your membership on the Web at:**
> **http://www.unlv.edu/RCML**

Research Council on
Mathematics Learning
Thirty-First Annual Conference
Oklahoma City, Oklahoma
19-21 February 2004

We are looking forward to welcoming you back to Oklahoma City for the thirty-first annual RCML conference. A lot has changed since the last Oklahoma City RCML in 1992! We hope you will enjoy the scholarship and fellowship as well as take advantage of some of the opportunities to experience Oklahoma hospitality.

We have over 60 speakers who will be participating in the conference. There are several features of the program that are especially exciting. To get conversations started, we will begin on Thursday at 3:00 with three birds-of-a-feather discussion groups. Topics of the "BOFs" are: technology and mathematics education, teacher education issues and concerns, and mathematics learning assessment. After the BOFs we will have thematic roundtables so young scholars can present and discuss their research in light of the BOF conversations and in a supportive and discursive format. After a reception of light hors' douvers, we will facilitate groups dining in historic Brick Town (http://www.bricktownokc.com/), within walking distance of the hotel.

On Friday, in addition to many excellent sessions, we will have a special afternoon session coordinated by Dr. Anne Reynolds that includes many of Dr. Grayson Wheatley's former doctoral students who have become distinguished researchers. They will provide a retrospective of problem centered learning, a perspective on Dr. Wheatley's impact on mathematics education research, and an articulation of their own research. In addition, in preparation for the Wilson Lecture on Saturday by Cathryne Stein, students from an Oklahoma City high school will demonstrate their robotics projects. Friday afternoon, before dinner, we hope to have a special artistic presentation followed by dinner and Dr. Wheatley's keynote address. We will be inviting and hopefully joined by many mathematics educators in the state with whom Dr. Wheatley has worked. We are also working on possibly offering an excursion to the "Doublestop Fiddle Shop and Music Hall" (http://www.doublestop.com/), in Guthrie, Oklahoma, to hear the Byron Berline bluegrass band. Stay tuned!

On Saturday, our Wilson Lecturer is Cathryne Stein, the Executive Director of the KISS Institute for Practical Robotics, a national, nonprofit educational organization. Ms. Stein is a founder of the organization and, under her direction, the KISS Institute has developed several national programs, including KISS Institute's Botball Educational Robotics Program for middle school, high school and collegiate students (http://www.botball.org/), and the Robots in Residence Programs for elementary and middle schools. Over 20,000 students have participated in these programs. For those of you staying in Oklahoma City Saturday night, we invite you to attend the Regional Botball competition at the Omniplex (omniplex.org) Saturday afternoon after our conference has ended.

Oklahoma City 2004 Conference, cont'd

See the conference Web page (http://students.ou.edu/R/Kerri.D.Richardson-1/) for information about registration and links to some of the activities and opportunities available to you when you visit Oklahoma City. Hotel accommodations can be made by calling the Westin in Oklahoma City at: (405) 235-2780 or by going on-line at: http://www.westinokc.com or emailing: resvs@westin.com. This information can also be accessed through the RCML website at: http://www.unlv.edu/RCML/. In order to receive the conference rate discount, be sure to indicate you are registering for the RCML conference, code 2501, and register before December 31, 2003.

This year, for the first time, we are soliciting exemplary papers for awards and possible publication in our journal. Information about the awards can be found on the conference website. Award categories will be: Most Outstanding Young Career Research, Most Outstanding Empirical Research, and Most Outstanding Historical/Theoretical Research. Full papers are due January 5, 2004.

If you are not a member of RCML and wish to join, you may apply on-line at http://www.unlv.edu/RCML/memberform.html or send the appropriate information and your check to Roland Pourdavood at the address indicated on the form.

We are extremely excited about the conference and hope to see you in Oklahoma City. We're hoping our conference theme, Mathematics Education: Then, Now and the Future, plays out, as our organization as evolved – as an opportunity to visit our past and mentor the next generation of outstanding mathematics education scholars for the future. See you in Oklahoma City!!

Web Site Adds Features

Over the past year, the RCML Web site has continued to develop and offer features that were previously unavailable or included only in the newsletters. For example, from the Web site, you can now print out or directly submit your membership information, rather than mailing it in with a form from the newsletter.

Also, all of the elections information that was previously printed in the newsletter is now posted at the Web site so that you can read up on each of the candidates running for offices.

Thirdly, the Web site includes conference information that is frequently updated. So, for example, when the full conference program and time schedule is completed, it can be posted directly at the Web site, rather than having to wait for the next mailing to go out to members.

Finally, for the second time, this *Intersection Points* issue is being made available as a pdf downloadable file at the RCML site. With a click of the mouse, you can download the newsletter and either read it on-line or print out your copy. Members who have valid and current email addresses on file are included in a mailing list that is notified immediately when a newsletter is posted at the site.

In the near future, we hope to make the newsletter a full on-line feature, saving considerable paper, trees, postage, and cost for the organization. This will allow us to keep our dues to a minimum, while offering you the most information at your fingertips that is possible.

Be sure to check out RCML on the Web today at <http://www.unlv.edu/RCML>!

RESEARCH COUNCIL ON MATHEMATICS LEARNING
PERSONNEL, 2002-2003

President - Sheryl Maxwell
The University of Memphis
Office: (901) 678-4061
Home: (901) 755-2131
Fax: (901) 624-4934
smaxwell@memphis.edu

Past President - Virginia Usnick
3935 Chinchilla Avenue
Las Vegas, NV 89121
Phone: 702-895-4219
Fax: 702-895-4898
vusnick@nevada.edu

VP-Conferences - Kay A. Wolhuter
Department of Education
120 Montague Hall
University of MN--Duluth
Duluth, MN 55812
(218) 726-8588
kwohlhut@d.umn.edu

VP-Publications - Alan Zollman
Alan Zollman
Northern Illinois University
Dept. of Mathematical Sciences
DeKalb, IL 60115
815-753-6750
zollman@math.niu.edu

Secretary - Sue Brown
Sue Brown
University of Houston
Curriculum and Instruction
2700 Bay Area
281-482-1805
Houston, TX 77058
browns@cl.uh.edu

Treasurer - M. Jayne Fleener
M. Jayne Fleener
University of Oklahoma
College of Education
820 Van Vleet Oval
Norman, OK 73019
fleener@ou.edu
(405) 325-1081
(405) 325-7390 (fax)
www.ou.edu/education/ilac/fleener.htm

Membership - Roland Pourdavood
Cleveland State University
1333 Rhodes Tower
Euclid Avenue @ E. 24th St.
Cleveland, OH 44115-2440
r.pourdavood@csuohio.edu

***Focus* Editor - Jean Schmittau**
School of Educ and Human Development
SUNY-Binghamton
P.O. Box 6000
Binghamton, NY 13901-6000
Office: 607-777-2727
Home: 607-777-4209

Newsletter Editor - Daniel Brahier
124 Life Science Building
Bowling Green, OH 43403
Office: 419-372-0339
Home: 419-874-2836
Fax: 419-372-7291
brahier@bgnet.bgsu.edu
Internet: http://bgmath.org

Web Site Editor - Ryan Speer
Perrysburg, OH 43551

Intersection Points -- RCML Newsletter
Daniel Brahier -- Editor
124 Life Science Building
Bowling Green State University
Bowling Green, OH 43403

ADDRESS CORRECTION REQUESTED