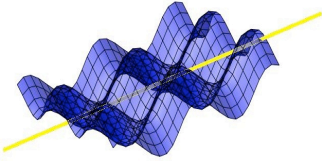


Intersection Points



The Newsletter of the Research Council on Mathematics Learning

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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. Visit us on the web at: www.unlv.edu/RCML

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President's Column: Common core standards

by Anne Reynolds

Spring has arrived with promise of new beginnings and renewals. Something new this spring is the release by the National Governor's Association and the Council of Chief State School Officers of the draft of the *Common Core State Standards for Mathematics*. For many years there has been a call for the development of national standards as part of the reform effort in education. Now governors from 48 states, as well as 2 territories and the District of Columbia have taken a step to make this happen. Is this a new beginning? Does it signal a positive step in the renewal process?

The list of Standards for Mathematical Practice shows promise, beginning with the

sentence: "Proficient students of all ages expect mathematics to make sense" (p. 5). The description that follows contains elements we would encourage in our students. The overview for each grade level is something that can be used to plan a coherent curriculum to support student learning.

The heart of the document follows with the listing of the "domains" and "standards" within each domain for each grade level. A significant number of these standards begin with the word "understand". For example, in Kindergarten, under the heading "Number – base ten" is the following: "Understand that 10 can be thought of as a bundle of ones—a unit called a 'ten'" (p. 11). This

understanding threads through the grade levels in the following way:

Grade 2: Understand that 100 can be thought of as a bundle of tens—a unit called a “hundred”. (p.17)

Grade 3: Understand that 1000 can be thought of as a bundle of hundreds—a unit called a “thousand”. (p.20)

Grade 4: Understand that a digit in one place represents ten times what it represents in the place to its right. (p. 24)

The question I have about such a standard is: What evidence would a teacher use to decide if a student has met this standard? How would a teacher document that a child understands this? I have posed this question to teachers on many occasions. Even though we have spent time exploring meaningfulness and number sense, they find it difficult to respond beyond discussing procedures that their students would be able to perform. With objectives like those listed above would this translate into children counting out ten sticks and bundling them? I suspect that such standards would have students filling in the ‘place value’ worksheets that are so prevalent in traditional text books. Yet there is abundant evidence that such activity does little to help students make sense of tens and coordinate units of different rank meaningfully. Research has shown that such activity does not support students’ attempts to develop number sense and facility in thinking strategically about number relationships.

The particulars of the various grade level standards presented in this document are in danger of becoming a laundry list of objectives to be taught in isolation rather

than a coherent set of mathematical ideas. Already we have school districts mandating which objective every fourth grade class will be working on each day throughout the district. Pacing guides mandate what should be taught and when. How finely do we want to slice up all of the mathematics content? We can slice it so finely that students do not put it back together. Instead of experiencing mathematics as making sense of patterns and relationships, students will continue to experience mathematics as a set of isolated facts that do not necessarily relate.

I would encourage all our members, to be involved in the local and state meetings that are being organized to respond to this document and to make constructive comments. However, by the time this article goes to press, the short turn around between the public release of the document and the window for public comment will have passed. Maybe that in itself speaks volumes about the sincerity of the invitation for feedback from those who will be most impacted by this document. Instead, I invite us all to consider how we are going to work with teachers, administrators, and local school districts, to bring coherence to the teaching and learning of mathematics if and when these national standards become THE core standards for mathematics nationally. I suggest that these standards may take us back decades as far as reform is concerned if, as I suspect, they become a laundry list of disconnected objectives to be covered one at a time. Our students deserve a meaningful mathematics learning experience, one that offers the opportunity for them to make sense of mathematical ideas, reason mathematically, and develop their mathematical potential.

2010 RCML Conference Report

by Carolyn Pinchback

37th Annual Meeting

University of Central Arkansas

11-13 March 2010

Recently, mathematics educators from across the country converged on the campus of the University of Central Arkansas to discuss “Real Challenges in Mathematics Learning.” The 37th annual meeting of the Research Council on Mathematics Learning hosted more than 80 educators from 15 states and offered two guest speakers and 58 sessions on mathematics learning and teaching. The sessions examined topics such as mathematics learning for students learning English as a second language, how demographics affect mathematics scores on comprehensive testing, assessment and accountability programs, and how to use movies, literature, and the Internet to promote critical mathematical fluency.

The conference was hosted by the Arkansas Center for Mathematics and Science Education and the Department of Mathematics at the University of Central Arkansas. The registrants enjoyed the springtime weather in Conway, Arkansas and the meetings kicked off with an evening reception at Garden Hilton Hotel. Friday offered sessions, a luncheon with a business meeting, and guest speaker. Saturday began with another speaker and divided into sessions before a box lunch.

This was the first year that speakers could have their papers reviewed for publication in the proceedings. Seventeen papers were submitted and peer reviewed by several members of the Conference

Committee. Thirteen papers were accepted and published. Authors received a disc of the proceedings during the conference; other participants will receive the proceedings soon.

Selected evaluation responses summarized the value of the RCML conference:

- The sessions are structured in such a way as to foster authentic academic idea exchange—this is the only conference I know of where it is possible to get meaningful discussions and feedback.
- Speakers were all well prepared; topics were very interesting with a strong research base.
- It was a great conference! I got something out of every session.
- I’m excited about the proceedings.

Wilson Lecture Speaker

Synopsis by Kerri Richardson



The 2010 Wilson Lecture was given by Dr. Vijaya Gompa, Professor of Mathematics at Jackson State University in Jackson, Mississippi. She addressed inequity and achievement gaps due to gender, race, economic, and geographic factors, offering insight into the physical, environmental, and social challenges surrounding poverty issues among learners of mathematics. She offered a comprehensive statistical view of achievement among various ethnic minority groups including test scores such as NAEP and SAT. A particularly interesting point centered on the social factors among differing groups. She noted how some groups who centered their social interactions through things like study groups were much more likely to succeed in STEM related fields. The social relationship to support high achievement needs a value system that encourages autonomy, competence, and relatedness. A look at gender factors, faculty collaboration, inquiry-

based learning, and cooperative learning were also discussed.

Founder Lecture Speaker

Synopsis by Elaine Young



The Founder Lecture speaker was Dr. William R. Speer, currently the Interim Dean of the College of Education and a Professor of Mathematics Education at University of Nevada-Las Vegas. He also serves as the Director of the Center for Mathematics and Science Education and Director of International Student Teaching at the University of Nevada, Las Vegas. He is an Emeritus Professor of Mathematics and Computer Education at Bowling Green State University, Bowling Green, Ohio. Dr. Speer has been a Fulbright Scholar to the Bahamas and a Visiting Professor at Northern Arizona University's Science and Mathematics Learning Center. His B.S. and M.S. Ed. degrees were achieved at Northern Illinois University while his Ph.D. was earned at Kent State University.

The title of his talk was “NRC, RCDPM, RCML: A Glance Back as We Strive Forward”. He began with a quiz to ground us in our

past and then helped us to see a future for RCML. A review of past mission statements showed just how far this organization has come.

RCML Business Meeting Minutes March 12, 2010

(pending approval)

Anne Reynolds called the general business meeting to order and welcomed all in attendance. First time attendees were recognized and provided encouragement to come back each year and join the RCML community. Pat Jordan thanked everyone who ran for the conference committee and introduced the new officers:

President Elect – Kay Wohlhuter
VP for Conferences – Stacy Reeder
Treasurer – Mary Swarhout
Conference Committee – Gabriel Matney
Conference Committee – Eileen Faulkenberry

Minutes: Juliana Utley presented the minutes to the membership. Minutes were approved with minor editorial changes and will be posted to the website.

Pat Jordan shared the rationale for a proposed amendment to the by-laws (see below). The intent of the change is to make the VP for Publications an appointed position with an initial three year term. Ginny Usnick brought up the issue of whether this person would be a voting member. According to the Archivist, Bill Speer, if they are a member of the board they are a voting member. Based on Bill's comments and general discussion, the VP for Publications will remain as a voting member of the board. Bea Babbitt made a motion to approve the amendment to the by-laws. Bob Drake seconded the motion. Motion carried. Anne Reynolds pointed out that taking the journal back over has been an arduous journey but an enjoyable one.

Article V. Nominations and Election
Section 4: Duration of Office
{add new paragraph here} *The President, in collaboration with the Executive Committee*

and in consultation with the Editor of Investigations in Mathematics Learning, will appoint a person to serve a three-year term as Vice-President for Publications. This appointment may be renewed based on a positive performance review by the Executive Committee during the last year of the appointment. The Vice President for Publications may be removed from office for cause following an investigation by the Executive Committee. Names for a person to serve in this position may be solicited from the membership at the Annual Business meeting.

Rationale for the proposal: Since the responsibilities of the Vice-President for Publications have expanded to include serving as the publisher of the journal as well as the business manager, the position now requires a more hands-on approach and an increasing knowledge-base in business. These changes require that a person seeking the position of Vice-President for Publications be interviewed for the position rather than standing for general election. In addition, this change would allow the person to remain in office to continue the work of the organization in a manner that would be constant and uninterrupted. Under the election status, a person is just learning the roles he/she must play when their time of service is up. Applications will be solicited from the general membership during the next election cycle for the term of office.

Treasurer's Report: Mary Swarhout presented the budget report for 2009. She pointed out that we now have two accounts – one for publications and one for our regular account – reminded us that our \$29 of our dues goes to the journal. Having the two accounts enables the board and membership to see how money for the publication is working and costing us. Additionally, it helps us see the health of our organization more clearly. Thomas Faulkenberry asked about the almost \$5000 deficit in the publications account and whether we can expect this trend to continue. Mary pointed out that

membership money for publications has not yet been transferred for 2009 (75 x \$29). Motion to accept the treasurer's report was made by Pat Jordan and seconded by Keith Adolphson. Motion passed.

Membership Report: Mary Swarthout presented that we currently have 75 members. She stressed the importance of recruiting members. A suggestion was made that we form a membership committee. Another suggestion was that we try to think about a way to pay our dues online, maybe via a PayPal type account. Mary took note of these suggestions and indicated she would explore their viability.

Newsletter (Intersection points): Gabriel Matney was introduced as the current newsletter editor. He asked for feedback and suggestions. A suggestion was made to include the table of contents for the upcoming journal. A question was asked as to whether the newsletter could be sent out to non-members as a way to recruit. It was agreed that this was an appropriate since the newsletter is posted to our website for anyone to see anyway. Another question was raised to see if the newsletter could be an avenue to get information out to the members (especially new members) related to the conference instead of members having to wait until the week the conference starts. Elaine Young was introduced as the new newsletter editor as Gabriel was in need of stepping down.

Journal (Investigations in Mathematics Learning): Sheryl Maxwell made the following comments/ suggestions:

- For each year of membership you get one year of the journal which is based on the academic year.
- There was some discussion about the possibility of requiring authors to be members at time of publication; no decision was made to change requirements for publishing at this time.
- Expressed the need for reviewers for the journal; a pad was passed around to allow members to sign up as reviewers; these

names will be passed along to Jean Schmittau

- Cost for institutions has increased but not for members; all journals are mailed via first class mail
- Sheryl point out that one-third of institutional subscriptions are outside of the USA; she encouraged each member to check at their own institution to see if they are receiving the journal, if not encourage your institution to subscribe as you are an active member of the organization; she pointed out that members are the most effective at getting this done

Report from VP for Conferences:

- 77 members registered for the 2010 conference;
- Reported that we need a site for 2011; 2012 will be in North Carolina and 2013 will be in Tulsa

Kay Wohlhuter, President Elect, encouraged members to sign up for elections for next year. She encouraged members to submit their nomination form to her prior to leaving the conference, but that she would welcome nominations via email after the conference.

Acknowledgments of service were given to the following:

Gabriel Matney for his service as newsletter editor

Uma Garimella for her service as Conference Chair

Belinda Robertson for her service as Program Chair

Eileen Faulkenberry and *Darlinda Cassel* for their service on the conference committee

Mary Swarthout for her service as treasurer
Carolyn Pinchback for service as VP of conferences

Patricia Jordan for her year service as President Elect/President/Past-President

Meeting was adjourned.

NUMBER RIDDLE

Submitted by Fernando Madrazo Vega

Find a 9-digit number in which each digit from 1 to 9 appears only one time. The number must obey the following characteristics:

- a. The number should be divisible by 9
- b. If the digit furthest to the right is removed, then the remaining 8-digit number must be divisible by 8.
- c. If, once again, the digit furthest to the right is removed, then the remaining 7-digit number must be divisible by 7.
- d. This tendency continues until the last number is divisible by 1.



Famous people at the conference

Pictures from the RCML Conference







RCML *Investigations*

Winter Edition 2009-2010

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Studying Personal Response Systems in a College Algebra Course, by Melanie Butler, Laura Pyzdrowski, Vennessa Walder, and Stephanie Yoho

Mathematics Achievement and African-American Students in Urban Schools, by Corinna A. Ethington and Tracey Wilson

A Description of Fourth Grade Children's Problem-Solving in Mathematics, by Martha K. Brennan, Ann M. Rule, Angela L. E. Walmsley, and Joy R. Swanson

Preparing Experienced Elementary Teachers as Mathematics Specialists, by Susan D. Nickerson





RCMIL *Nominations*

Elections will be held for the following leadership positions to take office in Spring 2011:

Secretary

- Record and maintain minutes of Business and Executive Committee meetings
 - Maintain current Constitution and By-laws
 - Record revisions of the master Handbook
- ### Conference Committee (2 positions)
- Works with the VP for Conferences, Conference Committee, Conference Chair and Program Committee Chair
 - Assists with annual conference activities

Please take the time to nominate a good candidate for these positions. Self-nominations are encouraged. Email the following information to [Kay Wohlhuter](#): Name, Office of Nomination, Institution, Address, Email Address, Telephone (work), Telephone (home).



by Elaine Wiegert

If a hen and a half can lay an egg and a half in a day and a half, at the same rate, how many eggs can 2 dozen hens lay in 2 dozen days? (Lamon, *Teaching Fraction and Ratios for Understanding*, 2005, p. 111).

“Oh no! Here we go again!” “I am getting a headache just thinking about this!” “Do we have to do this?” (This was not the first time my class had to grapple with this type of problem.) These are just a few of the comments made by a group of middle-level inservice teachers who were enrolled in a semester-long course on proportional reasoning. The reaction of my pre-service middle and secondary methods students was similar when this same question was posed. What makes this type of question so challenging and why should we continue to challenge students at all levels to think about the relationships among these quantities and how they are related?

The National Council of Teachers of Mathematics has identified proportionality as the thread that weaves through the content standards in middle level mathematics – algebra, geometry, measurement, as well as data analysis. Students must think proportionally to understand linear functions, similarity, units of measurement conversions, and to test conjectures based on experimental data. If proportionality is so important to middle level mathematics, why then do our adult students continue to have difficulty reasoning proportionally? Could it be that as adults we can

recognize when there is a proportional relationship between two or more quantities, but our school mathematics has only equipped us to deal with proportionality by setting up a proportion and cross multiplying? Questions posed by Susan Lamon (1999, 2005) facilitate intuitive reasoning about proportionality. These questions require our students to use charts, tables, graphs and numbers to explore the relationships among quantities. I would suggest that the students in our mathematics courses and mathematics methods courses should leave each class with a “headache thinking about” proportional relationships in all areas of mathematics until this type of reasoning becomes second nature and they (and we) no longer resort to “setting up a proportion and cross multiplying”. So to that end, another chicken and egg problem from Lamon (2005): A chicken and a half lays an egg and a half in a day and a half. How many dozen eggs do 12 chickens lay in 12 days?

References

- Lamon, S. J. (1999). *Teaching fractions and ratios for understanding: Essential Content Knowledge and Instructional Strategies for Teachers*. Mahwah, NJ: Lawrence Erlbaum Associates, Inc.
- Lamon, S. J. (2005). *More In Depth Discussion of the Reasoning Activities in “Teaching fractions and ratios for understanding”*. Mahwah, NJ: Lawrence Erlbaum Associates, Inc.



TELL ABOUT RCML!!

Currently, we have 57 members on our 2010 membership list. This includes new members like graduate student Molade Osibodu at the University of Georgia and those rejoining and renewing like David Davison and Jim Heddens. If you haven't renewed – look for further contact in your snail mail to remind and encourage you to get up-to-date with RCML – a great deal at \$35 for regular membership and \$29 for student membership. Tell everyone about RCML and help us move our membership list into triple digits this year! We are working on making the process of joining and paying your dues something that you can do online – a way to make joining easy and convenient.

I am taking this bit of space in our April newsletter to remind you to renew your membership in RCML for 2010 – and to take a moment to share your RCML experience with a colleague at your location -- a new hire this spring? A graduate student? Or someone else you know that would gain from participation in a

group that allows its members to “test the waters” with research ideas and receive helpful feedback and comments on work that focuses on mathematics learning, as Bill Speer so nicely reminded us as the Founder’s Speaker at our annual conference in Conway. This kind of environment is and continues to be a fundamental benefit of membership – together with a subscription to a great peer-reviewed journal!

NOTE: a copy of the membership submission form is on the inside cover of each of the *Investigations in Mathematics Learning* journal.

MEMBERSHIP DUES

A friendly reminder that your membership fee was due on January 1st, 2010. To renew a membership please send \$35.00 to Mary Swarthout.

Please direct those wanting to join RCML to our website
<http://www.unlv.edu/RCML/memberform.html>

On the website they can fill out a short form, print it off and then fax or mail that form to Mary.

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