



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 our **NEW** address: <http://web.unlv.edu/RCML>

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President's Column



by Kay
Wohlhuter

A couple of notes before I start my column:

1) It is not a surprise that one reason that I value RCML is because of the people that make up this organization. Our conference settings have enabled me to meet and interact with many individuals that I would not have met in a larger setting. David Davison was one of those individuals. As I

read about his passing, I was reminded of the many wonderful conversations I have had with him at sessions and over meals. I am so appreciative of his many contributions to RCML and to the field of mathematics education.

2) Please note that as of 1 January 2012, we have a new URL: <http://web.unlv.edu/RCML>

Mathematics Education and pre-K Children

The release of the Common Core State Standards has generated important conversations about mathematics content and practices. As you engage in conversations about and make decisions

based on these standards, I encourage you to raise questions concerning mathematics education for pre-K children. Why were the standards only written for K-12 students? What message is being sent due to the exclusion of pre-K mathematics? How can the Standards for Mathematics Practice be developmentally appropriate for pre-K children? What content is appropriate for pre-K children? How does the idea of emergent mathematics align with the vision of the Common Core State Standards?

My interest in and understanding of pre-K mathematics education began while working in Illinois. One person that influenced my thinking was Cheryl – a teacher of four- and five-year-olds – who taught me the meaning of “Don’t underestimate what young children can do”. Cheryl would continually amaze me with anecdotes about how she would challenge her children mathematically (e.g., working with shapes, symmetry, data collection, numerical patterns) and observe how her children successfully (and appropriately) met these challenges. During this time, I also interacted with Angela, a pre-K/K teacher who continually reminded me

“The standards are *PreK*–12 standards not K-12 standards.”

My journey of understanding continued when I moved to Minnesota and began to work with the early childhood educators at UMD. While team-teaching a language, literacy, and mathematics course, I realized the messages that had been sent and received about emergent literacy also applied to emergent mathematics. Specifically, young children begin school with initial ideas about mathematics. In order to enrich their backgrounds and better prepare them for additional mathematics, they need to be immersed in developmentally appropriate mathematical experiences as pre-K children. Just as there is a need for children to learn in a literacy-rich environment, there is a need for children to learn in a mathematics-rich environment. As we interpret and implement the Common Core State Standards, we need to make sure the emergent mathematics message is not lost.

Election Results

December 2011

President-Elect	Mary Swarhout - Sam Houston State University
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RCML 39th Annual Meeting

23–25 February 2012

Hilton Charlotte University Place, Charlotte, North Carolina



Learning, Teaching, and Knowledge: (Re)Constructing
Mathematical Ontologies and Epistemologies in an Era of Transition

The preliminary conference program is available at
<http://www.rcml2012.org/pdfs/Preliminary%20Program1.pdf>

For more information, visit <http://www.rcml2012.org/registration.html>

REGISTRATION: Add \$10 late fee if submitted after January 20, 2012

Conference Highlights:



Paola Sztajn is a professor of Mathematics Education in the Department of Elementary Education. She teaches mathematics methods courses for preservice and inservice teachers. Her research focuses on elementary teachers' mathematics knowledge and professional development. She will discuss the imperative of professional learning for practicing teachers, her current work with teachers, and her vision for the future.



Neil Calkin is a professor of Mathematical Sciences in the Department of Mathematical Sciences at Clemson University. He considers himself a mathematician, origamist and chef. He runs a seminar to prepare students for the Putnam Mathematics Competition. He will address mathematical connections within the arts of origami, magic, and music.



M. Jayne Fleener is Dean of the College of Education at North Carolina State University. She has received a variety of awards for her teaching, research and leadership including her most recent national AdvancED Leadership Award, dedicated to educators who are committed to influencing the future of learning and to ensuring student preparedness for tomorrow's world. She will explore various perspectives in mathematics education through her talk entitled, "Why mathematics? Grand Challenges of Education"

MEMBERSHIP DUES

PLEASE remember that dues were to be renewed in December 2011. If you have not yet paid your dues, go to:

<http://web.unlv.edu/RCML>

Member \$35.00

Student \$29.00





With many schools locking out social and other websites, a teacher cannot always access and use appropriate and exciting technologies for teaching and learning mathematics. With the prolific availability of mobile devices, the world of free and paid apps have exploded. It is sometimes hard to find an appropriate app for use in a mathematics education setting. There are an incredible number of drill and fact/formula apps. Finding apps that allow for students to explore and develop their understanding of mathematical topics is sometimes difficult. Many apps that support mathematical thinking are not coded as “math” apps.

I would like to share three geometry apps that offer different levels of interaction. One is a traditional “learn it as you watch/listen” app. Another is an interactive construction app, and the third provides a selection of games that are based in geometrical space.

Khan Academy Geometry allows students to learn geometry through various videos which are downloaded directly on your iPhone or iPod touch (and in the future to your iPad). Students can watch the videos anywhere, anytime, all the time. Cost: FREE

Apollonius is the first (and so far the only) Interactive Geometry Software (IGS) for the iPhone and iPod Touch. It allows you to make geometric constructions (such as those made using a compass and straightedge/ruler) and move their parts smoothly using the device's touchscreen. Has zoom and scroll capabilities. Cost: \$3.99
CON: can only save one construction at a time

Torus Games Classic includes 8 familiar games introduce children ages 10 and up to the mind-stretching possibility of a “multiconnected universe”. Games include: tic-tac-toe, mazes, crossword puzzles, word search puzzles, jigsaw puzzles, chess, pool and gomoku. While playing the games, kids develop an intuitive visual understanding of a model universe that is finite yet has no boundary. Players who master the games on the torus may move on to try them on the more challenging Klein bottle. Even though the games were designed with kids in mind, adults interested in topology, geometry and cosmology have also found them enjoyable and enlightening. Cost: FREE

If you have a great math app to share, send me an email at elaine.young@tamucc.edu

RCML Publications

Investigations in Mathematics Learning

Sheryl A. Maxwell, VP for Publications
smaxwell@memphis.edu

It's poetry time from the Publications workroom,
The 2011 holiday season has come and gone.
Investigations in Math Learning continues to bloom,
To be read by educators in the USA and beyond.

As the RCML VP of Publications, I announce with glee:
The transition from *Focus* to *Investigations* was successful.
We have worldwide subscribers, secured quite frankly,
Through continual efforts; thus all members should be grateful.

Volume 4 issues are being prepared in earnest.
Did Issue 1 arrive in your mailbox in late fall?
Issue 2 will be mailed in winter season; we'll witness
Issue 3 coming in Spring 2012, you recall.

The future journal publications look bright ahead,
With more manuscripts arriving daily.
Lots of RCML authors, from what I have proofread,
Have written for *Investigations* successfully.

I would be remiss if I didn't remind you
To check your institutional library and with a friend,
To see if they have been introduced to
Our suburb journal from beginning to the literal end.

For within the pages they will surely discover,
How to join RCML with a check in the mail.
Additionally, how to submit manuscripts to our editor,
Whose advice she shares and will not curtail.

So I reveal this information and progress report
To you for the calendar year 2012.
Thanks, RCML members, as you continue to support
And create more journal issues you can shelve.

INVESTIGATIONS

Fall 2011

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Fraction Operations: An Examination of Prospective Teachers' Errors Confidence, and Bias

Elaine Young, Texas A&M University – Corpus Christi
Linda Reichwein Zientek, Sam Houston State University

Abstract Fractions are important in young students' understanding of rational numbers and proportional reasoning. The teacher is fundamental in developing student understanding and competency in working with fractions. The present study spanned five years and investigated prospective teachers' competency and confidence with fraction operations as they entered a college mathematics content course designed for teachers. Results indicate prospective teachers' levels of competence vary by fraction operation. Many of the same error patterns exhibited in the 1980s and early 1990s are still exhibited today. Many prospective teachers inaccurately predict their performance on multiplying fractions with relatively prime denominators and dividing fractions.

Developing Addition and Regrouping Competence Among Second Grade Students

Susan P. Miller, University of Nevada, Las Vegas
Bradley J. Kaffar, St. Cloud State University

Abstract The purpose of this study was to investigate the effectiveness of using the concrete-representational-abstract (CRA) teaching sequence with integrated strategy instruction for developing addition with regrouping competence among students with learning difficulties in mathematics. A total of 16 lessons were provided to 24 students during a six-week summer program. Students who received CRA with integrated strategy instruction out-performed comparison students on both computation and fluency. The two groups performed similarly on word problems and a discrimination/review measure. Based on these results, practical implications and suggestions for future study are provided.

Error Pattern Analysis of Elementary School-Aged Students With Limited English Proficiency

Chin Wen (Christina) Yang, Wayne, New Jersey
Helene Sherman, University of Missouri – Saint Louis
Nikki Murdick, Saint Louis University

Abstract The purpose of this research study was to investigate and classify particular categories of mathematical errors made by students with Limited English Proficiency. Participants included 15 general education teachers, two English as Second Language teachers, and 91 Limited English Proficiency students. General education teachers provided mathematics worksheets to participating students at least once a week over a period of two months. This instrument was evaluated prior to the research study by a panel of experts who provided an average content validity (CVI>0.80) and inter-rater reliability (IRA>0.80). Students' worksheets were analyzed using chi-square and frequency distribution statistical methods. The outcomes of this study will not only help teachers identify common and uncommon computation error patterns across ethnic groups and grade levels, but also provide useful information by which education educators can develop effective intervention strategies for mathematics instruction.

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