

Mathematics Council NEWSLETTER

The Alberta Teachers' Association

Providing leadership to encourage the continuing enhancement of teaching, learning and understanding mathematics.

Volume 20

Number 2

February 2002

President's Message

Almost 600 delegates participated in another successful MCATA conference. In November we started planning for next year's conference in Canmore. We hope to see you there.

What does "literacy in mathematics" mean to you? The term *literacy* makes most of think of reading and writing, but a bigger, more inclusive definition is emerging. Jamie McKenzie, author of *Beyond Technology: Questioning, Research and the Information Literate School* and *Planning for Good Change with Literacy and Technology*, recently gave a presentation on literacy. He placed a list on a screen and asked us to add to it. He included media literacy, technological literacy, emotional literacy, artistic literacy and ethical literacy. Mathematical literacy must be added to all lists from the start. For me, the ideal of mathematical literacy equates strongly with the NCTM goal of math power. It includes, but goes beyond, arithmetic and procedures and strongly involves the mathematical processes in our curriculum.

I am especially taken by the words of Elliot Eisner. It helps to understand a more inclusive position of literacy.

In order to be read, a poem, an equation, a painting, a dance, a novel, or a contract each requires a distinctive form of literacy, when literacy means, as I intend it to mean, a way of conveying meaning through and

recovering meaning from the form of representation in which it appears.

Mathematics is a way of seeing and understanding the world. If the overarching intent in a classroom was mathematical literacy, what would it look like?

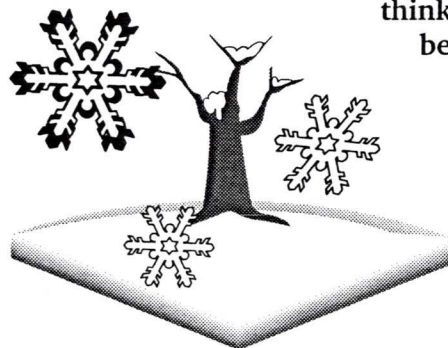
—Sandra Unrau

From the Editor's Pencil

Fall has flown past, and we are into a new term and a new year. Winter is upon us in full force, so grab a cup of cocoa, curl up by the fire and dig in. Don't miss the feature article about Dr. Art Jorgensen, and check out the new section, "Dialogue." In it, Indy Lagu, a math instructor at Mount Royal College in Calgary, has written an article expressing his own views about mathematics education (or lack thereof!).

Let us know what you think and we may be able to publish your reactions. Let's get a real dialogue going.

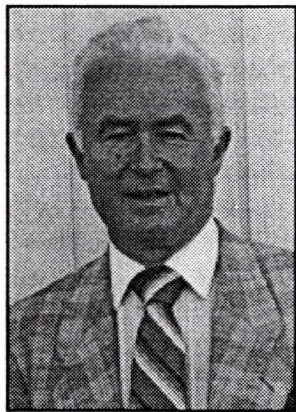
—Anne MacQuarrie



Dr. Arthur Jorgensen Chair Award

This award is presented by the Mathematics Council of the Alberta Teachers' Association (MCATA) to encourage students enrolled in education programs in postsecondary institutions throughout Alberta to pursue and commit to mathematics education. The Award consists of a one-year term on the MCATA executive, with all expenses paid to attend executive meetings (meals, travel and accommodation when necessary) and the annual mathematics conference, as well as a one-year membership to MCATA and the National Council of Teachers of Mathematics (NCTM). For further details as well as an application form, see our website: www.mathteachers.ab.ca. A large plaque with the recipients' names will be prominently displayed at Barnett House.

Who Is the Man After Whom this Award Has Been Named?



Dr. Arthur Jorgensen is one of the most celebrated teachers in Alberta. Throughout his career in education, he has worked tirelessly for his profession and the Mathematics Council of the Alberta Teachers' Association. Any attempt to capture his achievements and

contributions to education and his community is at best an inadequate glimpse into his personal and professional life.

Art's association with MCATA goes back to 1964. He occupied the position of secretary for many years; served as vice-president for a term; and was the editor of the *Newsletter* and *delta-K*, the Council's journal, separately and simultaneously for many years.

He conducted inservices and workshops to mathematics teachers and made many

presentations at the local, provincial, national and international levels. He also drew attention to his work as an administrator; therefore, it was no surprise when the Council on School Administration selected him as the recipient of the 1977 School Administrator of the Year Award.

Art was always involved in the community as a volunteer and member of various community clubs. That involvement earned him the well-deserved recognition as "Citizen of the Year" in 1983. That same year, Art was also the recipient of a Life Membership in the Kinsmen Club, which is that club's highest award.

In 1985, Art retired from active teaching. He was principal of Jubilee Junior High School in Edson for 22 years. Art did not get any well-deserved rest with his retirement, but instead continued to be as busy as ever.

He has also continued his extensive involvement in education. He participated in numerous program and school evaluations. He was appointed as the chair of the Blue Ribbon Panel that examined the Mathematics 30 program. This panel came into being in October 1992 and concluded its work in September 1994. He served on the Junior High and Senior High Mathematics Committee for Alberta Education; was part of the CTF Project Overseas, which involved him in numerous assignments overseas in countries like Jamaica in 1986/87, Zimbabwe in 1989, Liberia in 1990 and Swaziland in 1991, 1993 and 1994, where he inserviced mathematics teachers and affected the lives of many people in so many ways; he taught education undergraduate students at the University of Lethbridge for four years during the summer in the 1970s and for six years at the Yellowhead Regional Education Consortium in Hinton and Edson; and he even taught as a substitute teacher in Grande Yellowhead schools whenever he was available.

As a result of his work in enhancing the teaching and learning of mathematics, the Mathematics Council of the Alberta Teachers' Association presented Art with the Mathematics Educator of the Year in 1988.

When one asks those who worked with Art what they remember most about him, they will tell you that he

✦ has a love of math that is very contagious;

- ✦ cares about the education and preparation of math teachers;
- ✦ is committed, dedicated and passionate about math and the work of MCATA;
- ✦ insists that one does not teach mathematics, but rather one teaches students to learn mathematics;
- ✦ is well known and respected in the mathematics community;
- ✦ spoke with pride and enthusiasm at the teachers' rally at the legislature and he made that event a source of pride for all of us;
- ✦ is proud to be a teacher;
- ✦ has high expectations of teachers and the teaching profession; and
- ✦ still contributes to every issue of *delta-K*, the part that I care most about as the current editor of *delta-K*.

Art cares deeply about children, education and the Alberta Teachers' Association. He is a man of honor and principles, who sees a need and does not shirk from assuming responsibility in filling that need; a man who works long hours tirelessly to produce the best education for children; a man who stands up for his principles time and again in the face of heavy opposition; a man with a grassroots understanding and strong community ties. In short, he is a man who is well respected in the education community.

In 1991, these qualities and the many contributions to education ultimately led the ATA to select Art as the recipient of the highest ATA award—Honorary Life Membership. In 1996, the Canadian Teachers' Federation honored Art with its highest award—the Special Recognition Award.

While there are numerous other outstanding achievements in Art's life, two more are worthy of mentioning. Art has been a member of MCATA for 36 years, most of which he has served on the executive. He has taught for over 50 years, either at school, a university or consortium.

It is with great pride that the executive of the Mathematics Council of the Alberta Teachers' Association creates this award in the name of this outstanding educator—Dr. Arthur Jorgensen.

—Klaus Puhlmann

Surf's Up!

Sites for Students

Math Projects for Science Fairs

✦ <http://camel.cecm.sfu.ca/Education>

This site is part of the Canadian Mathematical Society website, and it lists possible mathematics projects and references on many topics that could make interesting and exciting science fair projects. Some topics include:

- How Do Computer Bar Codes Work?
- What Is the Golden Mean?
- Investigating “Big” Numbers

Mathmania

✦ <http://www.theory.csc.uvic.ca/~mmania/index.html>

This is an interactive site for students whose goal is to “help young students explore topics in higher mathematics.” Some activities are related to graph theory, knot theory and sorting networks.

Sites for Teachers

Over the past few years, more and more schools have been entering their students in mathematics competitions. The following sites provide registration information, sample tests and solutions for various competitions.

✦ <http://www.mathleague.com/contests.htm>

This is the home page for the Math League competitions.

✦ <http://cemc.uwaterloo.ca/Contests/contests.html>

This website has information related to the Canadian Mathematics Competition, Canadian Computing Competition, Canadian Open Mathematics Challenge, Descartes Contest, Euclid Contest, Gauss Contest and the Pascal, Cayley, Fermat Contest.

If you ever have the urge to look up interesting math sites, start your search at the Google site. There you will find anything you will ever need and could possibly dream of. Check it out and you won't be disappointed.

✦ http://directory.google.com/Top/Science/Math/Education/Teaching_Resources/

Two other interesting sites are Alberta Assessment Consortium site and the 4teachers site. Both sites contain ready-to-use lesson plans.

✦ <http://www.aac.ab.ca>

✦ <http://www.4teachers.org>

The latter site even lets you customize your rubric for a particular assignment.

Pickovering My Books

We all have authors whose writing we like. Here are five by Clifford Pickover:

1. *Computers, Pattern, Chaos and Beauty* (1990)
2. *Chaos in Wonderland* (1994)
3. *Keys to Infinity* (1995)
4. *Fractal Horizons* (1996)
5. *Surfing Through Hyperspace* (1999)

The titles provide clues to the content. In addition to mathematics, humor, wit and beauty are among the pages. Enjoy.

—Dale Burnett

Friends of MCATA

Because of their commitment to MCATA, the following math educators were recognized as Friends of MCATA:

- + Joanne Stepney
- + Carol Klass
- + Janis Kristjansson
- + Dan Forest
- + Darryl Smith
- + Betty-Ann Beaudry
- + Sharon Gach
- + Martin Lewicky

Welcome to our ever-growing list and thank you for your contributions to the continuing enhancement of teaching, learning and understanding mathematics.

Be a Science Fair Judge

If you are interested in being a judge at the Edmonton Regional Science Fair, e-mail martinb@telusplanet.net or phone (780) 452-0284 and leave a message. You could also write to Post Edmonton Regional Science Fair, c/o Max Scharfenberger, Odysium, 11211 142 Street NW, Edmonton T5M 4A1.

MCATA 2001 Annual Conference

On October 26–27, “2001: A Math Odyssey” was held at the Fantasyland Hotel in West Edmonton Mall. Five hundred and sixty registrants attended sessions, shared ideas, visited displays and mixed with colleagues.

On Thursday, October 25, delegates attended the fall symposium cosponsored by Alberta Learning and MCATA. The symposium featured panel discussions from postsecondary representatives on preparation of mathematics teachers, updates from an Alberta Learning panel and an address by David McKillop from the Nova Scotia Department of Education on qualities of “The Ideal Math Teacher.”

Conference registration and a wine and cheese social began Thursday evening. Beginning Friday morning at 9:00 a.m., the majority of sessions were held at the hotel’s conference centre, with off-site technology sessions taking place at St. Francis Xavier High School. Many in-depth two-hour sessions and more sessions for Divisions 1 and 2 were featured. Division 3 teachers were well represented, and Division 4 teachers enjoyed sharing information about the implementation of the Applied Mathematics Program. Teachers enjoyed the workshop-style sessions.

Friday’s luncheon featured David McKillop, an assessment and teacher preparation specialist with the Nova Scotia Department of Education. He addressed and entertained on the piano as part of his presentation “Teaching Mathematics For Understanding: The Greatest Gift You Can Give Your Students.” The Math Educator of the Year and Friends of MCATA Awards were presented to recipients.

Keynote speaker Dr. Jere Confrey was unable to attend Saturday’s breakfast. Sessions continued Saturday morning and early afternoon. The closing session featured Dr. Rick Mrazek from the University of Lethbridge, who spoke on “Math Relevancy and Linkages.” About 100 door prizes were presented to delegates. Thanks to all who donated these items. Our 2002 annual conference will be held in Canmore, October 31 to November 2.

—Len Bonifacio, Conference Cochair

Dialogue

I was asked to write about the “postsecondary view” of mathematics education and I’m not really sure what it is, or if there is one. However, I’m quite sure what my views are, so at the risk of putting words in the mouths of my colleagues, here’s the first in a series of articles about mathematics, mathematics education and what I see.

Before I begin, let me give you a bit of background. I received my Ph.D. in Approximation Theory from the University of Calgary in 1996, and since then I have been an instructor at Mount Royal College (MRC). Under the auspices of the Pacific Institute for the Mathematical Sciences, I have been involved in working with teachers from all divisions. I joined the MCATA executive a year ago.

When meeting with teachers, I often lament the unpreparedness of students we receive at MRC. My concerns are met with skepticism at best, and deaf ears at worst. In an effort to raise awareness, let me give you an example that highlights the (un)preparedness of many students.

Recently a colleague gave a quiz to his first-year calculus class. All the students had passed Mathematics 30 with a mark of 60 percent or more.

Here is the quiz:

1. Solve $(x/2) + 3 = 5$ for x .
2. Solve $x^2 + x = 2$ for x .
3. (This one required a picture, I’ll try to explain it as best I can.) In triangle ABC, angle B is a right angle, side a is unknown, side b (the hypotenuse) is 2, and side c is 1.
 - i. Find side a.
 - ii. Find $\cos(A)$.
 - iii. Find $\sin(C)$.

The results? Out of a class of 46, 26 did problem one correctly, 18 did problem two correctly and only 13 students managed to do problem three correctly. Atrocious!

My experience is that students of calculus don’t have trouble with the ideas of calculus, but with basic algebraic manipulation. Certainly, all students can get the first problem, given unlimited time. However, what is required is not the ability to *eventually* solve

basic equations, but to do so comfortably, consistently, correctly and quickly.

Make no mistake. Calculus isn’t the killer; an inability to perform the most basic of algebraic operations is.

—I. Lagu

MCATA Executive Meeting Highlights

At the executive meeting held October 26, 2001, Dr. David McKillop shared his thoughts on what numeracy or mathematical literacy means to society and to the education of K–12 students.

Dr. McKillop is the mathematics evaluation consultant with the Nova Scotia Department of Education. It is hoped that the MCATA executive will consider some of Dr. McKillop’s insights on numeracy or mathematical literacy in future meetings and conferences.

Congratulations

The 2001 Math Educator of the Year Award was awarded to a very special teacher who has made significant contributions to mathematics education in Alberta.

Roxann Trouth was instrumental in initiating as well as providing leadership as coordinator of Mission Possible-Collaborative Senior High Math. The project focused on the smooth and timely implementation of new math courses, a key factor being the extensive professional development activities for the math teachers. To provide additional support to teachers, Roxann initiated an e-mail network to enable effective and efficient information sharing and problem solving as courses were offered for the first time. She is a valued member of the Elk Island Public AISI team and has made exceptional contributions to the professional development of teachers at the school at local and regional levels through her extensive networking and frequent presentations.

Alberta Learning Update

Curriculum

The Program of Studies for Pure Mathematics 30 was reviewed in Edmonton on December 3 and in Calgary on December 5. The ATA nominated 6 teachers and 23 teachers were nominated by their superintendents for these committees. Any changes will be implemented in the 2002/03 school year.

Learner Assessment Branch

This year, the Applied Mathematics 30 diploma exam is worth 20 percent of the student's final mark, and the school awarded mark is worth 80 percent. For Pure Mathematics 30, the diploma exam and the school awarded mark are each worth 50 percent. For students repeating Pure Mathematics 30, the weighting will depend on which diploma exam mark is used to give the student the best overall mark possible. The highest school awarded mark will be used and if it is blended with last year's diploma exam mark, the weighting will be 80 percent, 20 percent. If it is blended with this year's diploma exam mark, the weighting will be 50/50. The weighting of both the Mathematics 33 and the Mathematics 30 diploma exams is 50 percent. These exams are secure, which means that they will not be released after their administration.

The *General Information Bulletin, Achievement Testing Program, 2001–2002 School Year* and the *General Information Bulletin, Diploma Examination Program, 2001–2002 School Year* are available at http://www.learning.gov.ab.ca/k_12/testing/.

Learning Technologies Branch

The new resource for Math 14 is being piloted this year. Pilot teachers met on November 15 in Calgary and November 16 in Edmonton. The resource is scheduled for completion in August 2002 and the Math 24 resource for August 2003.

There is a call for a new resource for Math 31 that would incorporate calculator technology. If successful, the resource will be authorized for September 2002. Hopefully there will be a French-language authorization approved at the same time. No changes to the Program of Studies are planned until 2005 or later.

The elementary online mathematics resource is part of the Online Curriculum Repository and is available at <http://www.learnalberta.ca/>. These resources are developed to aid classroom teachers and parents. The Grade 6 lessons were posted at the end of November, the Grade 5 lessons will be available in September 2002, and by the end of 2004, Grades 1–5 should be available.

French Language Services

The following Programs of Studies have been updated: Mathématiques pures 10-20, Mathématiques appliquées 10-20-30, Préparation aux cours de mathématiques 10 and Mathématiques 14-24. Mathématiques appliquées 20 is being implemented this year and Mathématiques appliquées 30 is being piloted by one French Immersion school and one Francophone school. The student textbook and project book are currently being translated and will be available in January 2002. The teacher resource manual should be available in the summer of 2002.

MCATA Grants

Grants worth \$500 each are available for mathematics education initiatives that support current learning and teaching practices and/or current priorities as outlined by or through Alberta Learning, school districts, MCATA, NCTM, ATA or other reputable educational associations. Deadlines are May 1 and December 1 annually. For full details as well as the application form, see our website at www.mathteachers.ab.ca. Send grant applications to lorraine.taylor@lethsd.ab.ca.

Annual Report 2000/01

In an effort to accomplish our mission of providing leadership to encourage the continuing enhancement of teaching, learning and understanding mathematics” to the teachers of Alberta, the Mathematics Council engaged in the following actions for 2000/01 school year:

- ✦ Organized a successful annual conference in Red Deer, which registered 456 delegates, offered 75 sessions involving about 60 speakers and displayed NCTM materials for sale to MCATA members.
- ✦ Held four executive meetings to conduct Math Council business, one of which was used to examine the activities in which we were currently involved.
- ✦ Sent representatives to the ATA Summer Conference’s president and conference director sessions.
- ✦ Attended the ATA symposium on high stakes testing with Alfie Kohn.
- ✦ Published regular newsletters.
- ✦ Re-envisioned the newsletter content, number of issues and responsibility of executive members for submissions.
- ✦ Published two issues of our journal, *delta-K*.
- ✦ Revised the MCATA handbook.
- ✦ Maintained and updated our website: www.mathteacher.ab.ca.
- ✦ Held a math leaders’ symposium with Alberta Learning the day prior to the annual conference.
- ✦ Wrote a letter to the minister of learning regarding the senior high pure and applied program.
- ✦ Reacted to the initial participant responses in the K–9 study from Alberta Learning and received direction from the provincial executive on this.
- ✦ Awarded the Math Educator of the Year Award to four deserving teachers.
- ✦ Struck a committee to design and release the Dr. Arthur Jorgensen Chair Award, a new award named after longtime executive member Dr. Arthur Jorgensen to promote

- student teachers who have chosen mathematics as their major area of focus.
- ✦ Maintained affiliation with NCTM.
- ✦ Sent the president to NCTM annual conference.
- ✦ Re-envisioned the executive members’ roles and responsibilities.
- ✦ Renewed our partnership with Alberta Learning to cohost two symposia per year.
- ✦ Attended numerous PD days, conferences or Alberta Learning committees around the province.

—Sandra Unrau

Symposium Review

As you will have read in the annual conference report, the 17th Semiannual Alberta Mathematics Leaders’ Symposium was held at the Fantasyland Hotel in Edmonton on Thursday, October 25. Although there were several components to the day, this article focuses on David McKillop’s keynote address. David asked the group to describe the “ideal mathematics teacher.” The descriptions included a profound knowledge of mathematics; a firm understanding of pedagogical techniques; the ability to be respectful and knowledgeable about alternative methods; the ability to give frequent, fair and relevant assessments that are returned on a timely basis; and the willingness to unravel student misconceptions and listen deeply. In response to the views of representatives from Alberta’s postsecondary institutions (most notably, the University of Calgary), our MCATA president proposed that one of the executive’s goals for the year would be to write a position paper regarding MCATA’s beliefs concerning mathematics teacher preparation. To adequately reflect your views and engage you in our conversation, please send your comments and concerns regarding teacher preparation and the “ideal teacher” to our editor by March 1, 2002. Let us hear what you think is important about our profession.