

Mathematics Council NEWSLETTER

The Alberta Teachers' Association

Volume 9

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June 1991

From the Editor

The following article from The Illinois Mathematics Teacher (February 1991), should provide a challenge to all teachers. Computers are becoming an integral part of all aspects of society. As a result, teachers must become computer literate so that they can effectively use this technological tool with their students from kindergarten to university.

Computer Literacy

by Barbara Gibson
St. Xavier College, Chicago, Ill.

Technological advances have resulted in extensive use of computers in homes, offices, supermarkets, banks, gas stations, schools and so on. This proliferation is dividing our society into two distinct classes: the technocrats, who are computer literate, and the techno-peasants, who are not.

But what is computer literacy? Bramble and Mason (1985) say that defining computer literacy is like trying to describe the shape of a cloud. Although stating what a cloud is may not be difficult, defining exactly what each cloud should look like may be almost impossible.

Most definitions of computer literacy are broad. Bramble and Mason include vague ideas such as comprehending the social, economic and ethical issues involved in computer applications, functioning in a society that is increasingly computer based, and operating computers "as necessary."

Extending the cloud analogy further, wouldn't it depend not only on who was looking at the cloud but also on whether they were viewing it from above or from below? The same is true of computer literacy, which is not the same for students (on the bottom looking up, so to speak) as it is for teachers (on the top looking down). Brownell's (1987) more specific definition recognizes that computer literacy is not the same for teachers as it is for students. Brownell

offers a six-strand curriculum taken from My Students Use Computers: Learning Activities for Computer Literacy (Hunter 1983). Although it did not intend to do so, Hunter's work offers an outstanding functional definition of computer literacy for students. Hunter's six strands are:

- * Ability to use and develop procedures for problem solving
- * Ability to use computer programs that are already available
- * Understanding what computers are and how they operate
- * Knowledge of how computers are used and how they could be used in different applications
- * Knowledge of the history of computing and an understanding of the impact of computers on society
- * Ability to write computer programs

For teachers, the requirements are greater for achieving computer literacy. Thus, Brownell integrates this six-strand definition with further requirements. Specifically, teachers must be familiar with current research on using computers in the classroom, particularly on when and how to use computers most effectively. They must know what education software is available in their particular field or grade level, and must be able to evaluate that software effectively. They must be aware of the relationship between computer programming and problem solving. Finally, teachers must have experience operating different types of computers.

Almost universal agreement exists on the question of when computer literacy training should begin: as early as possible. Bramble and Mason, and Brownell suggest that for all students, this learning should begin in kindergarten and should continue through all grades. Furthermore, it must be taught not only by itself but also integrated with all other areas of the curriculum, including mathematics, science, language arts, geography, and so on.

However, producing computer literate students is not possible unless their teachers first achieve computer literacy. When used correctly in classrooms, technology increases learning and retention while decreasing learning time required (Bitter 1987). Even so, teachers who are not computer literate often use the older methods of teaching although they have computers in their classrooms. Through workshops, in-service training, additional college coursework and individual work, teachers can achieve the necessary computer literacy to remedy the situation.

Suggested guidelines for teachers' computer literacy follow. Since everyone's perception of a cloud differs, these are only general guidelines from which individuals can determine their own requirements. For example, the computer literacy requirements for elementary school teachers will not be the same as those for high school mathematics and science teachers.

Guidelines for Computer Literacy for Teachers *

1. Understanding what computers are and how they operate.
2. Knowledge of the history of computers and understanding the impact of computers on society, including the job market.
3. Knowledge of how computers are used currently and of their potential uses in different applications.
4. Ability to use and develop procedures for problem solving, including breaking a problem into small modules, solving each one and then reassembling the whole.
5. Ability to use existing computer programs.
6. Ability to write (at least simple) computer programs.
7. Familiarity with current research on how and when to use computers most effectively in the classroom and curriculum.
8. Knowledge of what educational software is available.
9. Ability to evaluate educational software.
10. Awareness of the relationship between computer programming and problem solving.
11. Experience operating different types of computers.

* A combination of ideas from Brownell (1987), Bramble and Mason (1985), and Hunter (1983).

In summary, any definition of computer literacy must consider the needs of each particular group of people, whether they are composed of students or teachers. The needs of one group may not be similar to another. Computer literacy is the responsibility of the schools, and acquiring it should begin as early as possible, preferably in kindergarten. Computer literacy should be taught not only by itself but also integrated with all areas of the curriculum. Schools need to invest the time, money and space needed for computer literacy programs. However, students' literacy cannot be accomplished until teachers achieve literacy. Then education can change to meet the demands of our high-technology society and to produce students who are truly technocrats.

References

- Bitter, G. "Educational technology and the future of mathematics education." School Science and Mathematics 87 no. 6 (1987): 454-65.
- Bramble, W. J., and E. J. Mason. Computers in Schools. New York, N.Y.: McGraw Hill, 1985.
- Brownell, G. Computers and Teaching. New York, N.Y.: West Publishing Company, 1987.
- Hunter, B. My Students Use Computers: Learning Activities for Computer Literacy. Reston, Va.: Reston Publishing Company, 1983.

The Right Angle

by Florence Glanfield
Examination Manager, Mathematics 30

The new Mathematics 30 curriculum will be implemented this September. This article is the last of a three-part series discussing changes in the Mathematics 30 Diploma Exam. While the first article discussed mathematics as communication and the second discussed mathematics as problem solving, this final instalment will discuss the scoring of an open-ended question.

Open-ended Questions

We believe that an open-ended question is a way to examine mathematics as problem solving and communication. An open-ended question allows the student to communicate (at present, in writing) a response. It asks students to explain their reasoning and their solution, describe mathematical situations, write directions, create new problems, create new strategies, generalize a mathematical situation and formulate hypotheses.

Scoring an Open-ended Question

Scoring Rubrics, developed by the California Assessment Program, forms the basis for developing a scoring guide. A scoring rubric or scale is a description of the requirements for varying degrees of success in responding to an open-ended question. The scoring scale may be predefined, or it may be created as a result of reviewing a number of student responses.

During the 1990-91 field test process, we tested a number of open-ended questions. With the assistance of a group of teachers, we are presently developing a general scoring scale for the Mathematics 30 Diploma Examination questions. The committee developed a scale for a number of individual questions and then examined the individual scales and collected similarities to create a general scale. The scale is being reviewed and field-tested, and will be available in the 1991 version of the Mathematics/Sciences Bulletin that will be mailed to all high schools in September. The Bulletin will provide examples of student work that illustrate differing scores and expectations for students so that teachers can give examples to their Mathematics 30 classes.

I encourage you to obtain a copy of the following documents to examine open-ended questions in further detail:

- * Assessment Alternatives in Mathematics: An overview of assessment techniques that promote learning.
- * A Question of Thinking: A first look at students' performance on open-ended questions in mathematics.

Both documents are available through:

California State Department of Education
Bureau of Publications, Sales Unit
P.O. Box 271
Sacramento, CA 95802-0271

If you have any questions, please contact me at 427-2948 or FAX 427-4200.

Update on Mathematics 30 and 33

The Mathematics 30 and 33 Courses of Studies were approved recently. Copies of the final documents will be forwarded to schools beginning June 1, 1991. Textbooks for each course will be available in the Learning Resources Distributing Centre by June 1.

The following resources have been authorized:

Mathematics 30

Bye, M. et al. Holtmath 12. Toronto, Ont.: H.B.J. Holt, 1988.

Ebos, F. et al. Mathematics: Principles and Process 12. Scarborough, Ont.: Nelson Canada, 1991.

Kelly, B. et al. Mathematics 12 National Edition. Don Mills, Ont.: Addison-Wesley, 1991.

Landwehr, J.M. et al. Exploring Data. Palo Alto, Calif.: Dale Seymour Publications, 1986.

----. Exploring Surveys and Information from Samples. Palo Alto, Calif.: Dale Seymour Publications, 1987.

Mathematics 33

Carli, E.G. et al. Mathematics for a Modern World. Book 4, 2nd (Alberta) edition. Toronto, Ont.: Gage Educational, 1988.

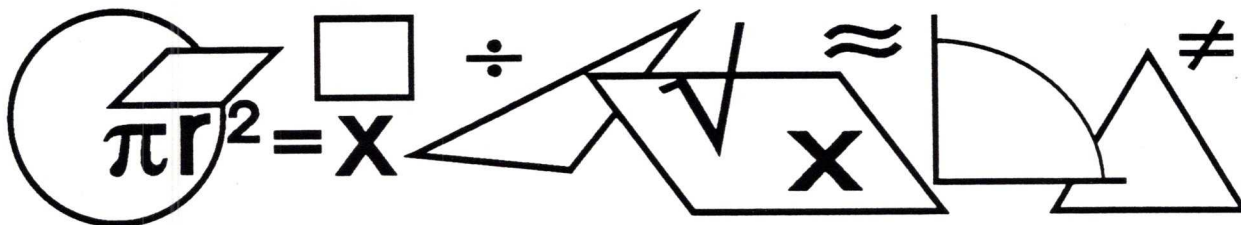
Ebos, F. et al. Math Matters: Book 4. Scarborough, Ont.: Nelson Canada, 1991.

Landwehr, J.M. et al. Exploring Data. Palo Alto, Calif.: Dale Seymour Publications, 1986.

----. Exploring Surveys and Information from Samples. Palo Alto, Calif.: Dale Seymour Publications, 1987.

The interim version of the Mathematics 30/33 teacher resource manual will be mailed to schools beginning June 1, 1991. Schools are encouraged to photocopy the document so that all mathematics teachers in the schools will have a copy.

For further information on the curriculum, please contact Enzo Timoteo or Morris Treasure at 427-2984.



Notice of Motion

Section 11 of the constitution requires that a "three months' notice to amend the constitution be given to each member." Amendments must be ratified by "a two-thirds majority of the members present at any annual general meeting" of MCATA, "subject to the ratification of Provincial Executive Council of the Alberta Teachers' Association."

On May 4, the Mathematics Council directed that the June Newsletter include a notice of changes to the constitution. Changes will be considered at the annual general meeting in Edmonton in October 1991.

Changes in Constitution

Section VI OFFICERS presently reads:

The officers of the Council shall consist of a president, a vice-president, a past president, a secretary and a treasurer to be elected for a term of one year by distributed ballot and a member appointed by the Provincial Executive Council of the Alberta Teachers' Association. To be eligible to become an officer of the Council, a candidate must be a member of the Association.

The term of office for elected officers is July 1 to June 30.

That Section VI OFFICERS be changed to read:

The Officers of this Council shall consist of a president, a vice-president, a secretary and a treasurer to be elected for a term of one year by mail in ballot, a past president, and the ATA staff advisor. To become an officer of the Council, a candidate must be a member of the Association.

The term of office for elected officers is July 1 to June 30.

Section VII EXECUTIVE COMMITTEE presently reads:

The Executive Committee shall consist of the officers, and the following members to be appointed by the officers:

- a) six directors for a one-year term appointed in such a way as to ensure that at least three members of the executive committee are representatives of each of elementary and secondary teachers and that at least one member is a representative of junior high and senior high teachers,
- b) one representative from the Department of Education for a two-year term,
- c) two representatives from universities in Alberta, one from a Faculty of Education and one from a Department of Mathematics, provided that two different universities are represented, each for a two-year term,

- d) one newsletter editor who also serves as publicity chairman for a one-year term.

One Member of the Executive Committee shall be designated as representative to the National Council of Teachers of Mathematics.

All appointments terminate as of June 30.

That Section VII EXECUTIVE COMMITTEE be changed to read:

The Executive Council shall consist of the officers, and the following members to be appointed by the officers:

- a) directors appointed by the officers for a one-year term,
- b) one representative from the Department of Education for a two-year term,
- c) one member of Provincial Executive Council,
- d) representatives from universities in Alberta, one from a Faculty of Education and one from a Department of Mathematics, each for a two-year term,
- e) editors of Council publications,
- f) a representative from College and Technical Institutions.

One member of the Executive Committee shall be designated as representative to the National Council of Teachers of Mathematics.

All appointments terminate as of June 30.

Notice for Elementary School Teachers

by Geri Dunsmore
Editor, Edu-cator

A new publishing company is now accepting teaching unit submissions from experienced elementary school teachers for all elementary subjects and grade levels.

If you have developed a unit that has been used successfully with your students, we'd like to consider it for publication. Units must

- * be previously unpublished,
- * not be restricted to the use of any one textbook or series, but teachers can suggest titles,
- * have been used successfully with students,
- * adhere to Alberta Education's Program of Studies for your grade level.

Payment rates are negotiable (depending on the unit content) but will involve a flat fee, paid immediately, plus a royalty, based on sales of your unit, paid annually.

Teachers submitting units to Edu-Cater are encouraged to adopt the following suggested format:

Unit Format

Introductory Remarks: Describe your use of the unit, including information on the grade level of students, when the unit was used (beginning, middle or end of school year) and general remarks about students' reactions to the unit's content and activities.

Time Frame: Describe the length of time your unit took to complete (five days? three weeks?). Also specify the number of minutes or periods per week (three 40 minute periods per week?).

Materials: Describe material needed to teach the unit. Remember, no one text or series should be used with the unit, but materials should be easily obtained. For example, a unit in music might suggest the type of records or tapes needed (rock, folk or jazz?), but would not suggest that you must use record 8 of a particular series.

Evaluation: This section should briefly describe how the students might be evaluated (written tests, verbal explanations, performances). Actual quizzes should be contained within the body of the unit plan.

Suggested Strategy: Describe in sequenced detail how you presented the information in your unit, what student activities were involved, your evaluations and culminating activities.

When you are writing your unit, imagine that you are explaining it to a new teacher. Try to leave jargon out of your plan.

All units accepted for publication will be edited to adhere to this format, but unit content will not be altered.

Submit material as soon as possible to:

Edu-Cater
Publisher, Elementary Curriculum Units
77 Jerry Potts Blvd
Lethbridge, AB
T1K 5R2

Please phone me at 1-403-381-7768 if you have any questions.

"The entire sum of existence is the magic of
being needed by just one person."

V. Putman

1990-91 Alberta High School Mathematics Competition Results

Part I of the AHSMC this year was written by 867 students from 50 schools. Prize winners include:

Major Individual Prizes

W. H. Freeman Scholars:

Rahim Hirji, Western Canada High School, Calgary (Grade 11)

Jason Colwell, Old Scona Academic High School, Edmonton

Third Prize:

Matt Fenwick, Sir Winston Churchill High School, Calgary

Grade 11 Prize:

Ozzie Gelbord, Western Canada High School, Calgary

Grade 10 Prize:

Robert Kry, Western Canada High School, Calgary

Major School Prizes

Peter H. Denham Memorial Plaque Winning Team:

Western Canada High School, Calgary, with Rahim Hirji, Aaron Pollack and Rhys Yarranton, managed by M. Milner

Second Team Prize:

Old Scona Academic High School, Edmonton, with Jason Colwell, Alan Hughes and Taha Taher, managed by L. Pascoe

Third Team Prize:

Harry Ainlay Composite High School, Edmonton, with William Lee, Patrick Chan and Simon Wong, managed by L. Lindenberg

Other Prizes

Zone I First Prize:

Reed Ball, Lord Beaverbrook High School, Calgary

Zone I Second Prize:

Aaron Pollack, Western Canada High School, Calgary

Zone II First Prize:

Marc Lim, St. Mary's School, Taber

Zone II Second Prizes:

Craig Sellars, Winston Churchill High School, Lethbridge (Grade 10)

Cory Pregoda, Eckville Junior Senior High School, Eckville

Murray Robinson, Acme School, Acme

Zone III First Prizes:

Alan Hughes, Old Scona Academic High School, Edmonton

William Lee, Harry Ainlay Composite High School, Edmonton

Zone IV First Prize:

Michael Roy, Salisbury Composite High School, Sherwood Park

Zone IV Second Prize:

Karin Lu, Salisbury Composite High School, Sherwood Park

Zone I Team Prize:

Sir Winston Churchill High School, Calgary, with Matt Fenwick, Shinichi Nakane and James Kao, managed by D. Cantrill

Zone II Team Prize:

Acme School, Acme, with Murray Robinson, Tam Harder and Jonathan Stade, managed by D. Denham

Zone III Team Prize:

Ross Sheppard Composite High School, Edmonton, with Albert Lee, Shui-Yeung Lam and Hussein Waljee, managed by K. Skrypnek

Zone IV Team Prize:

Salisbury Composite High School, Sherwood Park, with Michael Roy, Karin Lu and Rod Godwaldt/Anand Karvat/Joyce Tsang, managed by R. Broemling

Geoff J. Butler Memorial Team Prize:

St. Mary's High School, Calgary, with Cindy Mok, Shawn Pauliszyn and Noelle Bacalso, managed by G. Dorscher

Part II of the AHSMC was written by 71 students representing 17 schools. The scholarship winners and Olympians are:

Nickle Family Foundation Fellowship (\$500)

1. Charles Cruden, Harry Ainlay Composite High School, Edmonton

Peter H. Denham Memorial Fellowship (\$250)

2. William Lee, Harry Ainlay Composite High School, Edmonton

Canadian Mathematical Society Fellowship (\$150)

3. Michael Roy, Salisbury Composite High School, Sherwood Park

Alberta Teachers' Association Grade 11 Fellowship (\$100)

6. Ozzie Gelbord, Western Canada High School, Calgary

Alberta Teachers' Association Grade 10 Fellowship (\$100)

7. Robert Kry, Western Canada High School, Calgary

Remaining Olympians:

4. Rhys Yarranton, Western Canada High School, Calgary
5. Simon Wong, Harry Ainlay Composite High School, Edmonton
8. Zhi-Jian Li, Forest Lawn Senior High School, Calgary (Grade 11)
David Adams, Strathcona Composite High School, Edmonton
10. Albert Lee, Ross Sheppard Composite High School, Edmonton
11. Hussein Waljee, Ross Sheppard Composite High School, Edmonton (Grade 11)

12. Jason Colwell, Old Scona Academic High School, Edmonton
13. Taha Taher, Old Scona Academic High School, Edmonton (Grade 11)
14. Calvin Li, Archbishop MacDonald High School, Edmonton (Grade 11)
Shui-Yeung Lam, Ross Sheppard Composite High School, Edmonton
16. Ning Wu, Harry Ainlay Composite High School, Edmonton (Grade 11)
17. Reed Ball, Lord Beaverbrook High School, Calgary
18. Jennifer Bryce, Western Canada High School, Calgary
19. Rahim Hirji, Western Canada High School, Calgary (Grade 11)
Polianna Siu, Western Canada High School, Calgary
21. Keith Silva, Archbishop MacDonald High School, Edmonton
22. Darin McBride, Archbishop MacDonald High School, Edmonton

Conference Update

by Karen Skrypnek
Publicity Chairperson

Plans are under way for the 1991 MCATA conference "Mathematics: A Meaningful Mosaic," October 31 to November 2, 1991 at the Edmonton Inn. The program will offer 50 sessions and 20 workshops. Displays will feature the latest in publisher releases, and the new "Take It and Use It" looks promising. Don Fraser of the University of Toronto, who is a well-known speaker, will give the keynote address. Friday night's social event will be a time to simply relax and converse with colleagues, or let loose on the dance floor. Mark your calendar and plan to attend.

MCATA 1991 Conference Poster Contest Results

The conference committee received over 250 posters from more than 30 schools throughout Alberta. Contest winners are:

Division 1: Miriam Mol, Grade 2
Whispering Hills Primary School, Athabasca

Division 2: Holly Ann Penny, Grade 4
Parkallen School, Edmonton

Division 3: Deanne Lam, Grade 9
Earnest Morrow Junior High School, Calgary

Division 4: Chenoa Marcotle, Grade 10
Ross Sheppard Composite High School, Edmonton

Prizes of \$50 were awarded to each of the above students. The winning posters, along with many of the other entries, will be displayed at the upcoming conference.

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MCATA Executive 1990/91

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Math Teaching Associates

is offering, in cooperation with Alberta Education,

Teaching the New Senior High School Program

Dates: August 19 to 22, 1991

Workshop times: 8:30 a.m. to 4 p.m.

Place: Room 934a, Education Building, University of Alberta

Cost: \$160--includes course fee plus materials

Registration date: Workshop needs 15 registrants by June 15, 1991.
Participants will be advised on this date if workshop will not take place.

The workshop will focus on the new senior high school program, and will centre on several particular items of interest:

- * Teaching methods especially centering on teaching with meaning, manipulatives and the role of applications
- * Problem solving as a curriculum goal and teaching method
- * Specific recent provincial curriculum changes in content and teaching
- * Teaching specific content topics such as statistics, geometry, permutations and combinations
- * Technology and the mathematics program using the graphing calculator and general computer technology
- * Developing effective teaching techniques, cooperative learning ideas
- * Student assessment in the senior high school program

Note: This is a non-credit course. Special credit arrangements may be possible.

Workshop Leaders:

Sol E. Sigurdson, U of A--Teaching senior high mathematics
Bruce Kabaroff, Edmonton Public Schools--Effective teaching, content topics
Enzo Timoteo, Alberta Education--Mathematics curriculum, assessment
Elizabeth Mowat, Edmonton Public Schools--Statistics
Tom Kieren, U of A--Technology in teaching mathematics

Teachers wanting residence for these four days at reasonable rates should contact Food and Housing Services at Lister Hall, University of Alberta, telephone 492-4281, FAX 492-7032.

Please see reverse for registration form.

Registration Form

Math Teaching Associates/Alberta Education's

Teaching the New Senior High School Program

**August 19 to 22, 1991
University of Alberta**

Name: _____

School: _____

School Address: _____

Phone: _____

Home Address: _____

Phone: _____

This registration form should be sent along with the \$160 workshop fee to:

Bruce Kabaroff
Math Teaching Associates
15803 114 Street
Edmonton, AB
T5X 2V2

Mathematics Educator of the Year

Nomination Form

Nominee's Name _____ Phone _____

Home Address _____

School Address _____

Present Position _____

Nominated by _____ Phone _____

Address _____

Date _____

This award will be presented at the annual MCATA conference in Edmonton from October 31 to November 2, 1991.

Mail nomination form before September 15, 1991 to

Louise Frame
Chairperson
Award Selection Committee
#32, 1012 Ranchlands Boulevard N.W.
Calgary, Alberta
T3G 1Y1