BCCUPMS MFEE Subcommittee Meeting

July 12, 2007
SFU Vancouver
10:30 a.m. to 1:30 p.m.

approved minutes

Present: Veda Abu-Bakare (Lang), Brent Davis (UBC), Malgorzata Dubiel (SFU), Justin Gray (SFU), Bernice Kastner (SFU), Wendy Lynn (Cap), Wayne Matthews (Cam), Susan Milner (UCFV), Susan Oesterle (Doug), Margaret Wyeth (UVic).

1. Updates/reminders:

(a) **Action:** Malgorzata will stay in touch with Ian Affleck, webmaster of BCcupms site, to ensure that minutes of the subcommittee are posted and to invite feedback from visitors to the site.

(b) Subcommittee members were encouraged to read the articles by Betsy Darken sent by Leo Neufeld to the listserv.

(c) The BCAMT conference is October 19 in Richmond. Susan & Susan hope to chair a session seeking the opinions of elementary school teachers as to what they would have found useful in a mathematics content courses.
   Action: Susan O. will send in the workshop proposal, once Malgorzata reviews the revisions.

(d) The question of funding for the subcommittee came up. Currently, costs are largely related to travel to meetings.
   Action: Malgorzata will look into the possibility of some PIMS support.

(e) Next two meetings: **Thursday, July 26** at 10:30 and **Tuesday, August 21** at 10:30. Both meetings will be held at SFU Vancouver.

2. *Geometry for Elementary School Teachers*, a presentation
   Bernice identified two aspects of the geometry curriculum as both important and badly-handled:
   > *1. providing familiarity with the most commonly used geometric figures and a suitable vocabulary base with which to discuss them and also develop geometric concepts*
   > *2. making clear the distinction between counting...and measuring*

   Subcommittee members have a handout with the main points and examples.

3. General discussion of topics or approaches that should be addressed in MFEE, in the order in which they arose:

   (a) Teachers need to make key distinctions between related mathematical ideas (e.g. continuous vs discrete, rational vs irrational).

   (b) Crafting definitions: teachers need to know how to present definitions to their students and to use a level of rigour appropriate to the level of their students. Our students and their students need to understand the process of developing proper mathematical definitions; for example, to consider whether a given definition includes objects that don't fit or excludes objects that should be included.

(c) What level of rigour is appropriate, both in MFEE and in various grades? Teachers should understand that they are often simplifying concepts/definitions for their students and that teachers in subsequent grades will be refining definitions as appropriate. They need to pass on this understanding to their students, too, so that they are open to the revisions.   ("longitudinal awareness")

(d) MFEE students need to be aware that many concepts are introduced procedurally; of the process of "reification" or "encapsulation", whereby a procedure (e.g. counting) turns into a concept that can be used (e.g. number, quantity). They need to know where this happens in elementary school.

(e) MFEE students need to see a variety of methods, including erroneous ones, for at least some of the basic algorithms they will be teaching. "Error analysis" may be a good way to approach this; research seems to show that this increases mathematical understanding.

Action: Brent will send the subcommittee some references for this research.

(f) MFEE should avoid a pitfall common to many mathematics courses, in which the focus is on skills and there is no room for ideas. We don't need to worry about the speed of calculations anymore; we can now focus on understanding of the concepts.

(g) Calculator use: where is it appropriate, both in MFEE and in elementary school; where and why is it not appropriate? However, in general, a discussion of the appropriate use of calculators in elementary school belongs to the methods course rather than to the course we are discussing.

(h) MFEE course must focus on the fact that mathematical terms and processes have *meaning*.

(i) MFEE students must be able to cope with changes to the curriculum, including topics or approaches they may not remember or have ever studied themselves.

(j) They need to see the big picture: what mathematics is all about.

(k) The actual specific content of the MFEE course may matter less than the approach that we take while teaching it.

(l) Mathematics involves logical thinking. But how are logical arguments used within the course? Human beings are not logical, they are analogical. This may be something to discuss in the course.

4. We briefly discussed some aspects of teaching a MFEE course, including having open book tests, or allowing a cheat sheet.

5. **Homework:**
    In order to provide shape to future discussions, each committee member is to make a list of potential course objectives for MFEE, identifying such things as core mathematical content, goals for mathematical thinking, and "big picture" objectives. Members should bring 10 copies of their lists to the next meeting.

Minutes produced by Susan, Susan & Malgorzata