

**Report from the Working Group #7:
*Education of Elementary School teachers: Goals and
Challenges,*
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Working Group #7 discussed the issues and problems related to elementary teacher education and training in Canada. We looked at both pre-service and in-service education, though we put more time into the former. We have compared teacher education across Canada, in terms of what is required in various provinces, and the courses which are presently being offered at several universities. We also looked at various models of in-service training.

In Canada, elementary teachers are required to teach all subjects. They come primarily from the ranks of humanities and arts students. Many of them freely admit that they are uncomfortable with teaching mathematics, and even suffer from severe math anxiety. At the same time, the majority of students form their attitudes towards mathematics during their early school years. It is clear then that if we want to have math literate citizens and students interested in mathematics and science, we need to focus our attentions on those who guide the young minds in their early school years.

At present, mathematics requirements for elementary school teachers vary between the provinces, and even different universities. With the notable exception of Quebec, the majority of programs do not require more than one mathematics content and/or method course. But is requiring teachers to take more courses the answer to the problem? Our group felt that simply increasing mathematics requirements of future teachers was not necessarily the best solution; however, rethinking the content of the courses they would be expected to take may be part of the answer.

It is certainly true that teachers do need an expert knowledge of mathematics, but a different kind than is needed by engineers and professional mathematicians, which is not necessarily taught in the courses prospective teachers are required to take. Not all mathematics departments offer courses specifically designed for future elementary school teachers. And the existing

courses are not always appropriate for the intended audience. They are often overloaded with material in an attempt to remedy the students' perceived lack of necessary knowledge, and do not focus sufficiently on students' attitudes toward the subject. Thus they are often resented and feared by students, who look at them as one more hurdle to get over.

Students who have not taken appropriate courses often forget the little they have learned about mathematics by the time they become teachers. They lack a proper appreciation of mathematics and the belief that mathematical knowledge and understanding is important in teaching at the elementary level.

Our group came with two recommendations to improve the existing situation:

- All prospective elementary school teachers should be required to take at least one appropriate mathematics content course, and at least one mathematics methods course.
- CMS should create a taskforce, which will develop guidelines for universities on how to design a mathematics course for prospective mathematics teachers. Such a course, in addition to an appropriate curriculum, should address students' attitudes towards mathematics, teach them to appreciate its power and beauty, and to think of themselves as future teachers, and not just as students.
- We need to recognize that the societal perception of mathematics affects how it is taught, especially at the elementary level. Therefore, more effort should be put into actions attempting to improve societal attitudes towards mathematics, and stressing the importance of elementary education in mathematics.

Regarding the in-service programs for elementary school teachers:

In an ideal world, where all elementary teachers feel confident about their knowledge and understanding of mathematics and how to teach it, the role of in-service programs would be to provide enrichment activities and to inform teachers about new developments in math education.

In the world in which we live, many elementary teachers don't feel confident enough to attend meaningful programs. Many professional development activities organized in schools do not have serious mathematics content. Others work as band-aids, to patch gaps in teachers' knowledge.

Our group discussed various models for in-service teachers training, and how to influence what is happening during the Professional Development days in schools.

We believe that the remedial work and support for teachers who want to improve their understanding of mathematics they teach is most important at this time. To achieve this, short courses with a wide reach are the best, as most teachers are not able to commit large periods of time to further their education. And, we need to recognize that many teachers are interested mainly in lesson plans and activities they can try in class the next day. Designing meaningful programs which would also respond to these needs could go a long way towards motivating teachers to take them.

It would be very helpful for teachers, if each school would have at least two mathematics resource people, who could provide support to other teachers, and to each other. Therefore, any such initiatives should target at least that number of teachers.

Our slogans, which could be used in a campaign to bring attention to the importance of elementary mathematics education:

- Passion for Math is Elementary!
- (alternative wording) Passion for Math: it's Elementary!
- Elementary Education Matters to Mathematics Departments in Canada!
- Teaching Elementary Mathematics is important mathematics work.
- Elementary Mathematics Teaching – Critical, Inspiring, and Up To You!
- Guided Learning through Skills Acquisition to Provide Lifelong Positive Attitude Towards Mathematics.