

DG 7: Public understanding of mathematics and mathematics education

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Aims and focus

The aim of this discussion group was to provide a platform for the participants to discuss issues and problems relating to the public understanding of mathematics and mathematics education. The discussion was broad and covered five themes:

- the meaning of public understanding of mathematics and mathematics education;
- issues and problems associated with the prevalent public understanding of mathematics in culture and society;
- public perceptions of the nature of mathematical literacy and its relation to learning of mathematics;
- the roles of mathematics education community in promoting public understanding of mathematics and
- strategies of popularizing mathematics.

The discussion group commenced with an introduction by Chris Budd. During the three days four papers were presented to introduce the work of the DG. Moreover, two demonstrations on strategies for popularizing mathematics were given. The papers were:

- Rethinking the image of mathematics by Andy Begg (New Zealand)
- Use of mathematics for national education and development by S.E. Anku (Ghana)
- Improving perceptions of mathematics education through political action by Jonny W. Lott (USA)
- Mathematics as social construct: Two examples by Adriana C. M. Marafon, Chateaubriand N. Amancio and Denizalde J. R. Pereira (Brazil).

Also Chris Budd and Steve Humble from UK demonstrated some fun mathematics activities such as mathematics magical tricks, games and puzzles with all the participants. Most participants of the discussion group were amazed and interested in trying out the fun mathematics activities demonstrated. Perhaps these are ideas and strategies that could be disseminated to more teachers and be tried out in school classrooms as well as with the public. [For more details, please see Humble, 1994, 2001, 2002 and Chris Budd's home page www.bath.ac.uk/~mascjb]

For every session, the participants were divided into subgroups to discuss the individual themes. Some of the major points that emerged from the discussion are:

- Mathematics does have an image problem and we need to work both with the public but also to improve teaching so that the perception of mathematics of the next generation will be different.



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- (ii) There is a need to consider a variety of approaches to improve public images of mathematics and public understanding of mathematics, and to ensure that mathematics emphasises creativity as well as applications.
- (iii) Some issues and problems related to the negative public images of mathematics raised were:
- Mathematics is hidden in most human endeavour, thus efforts are needed to make mathematics visible and the public aware about the relevance and the applications of mathematics in daily life as well as in the workplace.
 - Most policy makers and politicians of different countries tend to be non-mathematics graduates. Although they usually recognise that mathematics must play a central role in school, they often have a superficial understanding of the subject and tend not to be able to promote appropriate mathematics learning in schools. For example, there are politicians who believe that mathematics learning needs little language competence because it is made up of mainly numbers and symbols.
 - There is generally lack of coverage and promotion by the mass media about mathematicians and mathematical knowledge, hence the need to have more TV programmes, publications and coverage of mathematical discovery, mathematicians' life stories etc to promote the awareness and interest of the public about mathematics.
 - The need to change the tradition of procedural learning of mathematics in schools to more problem solving and project based mathematics learning.
 - The need to create parents' awareness, upgrade their knowledge and interest in mathematics, because parents play important roles in cultivating or developing a positive image of mathematics among the children (who are our future public).
- (iv) Various strategies for popularizing mathematics were suggested. These include master classes, school talks, popular articles, mathematics contests such as Mathematics Olympiads, mathematics and science fairs at popular public places such as supermarkets and developing websites such as NRICH and PLUS. Both NRICH and PLUS are parts of the family of activities website in the Millennium Mathematics Project. NRICH or Enriching Mathematics www.nrich.maths.org/public/index.php provides mathematics problems, games and articles while PLUS <http://plus.maths.org/> is an internet magazine published four times a year which aims to introduce readers to the beauty and practical application of mathematics.
- (v) There is an urgent need to find ways that will intrigue the mass media and the politicians to raise the public awareness as well as understanding of mathematics. Some of the ways suggested are
- encourage more science and mathematics graduates become politicians and policy makers;
 - have more science and technology related company to sponsor TV programme that promote or popularizing mathematics such as those discussed in (iv). Nevertheless, every one acknowledged that it is going to be a challenging task trying to intrigue the mass media and the politicians if mathematics is hidden and mathematics people remain silent about mathematics.

At the end of the last session, all participants were asked if we should continue this discussion group in the next ICME-11. All participants unanimously agreed that the issues discussed by this discussion group, that is the public understanding of mathematics and mathematics education remains an important issue and needs to be pursued further.

References

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