



## From the Chair

The AGM at the ALM 10 conference in Strobl and the trustee's meetings after it decided to improve the organization of ALM in several aspects. Please read the information about these decisions and related activities in this newsletter (local agents, local ALM conferences, the next ALM conference, etc.).

Some years ago ALM decided to start a Journal. Now we are ready to give the starting signal. I am very happy to tell you that the group that prepared the first Call for Papers and planned the structure of the Journal (reviewing etc.) worked extremely well together. For more information please read the announcement inside this newsletter or visit our website.

Each year some of our ALM members finish a dissertation or a research project report and often I forget to say "Congratulations!" Sometimes I do not even hear about these successes. Please help me out: if you have finished such work please send a short summary or abstract to the editors of the newsletter so that we can publish it and let others know about it.

Two such summaries are included in this issue of the ALM Newsletter: one by Terry Maguire, and the other by Noel Colleran. Both are from the Centre for Advancement of Mathematics Education in Technology (CAMET), in the Department of Mathematics and Statistics, University of Limerick, Ireland. Congratulations to both Terry and Noel!

If you have any ideas or questions about ALM please do not hesitate to contact me.

*Juergen.Maasz*  
[Juergen.Maasz@jku.at](mailto:Juergen.Maasz@jku.at)

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## Sociomathematics: people and mathematics in society

*Tine Wedege, Roskilde University, Denmark*

**A**dults learning mathematics to live and work in our world was the title of the ALM conference this year. We went to Strobl in Austria to present our work, to learn from one another, and to debate our ideas and findings. At the conference, I gave a preliminary definition of sociomathematics, in order to designate issues in mathematics education research concerning people and mathematics in society.

Research is always an answer to questions — whether these are explicit or implicit. Within the field of research in mathematics education, the questions concern the relationships between humans and mathematics. Why should adults learn mathematics in our world? What kind of mathematics do adults learn in our world? How do adults learn mathematics in our world? These are some of the possible questions hidden in the title of ALM10, and in each question it is possible to focus on adults' cognitive, affective or social relationships with mathematics. The subject field is constituted by the problem field of mathematics education "in all its complexity", i.e., the subject area is structured and delimited by the concrete forms of practice and knowledge that are currently regarded as mathematics teaching, learning and knowing (Wedege, 2001) and by "our world". Thus, Gail FitzSimons's formulation and study of the question "What counts as mathematics in adult and vocational education?" is central (FitzSimons, 2002).

In the three questions that I formulated above, the relationships between humans and mathematics are extended with a context called "our world". But what do we actually mean by "mathematics" and by "mathematics education in all its complexity"? Are society and culture as contexts for adults learning mathematics seen as a boundary condition in our studies of teaching, learning and knowing, or as a central part of the study?

### Adult numeracy

The concepts of ethnomathematics and folk mathematics, as well as the concepts of numeracy and qualification, have expanded the field of mathematics education research. (Evans, 2000; Gerdes, 1996; Groenestijn, 2002; Mellin-Olsen, 1987; Wedege, 2000). A sociocultural approach is common in the studies of ethnomathematics, adult numeracy

*continued on page 2*

and mathematics in the workplace (not *for* the workplace), and a critical perspective might be opened up when studies concern the functions of mathematics education in society and in people's lives. Today it is scientifically legitimate to ask questions concerning people's everyday mathematics and about the power relations involved in mathematics education.

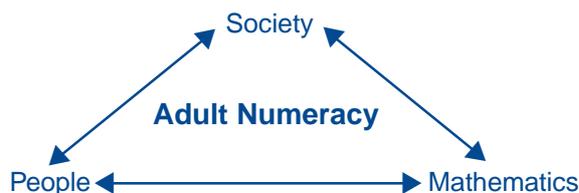
In adult mathematics education the term 'numeracy' is used but it is unclear where the dividing line between the two terms should be drawn. At ALM9 last year, John O'Donoghue discussed mathematics versus numeracy – asking the question "Mathematics or Numeracy: Does it really matter?" His answer was clear and affirmative: "Yes, it really does matter in a number of important ways." When mathematics is defined to include numeracy – as in the international research forum – we have moved out of the mathematics classroom and into society and adults' everyday lives. I find that a significant difference between adult numeracy and mathematics is that the idea of society and the need for mathematics in adult life are in-cooperated in numeracy but not necessarily in mathematics. This is a conception that I found confirmed in David Kaye's workshop at ALM10 where he presented at long series of numeracy definitions. For my purpose I have selected three of the most recent working definitions of numeracy:

Numeracy is the ability to process, interpret and communicate numerical, quantitative, spatial, statistical, even mathematical, information, in ways that are appropriate for a variety of contexts, and that will enable a *typical member of the culture or subculture* to participate effectively in activities that they value (Evans, 2000:236, my italics).

- Numeracy consists of functional mathematical skills and understanding that in principle all people need to have. Numeracy changes in time and space along *with social change and technological development*. (Lindenskov and Wedege, 2001:5, my italics)

Numeracy encompasses the knowledge and skills required to effectively manage mathematical *demands in personal, societal and work situations*, in combination with the ability to accommodate and adjust flexibly to new *demands in a continuously rapidly changing society* that is highly dominated by quantitative information and technology. (Groenestijn, 2002: 37, my italics)

Although it doesn't appear explicitly in the definitions, these three numeracy studies are concerned with the relationships between people, mathematics and society. When talking about numeracy as a competence we mean competent people in society, not only mathematical competence in society (see figure 1). By numeracy we understand "adult numeracy".



**Figure 1.** Adult numeracy as a subject field

### Sociomathematics – an analytical construction

On the basis of previous studies of people and mathematics in society, I give a preliminary definition of an analytical concept, which encompasses the studies of for example numeracy, ethnomathematics and workplace mathematics in a single term. By *sociomathematics* I mean:

- a problem field concerning the relationships between people, mathematics and society, and
- a subject field combining mathematics, people and society – as we may find it for example in ethnomathematics, folk mathematics or adult numeracy.

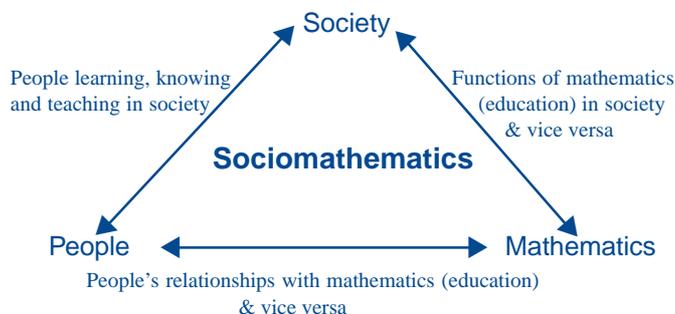
As a problem field, sociomathematics is defined by a socio-cultural perspective on mathematics education. As a subject field, sociomathematics is defined by a sociomathematical approach to the subject area of people, mathematics and society, see figure 2.

*Sociomathematical problems* concern:

- (1) people's relationships with mathematics (education) *in* society and vice versa.

People's relationship might be seen as cognitive, affective or social according to the given perspective of a specific study. This relationship is the key issue, but to investigate this problem you have to study two other problems:

- (2) the functions of mathematics (education) in society and vice versa, and
- (3) people learning, knowing and teaching *in* society.



**Figure 2.** Sociomathematics as a subject field

A *sociomathematical concept* (an example): When Ole Skovsmose studies students' learning obstacles in mathematics he doesn't stop with their cultural background but also involves the students' *foreground* i.e. the opportunities provided by the social, political and cultural situation.



When a society has stolen away the future of some group of children, then it has also stolen the incitements of learning. (Skovsmose, 2002:9)

A *sociomathematical study* (an example): When I study adults' resistance to learning mathematics I don't stop with the situation given by Lave's socio-psychological concept of community of practice but also involve Bourdieu's sociological concept about the adult's *habitus*:

(...) the habitus of a girl born 1922 in a provincial town as a saddler's daughter, of a pupil in a school where arithmetic and mathematics were two different subjects at a time where it was "OK for a girl not to know mathematics", and the habitus of a wife and mother staying home with her two daughters is a basis of actions (and non-actions) and perceptions. Habitus undergoes transformations but durability is the main characteristics (Wedeg, 1999:222)

In my terminology, sociomathematics is the name of a subject field and a specific problem field just like ethnomathematics (see Gerdes, 1996).

### Sociomathematics – an answer to a problem

The concept of ethnomathematics has been a very important construction in my studies of unskilled and semi-skilled workers' mathematics in the workplace (Wedeg, 2000). But I never use the word "ethnomathematics" in the Danish vocational context where we talk about "workplace mathematics" or "everyday mathematics" instead. In many languages and situations, the prefix 'ethno' has connotations with reference to biological characteristics, colour of skin etc. At the Second International Congress on Ethnomathematics, in Brazil last year, Ole Skovsmose presented a strong reservation about the very notion of "ethnomathematics". His reservation is not to do with the meaning of "ethno" in the literature of ethnomathematics where according to D'Ambrosio, it simply refers to "environment" – e.g., culture and society: mathematics is acted out in many different ways in different cultures and by different groups. What is emphasised in ethnomathematics are the connections between culture and mathematics. Mathematics is always socially embedded. Thus "engineering mathematics" and "mathematics in semi-skilled job functions" also represent different branches of ethnomathematics (Skovsmose, 2002).

I find that "sociomathematics" could be an answer to this problem. However, sociomathematics is not just a translation of the word ethnomathematics into a more "clean" word. I found my inspiration in *sociolinguistics* i.e. relationships between language and society constituted as a scientific field within linguistics. But there is an important difference: sociomathematics is a field within mathematics education research (studying people's relationship with mathematics in society), not a subdiscipline of mathematics.

As far as I know the term "sociomathematics" hasn't been used before as a supplement to "ethnomathematics". At the level of the social context of the classroom, Paul Cobb and his colleagues developed the term "sociomathematical norms" in an interpretive framework for analyzing mathematical activity with a social dimension (classroom social norms, sociomathematical norms and classroom mathematical practices) and a psychological dimension (beliefs about roles and mathematical activity in school, mathematical beliefs and values, and mathematical conceptions) (Cobb, 1996). In this framework the social category of socio-mathematical norms is correlated with the psychological category of mathematics beliefs and values. In my terminology, studies of socio-mathematical norms in a classroom would be called sociomathematical if the students' relationships with mathematics *in* society are explicitly on the agenda. For example the students' gender, race or class.

The critical approach to ethnomathematics defined by Gelsa Knijnik (1997) through her ethnomathematical work is clearly an example of what I would name "sociomathematics". In the Nordic countries, we have at least two important "sociomathematicians" apart from Ole Skovsmose and his "Critical mathematics education". I am thinking of the Norwegian Stieg Mellin-Olsen (1987) and his "Politics of mathematics education" (who unfortunately died in the late 1990s) and of the young Paola Valero (2003) in Denmark who defended her doctoral dissertation "Reform, Democracy and Mathematics Education" in March 2003. The approach in the work of these researchers is also socio-political.

### ... and new problems are created

It seems like every time we try to solve a problem or to answer a question in mathematics education research we open up a new problem. During the ALM conference, Mercedes de Agüero told me that mathematics shared by a cultural subgroup of only two persons could be regarded as "ethnomathematics". I wouldn't call this phenomenon "sociomathematic" but a new issue has arisen: What do we mean by society and what do we mean by culture?

Last year I found a short and excellent introduction to social and cultural anthropology in the bookshop. According to the authors, the two approaches, social and cultural, are far from incompatible. They are simply different angles from which to see the same complex thing. We may *have* a culture but we *belong* to a society.

An interest in culture is prompted by a desire to discover the way people comprehend the world around them, to frame their action, and to interpret the actions of others. An interest in society has more to do with understanding the rules and regularities that govern human social behaviour, the ways people associate with one another, and how activity is organized (Monaghan and Just, 2000:53).

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**Sociomathematics**
*from page 3*

As the context here is anthropology, not education research, this doesn't quite solve the problem. I find that norms and institutions could be key words in, respectively, cultural and social approaches to mathematics education. I hope very much that my short presentation will open up a debate. So far, I want to thank Gail FitzSimons, Mieke van Groenestijn and Ole Skovsmose for spending their valuable time discussing some of the issues connected with the introduction of sociomathematics.

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## A numeracy poem

Being a teacher is not so easy  
 Imagine yourself teaching Numeracy  
 You'd probably have real difficulty  
 If you don't have a really good strategy  
 To explain whatever topics may be  
 In order for your students to see,  
 To understand the 'whats' and the 'whys'  
 Of any topics they might try.

Whether you call it Numeracy,  
 Or Mathematics or 'Mathemacy'  
 It's still perceived not to be easy  
 Unlike one, two, three, or A, B, C  
 No matter how hard they try  
 We must not let them cry

Our students may have dyslexia,  
 Maths-phobia or dyscalculia.  
 No matter whatever it is  
 They can't afford to give it a miss

If they think Numeracy  
 Is not so easy, like A, B, C,  
 It's our duty, we must try  
 To understand them, why?

(R. Topo WRESNIWIRO  
 Conceived, Wednesday evening, 25 June 2003)

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Tine Wedege, e-mail: [tiw@ruc.dk](mailto:tiw@ruc.dk)





## **Adults Learning Mathematics — An International Journal: Call for Reviewers**

**A**dults Learning Mathematics – an international forum (see <http://www.alm-online.org/>) has been established since 1994, with an annual conference and newsletters for members. Through the annual ALM conference proceedings and the work of individual members an enormous contribution has been made to making available theoretical and practical research in a field which remains under-researched and under-theorised. We now seek to establish a refereed electronic journal to further develop the high quality work in this field.

*Adults Learning Mathematics — An International Journal* will be an international refereed journal that provides a forum for the online publication of high quality research on the teaching and learning, knowledge and uses of numeracy/mathematics to adults at all levels in a variety of educational sectors. We will invite contributions in the following areas:

- Research and theoretical perspectives in the area of adults learning mathematics/numeracy
- Debate on special issues in the area of adults learning mathematics/numeracy
- Practice: critical analysis of course materials and tasks, policy developments in curriculum and assessment, or data from large-scale tests, nationally and internationally.

It is critical that ALM has a database of members who are prepared to review papers submitted for inclusion in the journal. Each reviewer will be sent a set of guidelines, and afterwards a copy of the composite review including the comments of all reviewers, as a professional development exercise. Please help us by sending your name, email, and areas of professional expertise or interest to Dr Gail FitzSimons, the nominated Chief Editor, <[gail.fitzsimons@education.monash.edu.au](mailto:gail.fitzsimons@education.monash.edu.au)>.

### **ALM 11 Conference The eleventh International Conference on Adults Learning Mathematics**

*Will be held in Kungälv, Sweden  
Dates: Tue 29 June – Fri 2 July 2004*

Theme of the conference: (Not decided yet.)

Local organizers:

- Senior lecturer Lisbeth Lindberg, Göteborg University
- Professor Rudolf Straesser, University of Luleå

## **Engendering Numeracy in Adults Mathematics Education with a Focus on Tutors: A Grounded Approach**

*Terry Maguire, Centre for Advancement of Mathematics  
Education in Technology (CAMET - Ireland), University  
of Limerick, Limerick, Ireland*

### **Abstract**

**T**he potential of any individual to participate fully in modern society and in the labour market is linked to their capacity to acquire knowledge and to develop and maintain a broad range of skills. In this context, numeracy skills help adults to realise their potential in a rapidly changing world. A lack of appropriate numeracy skills will critically affect an individual's employability and choice of career opportunities. The results of the International Adult Literacy Survey highlighted that a significant proportion of the adult population in Ireland have unacceptably low levels of literacy and numeracy. Rectifying this situation is a matter of national priority (NDP, 2000). Tutors play a pivotal role in developing the numeracy capability of the adult population.

The primary focus of this research is on the tutors of adult numeracy in Adult Basic Education (ABE) in Ireland. A major emphasis of this research concern was to identify the nature of the training tutors of adult numeracy needed, to help them to improve practice in the adult mathematics classroom, and thereby ensure that adults had access to provision that meets their individual needs.

Using a 'grounded' and evolutionary research process, the author investigated the policy environment within which Irish adult numeracy tutors operate, and how numeracy has been conceptualised in Ireland to date. A profile of the tutors, together with an enunciation of their training needs, was produced as a result of two national surveys - A National Survey of Tutors of Adult Mathematics Education in Ireland and A National Survey of the Service Providers. The thesis also situated Adult Mathematics Education in Ireland in the wider international context.

Based on the outcomes of this research an integrative system for engendering numeracy in adult learners is put forward. The system incorporates two organising frameworks and two conceptual tools, developed by the author into a single unified entity. It is further argued that this integrative system has practical as well as scholarly use, both in Ireland and in the wider international context. The integrative system described, provides a meaningful basis for facilitating and planning both the development of adult numeracy provision and a means to engender numeracy in adult mathematics education in Ireland and elsewhere.



### Improving Adults' Quantitative Problem-Solving Skills: Theory, context and programme design

Noel Colleran, Centre for Advancement of Mathematics Education in Technology (CAMET - Ireland), University of Limerick, Limerick, Ireland

#### Abstract

Recent research suggests that problem-solving skills can be improved through appropriate teaching. It is generally accepted that an improvement in adults' quantitative problem-solving skills will increase their chances of obtaining and sustaining employment. This improvement will benefit adults experiencing educational disadvantage by enhancing their sense of inclusion and participation in society. However, resources available to practitioners in Adult Basic Education to address these issues are limited.

The processes through which adults solve problems are not well understood or modelled. This study develops a theoretical framework for adult problem-solving. It also evaluates the contributions that Lonergan's (1957) *Insight: A study of human understanding* and related works make to a better understanding of the adult problem-solving process. This study also develops a structured educational programme that improves adult learners' quantitative problem-solving and decision-making skills.

There are three major elements combined in the educational programme:

- Lonergan's cognitional structure,
- 'realistic' problem situations,
- an enabling social learning environment.

Lonergan's proposition that his cognitional structure is invariant, innate, and naturally available to all adult human knowers is supported by this study. The 'realistic' problem situations that are used throughout the programme, for the quantitative problem-solving activities, are drawn from various adult-related contexts. These contexts provided problems that were relevant and engaging for the participating adult learners. The social learning environment was developed and supported through Action Learning.

The evaluation of the educational programme was undertaken in two phases involving three separate groups of adult learners. The first phase of the evaluation consisted of a pilot study involving two groups of adult learners. The second phase builds on the pilot study and is reported in a case study.



# ALM NEWS



## ALM Membership Report to 17<sup>th</sup> September 2003

Valerie Seabright

The membership of ALM is continuing to grow as the research and practitioner developments within the numeracy field are becoming more important in different countries.

Members of ALM are working across country borders developing research and more recently exchanging good practice examples of practitioner materials.

The regular newsletters provide a vehicle for developing this research and practice and the conference proceedings encompass the combination of research and practice shared each year. During the next year it is hoped there will be a further dimension to the work through a new journal reflecting theoretical and practical research.

Members and other interested individuals have access to the ALM website which not only provides information but contact and links with other research and practitioner based organisations.

In each of the countries where ALM has members there is a contact agent (see the list of contacts in the newsletter and on the ALM website).

#### Membership totals by country

Australia	10	Ireland	9
New Zealand	3	Denmark	10
Canada	2	U.S.A.	13
Austria	2	Israel	1
Norway	1	Syria	1
Finland	2	Greece	2
Netherlands	9	Uganda	1
Sweden	6	U.K.	74

**TOTAL 146 Members**

#### Agents

Australia	Janet Taylor
New Zealand	Barbara Miller-Reilly
Denmark	Lene Johansen
Ireland	Noel Colleran
Finland	Marje Lise Malviouri
Sweden	Lisbeth Lindberg
Austria	Juergen Maasz
Netherlands	Valerie Seabright (interim)
United Kingdom	Valerie Seabright
United States of America	Kathy Safford (has agreed to also cover Israel and Canada)
Syria,Greece,Uganda	Valerie Seabright



# 10th International Congress on Mathematical Education, ICME-10

Copenhagen, Denmark  
July 4 - July 11, 2004

## Topic Study Group 6: Adult and lifelong mathematics education

### CALL FOR CONTRIBUTIONS

Adult and lifelong mathematics education is the focus of TSG6. Adults are engaged in a range of social practices, such as working (or seeking work), parenting and caring for other dependents, budgeting and organising consumption, voting, etc. The term lifelong indicates that education takes place in all stages and spheres of life. By mathematics we mean multiple activities and knowledge, including academic mathematics, vocational mathematics, ethnomathematics, folk mathematics and adult numeracy. Regarding education we have adopted the terminology of UNESCO (2000):

- Informal education means the lifelong process whereby adults are learning mathematics in everyday life (e.g., work, family, leisure, society).
- Formal education refers to the adult educational system from adult basic education and vocational training through further and higher education.
- Non-formal education is defined as any educational activity organized outside the established formal system that is intended to serve identifiable learning objectives.

Some of the issues to be studied and discussed in TSG6:

- Adult numeracy as a competence, building a bridge between school and personal, civic and working life.
- Adults' beliefs, attitudes and emotions to mathematics, including their resistance and motivation to learn mathematics.
- The role of technology in adult lifelong mathematics education (informal, formal and non-formal).
- Global aspects, such as the role of large-scale studies of adults' mathematical "needs".

Adult and lifelong mathematics education has multiple dimensions and we have to approach this subject area from psychological, sociological, anthropological, linguistic, philosophical, economic and political perspectives.

### Invitation

If you are interested in participating in TSG6, this call for contributions invites you to send in a proposal. Based on the received proposals the Organizing Team of TSG6 will compose the program. Proposals should be in English and should have the following content: name(s) of the author(s); institution, address, country, e-mail; title; and abstract (400-500 words). Proposals should be sent to Tine Wedege (see address below). All members of the OT are willing to give

informal advice to anyone preparing a proposal. All OT email addresses are listed below. Deadline for proposals was 30th November 2003. However, due to the delay in the publication of this newsletter, it is possible to send in a proposal by 31st December, 2003. Please contact Tine Wedege as soon as possible if you intend to do so. Deadline for sending in a full paper is 15 March, 2004.

### Options

All proposals received will be either:

- accepted in full
- accepted as a 20-minute oral presentation
- accepted to be presented as a poster
- rejected.

The group has four sessions at ICME-10: three 60-minute sessions (Tue, Wed, Fri) and one 90-minute session (Sat). These will be organised by the OT so as to maximise focus, discussion and participation. Parallel sessions may be used.

We look forward to hearing from you! Please share this Call for Contributions widely. Please consult the website of TSG6 at "<http://www.icme-10.dk>" for updates.

### Organizing Team of TSG6

#### Chairs

Dr. Tine Wedege  
Centre for Research in  
Learning Mathematics  
IMFUFA  
Roskilde University  
P.O. Box 260  
DK-4000 Roskilde  
DENMARK  
e-mail: [tiw@ruc.dk](mailto:tiw@ruc.dk)

Dr. Jeff Evans  
Mathematics and Statistics  
Group  
Middlesex University Business  
School  
The Burroughs  
Hendon, London NW4 4BT  
UNITED KINGDOM  
e-mail: [j.evans@mdx.ac.uk](mailto:j.evans@mdx.ac.uk)

#### Members

Dr. Marta Civil  
Department of Mathematics  
University of Arizona  
Tucson, AZ 85721  
USA  
e-mail:  
[civil@math.arizona.edu](mailto:civil@math.arizona.edu)

Dr. Gail FitzSimons  
Faculty of Education  
P.O. Box 6  
Monash University  
Victoria 3800  
AUSTRALIA  
e-mail:  
[gail.fitzsimons@education.monash.edu.au](mailto:gail.fitzsimons@education.monash.edu.au)

Professor. Dr. Wolfgang Schloeglmann  
Didaktik der Mathematik  
Department of Mathematics  
Johannes Kepler University of Linz  
Altenbergerstrasse 69  
A-4040 Linz  
AUSTRIA  
e-mail: [wolfgang.schloeglmann@jku.at](mailto:wolfgang.schloeglmann@jku.at)





## About ALM

Company No. 3901346  
Charity No. 1079462

**Adults Learning Maths - A Research Forum (ALM)** is an international research forum bringing together researchers and practitioners in adult mathematics/numeracy teaching and learning in order to promote the learning of mathematics by adults.

### What is ALM?

ALM was formally established at the Inaugural Conference, ALM-1, in July 1994 as an international research forum with the aim to promote the learning of mathematics by adults through an international forum which brings together those engaged and interested in research and developments in the field of adult mathematics/numeracy teaching and learning.

ALM is a forum for experienced and first-time researchers to come together and share their ideas and their reflections on the process as well as the outcomes of research into hitherto neglected area of adults learning mathematics. ALM puts people in touch with each other, providing a framework for collaboration and helping to stimulate and develop research plans. We are especially keen to encourage practitioners to undertake research.

Since 1994, ALM has gone from strength to strength and now has 146 members in 16 countries. In 2000, it was registered as a company and as a charity in England and Wales.

### What does ALM offer?

ALM membership brings with it opportunities to:

- contribute to an international forum of researchers and practitioners in the field
- share concerns, insights and research at ALM annual conferences, and to attend at a reduced rate
- receive ALM newsletter (free)
- receive ALM conference proceedings (free of charge to conference delegates). These proceedings constitute the most significant and authoritative collection of papers on adults learning mathematics available today
- network, electronically and otherwise, with practitioners and researchers in the emerging field of adults learning mathematics.

### ALM Officers

**Chair:** Prof. Dr. Juergen Maasz,  
University of Linz, Austria

**Secretary:** David Kaye, London

**Treasurer:** Pat Healy, Lewisham College, UK

**Membership Secretary:** Valerie Seabright, UK.

## Join ALM today!

ALM is actively seeking to expand its membership world-wide. Membership is open to all individuals and institutions who subscribe to its aims. For details contact Valerie Seabright, Park Road, Uxbridge, UB8 1NQ, UK. Ph: 01895853415, email: [valerieseabright@hotmail.com](mailto:valerieseabright@hotmail.com) or your regional ALM membership agent:

**AUSTRIA** Juergen.Maasz, Universitaet Linz, Institut fuer Analysis und Numerik, Abteilung fuer Didaktik der Mathematik, Altenberger Str. 69, A - 4040 Linz AUSTRIA Ph: 0732/2468/9182  
Email: [Juergen.Maasz@jku.at](mailto:Juergen.Maasz@jku.at)

**AUSTRALIA** Dr Janet Taylor, Office of Preparatory and Academic Support, Uni. of Southern Queensland, Toowoomba, Queensland, 4350 Australia. Email: [taylorja@usq.edu.au](mailto:taylorja@usq.edu.au)

**DENMARK** Lene Oesttergaard Johansen, Aalborg University, Strandvejen 12-14, 9000 Aalborg, Denmark. Email: [ljo@learning.auc.dk](mailto:ljo@learning.auc.dk)

**FINLAND** Marja-Lisa Malmivuori, University of Helsinki, Finland. Email: [marja-lisa.malmivuori@helsinki.fi](mailto:marja-lisa.malmivuori@helsinki.fi)

**NEW ZEALAND** Barbara Miller-Reilly, Student Learning Centre, The University of Auckland, Private Bag 92019, Auckland, N.Z. Email: [Barbara@math.Auckland.ac.nz](mailto:Barbara@math.Auckland.ac.nz)

**REPUBLIC OF IRELAND** Noel Colleran, Dept of Maths and Statistics, University of Limerick, Limerick, Ireland. Email: [noel.colleran@sheelan.ie](mailto:noel.colleran@sheelan.ie)

**SWEDEN** Lisbeth Lindberg, Göteborg University, Göteborg. Email: [lisbeth.lindberg@ped.gu.se](mailto:lisbeth.lindberg@ped.gu.se)

**THE NETHERLANDS** Valerie Seabright - see details above.

**UNITED KINGDOM** Valerie Seabright - see details above.

**USA** Dr Katherine Safford, Saint Peter's College, Kennedy Boulevard, Jersey City, NJ 07306, USA. Email: [RamusLTD@aol.com](mailto:RamusLTD@aol.com)

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Mieke van Groenestijn, Faculty of Ed., Hogeschool van Utrecht, PO Box 14007, 3508 SB, Utrecht, The Netherlands.  
Email: [Mieke.v.Groenestijn@feo.hvu.nl](mailto:Mieke.v.Groenestijn@feo.hvu.nl)