

## National and international perspectives on policies for and models of numeracy

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### Abstract

*One of the themes of ALM 23 was policies for and models of numeracy, and several contributions to ALM 23 focussed on these matters. This paper is a report on an all-conference symposium which aimed to discuss this theme. This is not a discussion paper, rather it is a collation of the outcomes of the symposium. Our hope is that this will facilitate future discussions and investigations in this area.*

### Introduction

The Adults Learning Mathematics (ALM) 23 conference ran over 4 days in July 2016 in Maynooth University. Prior to the conference announcement, the local conference organisers (first and third authors) were involved in discussions with the ALM committee, local practitioners, and policy makers in relation to numeracy issues for adults. The local organisations included NALA (National Adult Literacy Agency), SOLAS (Further Education and Training Authority), and the etbi (Education and Training Boards Ireland).

A recurring theme which emerged from these discussions was that, while policies and models regarding literacy are standard in further education in Ireland, policies and models in relation to numeracy are less common. If such policies exist, they are not distinct from literacy policies. Certainly, it was made clear to us that there was no one size fits all approach, and it was requested that we (at ALM 23) try to facilitate a discussion on best practice in relation to policies on and models for tackling numeracy.

After a discussion with the ALM trustees, and it was decided that an all-conference, large group symposium would be the optimal strategy. To this end, in advance of the conference, a special call was put out for workshops, papers, and posters which would contribute to this theme. Each day during the conference, delegates were reminded of the symposium and asked to take notes from any contribution that they attended which they felt would contribute to the discussion. Abstracts for all contributions to ALM 23, and presentations from most contributions are available from the conference website <http://www.alm-online.net/alm-23-maynooth/>

### All-conference Symposium

At the end of the 3<sup>rd</sup> day of the conference, delegates gathered in the mathematics support centre in Maynooth University for the symposium. This venue was chosen as it facilitates small round-table group discussions.

The symposium was chaired by the second author. It started with a reminder of the aims of the session and the key themes of the conference:

- Numeracy: A Critical Skill in Adult Education.
- The Language of Mathematics, and Language and Mathematics.

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•Adults Learning Mathematics: Research, Practice and Policy.

Participants were split into small groups. There were delegates from 13 different countries attending ALM 23, which enabled a range of different practices and policies employed at different levels in different countries to be discussed. Participants were given five statements/questions to consider and the main responses/outcomes from delegates are outlined below.

### Questions and Responses

#### **1. Issues of identity for ALM members and the broader mathematics education (ME) community. Where does ALM fit?**

a) The A (in ALM) differentiates ALM members/practitioners from ME.

- In Adult Mathematics Education (AME), the A is very important. There is a clear difference depending on whether you consider that the Adult is central, and ME follows, or that the ME is central and the Adult follows.
- Adult learning is different to ‘other’ learning: it is varied in terms of size and methodologies. There has been a lot of research to-date, but it requires more research around items like pedagogy, motivation, and the impact of time restrictions and working conditions for many practitioners and researchers.

b) Do ALM members feel that they are part of the broader ME community and vice versa?

- ALM members are part of the ME community, and vice versa. There are some barriers between the two communities but there are also clear links in terms of theory, research and practice.
- It is not clear that there exists a standard model/description of ME and AME (or ME-A?), or even what such a model/description would be.
- There was a concern regarding the possible perception that findings from one group could impact negatively on the other, e.g. if the numeracy is so bad in adults, what does that say about ME?

#### **2. What is the impact (if any) of living, learning, and working in a digital world, on numeracy teaching and learning?**

- The digital world can have a huge impact on students and teachers. Adults are embedded in a digital world and this must be reflected in our teaching, we must give them the opportunities, and prepare them for this reality.
- Technology is the new fluency and, especially for people from lower education backgrounds, students can have almost everything close to hand e.g., in their phone. Technology can empower students.
- Students who do not learn in traditional settings, can still learn mathematics at home using technology. It can be cheaper (financially) and it can be an adult student’s second chance to learn in a different way. However, there is a danger that students using technology in this way may not meet and tackle their (mathematical) fears.
- It can be very time-consuming for teachers to follow and keep up with technological developments and teachers must be digitally literate.
- Using technology only when students do not understand through traditional means is not good practice. There can be an imbalance between the mathematical ability and digital literacy of the student, and as a result, there is a danger that the support you can give students using technology may not fully meet their mathematical development needs.
- Not all learners/teachers want to use digital techniques, do they have a choice? For example, if students use a calculator too much, some teachers have concerns that students will not develop reason and estimation skills. It can also be very difficult to write maths on a computer or a tablet.

### **3. How do we address the issues around the type of language used in policy documents, in instruction of mathematics and how mathematics is talked about?**

- There is a distinction between the language used in public, in instruction and in policy documents. The key is vocabulary.
- There was a suggestion that the ALM make a list of words and highlight their different meaning in the maths world and the real world e.g., tables, mean, triangle, and add this list to the website.

#### a) Language of instruction

- The language used in instruction deals with the search for answers, looking for truth.
- A concern, especially in context questions, is whether or not we are measuring language skills or maths skills? For example, if students or adult learners have low vocabulary (e.g. immigrants or people who are not proficient in the language that the teacher is using), then are we really testing maths skills?
- What happens if, in your native language, you do not have the word for a certain (mathematics) situation or teaching strategy that occurs? The word exists in another language, but not in your own language. This can also have implications for teacher training.

#### b) Language used in public

- Highlighted issues include: maths anxiety, bad results and the idea that it seems ok to say “I’m not good at mathematics.” In terms of the use of mathematics in public, we need to have more public awareness about mathematics, and being good at mathematics.

#### c) Language used in policy

- Policy makers often discuss mathematics using negative language terms, e.g. remedial, innumerate or deficit when approaching mathematics. The ALM research forum should consider issuing a statement, which asks that these terms are used in an appropriate and a positive way. This could then be simulated by the main policy makers, stakeholders, organisations, etc.

### **4. Is there a disconnect between teaching and assessment at different levels of the education system? Is this disconnect a product of miscommunication?**

- Quantitative research is required to establish what good practice is. Evaluation and evidence is needed to determine what works and why, and what does not work and why at every level.
- It is important to adapt good practice to the country, the school, the students, the teacher, the class and the context. They all vary on a continuous basis.
- There can be disconnection and miscommunication between levels, e.g. between secondary and tertiary, but also between the secondary and the primary. It seems common to blame the previous teacher/system, e.g. my students are bad because the teacher they had before was not good. We need to work on this connection and on communication.
- There can also be disconnection and miscommunication with the workforce. Anecdotally it is often reported that students in tertiary level learn certain maths, but when they get out in the workforce they are told that they do not need that mathematics, they need other mathematics.
- To address the disconnection, the context that material is taught in, the content (what do we need to learn and when), and how it transfers to other areas and what it achieves needs to be communicated.
- Proper assessment and communication is key for transferring between levels: have you achieved, have you mastered what you were supposed to learn and can it transfer to different areas?
- It is important that we do not continue to only refer to what worked in the past. We need to look forward to the future, and consider how to bridge the various gaps.

Mac an Bhaird, C. et al. (2017b) National and international perspectives on policies for and models of numeracy.

**5. Service teaching: Research in this area is growing but finding a voice outside of ME is challenging. Service teaching in engineering has already found a separate voice (for example), so has the ALM missed the boat here?**

- The ALM research forum has not missed an opportunity; they have an active membership, building research etc. However, perhaps they have not made enough of the opportunity, and that is the real issue.
- Is mathematics and numeracy really a problem that concerns a lot of people?
- The ALM research forum and related bodies need to have a voice in the right places if they want to have influence. The question remains, what are those right places?
- Practical things to do could include: placing material on the website that would create links, e.g. actual links to mathematics. There is the potential to link to different industries and talk about mathematics there. Create liaisons with various national organisations. • We could have a publicity pack that everybody can access. For example, a pack could say that this is the ALM and this is what we do. Here is what we think is needed to help support adults learning mathematics. This could be in the form of a leaflet.

### **Conclusions**

This document reflects the discussions of the all-conference symposium, and the outcomes do not necessarily reflect the views of the authors. As you would expect, with delegates from 13 different countries, a mixture of practitioners and policy makers from different levels, there is a broad range of opinion. The authors hope that this paper will help facilitate discussions, and we will circulate the outcomes to all the relevant bodies and memberships.

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