

Mathematics for Lifelong Learning

A summary of a plenary discussion around emerging themes at the conference

Sylvia Johnson

Sheffield Hallam University, Sheffield, UK

The theme of the conference was:

What kinds of mathematics should we teach in order to enable adults to manage their own lives and to function optimally in work or social contexts?

Mathematicians do not do mathematics in an elegant, logical ordered fashion. They explore, try out strategies and evaluate their progress in an ongoing way. Their knowledge and skills within the mathematical context enable them to retain control of their actions to reach solutions. There is an analogy to be made with adult basic mathematics. Here learners manage mathematical situations through their own control of the context. Solutions emerge that are consistent with the context. Their workings are not necessarily logical, nor elegant.

A curriculum for adult learners of mathematics must allow and encourage such ways of working, of managing the situation, of exploring the mathematics. Those curricula that focus upon atomised skills and techniques may not help adult learners who can become dis-empowered by losing control of the context, by not having a situation with which they can identify and therefore explore meaningfully.

Adult learners need to learn how to learn mathematics. This is just as important as learning the mathematics per se. This should be an integral part of the learning process. That is not to say that adults should not learn skills and techniques, but that they need to understand how such skills and techniques contribute to their personal goals and needs.

It is important that we hold multiple perspectives towards the various goals for adults in learning mathematics and not jump overboard for a particular view of that may simply be a passing fad. Different contributors advocated a variety of approaches to helping students learn how to learn:

- Explicit discussion by students of ways of learning and doing mathematics,
- Self identification of positive learning strategies
- Focussed analysis of the similarities and differences in contexts to facilitate appropriate transfer of knowledge and understanding
- The introduction of explicit study skills techniques within the mathematics curriculum

Are we in adult education spending too long re-inventing the wheel? Those involved in adult learning may have much to gain from links with those working in schools with young learners. There is a significant overlap of interests and materials available for school pupils can easily be adapted to meet the needs of adult learners. Some teaching traditions in schools are ones that adult educators could usefully adopt, particularly those in Higher Education.

How important are teachers, and what are their functions?

Teaching and learning is a human activity. Other resources support that activity but cannot replace it. If resources take over, then there is a strong danger that mathematics becomes dehumanised. Mathematics learning is an emotional as well as a cognitive activity. This is particularly true for adult learners who may have experienced failure as younger pupils. It is useful to adopt Vygotsky's notion of the Zone of proximal Development and the role of teachers in scaffolding learning within the affective domain as well as the cognitive domain.

Whilst embracing the opportunities afforded by new technologies, technology based teaching of itself does not address the needs of adult learners. This is well documented in many countries.

An important and key function of the teacher is that of motivator. Again this is well acknowledged in a general sense but we have perhaps failed to articulate how this function works. More generally, it is important for adult learning that we teachers articulate what it is that we do and find ways of describing that in a holistic rather than a 'bitty' competence based manner.

Mathematics learning does not just take place in educational institutions and contexts. Frequently it takes place in workplace or in the social contexts in which people engage. What then are the function of other adults and mentors in the contexts? What do they do to motivate and support learning?

By better describing what it is that adult educators do, we can enhance the quality of in-service education for adult education tutors, many of whom are part-time and low paid. Ultimately the effectiveness of adult learning in mathematics is dependent upon the quality of those tutors. What skills do they need and how do they use them are questions we must explore in more detail.

For those of us engaged in adult learning, there is a continual self-improvement drive. This focuses on our own roles as learners – how can we become better teachers, better tutors, better mathematicians. In one sense the forum is unique in drawing together those from the different worlds of adult education, vocational training, teaching and mathematics, from those working in basic education through to those working at university level. A challenge for ALM is to find effective ways of sharing our professional and intellectual practices, skills and knowledge in ways that enhance mathematical learning for all adults at every level.

Political, ideological and theoretical dimensions.

ALM does not operate in a vacuum. Throughout the world there is an increasing emphasis on the notion of lifelong learning. Many political ideologies label this as part of the democratisation process. Is this what lifelong learning is for? Or, is it simply for individual fulfilment? Or, is it to support a changing demand on the workforce and to meet a need for economic growth?

We might choose to challenge the simplistic equation of

Qualifications demand – qualifications gained = qualifications need

Is there a genuine need for adults to acquire mathematical qualifications or is this simply a construct of governments keen to promote learning activity as a diversion from the shortage of employment?

Lifelong learning can be seen as part of an atomising political discourse. It can be argued that by deconstructing mathematics into individual skills and techniques, and by defining the individual tasks of a teacher, mathematics is demystified, teaching is demystified and bits of both the subject and the teaching role can be adopted by the majority. After all, the employment of non-specialists is significantly cheaper than that of knowledgeable experienced specialists. Also, the learning of the particular skills and techniques needed for a particular employment are much easier to achieve than some level of learning how to work mathematically in a variety of different contexts.

As an International Group we must challenge the current worldwide domination of atomisation and decontextualisation of mathematical skills so that they can be delivered, assessed and monitored by anyone. This simplification of mathematics and the processes of learning and teaching mathematics is one that we strongly condemn.

(Many thanks to those who chaired individual sessions and prepared notes for this summary, and to those who contributed so fully during the plenary session)