

Numeracy Counts

NIACE Committee of Inquiry on Adult Numeracy Learning

Final Report • February 2011

Chaired by
Dame Mary Marsh DBE

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1 Preface

The invitation from NIACE to chair this Inquiry into the current state of adult numeracy in England was one I could not refuse. For too many young people and adults in this country their lack of numeracy skills has been of significant concern to me and others for a long time. So I welcomed the opportunity to hear evidence from experts and learners, teachers and policy makers about why we have such a large proportion of our adult population with skills not adequate for the 21st century and what we can do about it.

We have a numeracy problem in this country – we are a nation quite happy to admit to ‘being bad at maths’; we see people almost wearing it as a badge of honour, in a way they would never admit to saying they couldn’t read or write. Too many adults have negative memories of maths from their schooldays and feel the numeracy skills they need to use as an adult bear no relationship to what they were taught.

Our recommendations suggest ways in which we can look at the numeracy that adults need as active members of society in work, rest and play; ways to engage adults in learning and keep them there; ways to measure their competence; and ways to bring a focus on an all-age approach which could support a more useful way of improving the skills of the nation.

Amongst the pieces of evidence we received was one from a learner – her words are sharply challenging and we should take serious note of them:

“So that when you are thinking of ways to help remember that yes they need education but don’t want to be told they need it. Don’t want you telling them it is for their best interest don’t want a new scheme or big governmental initiative. Screaming at them from the TV. Find ways to reach them that is subtle and respectful.”

Our Inquiry began from the premise that having adequate numeracy skills is a fundamental human right. This includes being able to make independent decisions on the basis of understanding about many aspects of life such as personal finances. This should start with a society where maths is well-taught in schools, where the fascination and confidence with number we see in very young children continues throughout life. We have a long way to go.

Dame Mary Marsh DBE

Chair of the NIACE Committee of Inquiry on Adult Numeracy Learning

2 Introduction

As a country we have long recognised that we have a problem with numbers. We say, ‘I’m useless at maths’ cheerfully, and with a sense of finality. Poor numeracy skills have a devastating effect on many people’s lives. We are faced with a large number of the adult population with poor numeracy skills not sufficient for the 21st century; with young people leaving school with inadequate skills for sustainable employment; with families unable to pass on skills to ensure their children have better life chances than they do; and with a strategy, Skills for Life,¹ which has pumped billions of pounds into raising literacy and numeracy standards, but with only minimal effect on numeracy. This report recognises the impact of the last 11 years since the Moser report,² but suggests a step change in our approach to numeracy learning.

People who reach adulthood with poor numeracy skills are more than twice as likely to be unemployed, and are far less likely to receive work-related training, get a promotion or receive a raise. Adults with poor numeracy are also more than twice as likely to have become a parent during their teenage years, to have long-standing illnesses or disabilities, and are far more likely to experience depression.

The widespread cultural attitude that being poor at maths doesn’t matter makes it difficult to recruit and retain teachers and mentors, at school and beyond, in sufficient numbers to transform things. Much of this was recognised when Lord Moser’s inquiry into adult literacy and numeracy skills was published in 1999. Government responded to Moser’s report by establishing the Skills for Life strategy, which overhauled curricula, standards and qualifications; embarked

¹ DIUS (2009), accessible at: <http://www.bis.gov.uk/assets/biscore/corporate/migratedD/publications/S/SkillsforLifeChangingLives>

² For a summary of the Moser Report’s findings and recommendations, see: http://www.literacytrust.org.uk/reading_connects/resources/1770_the_moser_report

on a major tutor training programme; developed new resources; and invested billions of pounds in provision. Over the decade 2.5 million people have achieved a first qualification through the strategy. And yet we have been far more effective in literacy and in provision of English for Speakers of Other Languages than in strengthening numeracy. There are still not enough good numeracy teachers, there is a shortage of teacher trainers, and there is still a powerful link between poverty and weakest skills in numeracy.

As a result NIACE, the National Institute of Adult Continuing Education, which is the leading non-governmental organisation in adult learning in England and Wales, decided to establish an independent inquiry to review progress and make recommendations on policy, practice and culture. Mary Marsh chaired the initial seminar in a series of expert seminars hosted by the Paul Hamlyn Foundation and unionlearn. The Inquiry then called for evidence, commissioned papers and came to a set of recommendations highlighted here. They were supported in their work by colleagues in NIACE – Sue Southwood, Carol Taylor, Fiona Aldridge and Ed Melia.

Our major concern, which underpins this report and its recommendations, is that we need a cultural shift in our attitude to maths and numeracy. With the support of media, especially public broadcasting services, we urge the Government to bring the pleasure of numeracy and numbers to the population in the way that reading and books has become such a focus since the first National Year of Reading. This report makes it clear that a successful approach to numeracy is of fundamental importance to England. To this end, the report sets out a package of recommendations, and we hope that government, funders, infrastructure bodies and providers will respond positively to it.

3 Recommendations

To improve adult numeracy, we need...

1 ...to change the way we think about numeracy

Adult numeracy should not be seen solely in terms of the maths that is taught in school. We recommend the Government adopts a new approach to numeracy that focuses on how adults use it in everyday life, and that it should be taught as such. Poor numeracy skills should not be seen as a badge of honour.

Being numerate and understanding when and where to use maths is a vital part of being able to function in everyday life. We believe, therefore, that the development of adult numeracy, underpinned by a high-profile, media-led campaign, should be central to social policy.

The current skills-based definition of numeracy from the Skills for Life strategy has led to discussions about adult numeracy in England to be overly focused on the need to improve skill levels, rather than to develop thinking, understanding and behaviour in relation to mathematics. It has resulted in policies and provision that prioritise the development of strong maths skills over the sort of confident numerate behaviour required of us all as citizens, parents, employers or employees and entrepreneurs.

We recommend that we rethink what we mean by 'being numerate' and adopt a revised definition of numeracy that focuses on adults' behaviours, particularly their mathematical thinking and conceptual understanding, not just procedural skills.

Within the Inquiry (and working with Diana Coben) we discussed and adopted a definition whereby to be numerate means to be:

“Competent, confident and comfortable with one’s judgements on whether to use mathematics in a particular situation, and if so, what mathematics to use, how to do it, what degree of accuracy is appropriate, what the answer means in relation to the context, whether/how to communicate the answer appropriately, and what (if any) action to take in the light of the analysis.”

The adoption of a broader definition of numeracy resonates with the idea of 'functional mathematics', which suggests that the practicalities of everyday life are likely to require us to understand and think mathematically, but not always to actually undertake calculations. For example, in making a judgement about whether to travel further to a supermarket that claims to have lower prices, we need to consider and compare how much cheaper the goods that we plan to purchase might be against the costs of travel.

This is not just semantics. The way in which numeracy is defined and used affects the attitudes of policy makers and funders, teachers and learners, as well as the wider public. It influences funding and policy decisions, curriculum, teaching and assessment practices and gives greater or less value to different kinds of activity. The adoption of a broader definition of numeracy should assist us in focusing on and developing policies and provision that support the kinds of numerate behaviour that can contribute to the pursuit of a stronger and more equitable society and economy.

2 ...a new measure of how well adults use numeracy

We recommend a new way of measuring how well adults use numeracy every day – for example how they manage bills, make decisions about credit and estimate time. We need to think more about the numeracy we need for work and home, and how we measure adults' success and levels of ability. Adopting a broader definition of numeracy will mean that it also becomes necessary to change the way we measure the numeracy competence of adults.

Numeracy competence is currently measured through the achievement of approved qualifications, with the national numeracy target counting the number of learners who have achieved their first Entry Level 3 qualification. Over the previous decade, the focus on meeting the Public Service Agreement targets 2008–11 to improve the basic skills of 2.25 million adults between 2001 and 2010 has led to major achievements in terms of national qualifications, although the true impact of this strategy on the nation's numeracy *competence* remains unknown.

In the light of this, we recommend that the Government should, following the results of the 2010 Skills for Life survey (due to report in the Autumn), adopt a revised assessment system to measure the competence of adults using sample surveys focusing on 'real-life' numeracy activities.

In relation to individuals we believe that a revised assessment system should support the development of numerate practices and behaviours. We believe that any such assessment to measure progress and achievement in numeracy learning should focus on adults demonstrating their understanding of mathematical concepts. Currently, we only test skills and knowledge, and do that via formal tests. Our testing process drives our teaching, so we pay little attention to developing adults' practices.

While some learners are motivated by the prospect of gaining what might be a first qualification (and we strongly recommend that this should remain part of the offer), for others qualifications may be a barrier, especially given the low success rates.

3 ...more, different and better numeracy provision

We recommend that numeracy provision should be available through a wider range of organisations – including workplaces and community groups, and not only from education providers – to encourage more flexible numeracy learning through bite-sized and informal provision. This should include embedding numeracy within vocational, family and other learning.

Adults with poor numeracy skills are often reluctant to attend numeracy classes. To date, only one in ten adults whose numeracy is below functional level (below Entry 3, often described as 'poorer than the skills of an 11 year old'), have taken part in a numeracy course (NAO, 2008).

Where adults do enrol on courses, success rates are not high. Around half of those who enrol on target-bearing courses succeed in gaining a qualification, and while success rates on other courses are higher, overall between one quarter and one half of numeracy learners are deemed to have 'failed' (NAO, 2008). The quality of numeracy provision is not good enough. Achievement and progression rates are low and Ofsted (2005) reports that the proportion of unsatisfactory provision is unacceptably high.

Not all learning, however, needs to happen in a classroom. Opportunities exist for more informal learning in the workplace, libraries and museums or as part of community activities. Within these contexts, the learning may not be specifically focused on numeracy. For example, the primary concern of a care worker is likely to be the well-being of the people he or she supports, while that of a community activist might be in getting a new zebra crossing installed. In both cases, taking

part in a formal numeracy class may be unattractive as well as inappropriate, and the current funding mechanisms, tied to the achievement of full qualifications, leave little room for manoeuvre. The development of a unitised curriculum in which individual credits can be awarded would support adults to develop specific skills or practices in line with their own priorities and concerns, and in the most appropriate contexts.

4 ...more numeracy teachers and a new group of people to support adult numeracy learning

We recommend that as well as more adult numeracy teachers being trained we need more numeracy champions, including family support workers, learning reps and job centre staff, to signpost and support learners.

Although there are currently around 5,000 qualified numeracy teachers (FTE) in England, the supply of teachers is a widely acknowledged cause for concern. The refreshed *Skills for Life Strategy* (DIUS, 2009), notes both a shortage of numeracy teachers and difficulties in recruiting additional teachers. Recent research undertaken by the National Research and Development Centre for Adult Literacy and Numeracy (2009) estimated that we need an additional 7,000 numeracy teachers. It also noted a capacity issue among teacher-training providers, where over 90 per cent said they have no additional capacity to increase their provision. Faced with this challenge we need to think creatively about alternative solutions.

The professionalisation of the adult teaching workforce over recent years has improved the quality of provision and provided a set of standards and curricula, as well as access to continuing professional development (CPD). We believe that we should continue to train and support the professional development of the numeracy teaching workforce. This could involve the promotion of 'access into numeracy teaching' programmes. The development of innovative, interactive CPD programmes for all staff, including non-specialists, might include whole-organisation maths and numeracy initiatives to raise the status of maths

and numeracy. Flexible approaches to delivery, such as blended learning and intensive programmes, could also facilitate access and aid recruitment in areas where there are shortages of provision.

In addition to supporting the numeracy teaching workforce, we also suggest that the skills and knowledge of a wider range of people could also be developed to support numeracy learning. Intermediaries such as Union Learning Representatives (ULRs) and Community Learning Champions (CLCs) have a potentially significant role to play as 'maths messengers' in supporting adults to engage in numeracy learning by building confidence and challenging the culture that 'it's ok to be bad at maths.'

5 ...to prioritise adults with the poorest numeracy skills

Those with the poorest numeracy skills have barely been touched by the Skills for Life strategy. We recommend prioritising resources to help adults address their fear of numeracy and encourage them to improve their skills, by making what they learn relevant to their everyday lives.

Poor numeracy levels significantly reduce the life chances of millions of people, with a clear relationship between poor numeracy and low earnings, unemployment and poor life chances. People who reach adulthood with poor numeracy skills are more than twice as likely to be unemployed, and are far less likely to receive work-related training, get a promotion or receive a raise (Carpentieri, Litster and Frumkin, 2009). Adults with poor numeracy are also more than twice as likely to have become a parent during their teenage years, to have long-standing illnesses or disabilities, and are far more likely to experience depression (Carpentieri, Litster and Frumkin, 2009). In contrast, adults with strong numeracy skills have better health, stronger and more varied employment prospects, greater access to good housing, higher earnings, more access to training opportunities and are generally more highly qualified (Carpentieri, Litster and Frumkin, 2009; New Philanthropy Capital, 2010).

Research suggests (DfEE, 2001) that while the greatest difficulties are associated with extremely low levels of numeracy, the greatest returns can be achieved by raising these very low levels, rather than simply improving the skills of those who already have good basic skills. Despite this, much of the Skills for Life effort has focused on improving the skills of those relatively well placed to gain Level 1 or Level 2 qualifications, while participation and achievement among those with the weakest skills has been low.

“To date, only 10 per cent of people whose numeracy is below functional level (Entry Level 3) have participated in a numeracy course and only two per cent have achieved qualifications that count towards the target.”
(NAO, 2008)

In addition, participation amongst a number of vulnerable groups has been particularly low.

“In 2006–07, we estimate that Jobcentre Plus only referred one in 30 of its 550,000 clients with a Skills for Life need to the Learning and Skills Council’s Employability Skills Programme. In addition, in 2006–07, we estimate that only one in five offenders assessed as having literacy and numeracy below Level 1 enrolled on a literacy or numeracy course.”
(NAO, 2008)

However, this recommendation comes with a caveat. While it makes sense to focus on people with the weakest skills, we must not lose sight of the larger-scale cultural issues. While educators and policy makers speak readily of the skills, attitudes, behaviours of those with the weakest skills and fewest qualifications of any kind, they rarely focus on the numeracy competence of those who are otherwise well qualified. Many adults we might perceive as ‘successful’ are also not confident in their use of numbers and mathematics.

6 ...an ‘all-age’ forum for key organisations to work together to improve adult numeracy learning

We recommend that the Government bring together a range of organisations to research, develop and improve numeracy in line with this Inquiry’s recommendations, which will improve the numeracy learning of both children and adults.

The report of the Inquiry into the Future for Lifelong Learning, *Learning through Life* (NIACE, 2009), argued that up to the age of 25 young people’s routes of entry to the labour market are ever more complex – and involve short-term and long-term judgements about loans, investment and debt. Between 25 and 50 almost all adults have to juggle time pressures as they resolve the competing pressures of work family and social life – throwing up a myriad of issues that involve mathematical judgements. From 50 to 75, as adults move out of their main careers and adjust to changing financial circumstances, duties as carers, contributions to the civic life of their communities, and the complexity of pensions, new demands arise for numeracy skills, and in later stages of life new challenges arise again. The need for numeracy skills shows itself most acutely at times of transition – beginning a job, children starting school, dealing with divorce or bereavement, managing a long-term medical condition, becoming unemployed, or moving into retirement. The role of intermediaries who have contact with adults at times of change like this, such as union reps, health visitors, family learning staff, become critical.

Echoing the recommendations of a New Philanthropy Capital report which stated “a concerted, joined-up effort is needed if standards are to be raised across the whole population” (Paterson, Stringer and Vernon, 2010), we believe that the establishment of an ‘all-age’ forum of key organisations would facilitate the development of a national strategy for numeracy learning and enable more effective use of budgets. Such a forum would bring together key players to promote the social and economic importance of numeracy for individuals and

society and to review progress towards a numerate, equitable and strong society. With an all-age focus, the forum would help to identify and promote approaches that work in boosting numeracy skills and lobby government to ensure that policy and practice supports continued improvement in numeracy skills.

7 ...more in-depth research to ensure we know what works best for adult numeracy learners

We recommend the Government and appropriate partners should continue to research and evaluate adult numeracy provision to chart progress on what works best for adults.

At present we know little about what adults want and need in relation to numeracy provision, to be able to support them to operate effectively in different roles and at different stages of their lives, for example as citizens, parents, employees, and employers. As a result, much adult numeracy provision is little more than a repackaging of the school curriculum.

As well as conducting and disseminating high quality research studies, government and appropriate partners should also support teachers and other numeracy learning champions to listen, understand and apply what different groups of adults say they want and need. Any research undertaken should be disseminated in the form of practical resources and used to inform the continuing professional development of teachers and intermediaries involved in improving numeracy.

4 Conclusion

“If you find out what people are interested in, you can relate the learning to it.”

Mick Power, Union Learning Representative

These recommendations add up to a radical reshaping of priorities for adult numeracy learning, but we believe that they would produce a better targeted and more equitable system than the current arrangements. We have not costed our recommendations but are seeking a re-balancing of public funding to support a focus on numerate behaviour rather than skills, and for qualifications to be a goal for some rather than a driver for all. It may seem unaffordable at a time of fiscal constraint, but can we afford not to address what we at NIACE would see as a fundamental human right, which holds back the productivity of British industry and is reinforced by each generation?

NIACE and partners will be seeking wider discussion of the report, its recommendations and findings, through national and regional conferences, articles in professional journals, and in the press and media.

5 References and further reading

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6 Stages of the Inquiry

Apr/May 2010

Desk research and focus groups with practitioners and learners.

Jun 2010

Call for evidence publicised via the NIACE website, the NCETM portal, the Skills for Life Network, and the UK Adult Numeracy Discussion List.

Respondents were invited to comment on the following:

What the evidence tells us about the current situation regarding numeracy learning

Where the gaps are in current numeracy provision

What the key messages are for numeracy learning

Submissions were received from a number of organisations and individuals.

Jun – Nov 2010

Four expert seminars held and small Expert Working Group established.

Aug – Oct 2010

Call for specific papers.

Jan 2011

Final consultative seminar to agree recommendations

7 Acknowledgements and contributions

Inquiry Commissioners

The Inquiry Commissioners have given generously of their time, in person and in response to questions and draft reports. At this point we would also like to record our thanks to the Paul Hamlyn Foundation, and to its CEO Robert Dufton, who helpfully agreed to host all of the Commissioners' meetings.

We would like to thank the all learners, practitioners, organisations and other stakeholders who participated in focus groups, interviews and contributed a range of evidence for this Inquiry. Our particular thanks go to the following people who attended seminars and submitted specific papers on our request.

Expert seminar participants

Karen Adriaanse, HMI, Ofsted

Helen Casey, Executive Director, NRDC at the Institute of Education

Diana Coben, Professor of Adult Numeracy, King's College London

Robert Dufton, Director, Paul Hamlyn Foundation

Jo Early, Skills for Life Manager, Red Kite Learning

Mike Ellicock, Business Development Director, Numicon, Oxford University Press

Barbara Frost, Family Learning Development Manager, Westminster Adult Education Service

Sarah Gibb, National Campaign Manager, Business in the Community

Norma Honey, Assistant Director, National Centre for Excellence in the Teaching of Mathematics

Meriel Hutton, Independent Consultant and Visiting Senior Research Fellow, Department of Education and Professional Studies, King's College London

Natasha Innocent, Senior Policy Adviser, The Museums, Libraries and Archives Council

Michelle Jennings, CPD Strategic Advisor, Institute for Learning

Wendy Jones, Head of Policy and Public Affairs, BBC Learning

Tim Joss, Director, The Rayne Foundation

Beth Kelly, Professional Development, LLU+

Annette Lowe, Assistant Director, Read On – Write Away!

Mary Marsh CBE (Chair), Director, Clore Social Leadership Programme

Dr Barbara Miller-Reilly, Senior Tutor, Department of Mathematics, University of Auckland

Karen Morse, Learning and Development Manager, Enhancing Practice and Influencing Team, Royal College of Nursing

Lord Claus Moser KCB CBE FBA, Trustee, Paul Hamlyn Foundation

Joan O'Hagan, Adult Mathematics Consultant

Margaret Phillips, Head of Skylight, CRISIS

Susan Quinn, Senior Project/Research Officer, NIACE/National Offender Management Service

Susan Royer, WSDAN Coordinator, The King's Fund

Michael Rumbelow, Producer, BBC Skillswise, BBC

Davinder Sandhu, Learning & Workforce Development Officer (Skills for Life Lead), Unison

Rosemarie Simpson, Divisional Manager, Extending Participation, Skills for Health

Terry Smith, formerly Skills for Life and Adult Functional Skills Advisor, QCDA

Sue Southwood, Programme Manager, NIACE

Annabel Steward, Skills for Life Development Manager, City Literary Institute

Nick Stuart, Chair of the NIACE Company Board

Judith Swift, Union Development Manager, Unionlearn

Dan Taubman, Senior National Education Official, UCU

Carol Taylor, Director of Operations, NIACE

Hugh Tollyfield, Deputy Director Further Education and Qualifications Strategy Division, Department for Business, Innovation and Skills

Keith Weeks, Reader in Health Professional Education, Faculty of Health, Sport & Science, University of Glamorgan

Paper submissions

Margaret Brown, Professor of Mathematics Education, Kings College London

Diana Coben, Professor of Adult Numeracy, Kings College London

Is school practice influencing adult numeracy practice and what still needs to be done?

Jane Wallis, Skills for Life Tutor, POA Learning

What has been learned from the prisons about workplace numeracy learning?

Judith Swift, Union Development Manager, Unionlearn

What can unions and ULRs do to support numeracy in the workplace?

Davinder Sandhu, Learning & Workforce Development Officer (Skills for Life Lead), Unison

How Unison Supports Numeracy in the Workplace

Dr Helen Oughton, Senior Lecturer on Initial Teacher Education, University of Bolton

"We all play teacher": A study of student discourse in adult numeracy classrooms. Summary of findings for NIACE review of adult numeracy learning in the UK

Barbara Nance, Senior Project Officer, NIACE

How ICT can support numeracy learning

Graham Griffiths, Assistant Director, Head of Division – Numeracy, LLU+

How can we support practitioners through CPD?

Terry Smith

What's the future for Functional Mathematics?

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NIACE, the National Institute of Adult Continuing Education, has a broad remit to promote lifelong learning opportunities for adults. NIACE works to develop increased participation in education and training, particularly for those who do not have easy access because of barriers of class, gender, age, race, language and culture, learning difficulties and disabilities, or insufficient financial resources.

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