The Al-jabr of Numeracy: Restoring the Balance (Between Literacy and Numeracy)

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The Skills for Life agenda, developing the language, literacy and numeracy skills of adults, has been in action in England since 2000. Our institution, the LLU+ in Southbank, London, were asked to undertake a small piece of research for the UK National Audit Office looking into possible reasons why numeracy take up has been less than literacy. The team used a range of data collection methods including questionnaires, semi structured interviews with learners and staff, email correspondence and desk research. The research revealed some interesting issues which will be discussed in this paper: perceptions of the comparative worth of literacy and numeracy, a variety of views concerning the imbalance, the management structures of providers, and the reporting structures of a variety of organisations. We finish the paper by suggesting future action which we feel will assist the increase in numeracy provision in order to meet UK national targets.

Introduction

There is compelling research evidence which suggests that millions of adults in the UK have numeracy skills below a desired level of performance (see Appendix for a description of the levels used in this paper):

One in four (25%) respondents achieved Level 2 or above in the numeracy assessment, which means that around 23.8 million adults had numeracy skills at Level 1 or below. (DfES, 2003, p. 2)

6.8 million adults have serious problems with numbers (DIUS, 2007, p. 7)

There is also other research evidence that higher numeracy levels are associated with better paying jobs (see Bynner & Parsons, 1997a, 1997b, 2005):

Poor numeracy had a particularly negative effect on men’s full-time employment in the 1980s recession, whether or not it was combined with poor literacy…

Overall, poor numeracy rather than poor literacy was associated with low economic well-being at this age. [aged 30] (Bynner & Parsons, 2005, pp. 5–6)

There have been national numeracy campaigns to raise awareness of these findings (e.g., DfEE, 1999; DIUS, 2008). Yet it appears that the demand for adult numeracy provision remains relatively low-key, with little hint of the adult workforce clamouring for more.

In this small-scale research, funded by the UK National Audit Office, we set out to explore what the contributory factors might be and to produce some recommendations for policy.
Rationale

From our knowledge and experience of the field of adult numeracy, we have considerable anecdotal evidence to suggest that there is a mismatch between the scale of need as indicated by research, and the interest of the public—and of providers of numeracy classes—to react with a sense of urgency. We set out to gather the views of a cross-section of those involved in this area of work—managers, teachers, workplace representatives, learners and those who could be learners.

The recurring message at policy and strategy level is that:

- Workforce numeracy levels need to be raised in the interest of competitiveness, the economy and individual advancement. See, for example, reports such as the Leitch report (DIUS, 2007) and the work of Bynner and Parsons (e.g., 2007a, 2007b);

- Any campaign to drive up demand for numeracy skill development must take account of the lack of readiness of provision to respond quickly—not enough classes, not enough adequately trained or experienced staff—and yet the campaigns that have resulted have not included a strategy or implementation plan for addressing the lack of sufficient teachers in readiness for a surge in demand, merely advice that this should happen.

At the consumer end of the spectrum, there is strong evidence to suggest that a majority of adults consider numeracy development needs to be non-essential (see DfEE, 1999), find the subject of mathematics boring, and often associated with negative memories of school mathematics learning (see Coben, 2003, pp. 100–104). In spite of recognising the link between mathematics and superiority in the job market, and whilst wanting their children to do well in mathematics, adults appear not to be very motivated to rush to numeracy or mathematics classes to improve their own skills. The national cultural trait of self-deprecating remarks about their own mathematics skills is alive, well and growing!

At the level of management and curriculum leadership, the anecdotal evidence has consistently suggested that there is insufficient interest in—and push for—expansion of numeracy provision. There are a number of possible reasons for this:

- A general fear of mathematics (many people recoil at the mention of the word, and thus close their minds, even when it is not to do with actually doing mathematics);

- A relative lack of numeracy specialists amongst senior and middle managers, when compared with literacy;

- A lack of dedicated numeracy co-ordination roles at curriculum management levels;

- Within the Skills for Life programme, curriculum leaders are more likely to be from a literacy than a numeracy background.

At the level of the teacher, mentor or supporter, there is evidence of the same fear of mathematics, lack of confidence and anxiety as in the population at large. The historical development of numeracy as an afterthought to literacy has left its mark—which suggests a vicious cycle of lack of numeracy specialists leading to fewer numeracy classes resulting in smaller numeracy numbers and therefore not enough demand for new numeracy teachers.
Numeracy teachers are more likely to be part-time than literacy teachers, and in many cases are likely to have started out as specialists in IT or literacy before taking on numeracy.

The introduction of subject specialist teacher qualification requirements in 2001 and revised in 2007, with its inclusion of mathematics at level 3 equivalence has resulted in some very experienced teachers turning away from numeracy, whilst others feel that it has brought professional rigour to the qualifications. The key question is whether or not the qualifications have had a beneficial impact and produced teachers with appropriate teaching and learning strategies.

Research Methods

The research process has sampled the views of a variety of relevant groups—policy and strategy agencies, managers and teachers in various settings for post-14 education and training, learners and potential learners, teacher trainers and their trainees.

Research methods used have included:

1. An on-line survey circulated to:
   1. a) all those who have been involved in the national consultation on the Skills for Life National Review of the Core-Curricula for literacy, numeracy and ESOL and the pre-entry curriculum framework,
   2. b) LLU+ National Numeracy, literacy and ESOL network mailing lists,
   3. c) LLU+ National Training the Teacher Trainer network mailing list.
2. An open-ended discussion via the LLU+ JISCMAIL numeracy-specific membership list.
3. Questionnaires completed by individual participants of regional focus groups:
   4. a) generic teacher educators (London and Hull),
   5. b) Dyslexia and Mathematics training group (Newcastle College).
4. Semi-structured interviews with selected individuals and small groups:
   6. a) sector skills representatives,
   7. b) workplace numeracy trainer,
   8. c) offender learning staff—prison and probation,
   9. d) literacy learners not currently involved in numeracy.
5. Group feedback to prompts in selected settings:
   10. a) classroom assistants,
       11. b) nurses’ numeracy refresher course,
12. c) national numeracy network meeting,

13. d) prison work-related training group.

Findings

(1) Provision—Who is Championing Expansion and Innovation?

The outcome of previous campaigns has generally been a short-lived increase in numbers wanting numeracy or mathematics and a small enhancement in provision that has lasted only as long as the dedicated funding.

The responses to the on-line survey suggested that many organisations are actively promoting the development of numeracy provision (51% of 193 responses). However, the qualitative responses to the question about ways in which numeracy provision was being promoted are neither innovative nor inspiring:

The organisation does promote numeracy as an add on to its ESOL package, but if a subject has to be dropped for various reasons then its numeracy, possibly because literacy is seen to be more useful to ESOL learners.

ACL curriculum leader

Numeracy provision is about one-third of literacy. Despite a new policy to encourage students who apply to do literacy to also consider numeracy, the take up is low.

FE Skills for Life Manager

Currently the provision is almost balanced—we have just started a waiting list for numeracy. We will set up another class after Easter and then the provision will be 50:50.

FE Numeracy Co-ordinator

One factor that may be contributing to the slow progress in numeracy provision is the lack of numeracy specialist representation at middle and senior management within organisations. The response to the online survey suggests that there are fewer such managers from a numeracy/mathematics background (67 out of 173). Even where there was evidence of relevant background, the examples were of mathematics and engineering rather than numeracy education. Almost all the examples of positive response to numeracy included reference to a “champion” with vision at a senior management level who had made it happen (see also Appendix, Vignette No 1).

We note that just under 53% of (142) respondents to the questionnaire considered that their institution had roughly the same amount of literacy and numeracy provision, some 42% felt that there was less numeracy than literacy with only 5% reporting more numeracy than literacy.

In addition, the organisational grouping together of literacy and numeracy as in the Skills for Life programme has resulted in a lack of special attention to numeracy. For this research, we reviewed recent inspection reports by the government Office for Standards in Education (Ofsted) and
Quality Improvement Programme organisational development action plans. There is generally no separate mention of numeracy. We wonder whether this is an avoidance strategy.

In the email discussion, a view was expressed that publicity about numeracy has not been as prominent as that for literacy, pointing out that there has been no “famous soaps with a character with numeracy issues.”

In summary, we found the following:

1. For about half the respondents, literacy and numeracy provision is of a similar size, almost all the remaining respondents noted that numeracy provision is smaller.

2. The organisational grouping together of literacy and numeracy as Skills for Life may have resulted in a loss of identity for numeracy.

3. Lack of specialist representation at middle and senior management level may impact on the nurturing of numeracy provision and capacity.

4. Promotion and marketing of adult numeracy provision remains low-key and, in many cases, uninspiring.

(2) The Profession—Why is it not Ready to Meet the Demand?

The key perception is that there are not enough numeracy teachers to meet a surge in demand for numeracy should the current numeracy campaign be successful. Evidence from our research shows that the picture is different region by region—for example, in the East of England, the setting up of a specialist Mathematics Centre has raised the profile of adult numeracy and built up capacity. In London, LLU+ at Southbank University is currently the only provider of numeracy-specific initial teacher education. Although many trainees do find jobs, it is not the case that there are enough full-time numeracy jobs to go round, hence a continuing lack of capacity to respond to the perceived ‘demand’ that has been estimated in the surveys described above.

A previous unpublished survey carried out in 2006 and 2007 as part of the review of the adult core curricula revealed that numeracy staff were more likely to be part-time rather than full-time, and that even when full-time, they were more likely to be teaching a combination of subjects (e.g., IT & numeracy). This impacts on the degree of engagement of numeracy staff in professional development. The relative lack of prioritising of numeracy often results in lack of attention to staff development needs of numeracy teachers (e.g., out of 60 staff development topics requested within the offender learning sector pan-London, not one related to numeracy).

A significant point made by one tutor is that issues with language and literacy will cause problems for numeracy. For many learners to engage with numeracy they may need to develop their language and literacy skills in order to assist learning. Given the increasing number of ESOL learners in the system, this is a particularly important issue. One problem here may be that numeracy teachers may not have gained skills that assist the development of language alongside numeracy. This situation is however being addressed through the new Initial Teacher Education and Continuing Professional Development [CPD] frameworks, although a greater emphasis on this aspect of training would benefit learners.

In summary, we found the following:
1. There are not as many numeracy specialist teachers and teacher educators as there are for literacy and ESOL.

2. There are fewer full-time posts for numeracy than for literacy.

3. An increased emphasis on developing language and literacy for mathematics learning would better prepare numeracy teachers to respond adequately to the needs of learners.

(3) The Numeracy Curriculum Offer—Is it what Everyone Wants or Needs?

We need a campaign that lets everyone know that it’s the system that has let them down. I tell my learners that if they are have difficulties understanding what I am trying to teach them that’s my problem—not theirs. You should see the look on their faces …

Numeracy tutor

One view raised during the consultation is that of the name of the subject and courses. At the moment we have the official titles of ‘Skills for Life’ and ‘adult numeracy’. A question is raised as to what learners think of the notion of ‘numeracy’. To some it may be seen as ‘basic maths’ which the use of the term was intended to replace. This may particularly be so for parents for whom numeracy is the subject studied by their children at primary school.

Some propose titles such as ‘Managing money better’, ‘Organising your time’ and ‘Maths in your home’.

We would stress the way the learning would be relevant to their [learners’] lives and work and make this clear in the marketing

Numeracy tutors

For some numeracy is seen as a ‘poor relation’ to mathematics and ‘therefore not worth trying for’. This presents a contradiction, as the overwhelming reaction to any consultation about numeracy is that the experience of school mathematics has put people off from revisiting the subject as adults. Indeed, the evolution of the adult numeracy curriculum and teaching methodology has had at its heart the need to make second chance learning in this subject as different as possible from the school mathematics experience, and the nomenclature pays a part.

In our research, some respondents were concerned that the emphasis on targets and funding priorities has led to a particular type of provision. It is argued that provision is too focused on test techniques and outcomes and does not allow for the appropriate development of knowledge and understanding:

Open learning and pre-entry classes were closed as they were regarded as ‘other provision’, yet there was a lot of learning taking place and real progress was being made; however it couldn’t be measured.

Course Director, Numeracy
The development of mathematics in—and for—the workplace has had a positive impact on the numbers engaging with mathematics. However, the imposition of a test as a goal is not always received well. Many learners question the relevance of a set curriculum to their particular needs:

I am a nurse—I only want to be able to learn the maths I need for my job, not a whole numeracy curriculum. I already have a GCSE.

NHS Nurse

Compounding this is the view that the various assessment regimes can be so different and that means that each course has to deal with different techniques. This was specifically mentioned as a problem between the level 1 and 2 tests. While the multiple choice system is the same, the skills and demands on the learners can be quite different:

I also think the level 2 test is unfair and way too different from level 1. Its language is very difficult and even talented students struggle with it.

Numeracy lecturer

In this context we note the comment from the DfES Skills for Life Survey of 2003 comparing the highest grades of the school leaving qualifications GCSE/O Level (identified as existing at Level 2) with the separate assessment of Skills for Life:

It was rare for somebody with an A*-C GCSE/O level in English to be classified as having Entry 3 or lower level literacy (4%) but much more common for someone with A*-C GCSE/O level in mathematics to be classified as having Entry 3 or lower level numeracy (24%). This may demonstrate how numeracy and mathematics are not identical. (DfES, 2003, p. 21)

Our research confirms the general attitudes towards numeracy and mathematics range from apathy to phobia. Interestingly, the reactions are likely to come from curriculum leaders, managers and non-numeracy teachers as they are from amongst learners. In the course of research, we experienced managers who reacted with “Don’t talk to me about numeracy!” and who assumed that any question ABOUT numeracy was going to be a maths problem.

… learners’ motivations for joining, and continuing to attend, numeracy classes are actually many, intricate and often overlapping … most learners reported ‘getting a qualification’ as the main reason for doing a numeracy course, with ‘getting a better job’ being the second most popular response; clearly these two reasons are closely linked. When the reasons were broken down by age, we found that more than twice the number of adults over 20 said that they wanted to study numeracy to prove something to themselves; become more confident; or help with their lives outside the classroom, as against the 16–19 cohort. More obviously, more than three times the number of older adults cited helping their children over the younger group. (Coben et al., 2007, p. 19)

Although students’ motives are varied and intricate we find that the three main motivations students have for attending and continuing to attend numeracy classes regularly in this study are as follows:
- to prove that they have the ability to succeed in a subject which they see as being a signifier of intelligence;
- to help their children; and
- for understanding, engagement and enjoyment. (Swain et al., 2007, p. 44)

Evidence from the research activities confirms that adults are more likely to engage with mathematics when it is relevant to managing finances (financial literacy), work-related learning (embedded numeracy provision) and most popular of all, linked to helping children with mathematics (a range of *Family Maths* programmes)

In summary, we found the following:

1. Not every adult with lower level numeracy skills wants to develop their numeracy further —campaigns may help.
2. Not every adult with lower level numeracy skills feels a need to gain a qualification— provision and curriculum should reflect this.
3. There are a number of other drivers for individuals to want to improve their numeracy— provision and curriculum should respond to these.

(4) The Potential Learner—Why Aren’t They Getting the Message?

Two-thirds (67%) of those with Entry 1 or lower level numeracy felt they were very or fairly good at number work, and 88% of all respondents felt that their weak skills had not hindered their work prospects or resulted in mistakes at work…

Nearly all parents of children aged 5–16 said they helped their children with … Maths (87%)…

55% of those with Entry level 1 or lower numeracy helped their children with maths.

*(DfES, 2003, pp.22–23)*

The responses to the question “What do you think are the main barriers to adults joining a numeracy or mathematics class” were fairly consistent. The main barriers suggested were:

- Lack of time/other priorities
- Prior negative experience
- Feelings of inadequacy/low self-worth
- Lack of relevance of programmes and courses
- Lack of information
- Funding issues
- Lack of accessible provision.

Motivational factors included:

- To be able to help children
- To gain a qualification
- Relevance to job seeking or vocational training
- Self-improvement for its own sake
- Self-improvement for economic gain
- Enjoyment of the subject.

Learners consulted in this research, while not representing the full range of learners, do appear to mirror the views proposed by a number of managers and teachers. The learners have prioritised literacy over numeracy; they feel that the classes they are doing satisfy a more urgent need. It is interesting to note that some did not seem to be aware of numeracy provision which may suggest that a positive promotion of numeracy could well produce positive results. Nevertheless, carefully thought through learning and teaching strategies would need to be employed to continue to engage the learners. Finally, for these learners employability arguments are not particularly important. This would suggest that learning rather than qualifications are key.

Public and popular perceptions of mathematics (and numeracy) formed the basis of many responses in the discussions and questionnaires. Respondents talked of people being ‘scared’ of numeracy; that mathematics is seen as a ‘difficult’ subject and only to be understood by the ‘clever’ people. This perception may have been formed in people’s own experiences of learning mathematics.

This view of mathematics and numeracy may run throughout society and include a number of managers and teachers within institutions. This raises an issue of concern in that it is possible that numeracy is not promoted as much as it could be in certain institutions and thus leading to lack of expansion. The research team heard from some literacy learners who reported that they were unaware numeracy classes were available (see Appendix, Vignette No 2).

Ideally staff should be more aware of the dangers of mentioning their own negative perceptions.

Learn Direct tutor

Some respondents were able to see the positive side.

When adults manage to achieve a maths qualification I have witnessed an enormous boost to their self confidence and an improvement in their academic work in other areas.

Numeracy specialist Programme Area Leader.

Survival isn’t an issue. They all have developed finely tuned avoidance techniques or coping strategies for anything they can’t do. Increased opportunities is the key factor as adults find they can’t move away from manual work without level 2 literacy and numeracy.

Learn Direct tutor.

A number of views were expressed that, for most people, language and literacy was a priority subject and that numeracy could be avoided on a day-to-day basis. This can link with public
perceptions of mathematics as being difficult and therefore to be avoided. In addition, a literacy teacher proposed the notion that it is ‘easier to mask a lack of progress in literacy’ than in mathematics. In responding to the idea that numeracy being less important than literacy might be a perception rather than a reality, one response was particularly heartfelt.

It may be that is just ‘a perception’ but if it is the perception of those who are defined as lacking skills, then it is a significant perception. Its accuracy can only be determined by those who lack skills—whatever research may tell us. After all, people know their own experience and know when things are not working for them—even if they do not know what to do about it.

Tutor

In summary, we found the following points:

1. Adults are managing their lives and often do not consider that their “lower than level 2” numeracy is a problem.

2. Improved marketing of more innovative and responsive numeracy programmes may attract potential learners.

Summary and Discussion

There is a need to tread carefully when promoting numeracy. Amongst many people there is a view that mathematics and numeracy are difficult, boring and not particularly important for their daily lives. This perception is held by many teachers and managers as it is by the general population. To overcome this will require considerable effort and time.

Alongside promotional campaigns it will be important to increase the capacity to deliver an appropriate adult numeracy curriculum. This will require a growth in the number of teachers, teacher trainers, mentor teachers and support for training and development.

We argue that the following actions will help to increase the numeracy provision in the lifelong learning sector:

1. The reporting of numeracy should be decoupled from literacy in all national bodies/reports and development plans. In order to focus on adult numeracy all organisations should be required to report on numeracy issues separate from literacy. This should include Ofsted, the Centres of Excellence in Teacher Training (CETTS) set up by the government to promote effective practice, the Learning and Skills Council (LSC), the funding body for the majority of numeracy provision, and the various initiatives around the government Skills for Life strategy.

2. The campaign for adult numeracy should require organisations to identify strategies that are being employed to increase numeracy with targets for increases in provision, staffing and professional development. This is a challenge to all lifelong learning providers to identify some of the steps that they will take in relation to adult numeracy. This ‘stick’ will be more effective if presented with a ‘carrot’ of funding to prepare for meeting the demand—better still through a parallel campaign for teachers of numeracy. A multi-sensory (or learning styles) approach to adult numeracy teaching and learning is likely to hook reluctant newcomer adult learners into attending, more than joining a class only to find that it is worksheet and chalk-and-talk driven.
3. A series of adult numeracy awareness raising events should be launched:
   - for managers with a focus on structural issues,
   - for teachers with a focus on appropriate learning and teaching strategies; and
   - for the general public with a focus on how things have changed in education.

4. Positive action to value and engage numeracy staff at all levels to be undertaken—targeted at middle and senior management in particular. Under the umbrella of Skills for Life the nurturing of numeracy provision and capacity should be a priority for all organisations—with policy, strategy and resources allocated to this end.

In the implementation of recommendations (1) and (2) above, a series of events explaining the purpose and outlining possible solutions would assist. For managers, the problems outlined in this report could form the basis of discussions with identified examples of good practice showing ways forward. For teachers, it would help for them to emphasise the issues that concern those who have not yet come forward and consider appropriate learning and teaching strategies. In relation to the general public, a positive campaign that explains how they may be helped and how the type of education that they can now expect has changed over the years should be fruitful. It would help if this could be written into plot lines for drama—for example, with mothers assisting their child’s mathematics through Family Learning groups.

**Conclusion**

In this paper we have identified a number of issues in relation to the imbalance of literacy and numeracy provision in England. We have noted some of the organisational issues involved and argued that a senior manager who ‘champions’ numeracy will help address the disparity. We have considered a number of staffing issues that could be addressed including the recruitment of more adult numeracy teachers and appropriate training and development. We have noted some of the aspects the curriculum which could be considered and maintain that the drive for qualification targets is not always helpful. Finally, we confirmed other research which suggests that adults do not always see their situations as a problem in the same way as do policy makers.

We argue that if we are to significantly change the status of numeracy provision in England then structures will need to report separately on literacy and numeracy rather than in the current combined manner. In addition, we argue for a series of positive campaigns aimed at senior managers, teachers and learners.

If these recommendations are implemented, partially or fully, then it would be helpful to research any changes that may occur. This is likely to involve some large scale quantitative study using national data from providers combined with more small scale qualitative research into the attitudes of learners and teachers. Then we can see if the balance between literacy and numeracy moves to a more equitable position.

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References


Appendix

UK Education Levels

The levels described in the article refer to those of the UK National Qualification Framework (NQF). Level 3 (L3) is considered the level required for entrance to Higher Education/University, level 2 (L2) is the ‘intermediate’ level that is the intended target for those at 16 years of age (usually demonstrated by the grades A*-C in the school leaving qualifications General Certificate for School Education (GCSE)), level 1 (L1) is the ‘foundation’ level preceding L2 (equivalent to the lower grades at GCSE i.e. D-G). There are three ‘entry’ levels (E1/E2/E3) describing the preparatory work prior to level 1. In the Skills for Life strategy E1/E2/E3/L1/L2 are the levels used for adult literacy and numeracy.

Vignette 1: An FE college promoting numeracy

A former adult education institute merges into a large FE college and transforms its provision. A manager, with national influence, insists that part-time numeracy provision should be the same as that for literacy. This increases both the number of classes and the hours for each class. The institution is challenged by a number of issues including the staffing of the provision and the professional development of its staff. Some 5 years from this initial drive the college has its first curriculum manager for adult numeracy.

Vignette 2: Interviewing three literacy learners in an adult education centre

Three literacy learners were interviewed in an adult education centre in a large metropolitan area. The learners were not undertaking numeracy provision and the intention was to discover why this was the case. The interview was semi-structured with the researcher having a few prompt questions: Why are you not studying numeracy? Has anyone suggested you should? What might encourage you to do numeracy? These questions followed reassurances that they were not wrong in their choices. Nevertheless, at times the researcher wondered whether the learners were being more positive about numeracy than they might otherwise be due to his presence. The responses may need to be considered in relation to this.

The three learners were all female and of, or about, retirement age. This might well influence the way they responded to a query about employability. The idea that numeracy might make them more employable was not of any particular interest to them (although they suggested that one of their class, a younger woman, may be interested). Their purpose in studying was more about their own feelings of confidence.

It is interesting to note that one of the learners was eager to point out that she was unaware of numeracy provision being available and thought that the focus of support was for language.

One of the learners was concerned about the teaching of numeracy. She felt that studying numeracy would be possible but only if the teacher really understood how to deliver appropriately.

The learners all felt that they had limited time to fit classes into their lives and that numeracy was not their priority.