

## The SfLIP<sup>1</sup> side of numeracy: what teachers want (in England)

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*The academic year 2008/2009 saw a growing focus on numeracy in the Skills for Life Improvement Programme (SfLIP). This has involved the development of a range of programmes for numeracy including targeted sessions for adult numeracy teachers. Sessions were run in the nine regions of England and involved 2 days of delivery and were focused on the teaching of aspects of adult numeracy (called 'pedagogy' sessions). The first day involved a programme designed centrally and was concerned with specific pre-arranged areas of numeracy. The second session was constructed around the aspects that the teachers requested. This paper will use these sessions as raw data to consider what training teachers feel that they need. Given that this is a self-selected sample, we will then conjecture what this tells us about the population of adult numeracy teachers. We will then consider what further research and development can be developed.*

### Background

Since the introduction of the Skills for Life Strategy following the Moser report (DfEE 1999), there has been concern about the development of teaching and learning of adult numeracy in the UK. In addition, the inspection regime has shown some concern about the delivery of adult numeracy. The Office for Standards in Education (Ofsted) produced a summary report in 2003 which described some issues related to teaching and learning of language, literacy and numeracy.

There is still a shortage of good learning materials. Too often, teaching relies on poorly copied worksheets, which have apparently been selected at random, have little relevance to learners' needs or interests and are not marked. (Ofsted 2003)

The report commented more specifically on numeracy arguing that the subject "is too often taught rote learning rather than by developing understanding of numerical concepts."(Ofsted 2003)

This parallels other reports concerning the teaching and learning of mathematics in general. For example, the Ofsted survey of school mathematics teaching (Understanding the score Ofsted (2008)) recommended that schools should

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<sup>1</sup> The Skills for Life Improvement Programme – SfLIP – was a UK government funded project to support language, literacy and numeracy (i.e. Skills for Life) developments in the post school sector. It was the successor programme to the Skills for Life Quality Initiative and precursor of the Skills for Life Support Programme.

...provide well-targeted professional development in mathematics, particularly to improve teachers' subject-specific pedagogy and the subject knowledge of non-specialist teachers of mathematics. (Ofsted 2008)

The National Development Centre for adult literacy and numeracy (NRDC) led a project to identify effective teaching and learning strategies for Skills for Life subjects. While recognising that the research was based on a smaller sample than Ofsted's, the report (Coben et al 2007) is somewhat more upbeat about teaching and learning of adult numeracy than the inspectorate.

The authors identified that a "wide range of different teaching approaches was observed, although whole-class and individual work predominated."

They also noted the following issues:

Most teachers gave clear explanations, which were much valued by learners. They also broke work down into smaller steps and gave feedback to learners about their work. Most teachers followed a set scheme of work, and few incorporated learners' personal interests. It was also less usual for teachers to differentiate work, make connections to other areas of mathematics, or ask higher-order questions to encourage higher-level thinking or probe learners' misconceptions.

Although activities were often varied, there was little use of practical resources or ICT, little group or collaborative work, and it was unusual to find learners collaborating with, and learning from, each other. (Coben et al 2007)

## **This study**

In recent years, the Skills for Life Improvement Programme has worked on professional development in a number of ways. In 07/08, a number of Continuing Professional Development sessions were run across the country focusing on dyslexia and mathematics, language and mathematics, and numeracy and employment.

In 08/09, numeracy sessions were focused on the teaching and learning of particular parts of the curriculum. It is these sessions that are the focus of this report.

## **The Data**

### **Motivation for applying to attend the SfLIP events**

Partly because of the concerns about the standard of adult numeracy teaching and partly because of the demand for CPD, it was decided to run a series of numeracy pedagogy workshops across England. Ten two-day workshops were held in the nine regions of England. (Two events were held in the East Midlands due to high demand in this region). (See Appendix 1 for attendance data).

Key personnel in each region were contacted before the events in order to gather preferences for the focus of day one of the pedagogy workshops. They were asked to select from a menu of topics but were invited to add their own topic if they wished. Flyers were then sent out to the regions inviting practitioners, teacher trainers, managers and other interested people to apply to attend. The content of first day of the events was similar for each region: sharing good / effective practice; strategies for teaching concepts; sharing a range of methods for performing calculations; supporting

learners' needs such as dyslexia and language; strategies for differentiation; addressing learner errors and misconceptions and action planning. However, the content was differentiated by adding the focus requested by the regions.

Applicants were asked to state their reasons for applying to come to the events. The main reasons they gave were as follows:

<b>Reason</b>	<b>% of applicants who gave this as reason for wanting to attend</b>
Improve own teaching skills / enhance effectiveness of teaching	17
Share good practice	15
Greater knowledge of SfL numeracy pedagogy & related issues	13
Update on pedagogy /new ideas & approaches	12
To find out about different activities, techniques, strategies and approaches for making numeracy interesting	12

These events proved to be very popular with over 40 applications for places in some regions. It is therefore interesting that some of the main reasons for attending appear to tie in with one of the Ofsted recommendations, namely to improve teachers' subject-specific pedagogy. Applicants were also very interested in sharing good practice indicating that they feel they are already doing something that is worth sharing and are aware that some of their peers are doing the same. The most popular reason of all however was simply to improve teaching skills, perhaps indicating a recognition that some improvement is necessary.

Other suggested areas for improvement, as mentioned in the NRDC report, were cited as reasons for wanting to attend by a much lower proportion of applicants e.g. only 4% stated that they wanted to find out about active and collaborative learning techniques with the same percentage referring to resources as being their reason for applying. Only 1% of applicants cited 'how to make learning relevant' as what they wanted to get out of attending the event. However, while these may not have been the main motivator for making the application it does not necessarily preclude them from being desired outcomes.

#### **Current good / effective practice:**

Participants were asked to discuss strategies, activities or resources that they had used or seen used to teach Numeracy that had been successful. Feedback from this activity produced a wealth of responses indicating that the participants, when taken as a whole, were using a wide range of effective strategies, activities and resources. Many of them matched the areas that were demonstrated by a minority of observed teachers in the NRDC report; for example, they included having a context relevant to the learners, making connections, using practical resources and ICT and group/pair work. Differentiation was only mentioned once where one group recorded that they use differentiated questions. The use of higher order questions and misconceptions was

not mentioned by any group. In making the comparison between areas of weakness stated in the aforementioned reports and what practitioners state they are doing, it must be noted that each group only recorded some of the examples of good practice inferred by the reports whereas the whole group of participants covered most of them between them.

### **Requests for day 2 of the professional development sessions**

At the end of the first day of each event participants were asked what topics they would like to be covered on the second day. We then proceeded to plan day 2 with the aim of covering as many of the requests as possible. There was quite a wide range of requests; these could be categorised under the following headings:

- i. Resources and materials
- ii. Activities
- iii. Strategies
- iv. ICT
- v. Topics
- vi. Vocational / embedded / maths in context
- vii. Differentiation
- viii. Language
- ix. Learning needs / difficulties
- x. Functional skills
- xi. Collaborative learning
- xii. Assessment
- xiii. Motivating / engaging learners.

It should be noted that resources and websites were among the most popular requests. Also popular were the development of particular maths topics, differentiation, learning difficulties and practical activities.

### **Action planning**

At the end of the two-day events, participants were asked what they would be taking away from the events and what they intended to implement or disseminate. The majority of responses focused on resources and websites with many participants saying they would try out particular resources or that they would build up a bank of resources and activities. This may be encouraging in the light of the Ofsted report which stated that 'there is still a shortage of good learning materials' and the NRDC report which claimed there was 'little use of practical resources or ICT'. Overall, there was a wide range of responses spanning the following categories:

- i. Starter activities
- ii. Games
- iii. Materials
- iv. ICT based resources and websites
- v. Kinaesthetic activities
- vi. Group activities
- vii. Practical / tactile resources

### viii. Videos

Strategies and approaches that participants said they would implement after the events included some of the areas of weakness reported by NRDC, for example: using collaborative activities, strategies for how to differentiate, strategies for encouraging active learning, making connections e.g. between fractions, decimals and percentages, use more practical and tactile resources and games, incorporate ICT where possible and use of open-ended questions. Several participants also said they now felt confident enough to enrol in the Level 5 numeracy subject specialism course. This outcome equates with the Ofsted recommendation that subject knowledge of non-specialist teachers of mathematics should be improved.

## Discussion

A number of points for discussion arose from the data collected.

- There was a lot of demand for these events, indicating that practitioners feel they have a need to find out more about / get up to date with numeracy pedagogy.
- Teachers appear to be aware of what they need to do to improve and this seems to tie in with what has been reported by Ofsted and the NRDC.
- For some, it has been an affirmation that what they are doing is what is considered to be current good practice and that they are being creative in their approaches.
- Teachers are very keen to share ideas and resources with other teachers. They seem to appreciate this opportunity for peer sharing just as much as, if not more than, learning from 'experts'. Many are working in isolation and feel frustrated that they are probably producing the same materials as another teacher working in the next town but they do not feel there are sufficient opportunities or time for sharing.
- Teachers are particularly hungry for learning materials including ICT based materials and websites. This is despite the wealth of learning materials available such as the Maths4Life 'Thinking Through Mathematics' materials.
- Teachers recognise what is seen as good practice and are already employing some of it, but may not individually be putting the whole spectrum of good practice into action and may be using it occasionally rather than as a matter of course.
- On the whole, the teachers who attended the events have 'bought into' many of the ideas presented as good practice, such as using practical and interactive resources and collaborative learning and would like to put them into practice. However, it may be that the teachers whose teaching practices and beliefs are most entrenched in the chalk and talk / worksheet direction were not moved to attend these events.
- Many teachers see the employment of interactive and engaging materials and group work as a change in the right direction that can be made relatively easily whereas other ideas of good practice, such as differentiating learning, are still something they require a lot of support with. For example, some teachers were working under very challenging circumstances, having to teach a very wide range of levels, sometimes teaching both literacy and numeracy within the same class and having to deal with language issues and learning difficulties.
- Embedding numeracy is also a topic that some teachers felt they would like more support with, although several ideas were taken away from the events such as

using photographs to see where the numeracy is and using games with numeracy embedded in them.

- What they have appreciated with these events is the time to browse, try out, discuss and experience the ideas, strategies, activities and resources suggested. This appears to have been much more preferable than being presented with a pack which they may not feel they have to time to sort through for something suitable for their learners.
- However, there is still a lingering feeling among many that time pressures do not allow for the use of some of these ‘fun activities’ and they would use them more given more time or flexibility with what they have to cover.
- Experiencing the active and collaborative approaches and the interactive and engaging learning materials has helped to boost the confidence of the teachers who came along without a numeracy specialism and has encouraged them to commit to achieving that qualification.
- Most of those who attended went away with ideas for self-development and/or further work including dissemination to colleagues, however it remains to be seen whether this will translate into concrete action and whether this, in turn, will result in improved teaching and learning.

Interesting points about those who applied:

- The majority of SfL teachers who applied to attend the events currently teach more than one SfL subject
- Very few teachers who just teach ESOL applied to attend. In fact more literacy teachers than ESOL teachers applied.

### **Conclusion**

Developments in policy over the past few years have produced large numbers of documents, including resources / materials such as the Skills for Life learning materials, diagnostic assessment materials and embedded materials. Some of these developments go further with professional development aspects to the packages such as the mathematics packs developed by Swan and others (DfES 2005 and DfES 2007). Yet there is concern that these resources have not yet had the impact that was intended.

The teachers in our study have shown that they value such resources but that the existence of these resources is not enough. We note that the field as a whole contains a wide range of practice and experience and that practitioners can learn from each other. What they value is the opportunity to meet and discuss the use and development of resources and ideas. It would therefore seem important to give as much opportunity for this to happen as possible. The requirement for teachers to undergo 30 hours of professional development each year would seem to help such a position although the cost of organising such meetings beyond one institution may be a threat.

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## Appendix

### 1 Demographic data of participants

#### SfLIP data10 regional events, 2 national events

<b>Gender</b>	<b>No.</b>	<b>%</b>	<b>SfL tutor specialisms</b>	<b>No.</b>	<b>%</b>
Female	308	70.6	Mixed	96	48.5
Male	128	29.4	Numeracy	80	40.4
<b>Total</b>	<b>436</b>	<b>100</b>	Literacy	19	9.6
			ESOL	3	1.5
			<b>Total</b>	<b>198</b>	<b>100</b>
<b>Ethnicity</b>	<b>No.</b>	<b>%</b>	<b>Setting</b>	<b>No.</b>	<b>%</b>
White British	323	74.1	FE	126	28.9
Not stated	39	8.9	ACL / Vol & Comm / FL	104	23.9
Asian	21	4.8	Not stated	56	12.8
White other	14	3.2	Work based learning	39	8.9
Other	12	2.8	Prisons / Prob Svce / Young Offenders	31	7.1
Black African	11	2.5	E2E	25	5.7
White Irish	9	2.1	Train to Gain	18	4.1
Black Caribbean	6	1.4	Learners with LDD	17	3.9
Black other	1	0.2	Learn Direct	8	1.8
<b>Total</b>	<b>436</b>	<b>100</b>	IAG / job centre plus	7	1.6
			Teacher Ed	5	1.1
			<b>Total</b>	<b>436</b>	<b>100</b>
<b>Job role</b>	<b>No.</b>	<b>%</b>			
SfL tutor	198	45.4			
Other / Not stated	80	18.3			
Manager	51	11.7			
Key Skills tutor	51	11.7			
Teacher Trainer	24	5.5			
Assessor	12	2.8			
Vocational tutor	11	2.5			
Support	7	1.6			
Subject learning coach	2	0.5			
<b>Total</b>	<b>436</b>	<b>100</b>			

### 2. Reasons for attending the SfLIP regional numeracy pedagogy workshops

Reason (proportions with more than 10% shaded)	Freq.	%
Improve own teaching skills / enhanced effectiveness of teaching	29	17
Share good practice	25	15
Greater knowledge of SfL numeracy pedagogy & related issues	22	13
Update on pedagogy /new ideas & approaches	21	12
To find out about different activities, techniques, strategies & approaches for making numeracy interesting	20	12
Provide better support in SfL numeracy/ meeting learners' needs	7	4
Active and Collaborative learning techniques	7	4
Resources	6	4
Develop numeracy provision / dissemination / become involved in numeracy provision	6	4
Increase confidence with numeracy	4	2
Differentiation / inclusive approaches	4	2
Topic specific delivery strategies	3	2
Embedding numeracy within other subjects	3	2
To support own studies	3	2
New ideas to help with training	2	1
Networking info	2	1
Improve planning	2	1
Formative assessment skills	1	1
Delivery of numeracy programmes to families	1	1
Making learning relevant	1	1
<b>Total</b>	<b>169</b>	<b>100</b>



### 3. Activity 1: Sharing good practice

**In groups of three, discuss strategies, activities or resources that you have used or seen used to teach numeracy that have been successful (20 minutes)**

- Describe the strategy/activity/resource
- State what context it was used in
- How could you tell it was successful?
- Record responses to the above points on the flipchart paper provided
- Completed sheets will be displayed for the group to read during breaks

#### **Feedback from activity:**

##### **Strategies:**

- Informal strategies e.g. finger multiplication for 6-10 times tables, lattice method, percentage bubbles
- Using visuals e.g. animation and colour
- Multiple representations
- Using discussion
- Everyday-life use of maths / learning in context relevant to learners e.g. relating decimals to money (pence)
- Language support e.g. work on terminology / focus on instructions
- Group and pair work
- Use of team games
- Use of multimedia including virtual learning environments
- Making maths fun
- Using spreadsheets e.g. for budgeting / doing Bodmas in Excel
- Engagement through history of maths
- Challenge through differentiated questions
- Making connections e.g. relating fractions to decimals
- Use of rewards e.g. prizes for completing challenges

##### **Resources:**

- Number lines
- Rulers in metric and Imperial starting at the same end to help with conversion
- Place value slider
- Partition cards
- Fraction walls
- Dominoes
- Dice
- Tarsia puzzles
- Follow-me cards
- Card matching exercises

- Tactile objects such as cubes e.g. to help with addition and subtraction
- Websites e.g. Skillswise / Sparklebox / Skillsworkshop
- Teachers TV
- Smartboard
- Turning Point
- Realia e.g. measuring jugs / recipes / catalogues / money / football league tables / maps
- Food e.g. cake / chocolate – use to demonstrate equivalents
- Barbie dolls for ratios and proportions
- Calculators
- Plastic shapes e.g. circles and squares for fractions
- Worksheets with answers
- Large charts / posters to help with FDP

##### **Activities:**

- Practical activities e.g. cooking / measuring objects or body measurements not just worksheets
- Completing a mini project
- Mental starters with individual whiteboards
- Games e.g. Bingo / Language games such as taboo words / online games e.g. Racing Dolphins
- Doing puzzles, challenges and conundrums
- Arranging events on a washing line for probability
- Tactile activities e.g. colouring, folding and cutting for fractions and percentages
- Kinaesthetic activities e.g. learners order themselves or objects a/c to data such as averages and range
- Data handling activities using Smarties
- Making posters
- Learners create games and puzzles

#### 4. Personal action plans: what participants planned to disseminate

##### Ideas for activities and resources and how to use or develop them

###### *General*

Starters

Games

Materials

ICT based resources and websites

Kinaesthetic activities

Group activities

Practical / tactile resources

Videos

###### *Specific activities / resources*

Using hands for teaching times tables

Develop kinaesthetic activities specific for context of hairdressing

Laminated number cards for rounding activities / reading large numbers

Multiplication grid

Have I got numeracy for you (Powerpoint)

Behind You – guess the number / symbol / maths term

Rounding in the rain

Place value slider

Pelmanism

Ratio matching cards

FDP matching cards

Fraction circles

Large number dominoes

Speed /distance /time matching cards

Ratio bingo

% bubbles

True / false measures activity

Measure Up game

###### *Strategies and Approaches*

Resource-light teaching approaches

Using a range of different teaching strategies

Using the history of Number

Use collaborative activities with pairs / groups

Strategies for how to differentiate e.g. develop project ideas for mixed ability classes

Strategies for encouraging active learning / more active participation of learners e.g. use

more interactive activities and workshop style approach

Ideas for teaching entry level learners

Making connections e.g. between fractions, decimals and percentages

Use photographs to see how numeracy (and literacy) can be embedded in a given context

Help learners with the language of maths e.g. work on the language involved in number problems / simplify language used until

learners understand concepts / Work on ensuring learners understand the question

before they try to solve it / extend vocabulary of learners

Use games with embedded numeracy

Use of starters: use starters in every session / use of investigative activities as starters

Use more practical and tactile resources and games

Incorporate ICT where possible

Ideas for embedding numeracy within ICT

Use learners as a physical resource

Use more colour and pictures in resources

Strategies for assessing learners' numeracy levels

Use of open ended questions

###### *Further work / Self development*

Enrol on L5 numeracy subject specialism course

Build up a bank of resources

Identify / develop starters for each topic

Identify key terms/phrases in the different contexts they work in

Research suggested websites / investigate more e-learning resources

Attend training on IWB

Revisit scheme of work

Create games to use with functional skills

Share information from examiners' reports with colleagues

Look into Turning Point