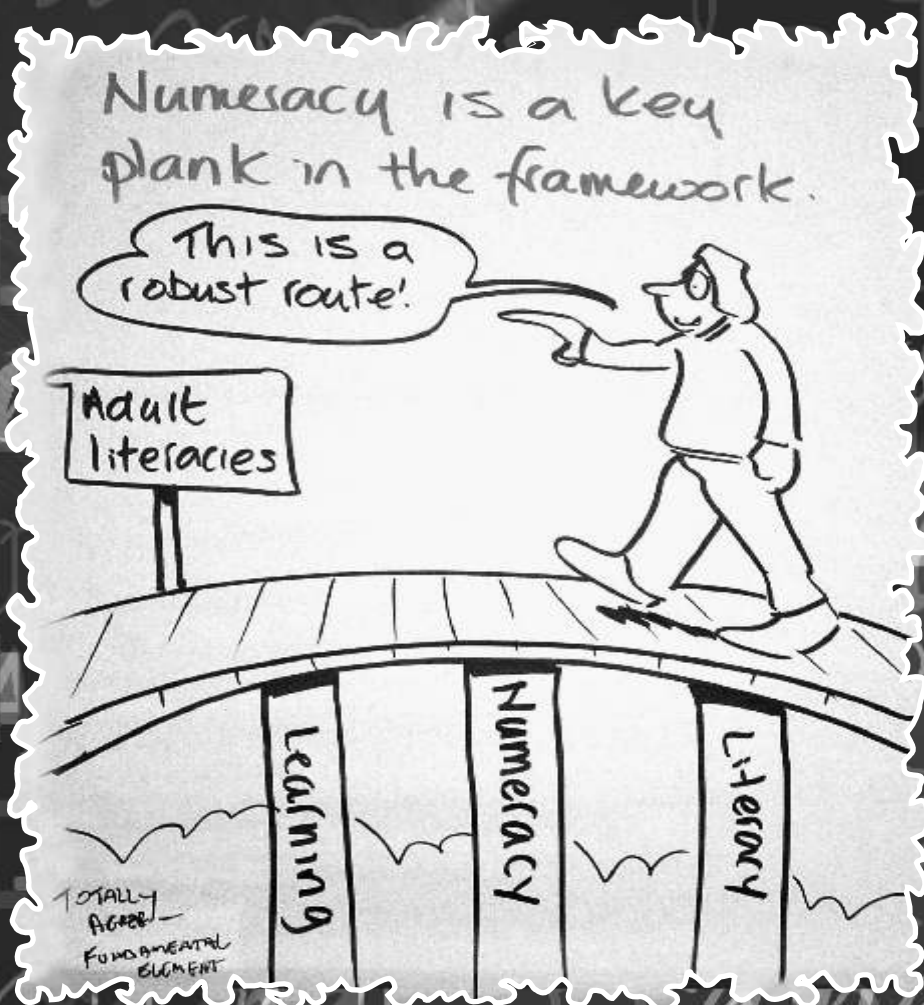


RAPAL

Research and Practice in Adult Literacy



The Research and Practice in Adult Literacy Network

Who we are

RaPAL is an independent national network of learners, practitioners, teachers, managers and researchers engaged in adult literacies and numeracy. Our support is generated by membership subscription only, and we are therefore completely independent in our views. RaPAL is the only national organisation focusing on the role of literacies in adult life.

What we do

- **campaign** for the rights of adults to have access to the full range of literacies in their lives
- **critique** current policy and practice where it is based on simplistic notions of literacy as skill
- **emphasise** the importance of social context in literacy
- **encourage** collaborative and reflective research
- **believe** in democratic practices in adult literacy
- **create** networks by organising events (including an annual conference) to contribute to national debate
- **publish** a journal three times a year

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We are a friendly group - open to new members and new ideas. Please contact us with any contributions (views, comments, reports and articles) and do not be put off if you are new to the field or if you have not written for a publication before. This Journal is written by and for all learners, tutors and researchers who want to ask questions about this field of work. It does not matter if the questions have been asked before. We want to reflect the many voices within adult literacy and numeracy work and to encourage debate. Why not join in?

Further information can be found at our website: www.rapal.org.uk

The RaPAL Journal expresses a variety of views which do not necessarily reflect those of the editorial group.


The RaPAL Journal has been printed by Image Printing Co. Ltd, Lumsdale, Matlock, Derbyshire. Matlock, Derbyshire.

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Editorial



Welcome to the Spring 2006 issue of the RaPAL Journal, with its focus on Numeracy. Once again I am delighted that we have contributions from across the UK and that we have maintained our Canadian links. Our annual conference with its theme of 'Transforming Literacies' is fast approaching: you will find a registration form towards the end of the Journal. You will also notice that there are currently 3 positions available on the Management Group. This is an exciting time to get involved with RaPAL, as we aim to double our membership. We would like people from a wide range of locations and covering a range of interests to become involved in the Management Group so that we can widen our representation. Please think about joining us.

Alison Gorf has edited this issue. Alison has been a teacher trainer since 2002, working at the University of Huddersfield where she is engaged in both Pre and In-Service teacher training. Prior to this she taught for 10 years in Adult and Community Education in the Huddersfield area after (like many people) 'accidentally' becoming a Skills for Life tutor. Alison's research interests are in developing awareness of kinaesthetic learning in her trainees and in looking at why people become numeracy teachers. She also has a special interest in integrating the use of chocolate into her numeracy teaching and her personal mantra is '*maths games are for life, not just for Christmas.*'

Deirdre Parkinson Journal Co-ordinator

In this edition we have a number of contributions from Scotland resulting from the second national Adult Numeracy Seminar, *Focus on Numeracy* held in December 2005 which is outlined in Cath Smith's article '*Focus on Numeracy*'.

The publication '*Adult Numeracy: shifting the focus: A Report and Recommendations on Adult Numeracy in Scotland*' by Diana Coben, who is one of our contributors this month with her article on ongoing projects including Maths for Life, makes the following two points in its section on '*Learning and teaching Approaches*'

'Connectionist' teaching should be promoted (that is, teaching that makes connections between different aspects and representations of mathematics, as well as with learners' own methods; this entails an emphasis on listening to learners and observing what they do).

Critical numeracy and realistic mathematics offer ways forward geared to adults' lives, interests and purposes.

The views in these quotes very much sum up the flavour of our contributions in this edition with emphasis on listening to what learners say. This is very much emphasized in Kate Nonesuch's piece on '*Reducing Student Resistance to Using Math*

Manipulatives'. Kate tackles issues of how to respond when learners don't see how what you are doing with teaching tools links in with their learning. Alison Kelly's research into what motivates or demotivates numeracy learners looks at issues relating to reluctant learners who don't yet see how the subject fits into their lives. Alison Tomlin's article '*If you can make it, you can own it*' explores links between numeracy and literacy and gives examples of many aspects of numeracy used in her teaching, including the link between fractions and tap dancing.

There are also examples of practical ideas for teaching numeracy in this edition. Games and activities, including the current craze for Sudoku, are explored in Helen Johnston Morris's '*Fun with Numbers*' article. Denise Hepplewhite's article '*Can Playdough be fun and educational?*' looks at how to encourage participation in family learning. Alison McLachlan outlines a different approach to integrating numeracy through her article '*Local to global - starting with the weather*', which also explores work with other community groups to encourage numeracy provision which really does fit with the ideas of '*adult's lives, interests and purpose*' from the above quote. The themes in this article also link with Ann Russell's piece entitled '*Map Reading*'.

Angela Valente reports on professional development undertaken through the Scottish Numeracy Energiser held in November 2005 with some examples of real life objects such as 6 packs of lager used at this event to explore ways to teach.

John Swain, Graham Griffiths and Rachel Stone report on the changes in practice that arose as tutors took part in a research project focusing on the use of observation and questioning in their article '*Integrating formative/diagnostic assessment techniques into teachers' routine practice in adult numeracy*'. The ideas expressed in this piece link very well with the connectionist ideas in the above quote.

In the Reviews and Reports section we have feedback from Kara Jackson and Dave Baker about the most recent Uppingham Seminar held in October 2005 on the topic of '*Numeracy and Development*'. We also hear again from Kate Nonesuch with a review of ongoing research in Canada and from Julie Simmons with her piece on '*Mobiematics*' which gives us not only an insight into current developments in using new technology for teaching but also a new piece of 'techspeak' to master. There is also a comprehensive review by Azumah Dennis of '*Outside the Classroom researching literacy with adult learners*' edited by Ellayne Fowler and Jane Mace.

We hope that you will enjoy this edition and that you too will be 'energised' by the ideas put forward by our contributors.

**Alison Gorf
Editor**

Section 1. Focus on Scottish Numeracy

Cath Smith

Cath Smith is a Development Co-ordinator with Learning Connections, which supports the work of the adult literacies partnerships throughout Scotland. It is based within Communities Scotland, an agency of the Scottish Executive. She can be contacted at cath.smith@communitiescotland.gsi.gov.uk

In December 2004, Learning Connections held its first national adult numeracy seminar, *Shifting the Focus*. At that seminar Diana Coben presented her recommendations for adult numeracy in Scotland and practitioners were given an opportunity to contribute their ideas on the way forward for adult numeracy.

This article in RaPAL reports on the most recent developments in adult numeracy in Scotland, including our second national Adult Numeracy Seminar, *Focus on Numeracy*. In *Reflect*, October 2005, John Leavey and Juliet Merrifield reported on the Scottish approach to adult literacy and numeracy and the key principles underpinning that approach; in *Numeracy Briefing*, January 2006, Diana Coben reported on developments in adult numeracy in Scotland since the publication of the ALNIS report in 2001.

At our second national adult numeracy seminar, *Focus on Numeracy*, December 2005, practitioners from across Scotland were able to hear another inspiring speaker from the adult numeracy field, to meet each other and to share effective practice.

Dave Baker of the Institute of Education, London University, provided a wide -ranging keynote speech. He highlighted the importance of numeracy as a barrier and a gateway for adults. By getting us to think about our own uses and understanding of numbers he helped us to appreciate the many different and creative ways in which individuals can approach the same calculation or solve the same problem. He advocated an approach which valued and built on the understanding and experience that adult learners bring with them. Dave's ideas supported the social practice approach advocated in the *Adult Numeracy; shifting the focus* report and in the *Adult Literacy and Numeracy Curriculum framework for Scotland*.

Graham Ogilvie provided a creative way of recording some of the key messages of the seminar with his illustrations which were drawn throughout the day. He asked participants to respond to his illustrations with comments to support or challenge the message in the picture. The illustrations here capture some of the points made in Dave's speech.

The day included 14 workshops showing the creative ways in which practitioners were seeking to attract learners into numeracy and provide them with stimulating learning experiences. Workshops topics ranged from map reading to origami, from using mobile phones for learning to current practice in numeracy teaching in primary schools.

In the following pages some of the workshop presenters discuss the successes and challenges of their creative approaches to working with adult numeracy learners, and show how they are responding to the recommendations for tutors in the *Shifting the focus report* for example - to 'develop a wide range of teaching and learning approaches', and to 'be creative.'

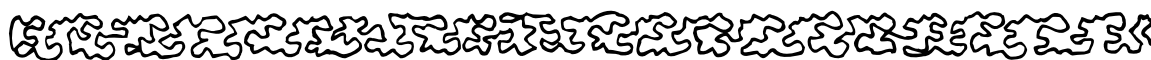
Numeracy learning is for tutors too. Learning Connections recognised the need to provide numeracy training for tutors who might be more comfortable teaching literacy. We commissioned NIACE (National Institute of Adult and Continuing Education) to develop and deliver a Scottish version of its energiser training on numeracy and to include Scottish based trainers in their team. An article about that training, by the two Scottish trainers, is included in this edition of RaPAL.

The latest numeracy publication from the NRDC, *Does Numeracy Matter More?* provides clear evidence that people need good numeracy as well as literacy skills if they are to reach their full potential economically, socially and psychologically. There are still plenty of challenges ahead in improving the quality and quantity of provision for adult numeracy learners and it is heartening to see the commitment and creativity of tutors in rising to that challenge.

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Local to global - starting with the weather

Alison McLachlan

Alison was a part-time tutor and is now the Co-ordinator for the WEA numeracy and environment project at Glasgow Science Centre.

Working in partnership with the Glasgow Science Centre, the Workers' Educational Association offers an environment course which explores topics linking the local and global environment with numbers. The course uses the planetarium, climate change theatre and exhibits in the Science Centre as resources for learning.

The course is geared towards people who would not normally access the science centre, and who are not regularly involved in learning programmes (e.g. hard to reach learners, or learners from socially excluded groups or disadvantaged areas: these are learners from the priority groups identified in the Adult Literacy and Numeracy in Scotland report, 2001).

The programmes are designed around the needs and interests of each group, though generally topics will include, weather, climate change and energy use, and resources will include globes maps and atlases.

The aims of the course include:

- Participation in an informal, flexible course programme, which is based around the needs and interests of learners;
- Encouraging ownership of learning by students through use of participative resources e.g. discussions, use of science centre resources, small group exercises and formative evaluation that informs course development;
- Building the confidence of learners in their existing knowledge and their ability to share this with others through the process of lifelong learning;
- Exploring numeracy in relation to topics which affect aspects of their everyday lives.

The course engages a social practices approach to numeracy, as highlighted in *Adult Numeracy: shifting the focus* (Coben D.2005 p.54), by focussing on learners' knowledge, skills and understanding and making numeracy relevant to individual learners in their roles as citizens, family members and lifelong learners.

Diane Coben advises tutors to , "*be creative - numeracy isn't just sums*"(op.cit.). This wider view of numeracy learning is a key factor in maintaining the interest of and relevance to learners. In the environment group we do very few calculations or practical numeracy exercises because it is a short course (8 weeks) and the adult learners have not asked for a specific numeracy course. However, by exploring issues around our place in the world, numeric concepts are introduced and connected to issues which affect us all, and through this approach learners' understanding of numerical concepts and of the relevance of numeracy to their everyday lives is developed.

We use globes to look at the worldwide connections people in the group have. In small groups we look at family ties, immigration/emigration, ancestors, holidays and current news topics. Discussions include global /local socio-economic issues, travel, distance, time and space. Exploration of geographical imaginations, through looking at various map projections of the globe, focuses on our perception of the world as shaped by political, economic and cultural views depending on who and where we are. The information we discuss in small groups can be shared in the whole group and can be collated in various forms, for example to show the number of connections we have for each of the continents and to discuss why some continents have more connections than others.

The aim of the exercise is primarily to make the course relevant to learners, to encourage learners to share their knowledge with others and have ownership of the learning resource we are creating. The course strives to fit adults' purposes for learning through a flexible, learner-centred approach to course development.

We are currently working with Galgael, an organisation that offers traditional boat-building and craft skills to adult learners. The following excerpt from their website highlights the importance of creativity in learning:

"We all have skills to offer-yet some feel they have little value to contribute. At Galgael we take the view that this is at the root of exclusion. So we offer a place where people can come to value and expand on current skills and pick up some new skills too. Skills that will expand options for generating income. But also skills that will ensure a quality of life."

www.galgael.org

In partnership with Galgael, we have designed a course, which looks at environmental topics relevant to the learners' interests. We are exploring globes, maps, weather and climate, with an emphasis on the skills and knowledge required for sailing. For example, the weather topic will include listening to shipping forecasts and interpreting the data presented and we will look at admiralty charts and legends as well as OS maps.

Galgael sail predominantly around the West coast of Scotland, and a discussion on local geological features and age can be a useful link to big numbers, place value, notation and abbreviations.

Through discussions and feedback from small group sessions, the interests of the group are incorporated into the programme in order that the programme maintains flexibility and relevance. When we were introducing the course to the group, someone asked if we could look at forests, as sustainable wood sources is a relevant issue for their boatbuilding and craft work. We will endeavour to incorporate this learner-led request in a session around use of atlases so that we can focus on forestation and connections to climate and global/local imports/exports.

This course is a starting point for learners to develop confidence in their own skills and knowledge and to hopefully think about engaging in other relevant learning opportunities.



FUN WITH NUMBERS WORKSHOP

Helen Johnston-Morris

Helen is an Adult Basic Education (ABE) Group Tutor with Fife Council Community Services

Background to the workshop

Numeracy learners always want to learn about fractions, don't they? Trying to make the work as practical as possible I usually use a floor tile cut up to illustrate fractions and the relationships between them. On this day I was away from the resource centre and was caught unprepared, so I made a square from a piece of A4 paper, folded it in half and opened it out to show that the whole was made up of the two halves... which made me think of Origami.

Be creative numeracy isn't just sums was one of the recommendations of the Shifting the Focus report. (p54) The aim of this workshop was to share ideas on, and explore all sorts of

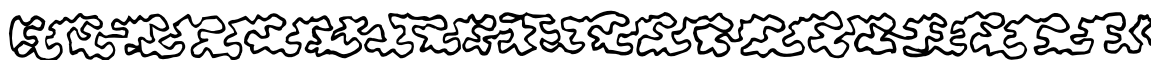
activities which might engage learners in enjoyable numeracy learning.

Workshop Activities

The 50 minute workshop was divided into two groups one using IT for problem solving and the other using games and puzzles as learning tools. Half way through the sessions the groups changed over.

The games and puzzles group looked at a variety of activities including

- Bingo
- Dominoes
- Pelmanism



- Sudoku and kakuro
- Origami

The workshop concentrated on the less well known activities as tutors were already familiar with traditional bingo, dominoes and Pelmanism although they had not all used money, time, percentages or telephone numbers as the basis for games. Tutor-made and commercially available games were shown.

Sudoku has become very popular recently so I decided to introduce it to our learners using a step by step approach. I completed a simple puzzle and then removed just one number from each row, column and mini grid. Learners easily completed the puzzle as did the group, thus learning the rules. They then tried a puzzle with two numbers missing from each row, column and mini grid to make them aware that each number must be placed in its specific cell. By playing on www.websudoku.com, the learners have become more confident with numbers as well as developing strategies for completing a puzzle grid. As a result they are able to take part in another social activity if they wish.

KAKURO

			6	4			6	15	4
		3			10	6			
	10					7			
7					4				
8				11					
			9						3
4			7				4		
						6			
15						24			
	17	35			17			28	24
				35					
17				17					
			24				16		
14			22				24		
	29					24			
	16					16			
23				29					
					17				
21									

Kakuro seems much more mathematical and my learners are not enthusiastic about it yet! However, it engages solvers in thinking through

the different combinations of numbers that can be used to make a total, and again there is the satisfaction of developing successful strategies and collaborating with other learners.

Start with some hints:

As with sudoku use only the numbers 1 - 9, and no repetition, therefore:

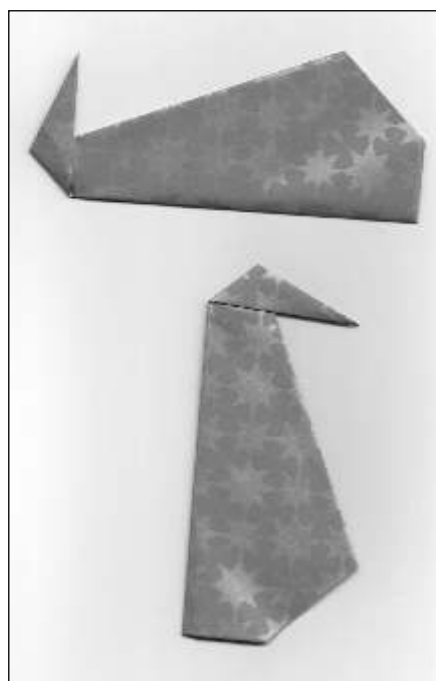
- there is only one combination that will make 4 from two squares
- there is only one combination that will make 6 from three squares
- there is only one combination that will make 7 from three squares
- start where some of these numbers intersect

A useful resource is

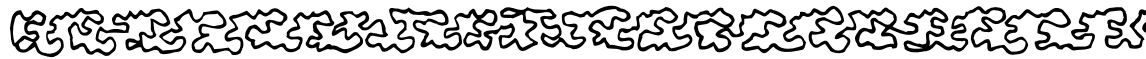
www.kakuro.com/howtoplay.php

The final part of the workshop was **origami**.

Origami can be used to introduce the concepts of shape, angles and lines of symmetry as well as fractions, and to reinforce relevant vocabulary. Kinesthetic learners enjoy the tactile approach, it appeals to our creative side and it makes a change from routine numeracy activities.



The group made a simple model to illustrate this practical, hands on activity. Instructions were given orally while the technique was demonstrated. We began by taking a square of paper and placing it with two opposite sides parallel to the edge of the table then rotating the square through 90° to a diamond. A diagonal fold was made by taking the left corner over to the right corner. Discussion followed about the



shape produced and its angles. The paper was then opened back out. The left side was folded in to meet the diagonal fold at the centre. The right side was folded in to make a symmetrical shape. There was discussion about the shape produced and what had been done to the angles. The top corner was then folded down to meet the original left and right corners at the diagonal fold. The right side was taken over to the left side using the original diagonal fold. The model was rotated through 90° so that the centre fold formed the base with the right angle at the right hand side. The final step was to fold the left corner up to point away from the edge of the table (this angle is not precise) to make the whale's tail. By first rotating the whale through 90° and then standing it up, the whale was transformed into a penguin.

The material required is cheap and readily available even in outreach centres! Tips were given about different types of paper suitable for origami and a number of books and models were displayed. This is a good example of the use of multi-sensory techniques to reinforce learning.

The Shifting the Focus report pointed out that our uses of numeracy in adult life are wide ranging and include shape and space as well as number. The ideas described here are flexible and can be used as warm ups or end of session group activities as well as to support earlier learning. And in the words of the report 'help to wean tutors and learners off a diet of unadulterated sums'. (p54)



Inspiring work with young adults in Glasgow Creating hopes and dreams.....

Ann Russell

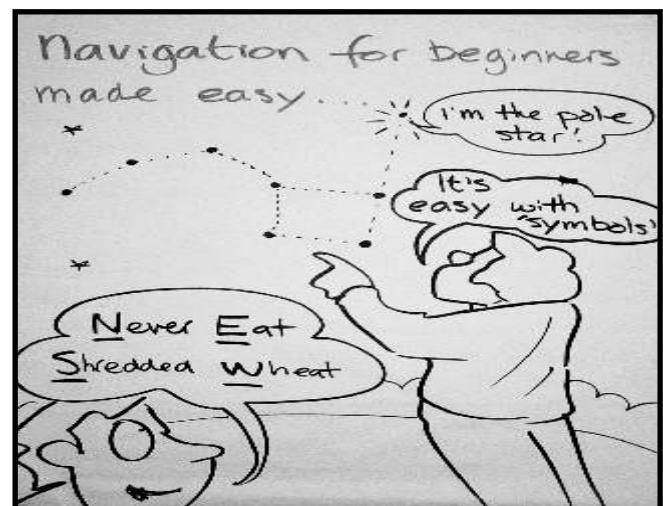
Ann is a Community Learning Officer with Glasgow City Council

Glasgow City Council's Community Learning Service welcomed the challenge of developing literacies work with young adults to help them achieve better skills for their future. Funding for this new area of work was secured from the Adult Literacies Partnership in the city and involved:

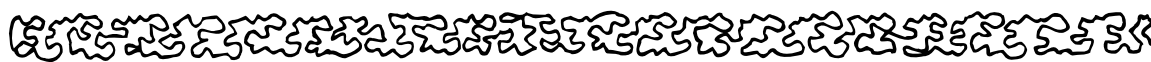
- Establishing structured literacies provision within pre-access learning projects for young people in the city;
- Establishing literacies work with young people who were seen as difficult to reach and had not attained qualifications at school but had attended secondary schooling;
- Developing a range of imaginative integrated literacies learning opportunities within these structures. This work has included integrated literacies courses such as: -
 1. Map reading and hill walking
 2. D J skills
 3. Photography through IT
 4. Film making

basic maths in a way that also involved them in practical exercises. It involved them in learning that was real to them. They were undertaking a practical exercise, being given the responsibility of plotting a hill walking route, using the skills that they had learned on the course and then given the opportunity to see if they had plotted the route correctly while being accompanied by a qualified instructor up the hill.

And with the skills that the young people gained through taking part in this they went on to take up places on construction industry courses and into further education colleges, using their positive feelings about learning and new skills to move on.



In particular the Map Reading and Hill walking course helped the young people to undertake map reading exercises and plot routes using



Can Playdough be fun and educational?

Denise Hepplewhite

Denise is a Family Learning Coordinator/tutor and Skills for Life Tutor at Bridge Women's Education Centre in Washington. She can be contacted at hepplewhitedenise@hotmail.com

My Fento Level 4 Lecturer Sarah Rennie introduced me to the RaPAL Journal. I read Alison Gorf's piece 'Forty Ferrero Rocher, four kilograms of macaroni and the Tower of Hanoi some thoughts on developing active numeracy teaching activities' (Issue 57 Summer 2005) with great interest and enthusiasm. Like Alison I am an active member of the governing body of the primary school that my children attended. I am also a very passionate numeracy and family learning tutor, recognising that most of my learners prefer the kinaesthetic approach.

The family learning courses are delivered in our own Bridge centres, primary schools, nurseries, SureStart buildings and other community venues. The groups vary in size and are usually between five and twelve learners with their children. The learners that I have taught are parents (mums and dads), grandmas, granddads, carers, guardians and other interested parties.

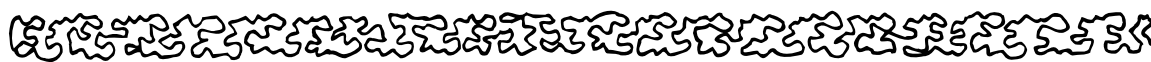
In this article I will outline my approach to the delivery of a particularly successful and enjoyable learning experience. The session initially focussed on numeracy, which was developed to incorporate literacy and then finally ICT. I feel that the content of this session engages all of the learners' interest and needs. Many of the learners have had very negative experiences of education and left school either at the age of sixteen or before and have never accessed formal learning since that time. However, they decided to attend a family learning course in order to support their own child's individual needs, and hopefully make their child's educational experiences more positive than their own. I wholeheartedly believe that family learning, if delivered correctly, can be the beginning for many learners to revisit and restart their own learning journeys. I have taught many learners that originally enrolled on a family learning course at their child's primary school and caught the learning 'bug'. A few years later they have secured employment as teaching assistants, learning mentors, administrators, crèche workers, play workers, enrolled on an accredited college course or went on to study at university.

One of my greatest challenges in 2005 was to inform and 'win over' early years staff in the area of the dreaded basic skills and the even

more feared numeracy! Probably they all shared the idea that basic skills was extremely tedious and boring and of no interest to their client groups. The Early Start Programme was part of a contract that Bridge had with Sunderland Adult and Community Learning where we worked jointly with SureStart. I was asked to deliver a workshop and presentation at a Sharing of Good Practice Event at Sunderland Stadium of Light. The audience included early years practitioners, Connexions staff, representatives from voluntary and community groups, primary school teachers and other interested parties, in fact a very mixed group. I decided that I would use the theme 'Playdough can be educational and fun!' Throughout the session I referred to theorists and psychologists beginning with a reference to Vygotsky's theory that states "*learning awakens a variety of internal developmental processes that are able to operate only when the child is interacting with people in his environment and in cooperation with his peers. Once these processes are internalised, they become part of the child's independent developmental achievement.*" 1978 p90). Followed by Bandura's social learning theory 1965 which shows that children learn from watching others.

The scene was set with the aid of a PowerPoint presentation that outlined the different programmes that I delivered and how I approached the Skills for Life Strategy (usually very successfully). I also showed how the Adult Literacy Core Curriculum, Adult Numeracy Core Curriculum, the Primary Literacy Strategy, The Primary Numeracy Strategy, Foundation Stage Curriculum and Birth to Three Matters could be used to plan and be easily incorporated into the sessions.

The workshop described how a session would be approached by making playdough using non standard measure, which could be further developed by using and converting metric and imperial measure. The learner would have to follow a set of numbered instructions. Throughout the activity one would discuss other subjects of interest e.g. art and colour mixing or science and the changes of state. Most learners enjoy this experience, as playdough is so quick and easy to make. The group would then work in pairs where one took on the teacher role and one the learner role, which could be reversed and repeated. They had to follow an activity



script that explored positional vocabulary in Year Reception. The learners feel very relaxed and enjoy the informal/fun approach. This activity actively encourages speaking and listening and learners freely participate in this activity. As the session is delivered in a non-judgemental, non-threatening environment learners readily ask questions and will admit that they do not understand the language. I was asked to deliver a taster session to a New Me group (these women often have very low self esteem, are lacking in confidence and have mental health issues). By Week 6 one particular learner had never participated in any activity during the course and had said that she did not want to join in the session. However, much to everyone's amazement she did join in with the other learners after about 15 minutes and told everyone how she really enjoyed the session.

Normally the session is carried out as a group where the activities are all demonstrated, discussed and practised before the learners work alongside their children. This approach is very successful, as they feel confident with their own abilities and feel able to mirror the session with their child; I am always there to offer empathetic support and guidance. This session has also been adapted in order to include nursery-aged children, obviously with a little more support and guidance from their parent/carer. This approach links with Vygotsky's (1978) thought that children's learning of new cognitive skills is guided by adult/sibling interaction; they model and structure the child's learning experience. Bruner later called this process 'scaffolding'. Vygotsky's Zone of Proximal Development theory explored a range of tasks that are too hard for the child to do alone but they can manage with guidance. Therefore, as a child becomes more skilled the 'Zone' shifts upwards to include even harder tasks. Vygotsky thought that the key to this interactive process lay in the language that the adult uses to describe or frame the task. Later the child could use this same language to guide her independent attempts to do the same kinds of tasks.

Using language from The National Numeracy Strategy Mathematical Vocabulary 2000 book can also extend the activity. The learners would choose a particular year group and then compile a new script that includes the appropriate vocabulary. This particular session would link to the literacy element.

In the next instance I developed a set of literacy activities using playdough as the theme. As a group we mind-mapped a list of health and

safety issues that parents/carers must be aware of when carrying out the activities. The emphasis then changed to feelings and how stressed/uncomfortable children may become when asked to use the playdough and "make a dog!" or "is that a cat?" Each parent/carer was given a piece of playdough, they had no choice of colour, size etc, and a picture card (they were asked to show no one the card). They were then told to make the object on their card and when they were finished the other members of the group had to guess what it was. I then went on to discuss how they felt and everyone agreed that they would approach similar activities in a very different way due to this experience.

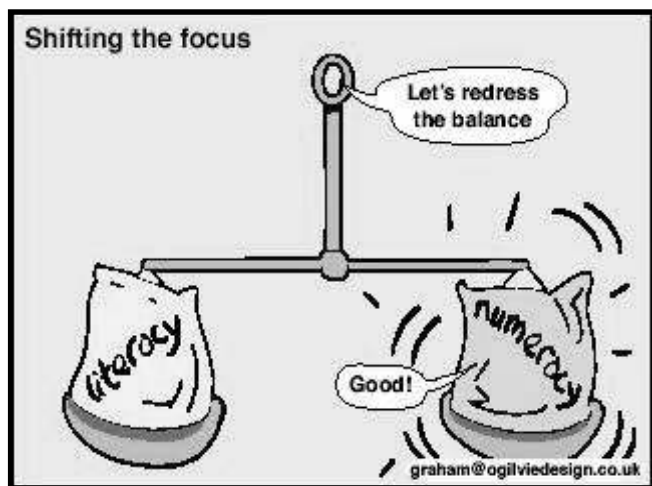
In order to incorporate adult learning and progression I developed a 'word class' activity. In a session we would discuss the eight different word classes, their names and examples of how and when they would be used. Then each learner would be given a handout explaining what we had discussed, which we would read through and check for understanding. We would explore adjectives, verbs and then nouns as part of the activity. All learners would then be given a picture card and in turn they would offer an adjective that they felt best described the object on their picture card (support would be offered if needed). The other members of the group would then try to guess what the object was. The group would take it in turns offering first an adjective, the next round a verb and then finally a noun. Again this session was fun and the whole group were extremely supportive of one another. As well as supporting their own learning needs some learners commented upon how they would feel comfortable enough to support their older children with their homework.

The final session/sessions would be where ICT would be used. Hansman-Ferguson & Wilson(1995), Moeller (1993) found that the use of ICT enabled collaboration amongst learners, sometimes with the support of the tutor. It can also aid writing for 'genuine purposes and real audiences' (Maring et al, 1997). Throughout the previous sessions I would have taken photographs with a digital camera, with the learners' consent. Before the final session the images would be downloaded onto a laptop and a set of images printed out. At the beginning of the session we would discuss the previous session's activities and then as a group decide on how we could incorporate a numeracy theme and compile a booklet for everyone to keep as a memento. The ideas always flowed and often the page border would incorporate shapes and colour, the images allowed for questions pertaining to number and positional vocabulary.

sequence the images before adding the text whilst I acted as the facilitator (Smith 1983), encouraging and developing discussion, but not taking control of the group. I also provide positive feedback; however, I attempt not to be the source of the knowledge. The role that I undertake is simply collaborative. Hall & Robinson (1994) showed that when teachers consciously withdrew from a dominant role, the fluency of children's writing increased as a result of their empowerment. This also appears to be the case with the groups of adults that I have worked with. During the joint session the parents/carers would guide and support their children. Teachers and parents/carers should:

"create the situations and construct the initial devices which present useful problems to the child" and "provide counter-examples that compel reflection and reconsideration of over-hasty solutions" (Piaget, 1969, p.16).

This small project has always proved to be very successful and when the practitioners at the Sharing of Good Practice Event were introduced to it they were all very complimentary and felt that they could work alongside a skills for life tutor and promote the Early Start Programme.



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Section 2. Maths4Life and other projects - Teaching, Learning and Research Resources on Adult Numeracy from the NRDC

Diana Coben - King's College London

Dr Diana Coben teaches and researches at King's College London, where she is Reader in Adult Numeracy. She is dedicated to bringing together researchers and practitioners in adult mathematics/ numeracy education and she was Founding Chair of Adults Learning Mathematics - A Research Forum (ALM) (www.alm-online.org), which does just that.

Maths4Life is the latest and largest project on adult numeracy so far undertaken by the National Research and Development Centre for Adult Literacy and Numeracy (NRDC) in England. This article outlines what's happening in Maths4Life and other NRDC numeracy projects and gives an update on teaching, learning and research resources on adult numeracy from the NRDC.

Maths4Life

Maths4Life is a 3-year project which started in 2004 and aims to stimulate a positive approach to teaching and learning in numeracy and maths, in particular, "to contribute significantly and measurably to high quality, attractive numeracy and non-specialist mathematics provision post 16, which responds to the needs of increasing numbers of *Skills for Life* learners". The Maths4Life website is at www.maths4life.org.uk.

Maths4Life researchers from King's College London, the Institute of Education University of London, the University of Nottingham, LLU+ at London South Bank University, LSDA, the DfES Standards Unit and other organisations are working with teachers and managers to investigate:

- what individual teachers do;
- what professional development they need to do it better;
- what whole organisations need to do to facilitate these.

Maths4Life pathfinders

Maths4Life started with two sets of pathfinder projects. Stage One pathfinders focussed on motivation: attracting adult numeracy learners; attracting teachers to numeracy teaching; talking up numeracy; and the role of ICT in the engagement of learners. The final report for the Stage One pathfinders will be available from 8 February 2006. Pathfinders in Stage Two explored various issues, including: the integration of formative/diagnostic assessment techniques into teachers' routine practice in adult numeracy; the development of a professionalised, qualified workforce; decisions in mathematics/numeracy that count in health and social care; and projects based in different workplaces.

Maths4Life Effective Practice project

Following on from the pathfinders, the Maths4Life Effective Practice project is working with the DfES Standards Unit (SU) Mathematics Team to extend the work of the SU 'Improving Learning in Mathematics' project (www.dfes.gov.uk/successforall/index.cfm?pg=185) to learners, teachers and organisations working in numeracy and maths up to Level 1 in various settings in the learning and skills sector (the 'Improving Learning in Mathematics' project covered Levels 1-3). The project is based on Malcolm Swan's research (Swan 2005) and has two related aims: to help learners to adopt more active approaches towards learning and to develop more 'connected' and 'challenging' teaching methods.

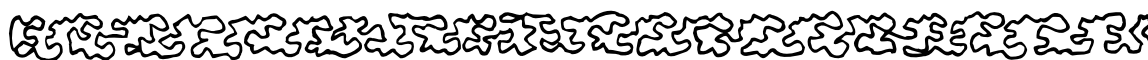
The principles which inform the project are:

- Build on the knowledge learners already have
- Expose and discuss the thinking behind common misconceptions
- Use higher-order questions
- Use cooperative small group work
- Encourage reasoning rather than 'answer getting'
- Use rich, collaborative tasks
- Develop connections between topics
- Use technology in appropriate ways

The Maths4Life Effective Practice project started in October 2005 and will last about one year. It has three phases. The trial phase included six sites across England, mainly located in Further Education colleges. In the second phase, which was launched in Warwick on January 26-27, a further six sites have been added, widening across a wider range in the sector. The second phase involves piloting materials and approaches that have been developed in the light of the trial. The third phase will involve final revisions of models and materials, and write-up of the project report.

Online Numeracy Research Database

The Numeracy Research Database (Coben et al., 2004) is a comprehensive searchable online database of adult numeracy research, with many entries annotated. The database accompanies and complements the report 'Adult Numeracy: A



review of research and related literature' (Coben et al., 2003) and includes sources from the wider mathematics education literature (across all ages), as well as relevant sources from related fields, such as psychology, sociology, etc.. It is designed to be especially useful to those studying for teaching qualifications in adult numeracy, those studying at Masters or doctoral level, or undertaking research to inform policy and practice.

Effective teaching and learning projects, 2003-06

Meanwhile, five projects to identify effective teaching and learning practices in reading, writing, numeracy, ICT and ESOL are running concurrently, building on the American Institutes of Research report, 'What Works Study for Adult ESL Literacy Students' (American Institutes for Research, 2002).

The numeracy project complements Maths4Life as it is investigating the range of approaches to the teaching of numeracy to diverse adult learners learning in different settings, to ascertain the progress learners make, and the correlation between teaching and learning, and to make recommendations for effective practice in teaching, teacher education and CPD, and for intervention studies. Findings from Phase 1 of the project include:

- Adult numeracy learners are not a homogenous population; what may be effective in terms of learning outcomes for one numeracy class, may not work for another class.
- Overall, learners scored significantly better at the second assessment compared to the first one.
- A small but non-significant positive change in attitudes towards mathematics between the two time points.
- Most teachers demonstrated good subject knowledge and used a range of activities and worked through examples. About half broke work down into smaller steps and made connections to other areas of maths.
- Most teachers used resources to enhance learning but hardly any used practical apparatus, games, computers or calculators. Worksheets were used extensively; few used textbooks; only a third of teachers commonly used a plain white or black board.

The project is based at King's College London and ends in March 2006. Our final report is in preparation.

Teaching and learning common measures

'Teaching and learning common measures especially at Entry Level' was a 20-month teacher-researcher project based in Further Education colleges and prisons and run from King's College London and the University of Nottingham. It pre-dated Maths4Life and ran alongside the 'Making numeracy teaching meaningful to adult learners' project (see below), ending in August 2004. The project aimed to establish the features of successful learning and teaching of measurement to adults, especially at Entry Level. Two apparently contradictory themes emerged:

- Work on measurement is important for gaining qualifications (and qualifications are important) but people do not need measurement skills in their everyday lives.
- What are numbers if they are not connected to something? Measurement should be at the heart of the adult Numeracy curriculum.

These themes are explored in the project report, which will be published in April (Baxter *et al*, 2006). Meanwhile, the teaching and learning common measures website

(www.nrdc.org.uk/content.asp?CategoryID=511)

includes copyright-free resources produced as part of the project, which teachers and students may edit and adapt to suit their own contexts. They include teaching and learning materials to support working on measurement skills, but also readings on the history of measures, measures questions in different styles to support discussion of students' preferred ways of working, weblinks to useful sites, relevant images, a scheme of work focused on measures and a measures webquest.

Making numeracy teaching meaningful to adult learners

This teacher researcher project aimed to explore adult learners' relations with numeracy in both formal and informal contexts, based in three colleges of Further Education in different parts of England. The two principal methods of data collection were by semi-participant observation within the classroom, and semi-structured interviews with learners. The project found that:

- Mathematics does not have to be functional to capture learners' interest, involvement and imagination.
- Learning is inextricably linked to identities and the learners' biographical contexts are the most important things they bring to the classroom. It is therefore vital for teachers to get to know their students as well as possible.



- Few of the learners' motivations for joining, and continuing to attend, numeracy classes were related to perceived needs within their current employment, or to a feeling that they lack skills in their everyday life. The main motivations for learning expressed by learners in this study were:
 - to prove that they have the ability to succeed in a subject seen as being a signifier of intelligence;
 - to help their children;
 - to be challenged and engaged;
 - for the enjoyment.

The project report was published in October 2005 (Swain, Baker, Holder & Coben, 2005).

Other NRDC numeracy-related publications

In addition to the reports and other resources detailed above, other NRDC numeracy-related publications include: *Financial literacy education and Skills for Life* (Coben, Dawes, & Lee, 2005); *Does Numeracy Matter More?* (Parsons & Bynner, 2006); *The implications for post-16 numeracy of the Smith and Tomlinson reports, the 14-19 White Paper and the Skills White Paper - A policy summary and discussion paper* (NRDC, Feb 2006); *Maths4Life Pathfinder report (Stage 1)* (NRDC, Feb 2006). NRDC reports, interactive materials and the online database are available on the NRDC website (www.nrdc.org.uk)

Note

This article is based on a presentation at the ALM* Symposium held on 30 January 2006, at the Westbury Centre, London Borough of Barking and Dagenham.

*ALM is Adults Learning Mathematics, an international research forum bringing together researchers and practitioners in adult mathematics/ numeracy teaching and learning in order to promote the learning of mathematics by

adults. Our next conference, ALM13 'Crossing Borders - Research, Reflection and Practice' will be held in Belfast, Northern Ireland from Sunday 16th to Thursday 20th July, 2006. All welcome and there is a fund to which UK-based ALM members who are presenting their work at the conference can apply to support their attendance, details are on the ALM website (www.alm-online.org).

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Reducing Student Resistance to Using Math Manipulatives

Kate Nonesuch

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This article was first published in *Literacies*, No.5, Spring, 2005 (Toronto).

When I began teaching Math 020 (fractions and per cents) twelve years ago, I started teaching as I had been taught, that is, the teacher did the math at the blackboard and the students watched the teacher do math, and listened to her talk about doing it. From the beginning, I knew it wouldn't work; students were bored and frustrated by their lack of activity and their lack of understanding. I was bored and frustrated by their lack of engagement and their lack of understanding. I wanted more. I decided to introduce some manipulatives in order to offer them a concrete invitation to join me in doing math.

In this article I will discuss the sometimes difficult but ultimately rewarding road to using math manipulatives with the adult students I have taught in the intervening years, in light of some of the principles and goals of the math department at the Cowichan Campus of Malaspina University-College where I work, and more particularly in light of the philosophy of teaching and learning at the Reading and Writing Centre, a storefront literacy program that is part of Malaspina, and in light of some aspects of my personal teaching philosophy. At the Reading and Writing Centre our goal in teaching basic numeracy is to prepare students for the next level, equivalent to grade 10 math, from which they might move into a trades program or go on to grade 11 or grade 12 algebra. Hence we do not teach 'everyday' math or life math or business or consumer math, although we try to use examples and problems from everyday life and from trades applications. Our philosophy at MUC, Cowichan Campus, is to teach math concepts, not only algorithms, and to teach groups of students whenever possible, rather than providing self-paced programs for students.

The use of manipulatives, it seemed, would fall within those parameters. They could certainly be useful in teaching concepts, and I suspected that they would be useful in class management, since I thought using them would help even out the differences in students' abilities to remember what they had previously learned, and in their confidence at doing math. I hoped that making

manipulatives part of the assigned work in the class would mitigate that difficulty that always comes in a teacher-paced class, that is, that from the first day there is a gap between how much explanation, attention and practice is needed from one student to the next, and, as time goes on, the gap gets wider. In our program, we prefer to struggle with these difficulties rather than go to a self-paced delivery style. We want the advantages we see in group teaching and learning, and we notice that self-paced is often dead slow.

I thought that using the manipulatives to do fractions work would make more of a level playing field; that the students who were confident and dextrous with the pieces might not be the same students who were confident about their ability to manipulate numbers mentally in that often rote process that leads to the right answer, and that the leadership of the class might be spread out a little more widely. Eventually, that proved to be the case, but not before I encountered intense student resistance to using the manipulatives, and developed some ways of reducing it.

I began by introducing some homemade manipulatives, strips of paper representing one, colour coded so that halves, fourths, eighths and sixteenths were pink, thirds, sixths and twelfths were blue, etc. I began by using them in the class, so that students each had a set and could manipulate them with me as I taught various lessons. I assigned them the job of using the strips to prove their answers to some exercises involving equivalent fractions and adding and subtracting fractions. Later I bought a variety of commercial manipulatives, sets of plastic towers and flat squares and circles cut into various fractions. I also bought two sets of cardboard pizzas, each set having several pizzas in full colour, some cut in halves, others in quarters, thirds, eighths, etc. Over a period of a year or two, doing 'proofs' become more and more central to my math class, and I began to let the individual work with manipulatives do more and more of the teaching of the concepts, while the whole class discussions, lectures and practice activities focussed on reviewing concepts and practicing the algorithms.

I had expected some resistance from students, but was not prepared for the strength of it. Students resisted using both my homemade manipulatives and the commercial manipulatives, their responses ranging from silent withdrawal to open refusal to use them. Over the years, I have tested different strategies of honouring student resistance and working with it rather than against it. I find that students need to be able to express their resistance in order to maintain their sense of self in the class, and that when they can do so with dignity, they are more likely to be able to stay present and attend to the work. When Arleen Pare (1994) did some research for her MA thesis in my classroom, she found a positive correlation between student expression of resistance and student retention. The more complex and open their resistance to me and my teaching, the more likely they were to continue to come regularly:

These results suggest a positive association between conscious, active resistance and regular attendance. It also suggests that the more that conscious resistance is encouraged, the more likely it is that regular attendance will result (115).

Students sometimes express their resistance by leaving the class, but over the years I have developed a teaching stance that recognizes, honours and encourages open expression of their resistance, and hence many students will question the use of manipulatives, although, as you will see from the examples that follow, their resistance may be indirect, and often comes in the form of a question that is not a real question.

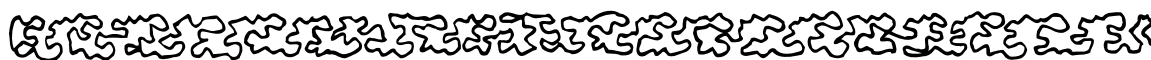


“This is not real math.”

I made a mistake the first time I brought the commercial manipulatives to class; I was excited about them, and I said something like, “I’ve got a bunch of new toys for us to play with.” It hit the wrong note with the students: they were not in the class to play games, and in any case, they did not expect to enjoy any math activities. I soon learned to call the manipulatives ‘math tools.’ Nearly every student who enrolls in the class has years of experience as a math student; it stands to reason that they have a firm idea of what math class should be and what success in math looks like. They expect me to give them sheets of questions and some tricks to help them remember how to work with fractions. When I don’t, they resist. “This is not real math.” I deal with that resistance by acknowledging that what I am asking them to do is not what they are used to, and it feels strange. I ask them to tell me all the ways they have tried to learn math in the past. Then I ask, “Does any one know a way to learn math that really works?” Invariably, nobody does because they have all been previously unsuccessful. This conversation with students is part of making my work and theory transparent, and makes them partners in designing their own learning. The discussion about past methods of learning math, an evaluation of what parts were more useful or less useful and the conclusion that something new needs to be tried, means that they are part of the team talking about what form teaching will take.

“How can those things help me learn?”

At the Reading and Writing Centre, we aim to make the learning process more transparent so that students can make decisions on how best to accomplish their academic goals; we ask students to be in control of their learning and to understand their own ways of learning best; and



we offer a variety of modalities to students in every subject area. I often do some work with students on learning styles, and using manipulatives gives them a chance to experience and talk about their own styles "I'm a body (kinaesthetic) learner, and holding the pieces and piling them up helps me remember;" or "I'm an eye (visual) learner, and the different colours and patterns really help me remember how things go together."

"Why do we have to use those things?"

My answer to this question is, "You don't have to use them." No matter the theoretical discussions referred to above, or the general agreement in the group to try this new way of learning math, any individual is free to choose whether or not to use the manipulatives. This is fundamental to my stance as a teacher, a refusal to get into a power struggle with a student about the way learning will take place, and a desire to honour their resistance to being put into the traditional one-down role of the student. Of course, I am not saintly enough to pull this off every day, but every day I strive to do it. So I do not require students to use the manipulatives. Their assignment is to prove various propositions that $\frac{3}{4} = \frac{6}{8}$, that $2\frac{2}{3}$ plus $1\frac{1}{2} = 4\frac{1}{6}$, $\frac{1}{2} \times \frac{1}{3} = \frac{1}{6}$ and even that $\frac{1}{4}$ divided by $\frac{1}{8}$ equals 2. If they want to use drawings or apples or anything else that will prove it, they can do so. (If they reject the assignment altogether, we will work on a plan that will allow them to complete the course without doing proofs, although often we are not successful at doing so.) They have the choice to use manipulatives or not; my hope is that this position of choosing will allow them to see the advantages of the tools, so that they might decide it would be worth overcoming feeling silly or awkward about them. In any case, if I insist, if I answer this question with a list of reasons, I am in a power struggle that I cannot lose and the student cannot win except by leaving. The students' right to choose is the only position from which we can both win.

"I feel like I'm in kindergarten."

An important strand of my teaching philosophy is to deal with emotions, my own and the students, so they don't get in the way of the learning. This comes partly from my training as a Life Skills Coach (Saskatchewan NewStart Model). My coach trainer, Audrey Adilman, used to say that it will probably take less than a minute to deal with the emotions that come up in the moment; that if you leave it for an hour, it might take two minutes to deal with them; if you leave it until the next day it might take half an hour, and if you leave it for longer, who knows how long it

will take? I know that a student whose mind and heart is occupied with feeling stupid and resentful about using the manipulatives will not see that $\frac{2}{6} = \frac{1}{3}$, and since my interest is in exactly that, I'll do something to help express the feelings, so we can both get on with the job we came to do. I am happy to hear people express their feelings, but if a student is not expressing anything, just sitting with hands in pocket, I may make a stab at identifying the emotions by saying something like, "When I first started using these I felt clumsy with all these little pieces," or "Sometimes students tell me that the tools are just for kids, and they feel silly using them." That is often enough to open the way to the student expressing the feelings, and once that is done, a rational decision can be made about if and how the manipulatives will be used.

"I'm not allowed to express opinions/I don't have any opinions worth expressing."

I know from my reading (Horsman, 1999) and from my experience that students who have experienced violence may be reluctant to engage in anything as 'out front' as piling up plastic towers, or taking the risk of proving that they know something. Expressing an opinion has been dangerous in the past, and it is not possible to work with the manipulatives while avoiding expressing an opinion. With these students, I will often start by doing the proofs with them, so I am the one building up the plastic towers under their direction. When they have more confidence that they know what to do, they take over. With every student, I concentrate on the fact that the proofs are correct. (It is one of the advantages of using manipulatives that student work is nearly always correct. $\frac{1}{8}$ plus $\frac{3}{8}$ always equals $\frac{4}{8}$ or $\frac{1}{2}$, never $\frac{4}{16}$, a common error students make without the manipulatives.) I ask questions so students can get a chance to articulate what they are doing, but I say first, "This is the right answer." Now they can be relieved of the worry that the teacher is pointing out their errors and concentrate on my questions and the new learning, rather than being lost in the often humiliating process of the teacher proving they are wrong.

How do I know the manipulatives are useful for students learning fractions? And how do I know that I have successfully reduced student resistance to using them? Many observations over the years have given me some evidence: At the beginning of a term, when there are many new students busy resisting using the manipulatives, I have no trouble getting old

students to talk about how useful they are, and old students encourage new students by their words or by their matter-of-fact use of the tools. Many students ask to take manipulatives home to help their kids understand their own schoolwork. Several students have even bought a set of the most popular kind of tool for their kids, at about \$50 a set, more than 10% of the monthly income of many of our students.

Furthermore, students treat the manipulatives as tools: they take care of them, and they use them for their appointed purpose. The same sets have been in use at the Centre for six years, and there are no pieces missing or broken. Even the cardboard pizzas are still in good repair, a little dog-eared, but not torn and not covered with writing or doodling. Four years ago I asked a student to sort some sets of plastic fractional pieces into five plastic tubs, fourths and eighths in one tub, thirds and sixths in another, and so on. The tubs remain perfectly sorted; students take them out and put them back in the proper tub. Since this is not anything I ask them to do, and since many of them are careless about leaving their books and binders around, and don't take their coffee cups back to the kitchen, I infer that there is something special about the tools. I have never seen anyone use a piece of the math manipulatives for any other purpose than doing math; they don't use them for holding down papers, for example, or for propping up a window. I trust that kind of feedback.

I see that manipulatives are a useful way to teach fractions to adult students, as I thought they would be. However, instructors must plan to take into account student resistance to using manipulatives if manipulatives are to be useful in the adult literacy classroom. A careful attention to dealing with emotions, making the students part of the team that plans the teaching methods, giving individual students control over their learning, and inviting students to become more aware of their own learning styles and needs are all strategies I use to reduce resistance to using math manipulatives.

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Integrating formative/diagnostic assessment techniques into teachers' routine practice in adult numeracy.

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Introduction

This article reports findings from a small pathfinder project [1] [2] which set out to develop adult numeracy teachers' ability to assess the mathematical understanding of learners (including possible errors and misconceptions) and better integrate formative assessment into their routine practice. The main vehicle to achieve this was to develop the observational skills of teachers and their questioning techniques as well creating opportunities for learners to articulate their learning, for example through group work. The ultimate aim was to see if these formative approaches could be habitualised into teachers' everyday classroom routines and lead to enduring changes in their practice.

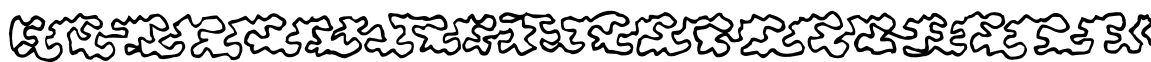
The incentive behind the project came from Noyona Chanda and tutors at the LLU+ Numeracy Professional Development Centre who, through their observation of many numeracy teachers, noticed that few used formative methods of assessment, that is methods that are *for* learning and inform future planning, rather than a summary *of* learning. Moreover, there were many missed opportunities to access learners' conceptual knowledge and thinking skills, and to diagnose strengths and weaknesses. Few questions were asked such as, 'Can you tell or show me how you worked that out?' However, the project was about more than formative assessment and went beyond it. Ecclestone (2003:53) writes that 'information that teachers gain from diagnosis does not become feedback until it makes a difference to learners' performances'. In other words, it is more than just asking questions, it is knowing what to do with the responses. Thus more effort needs to be spent in framing questions that are worth asking, exploring issues which are critical to the development of learners' understandings, followed up by activities that provide opportunities to extend these understandings. In this way, teachers shift their main role from presenters of content to facilitators exploring ideas that the learners are involved with. The idea was to produce a model that is sustainable and can be used for continuing professional development.

Background and methods

The potential of formative assessment to improve teaching and learning is being increasingly recognised amongst policy makers at all levels of the education system. A major influence on the project was the Black Box Project at King's College, London (Black and Wiliam, 1998a). Although it looked at assessment in secondary schooling, many of its findings have a direct relevance for adult numeracy teaching. An extensive review of the literature by Black and Wiliam (1998b) has also been very influential in relation to pedagogy and shown that formative assessment encourages deeper levels of learning, greater learner motivation, and closer relations between teachers and learners. Other literature that was drawn on comes from Derrick (2004) and Lavender (2004), and there are currently parallel developments in formative assessment, which includes a major two-year project initiated by the NRDC [3] in partnership with NIACE [4] and LSDA [5].

The sample involved tutors from the LLU+ Numeracy professional development team working with six teachers of adult numeracy with different amounts of experience two each from 3 colleges of further education in and around London. The colleges were selected on the basis that both managers and the named teachers were willing and able to commit their time and resources to the project tasks. The learners taught by the 6 teachers were a mixture of ethnicities and were aged 16 to 60 plus; classes were working at Entry level 2 to Level 1, and class sizes ranged from 6 to 14.

The project promoted a model that was based on teachers' reflections and interrogations of their own practice, which were modified in conjunction with negotiated guidance from the LLU+ tutors. The tutors visited each of the 6 teachers on three occasions, participating in, and observing, their sessions; the NRDC researcher (Jon) appointed to the project visited each teacher once and noted the types of questions they asked their learners; and individual teachers, from each institution, observed each other's classes twice. Each visit was followed by an in-depth interview of the session that had just been



observed, and these were recorded and transcribed, and findings were fed back to the teachers. Teachers also kept reflective diaries about their growing perceptions of how the project was developing. In addition, there were four group review sessions at the LLU+ Development Centre that were filmed, and included discussions of teachers' reflections and observations with the LLU+ team. Right from the beginning, the project was seen as a joint partnership; the teachers were viewed as co-researchers and their views were valued and incorporated as the project developed [6]. In addition, the learners' views were incorporated through discussion and interviews.

Asking teachers to change their practice is a challenging task. From the teachers' point of view it requires them to take risks in a public arena and to step into a journey into unknown. It is generally more difficult to change practice than keep on using tried and trusted methods.

It actually felt scary to do the session like that, because it was totally outside my control, and I was thinking it was going to go wrong, but it didn't.

DEBB

The project worked because the teachers involved were highly motivated, and their discussions and diary writing revealed them to be highly reflective and critical thinkers who were willing to take risks in the classroom in order to explore a range of strategies.

The process

The project began by focussing on questioning and the type of questions teachers asked their learners. Underlying assumptions were that questions should be simple and clear, and phrased in appropriate language; they need to be interesting, purposeful and stimulate thinking; and also be able to be responded to. Rather than being simply *open* (how many ways can you make 24?) or *closed* (what is 6×4 ?), the teachers realised that questions can be categorised in many ways. While some are about *challenging* (how/why did you do that?); *checking* (do you know what a denominator is?); *uncovering thinking* (can you explain this pattern?); and *offering strategies* (have you thought about using smaller numbers?) others are more *functional* (have you got a ruler?) or *reassuring* (are you happy with that?). Teachers also found that playing *devil's advocate* (are you sure?) was often a very effective strategy.

However, after the first review session, teachers

began to realise that there was more involved than just asking a question: it was thinking more carefully about the question; giving learners the time to answer, and then being able to act upon their responses to move learning on:

The project has really brought up what does your question tell you? And that has quite changed the way I question and the way I respond. It is to literally think about each question what is this going to get me? And OK, if this response is so important I need to wait for it to know what question to ask next. And that as actually changed my practice.
JANE

[It's actually about] how to not answer their question directly, but how to draw more out of that question, kind of shape it more.
BARBARA

In the early stages of the project, teachers also began to realise that it was they who were doing most of the asking, and that some learners were feeling overloaded. The other important lesson was for teachers not to rush through and try and cover a topic too quickly. Understanding needs to be nurtured:

If I allowed myself more time, you know, more time, and limited topics rather than a very wide range [...]. I believe the students feel they are overloaded and they don't answer sometimes. They pretend they understand because they see you pressing to get on with it and cover the whole topic. And that is not the right thing.
SADROLLAH

It was also important to, not only think carefully about the type of questions teachers would ask, but also realise that the learners needed to be encouraged to ask more questions both to the teacher and to each other:

After the initial meeting in London, and seeing the volume of tutor questions compared to learner questions (in particular the type of learner questions), I thought more about the type of questions I was asking. I have now observed that the fewer questions I ask, the more the learners ask.
CHRIS (journal)

However, learners do not just suddenly begin to ask questions; they need to be given a structure.

I say things like can you explain a little bit further? Or can you comment on what

somebody else has said? If somebody raises something, sometimes I use that as a means of getting people to participate. So one person actually raises an interesting point and then I throw it to somebody else can you comment on that? Or why do you think he has raised that? Or if you make a claim about something can you justify it or explain why you think that? Can you put it in your own words? Can you give me some examples? Can you think of an example?
BARBARA

Findings: a summary of the changes in practice

There is strong evidence that engagement in the project has begun to change the teaching practice of the individual teachers involved. The teachers came from different backgrounds and had different experiences, and some had further to travel, in terms of changing their practice, than others. While all of the teachers changed their practice in various ways, some made more whole-scale changes than others. Some of the changes are set out below:

- Teachers began to anticipate the kinds of questions learners would ask and incorporated these into their planning
- Teachers began to ask more searching questions that would uncover learners' blocks and misconceptions; they began to increase the 'wait' time between asking the question and the learners' response.
- Teachers became better observers, which involved being able to stand back and listen to learners' conversations as they worked.
- Teachers began to act on the learner's responses and shape teaching and learning accordingly, for example, bringing in learner everyday experience such as buying wood for DIY purposes.
- Learners began to ask more questions, both to the teacher and to each other
- Teachers began to organise and manage their classes in a different way, and incorporate much more collaborative learning, for example, giving fewer procedural instructions so that learners had to decide for themselves how to present results.
- In two out of the three colleges, a series of staff development sessions were organised, and this has led to a raised awareness of the

effectiveness of using these approaches to questioning amongst the wider community of practice.

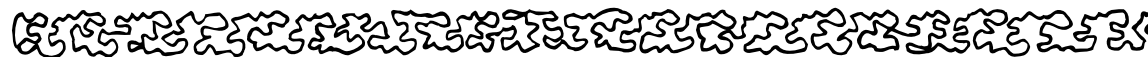
Conclusions and implications and recommendations for policy and practice

The theory behind the approach promoted is an interactive pedagogy based on constructivist ideas of learning; it is based on observation, questioning and creating opportunities for learners to frame questions and interact more, which is integrated into everyday classroom routines. The model is actually more difficult than handing out worksheets: it requires teachers to be more flexible and have a greater confidence to explore areas of mathematics. However, the gains for both teachers and learners are greater learner motivation, more profound levels of learning, and more inclusive relations between teachers and learners.

We believe that there are implications for numeracy-specific teacher education and, more generally, for models of continuing professional development. We feel that this model of diagnostic / formative assessment should be introduced into initial teacher training courses and, also, for more experienced teachers in CPD. It should include in particular, a focus on observational skills; questioning; wait times; and the actions to take on the basis of learners' responses. The teachers' peer visits to each others' lessons, were seen as being particularly effective. Evidence from the project supports the need for all teachers (whether newly qualified or experienced) to have the opportunity for periodic reflection and improvement through peer observation and targeted discussions.

Notes

- [1] The pathfinder was initiated by LLU+ Numeracy Professional Development Centre at South Bank University, which is part of a larger two year project, *Maths4Life*, being coordinated by the National Research and Development Centre (NRDC).
- [2] It is expected that a full report of the pathfinder project will be available on the Maths4Life website {www.maths4Life.org} later this year.
- [3] National Research and Development Centre
- [4] National Institute of Adult and Continuing Education
- [5] Learning Skills and Development Agency
- [6] The teachers' input was an invaluable part of the project. The names of the 6 involved were: Sadrollah Andvari, Jane Barnett, Debb Bouch, Rachel McLeod, Chris Ness and Barbara Newmarch.



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The Scottish Numeracy Energiser..... does what it says on the tin!

Angela Valente

Angela has extensive experience of teaching Mathematics and Numeracy in post-16 education. She currently lectures in Numeracy/Mathematics at Perth College of Further Education and is undertaking research for her Masters degree. She can be contacted on angela.valente@perth.uhi.ac.uk

There has been much activity in recent years in the field of adult literacies yet, until very recently, not much of this has focused on numeracy. Indeed, it has long been recognised by practitioners that numeracy was very much the 'poor relation' in regard to research and resource allocation, a view validated in *Adult Numeracy: shifting the focus, A Research Report and Recommendations for Adult Numeracy in Scotland* by Diana Coben commissioned by Learning Connections, Communities Scotland in 2004. However, recent initiatives have sought to redress the balance and much good work has taken place which should refocus and re-energise numeracy provision in Scotland.

In Diana Coben's report, published in Jan 2005, Coben makes it clear that:

"we do not wish to take adult numeracy out of its place within adult literacies but to ensure that it is not overlooked and that learners are provided with a variety of opportunities to develop their confidence and competence in numeracy as well as literacy" (Coben, 2005, p2).

This links well with the lifelong learning agenda. The interim report published by the Enterprise and Lifelong Learning Committee (2002) states that *"many would argue ... that a reasonable lifelong learning education is necessary to enable citizens to participate actively in modern society"* (p5). In the light of the findings of the report

the Committee proposed the following as the aim of a Lifelong Learning Strategy (ibid, p7):

"to create a culture where everyone has the desire and the opportunity to continuously develop their knowledge and skills, thus enhancing their quality of life and the well-being of society"

Political motivations and intentions aside, this is what adult education in Scotland seeks to address and always has done. Most welcome is the fact that numeracy is beginning to gain prominence and may, at last, be able to take its rightful place along side literacy, sharing equal status in terms of funding and resourcing.

Indeed, the recommendations from the Coben report state that there is a

"need to raise the profile of numeracy within a learner-centred, research-informed approach to literacies that suits adults' needs, rights and purposes for learning" and that this "entails building awareness and developing the capacity both to do and review research amongst practitioners ... and to reflect on practice, something already encouraged in adult literacies tutor training in Scotland" (ibid, p6).

This report resonates with many practitioners in Scotland who had long felt that numeracy was indeed the 'poor relation' there was a



recognition that numeracy had, in effect, come in from the cold. In addition, Learning Connections held the first annual National Numeracy Seminar in Edinburgh in December 2004, heralding a new focus on adult numeracy never before seen in Scotland. There was a call for resources and research to be deployed in the support of all aspects of adult numeracy provision as well as a commitment to improvement at national level alongside a curriculum framework linking numeracy (and literacy) to social purposes. This new framework, *An Adult Literacy and Numeracy Curriculum Framework for Scotland - ALN Curriculum* (Scottish Executive 2005) was described by a practitioner as:

"key both to supporting and delivering a quality service to learners. It combines what is available to be taught with a set of practices that fit the current Scottish context"
(Scottish Executive, 2005, foreword, p5).

The purpose of the ALN curriculum is to provide a tool by which tutors and learners can begin the process of identifying the skills, knowledge and understanding required to help achieve the learners' stated goals, in effect, specifying the framework, providing the tool for dialogue and then letting the tutor and learner 'get on with it' in the way they feel most appropriate. (This is in contrast to the English Curriculum, the *Skills for Life Strategy (2001)*, which specifies in great detail the content to be taught and learned based primarily on what was already in place for schools).

Building on this renewed impetus and as part of its response to the recommendations of the *Shifting the Focus* Report, Learning Connections commissioned NIACE to deliver a Scottish version of its very successful Numeracy Energiser training and to include two Scottish trainers in the training team. The *Scottish Numeracy Energiser* was to be aimed primarily at tutors who, for one reason or another, were not entirely confident in their ability to deliver numeracy to their adult learners. Applications were invited from those engaged in all areas of literacies work including youth, work-based and family learning, whether working in community learning and development, the voluntary sector or further education.

The Scottish trainers, Angela Valente and Jackie Howie, were recruited in June 2005 and work on the Energiser weekend, scheduled for November 2005, began immediately under the direction of Janet Swinney, project co-ordinator, NIACE. This

built on the success of the earlier energisers with adjustments made to take account of the differing Scottish educational, social and cultural context as well as the differing expertise and knowledge of the Scottish trainers.

The aims and objectives of the Scottish Numeracy Energiser weekend presented to the 36 participants were as follows:

- to enrich our own mathematical thinking
- to acquire methods for helping learners with varied backgrounds, perspectives and experiences of numeracy/mathematics to become confident and competent adult citizens
- to have some fun!

We hoped that by the end of the weekend we would:

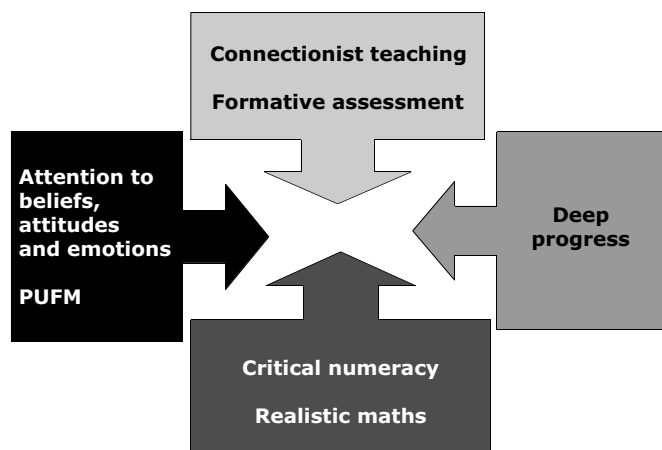
- feel more confident about our own mathematical skills and knowledge
- be aware of some of the issues associated with assessment
- have identified some ways to help learners develop their critical thinking skills using numbers
- have identified some approaches to use with learners who struggle with concepts and operations

The weekend was based on beliefs, attitudes and emotions, connectionist theory, critical thinking and the PUFM (Profound Understanding of Fundamental Mathematics) required by adult literacies tutors in order to be *"better able to understand, apply, and teach mathematics to their students"* (Coben, 2005, p27). The diagram below helps illustrate the *"coming together of approaches"* (ibid, p28) that may help inform adult numeracy education in Scotland.

The structure of the weekend was as follows:

- an introduction to current issues in adult numeracy teaching (presentation)
- ice-breaker activities
- what we need to know about learners and how to find some of it out (presentation followed by small group and whole group activities)
- learning and teaching: planning a programme of work (using everyday objects) to enable learners at a variety of levels to carry out a social investigation using mathematics/numeracy (group activity followed by group assignment)

- learning and teaching: ways of teaching operational skills (workshops)
- presentations by the groups on the learning programmes they had devised
- a round-up of events linking the work covered to the mathematical model set out in *Shifting the Focus* (p28)



Throughout the weekend the trainers attempted to engage the participants with the idea of 'community'; this meant thinking about the communities we are all part of, for example, the community of yourself, your family, your local community and the world! Participants were encouraged to think about social and global considerations when designing any piece of work. In addition, the concept of *Bloom's Taxonomy* was introduced in order to help develop critical thinking. Bloom (1956) developed a classification of levels of intellectual behavior in learning. This 'taxonomy' identified a hierarchical structure containing six levels: knowledge, comprehension, application, analysis, synthesis, and evaluation. In presenting their feedback on the work plans they had produced, participants were to give consideration to these concepts also.

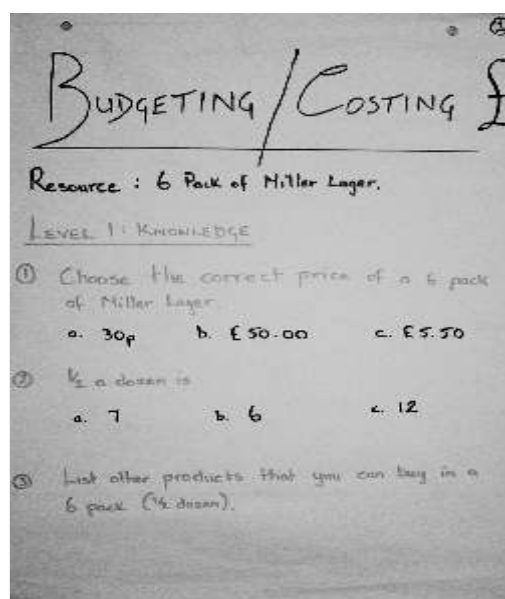
For the trainers, the culmination of the weekend and the work leading up to it was, in fact, these final presentations given by the participants to the rest of the group. The presentations were of an extremely high standard, demonstrating that the participants had engaged with many of the ideas and concepts introduced to them.

There were presentations on chocolate biscuits, packets of crisps, lipstick, petrol and disposable nappies, to name but a few. The presentations, whilst serious in intent, provided much amusement and hilarity within the group, mainly due to the enthusiasm, humour and camaraderie of those involved. One particularly good example was the presentation using *cans of*

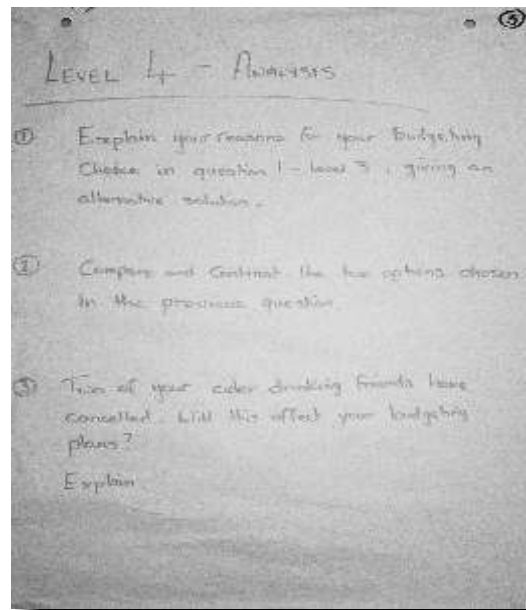
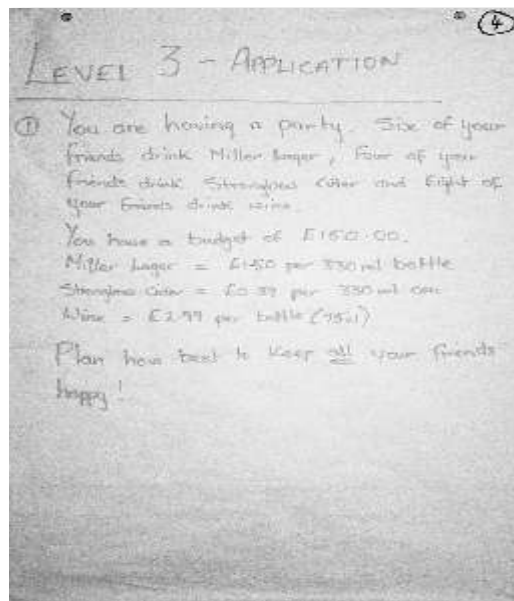
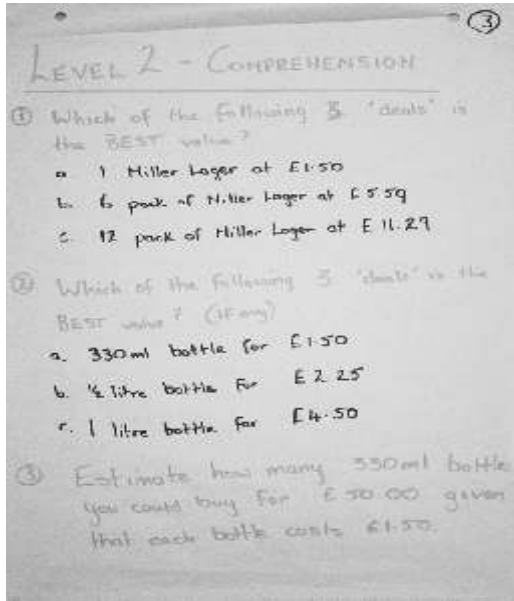
lager as the central theme. From the pictures below, it is clear that this group considered all the ideas of community and at least four levels of intellectual activity (allowing for differentiated learning) for their 'group of learners'.



Although there is a limit to how much can be covered in a weekend, all in all, the Scottish Numeracy Energiser was a phenomenal success. In addition to making new friends, it equipped those who took part with many ideas and tools to take back to their place of work and begin to apply with their learners.



To summarise, in the words of one participant, the Scottish Numeracy Energiser 'did what it said on the can!'



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Copy Deadlines for the RaPAL Journal 2005-06

Please see below for details of themes, deadlines and editors for the 2005-2006 RaPAL Journals. Please send your articles, comments, suggestions etc to Deirdre Parkinson (deirdre@dp-associates.org.uk) by the deadline dates shown, although the earlier you can send your submission the better if you want to guarantee consideration for any particular issue.

Don't be concerned if your chosen piece does not seem to fit with the themes selected as there will be 'open' space within the themed editions for work-in-progress or commentary in general.

Please note: these dates are **final** deadlines.

Issue	Copy deadline	General Theme	Editors
Summer	Friday 14 th April 2006	Appraisal of policy in England, Wales, Scotland & Ireland	Yvon Appleby; Sarah Rennie; Jim Crowther
Autumn	Friday 29 th Sept 2006	Conference 2006 edition: Transforming Literacies	Fiona Macdonald; Deirdre Parkinson

Section 3

What motivates or demotivates adults to improve their numeracy skills? A study of learners and non-learners in a range of sectors in Brighton and Hove.

Dr Alison Kelly

Alison Kelly is a part time lecturer, researcher and course designer for City College Brighton and Hove. This article forms part of a forthcoming NRDC paper reporting on the second round of the Practitioner Led Research Initiative. Contact details: ak@ccb.ac.uk

Statement of Research Problem

In a learning environment driven by the need to hit government targets, the need to identify and engage new groups of learners is ever urgent. Many agencies, including those partners listed in this project, have seen a rise in activity in literacy and ESOL provision without a parallel rise in numeracy recruitment. In order to further our understanding of why this is, this project seeks to add to our knowledge of learners and potential learners by investigating the perceptions and experiences of numeracy teaching and training held by adults. A review of recent research informed the study, both in terms of chosen methodologies and to enable testing and assessment of the degree to which the recommendations of previous research were appropriate and useful for our target groups. The conclusions of the research will allow the members of the Brighton and Hove Learning Partnership to better plan the delivery and marketing of future provision that matches the needs and expectations of adults. Planning of effective delivery and marketing of appropriate provision are concerns that resonate across the domains of adult learning. The experiences from this project could therefore be usefully transferred to other providers and learners as well as to those funding provision and responsible for achievement targets.

Background and Context

Swain et al (forthcoming) make some useful suggestions about teaching quality, relevance, initial contact between student and institution, management and government policy in relation to motivation and numeracy. These were incorporated into interventions forming part of the project (e.g. the taster session described below) and should be considered as integral to best practice and continuing improvements.

Making the decision to return to formal education can be a daunting experience for many adults. This is because many who return have had a poor experience of schooling (and of mathematics teaching) and see themselves as failures. Although FE colleges are initially viewed as being institutions similar to school, this perception amongst the students in this study

soon changed. The nature of the first contact with the college, and then with the teacher, is therefore crucial.

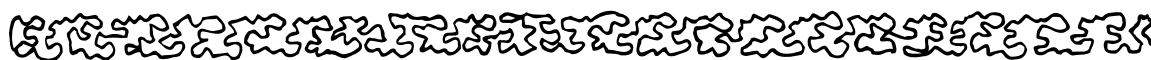
The teacher plays a crucial role and the quality of teaching is at least as important as the mathematical content. Although teachers often need to set mathematics in real contexts and use real examples to make it more understandable and interesting, mathematics is not necessarily made any more meaningful by making it more applicable to a specific adult's everyday life.

The motivations for joining, and continuing to attend, numeracy classes are many and complex. However, few of these are related to perceived needs in current employment, or to students' feelings that they have a deficit of skills in their everyday life. The main motivations for students in this study are:

- 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;
- for understanding, engagement and enjoyment;
- to get a qualification for a particular course or improve career prospects

For some students, there is the additional reason of functionality, that studying mathematics enables them to cope better with the maths they come across in their lives outside the classroom. However, we feel that this is usually a comparatively minor incentive to attend classes. (Swain 2004:5)

Swain's study raised some important issues for our research. Firstly, the small size of Swain's sample justifies the testing of his findings in our own sample, particularly with regard to students' experiences of learning maths at school, their motivations for improving their numeracy skills at college, and the factors that impact on the students' engagement with the subject. Our research aimed to investigate this through interviews with 50 current numeracy learners. Secondly, it poses a challenge to ensure that the



students' first contact with the college incorporates important elements of best practice. To this end, this project aimed to develop new taster sessions to assess the impact of Swain's suggestions on the recruitment process. He also makes important points about the negative effects of diagnostic testing, and the more constructive use of learner biographies. Further discussions with Alison Tomlin on this point uncovered an excellent approach to using line graphs as a way of describing and mapping learners' maths histories (Tomlin 1998)

Baxter et al's forthcoming NRDC study into the teaching and learning of common measures provides a fascinating insight into motivation:

There have never been as many students in adult numeracy as in ESOL (in some areas) and literacy. Numeracy is now a high priority subject and providers are encouraged to recruit as many students as possible. One means of expanding provision is to amalgamate numeracy with literacy as part of a combined course, as both the FE colleges had done. None of the students with whom we spoke resented being steered into numeracy - for example, Cartel went on to say that he had become interested in mathematics through attending the course - but the pressure for numbers forms the backdrop to our study.
Baxter et al, (forthcoming)

It appears that students' motivation is not necessarily affected by the degree to which they have been 'steered' into numeracy. This obviously has far-reaching implications for the marketing, provision and course structure of numeracy courses. Interviewing both Key Skills and Basic Skills current numeracy students offered a useful comparison between those who have chosen to study numeracy, and those for whom it was a compulsory part of their course. Offering mandatory or incentivised 'taster sessions' (which also incorporate the elements of best practice described above) was a method of examining the impact of steering upon motivation within the time frame of this study.

To summarise, there seemed to be three central themes emerging from recent research which related to the focus of our study: Firstly, that 'steering' does not adversely affect motivation, by which I mean that it appears that students who have been pushed onto numeracy courses can thoroughly engage with maths and be motivated to succeed. This sometimes happens

as part of a larger course or package, such as return to study courses, Pre-Access / Access, Key Skills. But what seems more important than having chosen to attend numeracy courses, as far as motivation is concerned, is that certain elements of best practice are in place (see Research Question 2, below). Secondly, that the first contact with the college is crucial to help overcome anxieties about returning to study and to challenge images of learning that persist since bad experiences at school. Thirdly, that mathematics does not have to be functional to engage students. In other words, students can become thoroughly engaged with pure or abstract areas of maths without it having immediate application to their everyday lives. This is important not just for the way that numeracy is taught and the ways in which course content is developed, but also in the way courses are marketed and how we conceptualise the potential numeracy student.

Research Questions

In general terms, the research problem required the project to focus on investigating who our target market is, how to attract them and how to keep them engaged to succeed in improving their numeracy skills. The research questions emanated from the research problem and the insights provided by the reviews of other current research:

1. What are the motivating and demotivating factors affecting current adult numeracy students' desire to engage with and succeed on adult numeracy courses?

Although research has been done on this and continues to take place within other projects, we felt that there is nothing to be lost and perhaps much to be gained from looking into it further. By comparing Key Skills and Basic Skills learners, along with non-learners, we hoped to gain insights into the differences in motivation between involuntary and voluntary numeracy students.

2. To what extent can these factors be incorporated into elements of good practice in order to recruit, engage and motivate the reluctant numeracy student?

Jon Swain's research suggests that first contact is central; that taking learners' biographies is more valuable than diagnostic assessment (which can be a very negative experience), or

ILPs (which can be irrelevant and difficult to implement); that quality of teaching and the teacher's ability to connect with the learner's situation is crucial; that soft targets such as interpersonal skills and the creation of a cohort peer group heavily impact on the learner's enjoyment of the course and motivation to study; that the course content needed to attract the learner may be different from that needed to sustain and engage the student. It was hoped that this information, along with the data collected from our 50 current learners, would be able to inform design of the taster session and future marketing and curriculum development.

3. Would mandatory extended taster sessions in numeracy have the motivational force necessary to 'sell' numeracy courses to those who would not have otherwise chosen to study numeracy at this time?

This was really the focus of our research. We wanted to be able to examine what happens to learners' motivation when they are forced to study numeracy, but the time constraints of the study did not enable us to look at this over the period of a course. This, combined with the hypothesis that the factors that motivate or demotivate people to enrol on a numeracy course, are different to those affecting students' motivation to engage with and succeed at numeracy, led us to the idea of compulsory taster sessions, aimed at people who would not have chosen to study numeracy at this time.

Research Design

The research took place at City College Brighton and Hove, mainly involving Basic Skills and Key Skills numeracy lecturers who participated in both the design and the data collection. The primary research was composed of two stages. Firstly, we looked at current numeracy students in order to discover what motivates or fails to motivate them, and secondly, we designed an 'incentivised' taster session for students who would not have chosen to study numeracy at this time.

Alison designed interview schedules that she piloted with some Access students. These were adapted for Key Skills students and (separately) for Basic Skills students and circulated to the practitioners to read through. A training session was then held by Alison for eight practitioners covering interview design and technique. All practitioners were involved in the design process. Most of the practitioners teach Basic

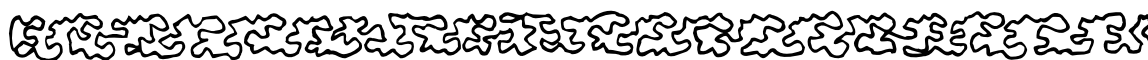
Skills or Key Skills Numeracy and their experience with these students was invaluable in shaping the final interview schedules. Following the training session, Alison re-wrote the interview schedules and they were circulated again for final proof-reading by the team before being sent to Jon Swain for checking.

The main message from the interviews of current students, for the purpose of designing the taster session, was that most people had extremely negative experiences of learning maths at school, found the prospect of studying it as an adult very daunting, and found learning it at college a very positive experience (particularly for the Basic Skills students). From this, Alison designed the data collection element and structure of the taster session, while the maths lecturers designed micro-teach numeracy activities.

Method of Data Collection

Of the current students interviewed, 33 were on Basic Skills Numeracy courses, and 24 taking Application of Number as part of their Key Skills courses. The practitioners mainly interviewed their own students in breaks or at the end of teaching sessions, and students were given a lunch voucher for participating in the research. The interviews were structured with mainly open questions but listed prompts to help students if necessary. The schedules clearly indicated which answers were to open questions and which were in response to the prompts. The decision to use structured interviews was based on the fact that several practitioners were to be doing the interviews, and most of them were inexperienced as researchers. This simplified the process of data collection and analysis, but the use of maths history line graphs as a method of taking learner biographies was so successful in the taster session that, on reflection, this would have provided an imaginative and in-depth classroom intervention for the current learners.

It had been hoped that we would have a sample of around 50 reluctant learners to attend the numeracy taster sessions. These were to be composed of claimants from Job Centre Plus (JCP), ex-offenders from NACRO, and existing Basic Skills Literacy students. In order to fully test the hypothesis that learners' motivation is not adversely affected by being 'steered' onto numeracy courses, we explored the possibility of making attendance compulsory for claimants (as a condition of continuing to receive benefits), and ex-offenders (as a condition of their probation). Although mandatory attendance on



Basic Skills courses is being piloted in other districts, this is not the case in our local JCP (Hove). They did, however, offer to display flyers for the event. Unfortunately this did not produce any attendees. Unfortunately, our contact at NACRO (and a research partner), left NACRO and by the time communication had been established with his replacement, it was too late to involve the probationers. This left only the students who were currently on Basic Skills Literacy courses at City College, only six of

whom attended. We were unable to make attendance compulsory, but did offer incentives (£5 Argos voucher and £3 lunch voucher) and were assured that they had not intended to attend a numeracy course. The taster session was on at a time when these students would normally have attended their Literacy class, thus avoiding practical difficulties of childcare / work commitments and possibly removing potential disincentives to attend.

The session was three hours long and timetabled as follows:

Time	Activity
10.00	Welcome Itinerary Split into 3 groups
10.10	Student talk A current student to talk to each group with staff support
10.15	College tour e.g. library, refectory, hairdressing, beauty, art, motor vehicle mechanics, computers etc
10.40	4 stop carousel 3 Micro-teach sessions & learner biographies (from 11am) of 20 minutes each
12.00	Lunch Give out lunch vouchers
12.30	Exit interviews recruitment opportunities / give out Argos vouchers

The carousel contained the following activities:

- Producing a line graph to describe the learner's history of maths confidence (see diagram)
- Making boxes
- Data handling
- One-to-one interviews taking learner biographies, based upon the students' own line graphs

The students were divided into three groups and rotated through the activities, spending twenty minutes on each. Elements of good practice described in previous research were incorporated wherever possible. For example, discussions with existing students and the tour of the college were aimed to help the attendees feel less alienated by the environment and to help them recognise that

their previous negative experiences and their fears of maths were feelings shared by many. Alison Tomlin provided the idea of helping the students to produce a line graph describing the history of their confidence in maths, and this was then used in the one-to-one interviews, where learner biographies were taken as an alternative to any form of diagnostic testing.

Comparisons and Conclusions

The samples provided useful comparisons. The Key Skills students did not choose to study numeracy as part of their course while the current Basic Skills students did. There is support for the argument that people's motivation for enrolling on a numeracy course is different from the motivation to engage with and succeed on the course. On the other hand, this research appears to contradict Jon Swain's argument that functional maths provides only



a minor incentive to continue to attend. Most of the Key Skills students said they would not have chosen to study numeracy now, and most of the Basic Skills students gave 'interest in the subject' as their reason for enrolling (non-functional). However, when looking at how people believe the numeracy course they were on will help them, both Key Skills and Basic Skills students gave predominantly functional reasons, strongly contrasting with their reasons (or lack of reasons) for choosing to do numeracy in the first place.

Reflecting on the first research question, 'What are the motivating and demotivating factors affecting current adult numeracy students' desire to engage with and succeed on adult numeracy courses?', it is clear then that the majority of the Key Skills students had had very negative experiences of maths at school and would not have chosen to study numeracy now. However, nearly all of them cited reasons that they felt the course would be useful to them now they were on it: practical life skills, increased confidence and career development. They compared numeracy at college very favourably with their experiences of maths at school, particularly liking the more relaxed atmosphere, the smaller classes and higher level of support, and seeing the teacher and quality of teaching as central. Half of the students felt that numeracy should be a compulsory course, whatever people sign up for. The data from the Basic Skills interviews provides overwhelming support for Jon Swain's findings. In particular, his argument that although there are many varied reasons why people join a numeracy course, 'few of these are related to perceived needs in current employment, or to students' feelings that they have a deficit of skills in their everyday life'. However, when asked later on in the interview how they think the course would help them, the answers are far more spread, continuing to support our hypothesis that people's reasons for starting a course are different to their motivation for engaging with and continuing on a course. Unlike Swain's argument that functionality is a relatively minor incentive for people to attend classes, nearly all of the sample cited more than one functional example of how they thought the course might help them.

The second research question, 'To what extent can these factors be incorporated into elements of good practice in order to recruit, engage and motivate the reluctant numeracy student?' was addressed through the design of the numeracy taster session. First contact was warm, unthreatening and well planned. Using maths

history line graphs as a method of taking learner biographies was a fantastic alternative to diagnostic assessment or ILPs and was successful at many levels: as a method of finding out more about the student and their experiences of maths, as a way of exorcising some of their maths ghosts, making them feel comfortable and relaxed, and giving the students a feeling of control over their future learning. The planning, experience and style of delivery of the teachers and their ability to connect with the learners' situations all contributed to a positive experience for the participants and teachers alike and confirms both ours and Jon Swain's evidence that this is a crucial element of good practice. In order to explore and capitalise on our previous findings that the course content needed to attract the learner may be different from that needed to sustain and engage the student, the learner biography interviews focussed on a range of motivational factors for studying numeracy, underpinned by a central theme that related all aspects of numeracy to feelings of self-confidence. So, in answer to this question, it was relatively easy to design a taster session that incorporated best practice as suggested by both the findings of previous research and of our own project.

Finally, then, 'Would mandatory extended taster sessions in numeracy have the motivational force necessary to 'sell' numeracy courses to those who would not have otherwise chosen to study numeracy at this time'? Certainly, this was the case for the attendees of our taster session, who all expressed an interest in studying numeracy after the session. However, in the end our sample for this section of the research consisted only of students who were currently doing Basic Skills Literacy classes at the college, and could therefore be considered as less 'reluctant' perhaps, than the ex-offenders or benefit claimants we had initially hoped to include. Still, there appeared to be two main reasons for the success of the session: Firstly, all the elements of good practice we incorporated into the session came together to create a comfortable, fun and confident learning environment that built on students' previous successes while performing a counselling function that appeared to be helpful in liberating them from their maths phobias. Secondly, the session contained some fairly covert selling techniques which had the effect not merely of focussing the participants' attention on the positive ways that improved numeracy would have on their lives, but more broadly, of empowering them to take control of their learning. For example, the maths history line

graphs ask students to look to future ways of improving their confidence in maths and the practical measures necessary in order to make this happen. It would be interesting to try the design of this taster session on other, possibly more reluctant, participants in order to test the degree to which our findings can be extrapolated. Many of the issues brought out in this project may well resonate with providers and tutors in other settings and reflect the concerns or worries of other learners. This project might do well to be seen as a beginning rather than an end, offering new insights into ways of attracting reluctant students and dispelling myths about maths. Dissemination events attended by practitioners involved in the provision of Literacy and other subject areas also produced some interesting suggestions for other applications of the use of line graphs to take learner histories. The author would be happy to share ideas or answer further questions from the RaPaL readership.

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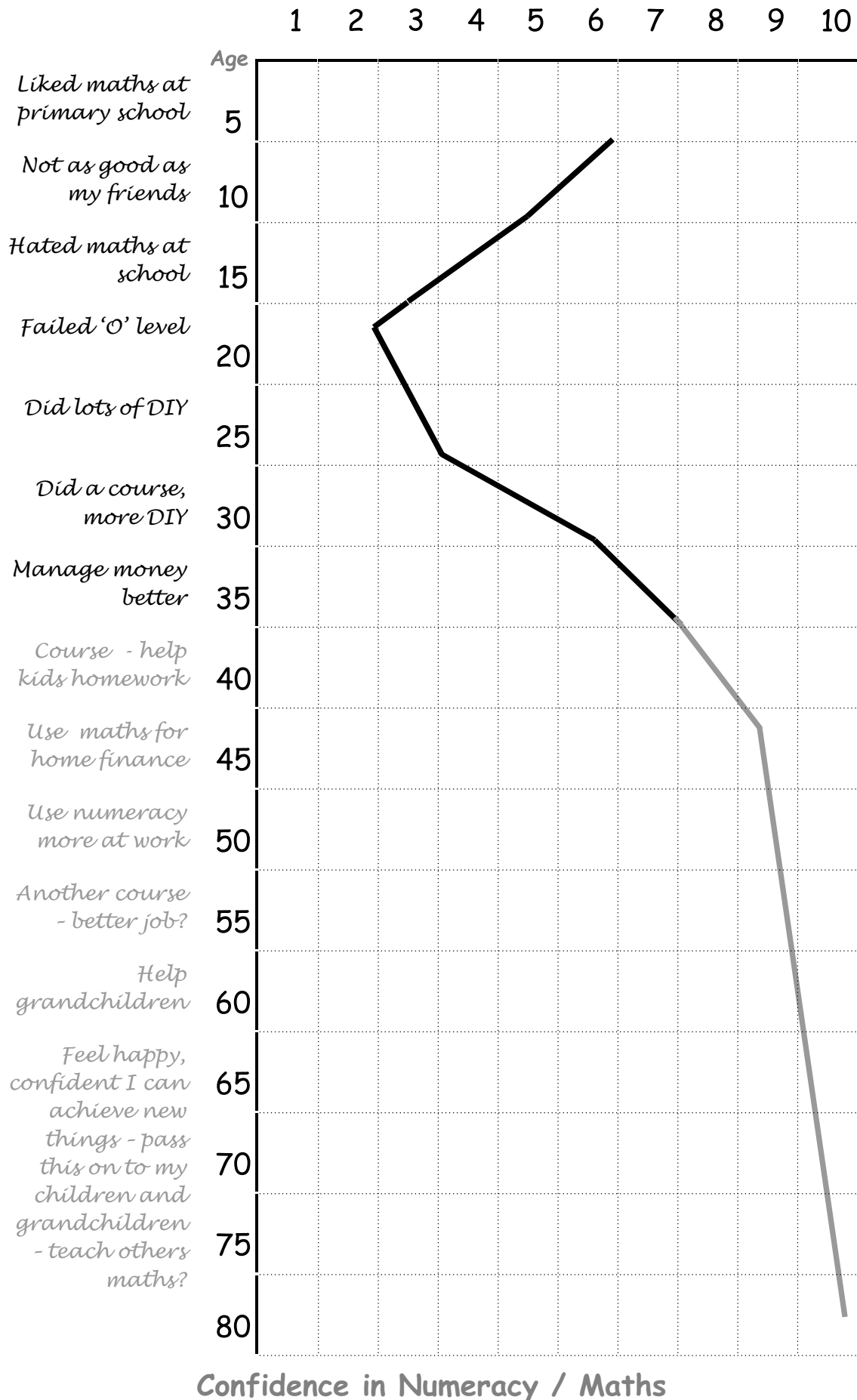
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Learner Biography: Maths History Line Graph





'If you can make it, you can own it'

Alison Tomlin

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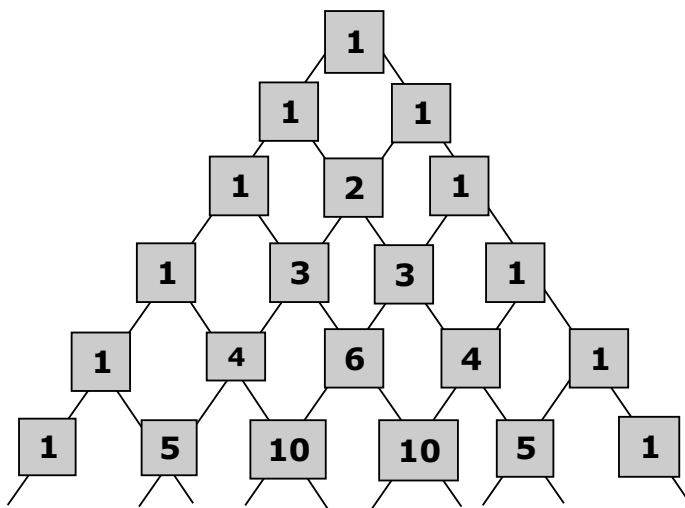
Introduction

I have two questions: what mathematics should we support in adult basic mathematics education, and how does it relate to literacy? I don't propose answers: not just because I haven't found them, but because I don't think there is an answer out there, and I don't really want one. I do want to challenge the development of what may become an orthodoxy. The term 'numeracy' was coined with a nod to 'literacy'; my concern here is to try to undo the nod and to outline why the yoking of mathematics to literacy/ies in adult basic education may not serve us well.

What do I mean by mathematics? Various definitions of numeracy, in adult education contexts, are summarised by David Kaye (2003) and discussed by Coben with others (2003). I don't want to plump for one definition rather than another; instead, here's a piece of mathematics to help me raise my questions.

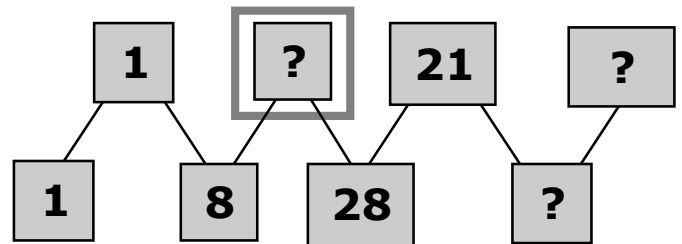
Pascal's triangle

Several years ago students in a basic mathematics class at a level that would now be called Entry 3 were working on Pascal's Triangle:



I'd suggested it because it fitted several purposes. It 'works' through addition (add two neighbouring numbers to generate the number below them eg $4 + 6 = 10$); some people worked on extending the triangle downwards. Another idea to try is totalling the numbers in each row across: in the first row there's 1; in the second, $1 + 1 = 2$; in the third, $1 + 2 + 1 = 4$...

then discuss what's happening, and work out why. It's easy to set up puzzles using just part of the triangle, with some missing numbers:



Once you know how the triangle works, you can work out what goes in the highlighted box: 1 and something add up to 8, so it must be 7. Rewrite that as $1 + x = 8$, and the problem's algebraic nature is clearer. Working out the other two missing numbers involves more 'unravelling', as one of the students put it; some students designed similar problems, and we all spent time debating what made some of them insoluble.

The triangle forms patterns which can be represented visually, so students' highlighting of the multiples of 2, 3, 4 etc was visually satisfying as well as calling new questions to mind. Some students developed generalisations about its structure.

Blaise Pascal (1623-1662) was a gambler, and the triangle we know as his is used in calculating chance, as well as in other branches of mathematics. It was known well before his time, though we have no record of how it travelled across languages, mountains and time. Omar Khayyam (the author of the *Rubaiyat*, born about 1040 in what is now Iran) wrote about it, as a tool in solving equations. In the third century BCE, in the Vedic period of Indian mathematics, Pingala worked out a way of establishing the number of combinations of short and long sounds in poems, and around the end of the 10th century CE Halayudha created a pictorial representation of Pingala's work: the triangle we now know as Pascal's (Joseph, 1992). There's a Chinese version, known by 1050 CE but probably older (Joseph, 1992). Some students started with that, without, initially, a translation, puzzling out both the meanings of the Chinese number symbols and the underlying structure of the triangle.

Sean found a pattern I had not noticed: powers of 11. If you read off numbers across the triangle



(11, 121, 1331 ...) you have 11 (or 11^1), 11^2 , 11^3 ... He thought 1 (the top line) didn't fit, and was delighted when I, astonished, said that it was 11^0 . Further down the triangle *something* carries on working. 15101051 is not a power of 11, but 11^5 is 161051. So does it work if you add some of the neighbouring digits? Well, yes, it seems to ...but which digits? why those? Sean asked me both why the numbers should be powers of 11, and why different rules seemed to apply further down. I had no answers so I asked colleagues and looked it up in mathematics texts. No-one I spoke to, including people who had used Pascal's Triangle in their own teaching, had noticed it before; none of the texts discussed 'reading' numbers across the gaps.

Finding, inventing or what?

Sean was *doing* mathematics: using it, but also 'finding' it. One view of mathematics is that it exists out there, and humans discover it. That's what it felt like to Sean.

Asking 'Can ordinary people do real maths?' Joan O'Hagan summarised the positions adult students may adopt (O'Hagan, 1993): Lakatosian when they are adventurously engaged in investigational mathematics (Lakatos, 1974), Platonist, cultural relativist, conventionalist or formalist. In O'Hagan's terms, then, Sean was engaged in a Lakatosian endeavour. I don't propose that mathematics students should be Lakatosian (or anything else); I am using O'Hagan's writing only to illustrate that there are worlds of critical discussion of the meanings of mathematics, at the levels at which numeracy students are working, which are in quite different language from that which we use around literacy.

For Sean, investigational mathematics was a creative adventure. So too were recreating the geometrical patterns of a cathedral pavement and the design of the Big Ben clockface. Whether it was 'relevant' to his life wasn't an appropriate question, though he said that at a time of great stress it 'kept him sane'. Perhaps that was because it was nothing to do with 'real life' in the terms adult education teachers and policy-makers usually understand it.

Many students, teachers, researchers and policy-makers have argued that mathematics teaching and learning should be grounded in 'real life'. The adult numeracy core curriculum for England (DfES & Basic Skills Agency, 2001), the context for most of my own work, focuses on skills deemed to be useful, but here I'd rather cite the case made by Keiko Yasukawa, who writes about

both higher mathematics education for engineers and adult basic mathematics education. She makes the case for 'critical' mathematics: it must be

contextualised within the maths learners' realities; otherwise, neither would the maths be 'critical' in the sense of utilitarian significance for the learners, nor would it be 'critical' in terms of the learners' purpose or interest in making it an object for critique. (Yasukawa, 1995)

She suggests that most mathematics education, including that in higher education, is not critical.

I have argued elsewhere that meaning is discursively formed, so that students' engagement (and the potential for learning) depends not only on the material studied, but on the discursive contexts of the work. 'Academic' maths can become the real world; apparently 'relevant' materials can be meaningless; and some apparently mathematical 'real world' problems may not be soluble through teachers' mediation (Tomlin, 2002b). Did Sean's work have what Yasukawa calls 'utilitarian significance'? The answers to both questions what's real? what's useful? are not in the gift of teachers.

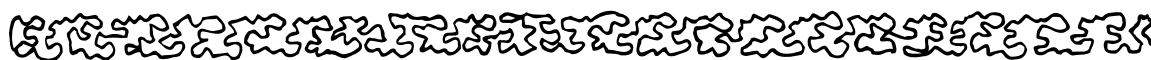
Literacies, numeracy, mathematics and music

Research and Practice in Adult Literacy doesn't sound like the natural home for discussions of mathematics. There is a thread in current policy in the UK, Ireland and parts of the USA and Australia which links numeracy to literacy or literacies, and sometimes literacy/ies is/are defined as including numeracy. As an example, here is a view from Scottish curriculum policy, chosen because it is one of the more open-ended and generous. Literacy is defined as:

the ability to read, write and use numeracy, to handle information, to express ideas and opinions, to make decisions and solve problems, as family members, workers, citizens and lifelong learners. (Scottish Executive, 2003)

The Scottish approach adopts:

a social practice model, which sees literacies as a key dimension of community regeneration and a part of the wider lifelong learning agenda. Such an approach recognises that: literacy and numeracy are complex capabilities rather than a simple set



of basic skills; learners are more likely to develop and retain knowledge, skills and understanding if they see them as relevant to their own problems and challenges. (Communities Scotland 2004)

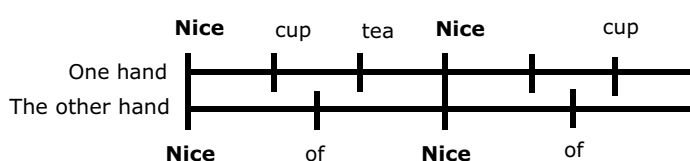
I suggest that the 'literacies' container limits our conceptions of mathematics. I have no proposals beyond these: I want to be democratic; and the more we define mathematics, the more we limit possibilities for students (and teachers). Linking mathematics to literacy opens up some areas of inquiry, but limits others, and it's those that I'm concerned with here. Linking the two has become naturalised in some discourses; I don't want to give yet another prescription for or definition of mathematics, but to challenge that link.

The connection seems to be made by education professionals, and particularly researchers and policy-makers, rather than readers/writers or mathematical practitioners. (Education professionals are readers/writers and mathematical practitioners too, of course; here I mean readers/writers and mathematical practitioners that is, perhaps all of us - at the moment when we are just getting on with whatever reading, writing or mathematics we are doing.) Before numeracy was gathered up into literacies, we had 'the basics' and 'the three Rs' ('rithmetic, 'riting and reading). To illustrate my argument, I shall go further back.

Until at least the time of the mathematician John Dee (1527-1608; astrologer to Queen Elizabeth I) the formal study of mathematics (in Europe) was through the 'quadrivium': astronomy, music, geometry and arithmetic (Open University, 1987). We now classify mathematics as a discipline in its own right, encompassing geometry and arithmetic; it also supports other disciplines, and so it is both used and developed in the service of astronomy. What's happened to music? Here are three links drawn from adult education. The first is between pitch and length. Pitch in stringed and wind instruments is determined by the length of the string or tube; halve the length, and the sound is raised by an octave, so called because, at least in European-rooted music, it has eight notes (in other musics, the octave is similarly significant, but there may be more or fewer notes in the scale). As a flute student, I find harmonics (studied by mathematicians since before the time of Plato) difficult: keeping the tube length the same (keeping the same keys down), but changing the pitch by how I blow the air through. This is

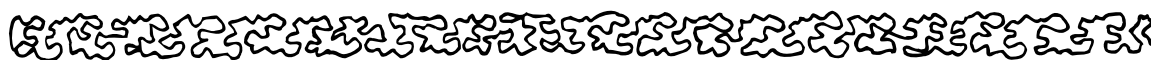
described in terms of numbered intervals above the original, natural note

The second link is between counting and rhythm: 'beating three against two'. Try this: with one hand tap out three to a bar, and with the other, at the same time, two to a bar. (I was helped by the teacher who said doing it quite fast was easier rather than harder, and suggested chanting the words 'Nice cup of tea, Nice cup of tea'.) This is a musical parallel to 'seeing' (understanding, and in this case hearing and feeling) that two halves are equal to three thirds:



The third link is through dance. A tap-dancer came to basic mathematics classes to learn about fractions. His tap teacher talked to him in terms of fractions of a beat and of a bar (the diagram illustrates two 'bars'). From Guadeloupe, educated there and in France, and already a skilled dancer, he wanted to learn the English for 'three against two', but also 'sixteenths' and 'quarters', of one beat as well as of a bar, in order to understand the teacher. He asked about crotchets, quavers and other names for the lengths of notes; the English he had learned at school used the US terms which are often more straightforwardly number-based.

Sean's work on Pascal's triangle was more or less purely mathematical, while the tap-dancer's interests were in mathematics at the service of another subject: he was interested in dancing, not mathematics. There are histories and discourses in the world of mathematics which are foreign to the world of literacy/ies studies. The notions of 'finding', 'discovering' or 'creating' mathematics have no parallel in literacy. We could analyse Sean's work in terms of the Scottish policy's 'complex capabilities', though that seems rather a cold term for it. His 'capability' was recognised with an Open College certificate in algebra, which is not now included in most adult numeracy curricula at Sean's (so-called) level. It's creative (sometimes), analytical, flexible, often personal, at the core of the communication of mathematical ideas, very old and with an interesting history. With a list like that, the closest parallel in literacy would be with writing but writing what? Filling in a tedious form, or writing a play? Both, depending on the mathematics and your relationship to it.



But there is no need for a literacy parallel to algebra; it can stand on its own.

Several strands of research in literacy have challenged definitions of literacy which are divorced from particular social contexts and purposes and/or which seek an absolute separation of literacy from the spoken word. Daniel A. Wagner (2004) surveys the development of the use of ethnographic approaches, combining social and political approaches to literacy/ies: rejecting the cognitive tradition, such approaches consider 'the behavior of real people in real time in varied cultural worlds' (op.cit.:33). Wagner links changes in literacy studies to perspectives on language:

Several decades ago the sociolinguistic domain ... made good on its challenge to formal linguistics, and psycholinguistics, on how individuals learn language. ... The ethnographic challenge in literacy studies also is here to stay. (Wagner, op.cit.:33)

But what of mathematics? Within both mathematics education and mathematics itself, the view that mathematics is socially constructed is now widely held. (This is a debate that has no parallel with literacy: written forms of language have always been understood to be a human and social development, even if only some of those forms were deemed 'correct'. Mathematicians on the other hand may feel, as Sean did, that they are 'discovering' mathematics that it exists without human agency.) Further, mathematics is widely seen as having what Ole Skovsmose (1994), writing from a Freirean perspective, calls a 'formatting power' in our social worlds.

Theories about the meaning of mathematics are not necessarily tied to particular views of how best to teach and learn mathematics. I used to suppose that mathematics was something 'out there', 'discovered' by famous people like Descartes; the astonishing similarity of versions of Pascal's triangle tends to support that view. Despite that, I would try to make mathematics classes a creative environment by modelling my work on the best of literacy teaching. More recently I have had a firm belief in the social construction of mathematics, yet when short of time or ideas I may resort to offering closed-answer worksheets. Nevertheless, most writers link their theories of learning and teaching to their epistemology of mathematics. In both there has been what Steve Lerman (2000) calls a 'social turn'.

I cannot here outline the range of debate within the 'social turn' in mathematics education (Benn, 1997; Coben with contributions by D. Colwell, 2003). Here John Volmink, re-thinking the mathematics curriculum in South Africa in 1990, catches the link between views of mathematics itself, teaching and learning mathematics, and their purposes. He argues for a constructivist view of mathematics, evolving within cultural contexts:

[A] constructivist approach is very helpful in providing a framework to understand and value [non-'standard'] representations and ... the politics of constructivism is much more compatible with the tenets of liberatory education than non-constructivist approaches to teaching and learning. (Volmink, 1990)

In discussing 'democratising mathematics', Volmink writes that mathematics helps us to come to know our world:

To the extent that mathematics explains things, it can help us to examine ideas that we otherwise could not and create fresh ones. (op. cit.:244)

Volmink then addresses ownership in mathematics:

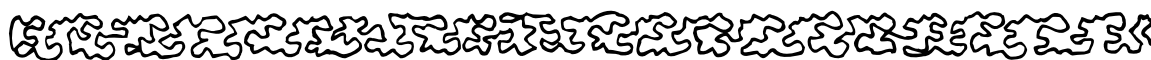
It is often said: 'If you can make it, you can own it.' If this is true for mathematics then the notion of ownership is intimately connected to the idea of construction. Mathematics for all should become mathematics by all. (op.cit.:245)

Students should be made aware that they have the power to mathematize. We have socialized them into believing that their own experience, their own concerns, curiosities, needs and purposes are not important. This means that we will have to share power with our students. (op.cit.:247)

How does mathematics relate to literacy, and how does mathematics education for adults relate to literacy education?

Boiling it down but losing the richness

In the language of cookery, a sauce is 'reduced' literally made smaller by boiling it down. That concentrates the flavour. Reducing mathematics-boiling it down to what is perceived to be suitable for adult students of numeracy- may lose it rather than concentrate it. I should say here that I am not advocating a diet of algebra for everyone. Indeed, I have often used



materials derived from news stories, to such an extent that one student said 'I get bored with your political worksheets' (Tomlin, 2001). I'm not advocating one diet rather than another - just that we should not rush to accept limitations without checking whether those boundaries are the ones we (students, teachers, researchers) want.

There is now a strand of research in mathematics education which draws on the notion of 'practices' developed within the 'new literacies studies' (Street, 2005). There are many ways in which that approach is productive, and I have contributed to such a study (Street *et al.*, 2005), but like any theoretical stance it has limitations. I want to challenge what seems to me sometimes a desire among literacy writers to own and describe numeracy too. Literacy workers were slow to develop any interest in mathematics; interest has followed, I believe, the recent enormous change in government policy, with a resulting increase in funding for numeracy. I write this as a literacy worker who had to be dragged into any serious engagement with mathematics, years after I started teaching numeracy; mathematics was a foreign world, and one I knew from school to be hard-edged, fixed, unmoving, full of right-or-wrong choices: unfriendly to the point of being offensive. My mathematics teaching was geared to protect students from the boredom or fear we all knew mathematics bred and the damage wrought by repeated failure. In telling that story, I don't want to suggest that other literacy workers now carry that burden but I do want to oppose reductionism in our views of mathematics. For years now many have argued against reductionism in literacy; why then accept it in mathematics? Encasing numeracy in literacies feels possessive - as though numeracy must remain within a nuclear family headed by literacy. As conference participants put it 20 years ago, 'Stop tacking numeracy onto the end of sentences about literacy' (NFVLS, 1986).

Literacy and numeracy workers and students do have a great deal in common. In Britain, at least, we have each other: many (perhaps most) numeracy students also take literacy courses; some teachers, managers and researchers work in both areas; government policy ties the two together. Some students whose main interests are in literacy education may be attending numeracy courses only because they have been bounced into them by organisations seeking to boost numbers attending numeracy, in order to meet 'achievement' targets (Baxter *et al.*, forthcoming).

If the world is 'formatted' through mathematics then we cannot 'read the world', in Freire's phrase, without dealing with mathematics. Reading may involve, say, interpreting and critiquing political parties' use of statistics; deciding whether to have an operation, given the chance of success or failure; understanding a pay claim or timetable; interpreting diagrams and maps. Mathematics is called upon in the support of arguments, from citing statistics to relying on particular forms of logic. In parallel with the awareness of the effects of choice of words ('the defendant claimed, denied, said, shouted, exclaimed, screamed ...') readers and writers interpret or choose particular forms of numbers (119, 60%, some, many, the majority ...) and consider the choice and sources of 'facts' presented in mathematical form.

Similarly, much mathematics relies on reading and writing (not all - some is 'in your head'). Approaches drawn from literacy work may be used in mathematics classes: they include students writing their own problems, solving each others', writing personal mathematics histories and mathematics history graphs, reading taped discussions about mathematics, using other languages and scripts, and publishing mathematics magazines. Using student-written texts contributes to changes in classroom discourse; students' writing, whether words, diagrams, visual patterns or numbers, offers some common ground and is one means of strengthening students' voices (Tomlin, 2002a).

The critical approaches to discourse that are discussed in literacy contexts are of equal value in adult mathematics education (Tomlin, 2001, 2005), from analysing the usual format of 'word problems' (Gerofsky, 1996; Tomlin, 2002a) to switching between local and 'standard' (or dominant) forms of mathematics (Knijnik, 2000). Keiko Yasukawa writes of numeracy leading to greater social empowerment: not only through improved mathematics skills, but through 'greater social awareness of maths abuse, manifesting in [...] political and mercenary manipulation of social statistics' (Yasukawa, *op.cit.*:41).

So literacy and mathematics education may contribute to each other, and I have illustrated a few specific links. Does that make them similar in such a way that a common theoretical framework would help us research and develop them? Not necessarily. Literacy and mathematics are central to our means of communication; any, absolutely any, area of life may call upon,



develop and in turn be formed by one, the other or both. Mathematics and literacy are fellow-travellers with art, poetry, physics, medicine, football or media studies as much as with each other.

Brian Street argues that particular versions and interpretations of literacy are always rooted in a particular world-view and a desire for that view to dominate and to marginalize others. (Street, 2001:8 quoted in Wagner, 2004:29)

Limiting our views of mathematics and mathematics education by viewing them through the lens of literacies studies allows 'that view to dominate and to marginalise others'. It's true that the world may be a safer place when some views of mathematics and mathematics education have been marginalised; however, my concern is that in accepting an offer of interest from research in literacies, we should beware any take-over moves.

Wagner mentions in passing (op.cit.:27) UNESCO's inclusion of numeracy in literacy, the latter defined as a set of tools needed to function in the everyday lives of people (UNESCO, 1957). Those of us adopting social and political approaches to literacy/ies now reject the 'tool' concept of literacy: a static, unitary skill, possessed (or not) by an individual and applicable in any context. I want to suggest however that a tool-ish view of numeracy lingers on in discussions about mathematics that are rooted in literacies debates. There is a world of mathematics education out there, with theories, politics, journals, websites, materials, student writing and so on, which we (those of us rooted in literacy/ies studies) are at risk of ignoring. Our lives in mathematics education are already hedged in, by funding, policy, management, no time for conversation, entry requirements for particular courses or areas of employment, the approaches taken by the teacher of the child you want to help at school, 'accountability' ... There may be other sorts of imprisonments too: fear of mathematics; a belief you're not brainy enough; the understanding, gained from experience, that mathematics and its teachers are boring, brutal, or both (and all these may constrain teachers as well as students). We must look out from adult numeracy education to others who have long explored the meanings and possibilities of mathematics education. The range available to us to try, dismiss, learn from or add to includes perspectives drawing on discourse analysis, Foucault, psychoanalytical theory, situated

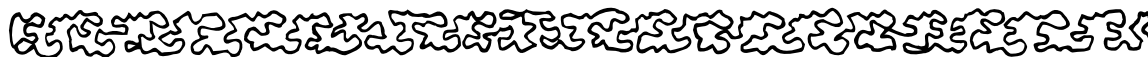
cognition, critical mathematics, drama, feminisms and theories of the post-modern.

I started by asking two questions: what mathematics should we support in adult basic mathematics education, and how does it relate to literacy? I have no prescription to offer, and a lot of what I have said may seem negative. I don't want numeracy included in literacy/ies, or indeed in mathematics: I'd rather we opposed the reductionism of numeracy (as it is used in England), and talked about mathematics instead. I don't want the wealth of research, from different starting points, on social, cultural and political aspects of mathematics itself and mathematics education to be ignored because it's easier to stick within domains which are more accessible to people grounded in literacy work.

Mathematics and the written word both have Skovmose's 'formatting power'. Worlds of discourse both rely on and form them: market trading (street and City) and conversations in the kitchen, history and physics, sexuality and gardening, *Big Brother* and the war machine, Pascal's triangle and crosswords, organised education and life outside, elections and striking, religions and street credibility - everything that ties us together and may set us against each other. Mathematics and literacy depend on each other too, but we should take seriously, and on their own terms, research in both worlds: if you can make it, you can own it.

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Report on the Uppingham Seminar 2005: Numeracy and Development

Kara Jackson and Dave Baker

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This report details the most recent Uppingham Seminar, held in Reepham, Norfolk, United Kingdom 20-22 October 2005. The topic was "Numeracy and Development." Rather than focusing on the dominant approach of how to promote functional numeracy in practice, the participants were invited to reflect critically on "what do we mean by numeracy and what does it mean to those who are involved in numeracy programmes in developing countries?"

Uppingham Seminars began in 1998 and grew out of a series of seminars on education and development issues started by Education for Development (UK). The Seminars are organized around a central issue to development and bring together people involved in development from around the world to engage in conversation and debate. Participants set the agenda, in part based on selected background papers that they receive prior to the seminar. Twenty-seven practitioners, policy makers, and academics attended this seminar from ten countries, representing the northern and southern hemispheres. The seminar received specific support from DFID and the National Research and Development Centre (NRDC), London, who provided funding to assist two of the participants from abroad.

Background Papers and Discussion Themes

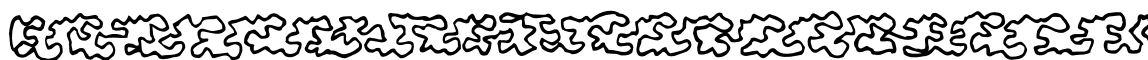
During the seminar, significant and contentious issues that arose included: meanings and uses of numeracy and maths; social justice; the nature of development; various approaches to the teaching and learning of numeracy; power, class, gender, and culture; language and its role in numeracy; context, values, and ideologies; and critical mathematics.

Many of these issues were initially raised in the background papers (see below) and an overview

paper (Baker & Street, 2005), all of which were distributed prior to the seminar. A brief description of each background paper follows. Baker (2005), a UK mathematics educator from NRDC with experience in projects on numeracy and development, argues that the current "access" agenda in adult numeracy education does not go far enough with regards to challenging "what counts" in numeracy education and "in whose interests" (p. 6). He calls for "a transformative model of adult numeracy" whereby the curriculum is altered to include and thereby validate the numeracy practices in which traditionally marginalized groups of individuals participate.

Fasheh (2005), writing from his experience as a Palestinian mathematics educator in the West Bank of Jordan, asserts that the teaching and learning of mathematics cannot be understood separate from the cultural and historical context in which it is embedded. He argues that particular forms of mathematics are given authority and are used to maintain inequality within and amongst nations. Khuzwayo (2005), a South African mathematics educator, builds on Fasheh's metaphor of "occupation of our minds" and argues that the apartheid South African maths education functioned to "occupy" individuals' minds as it did not provide individuals with a critical understanding of mathematics. He offers examples of maths education movements that challenge such occupation.

Black (2005), an educationalist from Sydney, Australia, challenges human capital theory, which often guides development programmes. Black challenges the basic assumption of human capital theory that increased literacy and numeracy levels lead to increased ability to gain employment. Further, he offers that while there



have been critiques of literacy and its relation to human capital, the assumed relationship between maths and human capital has been largely ignored.

The following summarizes the overarching themes raised in discussion. Important to note is that consensus is not the goal of Uppingham Seminars; multiple perspectives on these issues were raised and debated over the course of the Seminar.

It was generally agreed (but still contested) that mathematics/numeracy is always practised in a particular situation and therefore understandings and uses of numeracy cannot be understood separate from the sociocultural context in which such practices take place. Questions centred on the relationship between numeracy and social justice and the relationship between numeracy and development. How do numeracy practices work to include and exclude particular individuals from participation in various aspects of society? If people make explicit links between numeracy and social justice, is it possible to re-imagine understandings of numeracy, access, and equity?

Many participants offered case studies of groups of people's varied and distinct numeracy practices around the world. These "vernacular" or "informal" numeracy practices are often characterized as "inferior" to "formal" numeracy practices taught in school settings; seminar participants questioned such characterizations. It was debated how an ethnographic understanding of numeracy practices might help academics, practitioners, and policy makers rethink the role of "formal" numeracy and development. There was also significant discussion about the "currency" of formal mathematics around the world and its role as a proxy for intelligence in relation to the mathematics curricula offered in development programmes.

Next Steps for Seminar Participants

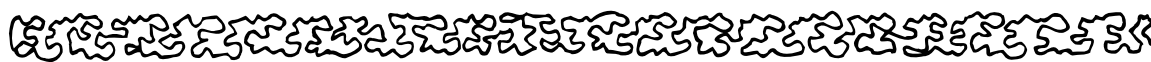
After a lively three-day discussion, participants organized several plans of follow-up action including the following: publication of articles on work shared at the Seminar in academic- and practitioner-friendly formats; production of an annotated bibliography of work related to the Seminar; collection of local numeracy stories to be shared on a website; and collaboration on research and development projects based on the concept of "numeracy as social practices" (Baker, Street, & Tomlin, 2005).

Acknowledgements

Parts of this brief report are based on a full report of the Seminar, written by Kate Newman. For the full report, please see <http://www.uppinghamseminars.org>.

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Adult Numeracy Instructors in BC Apply Research Findings to Their Practice: a report on research in progress

Kate Nonesuch

Last year I applied for a grant from the National Literacy Secretariat, Human Resources Development Canada, to do a project which would involve looking at the research in teaching numeracy to adults, and consulting with practitioners about applying the research to their teaching practice. I was thrilled to be awarded the grant, and have been working on it for a few months. There are three parts to the project: reviewing the literature, consulting with practitioners, and preparing a manual for practitioners based on the consultations. When I began my literature search, I settled on looking at articles and books that dealt with instruction rather than policy, administration, curriculum and so on. Early on I ran into a manual written by Gal, Ginsburg, Stoudt, Rethemeyer, and Ebby (Gal *et al.*, 1994) that set out 12 points for improving numeracy instruction to adults. I found other similar "best practices" lists, for example, in Canada by Barbara Glass (2001).

When I read these articles, I thought, "This is going to be easy. There's not much new here. All I have to do is take these 'best practices' out to the field, and everyone will change their practice and we'll have the best numeracy instruction in the world." That however, did not last for long. Given that I had heard of all these things, and agreed with them, for many years, why did my own practice not follow them more closely? I realized I didn't know anyone whose practice lined up with all of these "best practices." (Furthermore, Diana Coben and her colleagues (2003) caution that not enough research has been done to allow us to state clearly what good practice is.)

Gal *et al* (1994) put forth the possibility that many numeracy tutors do not follow these principles, even though they may agree with them, because of a lack of professional development activities to learn how to implement them, which may lead them to fall back on memories of their own math education and follow that pattern semi-automatically, or because of student resistance to these new ideas. While I agree that these reasons may play a substantial part in preventing tutors from adopting the principles, I think there is more at play here, more complexity, more hidden reasons.

Then I began to find some writing by Alison Tomlin, and Lindenskov and Hansen, and the website of the Literacy Enquirer, a publication from an adult literacy worker learning circle that meets in Ontario, Canada, <http://www.literacyenquirer.ca/> These sources started to unravel some of the complexities that lie beneath simple statements of best practices. My work became at once easier and more difficult, but exciting in either case.

I have just begun the second phase of my project, which is to take my findings out to practitioners. I have lined up 8 or 9 groups of numeracy tutors, mainly from colleges and school board programs. At these groups, I present some of the things I have found in the research literature, and consult with them about the relevance of the research findings to their teaching practice. I use the following questions to get the discussion going:

- What is real and useful here?**
- What is so far out of line with my situation that it has no relevance?**
- How does my present practice support or contradict these findings?**
- How might I change my practice to make it more in line with these findings?**
- What problems would I need to solve before I could do so?**

I am hoping to continue to collect feedback and expand the workshop discussion with an e-mail list for each group of participants.

The final stage of my research project calls for me to use the findings from these consultations to prepare a manual that would assist practitioners in applying research findings to BC situations: small and large group instruction, multi-level self-paced classes, or one-on-one. Again, when I planned the project and applied for funding, I had a clear idea of what that manual might look like. Those ideas are changing a little, given my findings, but I'm looking forward to figuring it out. The manual will be available on-line, free for downloading.

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Mobiematics

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The new generation of mobile phones are successfully being used to engage and deliver literacy and numeracy learning to young adults in the Highlands of Scotland.

M-learning uses mobile technology to engage learners. Learning can take place anytime, anywhere, according to the learner's needs, and in privacy. It extends the ways of distributing learning materials. M-learning is portable and is delivered through hand-held devices such as palm top computers and mobile phones.

In 2001 the M-learning project was launched. This was a pan-European project with a multi-million Euro budget. The three countries which took m-learning forward were Britain, Sweden and Italy. The target audience for the project were young adults who were at risk of social exclusion. They were people not involved in education, training or employment. Many were disaffected learners who had not succeeded at school.

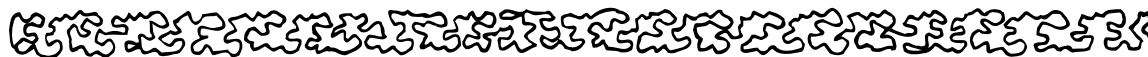
The project focused on mobile phones because of their popularity with 16 to 24 year olds. World wide over 1.5 billion mobile phones have been sold, which is treble the number of PCs. They are also relatively inexpensive yet this "cool" technology has proven an effective way to engage learners and deliver learning resources. Key findings included:

- Learners were enthusiastic about m-learning 62% were more keen on taking part in future learning
- Approximately 1/3 developed a more positive attitude to reading
- 82% felt the games helped them improve their reading and spelling
- 78% felt the games helped them improve their maths

These results from the Highland trials in 2004 reflected those of the whole project. Overall the results were positive, though network problems did hamper work in some of the more remote rural areas. The learners were enthusiastic about taking part and pleased at being trusted with such expensive devices. Mentors reported that the learners' self-esteem and confidence increased. There was sustained engagement. For example, one young learner who took part is still undertaking a learning programme and has progressed to accredited courses.



The trials were so successful that Learning Connections are currently funding further developmental work in this area of learning. The current project is a collaboration between Highland Council's Adult Basic Education Service and the Portree Learning Centre and is based on



the Isle of Skye. The devices being used are new "smart" phones; a hybrid between a mobile phone and personal digital assistant (PDA).

The phones are being used to deliver both literacy and numeracy resources. In all cases these materials have been developed around young people's interests and are based on situations they may face in day to day living. These include

- Learning how to estimate distances between places and read mileage charts found in road atlases
- Obtaining information from bar charts and pie charts from a quiz about nutrition
- Working out the area of a surface of a wall in a flat so that the right size can of paint can be bought
- Working out budget costs by practicing rounding prices to the nearest pound to estimate cost of purchases
- Using a formula to work out stopping distances and judge whether a car in a given situation is going to crash into the hazard ahead

All of these resources are presented in an attractive way, many as interactive games. Learners can even give themselves a "number skills health check".

Apart from the packages the functionality of the phones allows them to be used in creative and imaginative ways to help develop the learner's numeracy skills. The Excel package can be used for budgeting, tailored to an individual's needs

and requirements. The mentors can set tasks for teams of learners to collect numeric clues in a certain area. The answers can be sent back to the mentor in numerous ways text message, email, SMS, or even a photo.

In the new project, which has just been launched, there are plans for mentors and learners to work together in creating new learning materials for other learners. Eventually it is hoped that some of the learners will progress to becoming virtual mentors to other young adults in rural locations. So far the signs are all positive for this type of learning to become a mainstream methodology for delivering literacies learning in the future.



Information on the European M-learning project can be found at: <http://www.m-learning.org/>



Outside the Classroom - researching literacy with adult learners Eds Ellayne Fowler & Jane Mace NIACE 2005

Reviewed by Azumah Dennis, Research Student, Institute of Education a.dennis@citylit.ac.uk

'Outside the Classroom' is a series of richly textured case studies in which learners attending basic skills classes talk with trainee tutors about their literacy. The text introduces several different characters, many of whom we will instantly recognise. Others - the Jamaican serving in the British Army and the contemplative nun - are less well known and barely ever seen.

Through these case studies, the editors, Ellayne Fowler and Jane Mace present an interpretation of the ways in which literacy-in-theory and

literacy-in-practice connect to each other. Drawing on big ideas and grand theories, they write as everyday people rather than haughty academics. This is a book that the writers intended for us to read, to understand and to form an opinion about.

Written in substantial part by trainee teachers who use these profiles as part of their programme of study, 'Outside the Classroom' does not centre fully on the practice of teaching. It is however useful to teachers.

Insights that struck me were differing notions that filtered through the text on what does and does not count as literacy amongst teachers, learners and policy makers. The policy maker may talk of problems, deficits, limitations and serious consequences of poor literacy while Sam, one of the many learners in this study, views his literacy learning not as a solution to a problem, but as something to be relished. His own perceptions of his life and literacy challenge the notion of literacy as transferable generic skills. Sam views his everyday reading and writing activities, Bible reading, organising a social group as fundamentally different to 'literacy', which is firmly located in a classroom. These insights are more than mere theoretical flourishes. They affect how we think about literacy and therefore what we do in the classroom. I personally would have liked to see much more of a focus in teaching practice; it's easy to be seduced by theory especially theory that encourages us basic skills practitioners to cultivate a self-image that allows us to stand slightly outside the mainstream, quoting Friere, as inevitably these writers do. We all after all believe in virtue. What I think is much more of a challenge is translating these convictions into the kind of pedagogy that transforms people and their lives.

We catch glimpses of a pedagogy of transformation in the final chapters of the book. There are boxed sections with practical idea 1 and practical idea 2. Literacy learners are invited to actively bring the accoutrements of their - and this is one of the few technical terms the editors preserve 'vernacular literacies' into the classroom. In an exercise centred on letter writing, a group looks at official documents they have received over a period of time and deductively theorise about the defining features of formal letters. I simplify. But what seems clear is that the literacy that people live outside the classroom is invited and drawn upon.

The case studies themselves add nuance to what many of us have often suspected about our learners: that their lives exist in ways that reach beyond the policy maker's construction of them as functionally illiterate. Taken further - it is possible that the policy maker may conspire to create the functional illiteracy that policy is intended to curtail. A learner able to draw on a supportive community network, one that places a high value on exchange and reciprocity, writes long newsy letters to her pen friends. In class, her processes of composition, discussion and transcription are interrupted and this same

learner is barely able to put together an informal letter.

I enjoyed reading 'Outside the classroom' but I'm not entirely sure why. As a theorist (who works full-time and has given up week-ends to study) I was interested in this gentle introduction to a complex body of work. I was able to read. I was able to understand. But the book covers familiar and I think quite limited theoretical ground. As a practitioner (who sometimes dabbles in theory) I was fascinated by this insight into learners' beliefs and behaviours around literacy. But I wanted more pedagogy. Two practical ideas: it's not enough. If I refuse the neat sectioning of self as researcher / practitioner, I can see how the construction of these in depth case studies suggest a practical use of research techniques to profile learners' values, beliefs and practices, and attempt to connect these to what and how they learn.

I suspect that there are several practitioners who experience the current wave of policy effervesce surrounding literacy as both intoxicating and frustrating. We welcome the policy makers' determination to write Skills for Life into the curricular DNA of the post-16 sector. We are less sure about an approach that views literacy as existing along a rigid flat hierarchy. The case studies and theorisation in 'Outside the Classroom' provides us with insight into other ways in which we need to think about literacy, even if it stops short of prescribing ways in which this thinking translates into something more.

Why not write something for the RaPAL Journal?

This is an invitation to anyone involved in the field of adult literacy, numeracy and ESOL education to write and share their ideas, practice and evidence with RaPAL readers. The RaPAL network includes approximately two hundred managers, practitioner researchers, researchers, tutors, students and librarians in adult, further and higher education in the UK. It also has overseas members in Canada, USA, New Zealand, Australia, South America, Europe and Africa.

The RaPAL network produces a journal three times a year - winter, spring and summer-for contributions linking research and practice. RaPAL welcomes articles, reviews, reports, commentaries, letters and cartoons which reflect the range of activities and interests of those involved in this field. By writing for this network you will have the opportunity to refine your ideas and disseminate to the field. For RaPAL, research involves asking questions, trying to answer them, asking other people, recording what they say, developing ideas, changing them, and writing and sharing ideas in many different ways. We think that these processes should be open to students and tutors as well as to paid researchers. They often underpin the day- to- day reflective and evaluative work of practitioners but are not usually recognised as research activity.

We would like to develop our connections with the vibrant research and practice dialogue happening in Canada. Tannis Atkinson, editor of *Literacies*, hopes to attend the RaPAL 2006 Conference in Glasgow. Tannis is committed to supporting literacy practitioners to write about their work. She conducts workshops across Canada that lead participants through a series of activities where they reflect on literacy work. Using collage and different forms of writing, literacy workers explore some of the excitement, pain, and frustration of their practice. You can check out some of the writing and collages from these workshops at <http://www.literacyjournal.ca/cwpages/nbCALNconf2005.htm>. We hope you will have the chance to meet Tannis in Glasgow in June and experience one of her writing workshops.

Journal Structure

We have decided to retain the three-section structure introduced in 2002-3, as a means of addressing the emerging needs in this field:

1. Ideas for teaching

Descriptive and reflective pieces on teaching and learning to meet the needs of current teachers in this field. The contributions must demonstrate democratic practice.

2. Developing Research and Practice

An open-ended category for a varied range of contributions. We want to include articles which show people trying out ideas, pushing back boundaries alongside analysis and critique

3. Research and Practice: Multi-disciplinary perspectives

A section for more sustained pieces of analysis about research, policy and practice which will have refereed journal status.

We welcome contributions for each of these sections and are happy to discuss your ideas and proposals with you. We want the RaPAL Journal to continue its vibrant tradition of publishing views from all parts of the field.

Guidelines for Contributors

General

1. Writing for RaPAL must be in a readable, accessible style aimed at a diverse and international readership.
2. If you are writing about individuals or groups you must follow the usual ethical guidelines, seeking permission whenever possible and in all cases representing people fairly.
3. We are always looking for articles which link research and practice in some way. There are many possibilities and we do not set hard and fast rules about how this should be done.
4. RaPAL articles should encourage readers to question dominant or taken for granted views of literacy, numeracy and ESOL. We would, for example, challenge views which fail to acknowledge the abilities of learners to be actively involved in developing and evaluating practice.

Specific Pointers

1. When you submit your work, please indicate the intended section for publication.
2. Articles should have a title with clear headings and subheadings; and must contain a clear introduction, indicating the scope of the piece.

3. If you write for section 3, the article should:
 - **relate to the practice** of learning or teaching adult literacy (in any language)
 - **relate to research**: either by itself being a report of a research study and/or showing links to related research work;
 - **provide 'critical' analysis** of the topic, involving theoretical underpinnings; and
 - **be coherent** with a clear structure, explanation of any terminology, use of examples and the usual referencing conventions (Use the Harvard referencing system and make sure that all references are in alphabetical order and complete).
4. Length - Articles should be 1,000-2500 words for sections 1 and 2 and not more than 4000 words for section 3. These limits do not include any accompanying references and bibliographies. Reviews and reports should be 50-800 words.
5. Illustrations and graphic material are much appreciated. Please consult the editor about preferred formats.
6. Your article must be submitted both in hard copy and in electronic form. Please send it word processed, double-spaced, on A4 paper and with numbered pages. The electronic versions must be sent as Word files attached to emails. If we do not receive both versions, we cannot consider the paper for publication.
7. Please provide a title page with your name, title, and contact details (postal address, e-mail address and phone number). It is very important that you also provide a short 2-3 line biography to accompany the article. We like to encourage correspondence between readers and writers and if you would like readers to get in touch with you, please provide contact details at the end of the article.

Editorial Procedures

1. All contributions are peer reviewed by researchers and practitioners in the Editorial Group. The reviewing for section three is done by an experienced researcher and two additional researcher practitioners and focuses on the criteria noted above.
2. Feedback is provided by the editor within eight to ten weeks of receiving your text and constructive comment (and notes to be of use in its development) are made if appropriate.
3. If the article is accepted, once the amendments have been made, the editor will work on a final edit. We may make minor alterations ourselves and the final version will be sent to you for checking before it goes to print.

Please send an electronic copy to Deirdre Parkinson at: deirdre@dp-associates.org.uk

If this is not possible, then a paper copy can be sent to:

Deirdre Parkinson
20 Alnwick Drive, Glasgow G76 0AZ

RaPAL NEEDS YOU!

This is an exciting time to get involved with RaPAL, as we aim to double our membership. We would like people from a wide range of locations and covering a range of interests to become involved in the Management Group so that we can widen our representation. There are currently 3 positions available on the Management Group. All of them will be up for election in June at the AGM which means that you would have the option to try the post for a while to see if it suits you. If you are interested in any of the posts, please contact Fiona Macdonald at Fiona.Macdonald@communitiescotland.gsi.gov.uk

Secretary

This is an Officer's post, which involves:

- **Management Group Meetings**
Compiling the agenda for the Management Group meetings, in conjunction with the Chair
Booking venues for the management group meetings, in conjunction with hosts.
Taking minutes, on occasion, for the RaPAL Management Group
- **Annual General Meeting (AGM)**
Making arrangements for the AGM
Preparing and circulating nomination and ballot forms for elections
Taking minutes for the AGM
- **RaPAL Correspondence**
Receiving correspondence on behalf of RaPAL and circulating it as appropriate
Replying, on behalf of RaPAL, as appropriate

Annual General Meeting (AGM)

- Making arrangements for the AGM
- Preparing and circulating nomination and ballot forms for elections
- Taking minutes for the AGM

RaPAL Correspondence

- Receiving correspondence on behalf of RaPAL and circulating it as appropriate
- Replying, on behalf of RaPAL, as appropriate

Minutes Secretary

This post involves:

- Taking the minutes at each Management Group Meeting
- Circulating them to the Management Group

RaPAL Membership form

RaPAL Membership Fees for 2005-2006

	UK & Eire	Other EU	Outside EU
Individual Membership*			
Full-time	£35	£50	£50
Low-waged, unwaged, student	£20	£30	£30
* includes 1 copy of the RaPAL Journal			
Institutional Membership			
2 copies of Journal	£70	£75	£75
3-5 copies of Journal	£90	£100	£100
6-10 copies of Journal	£135	N/A	N/A

Help us to DOUBLE RaPAL's Membership in 2005-2006!

We are always keen to attract new individual and institutional members. Please copy or pass this page to friends, colleagues and your workplace library and encourage them to join RaPAL now!

Name _____

Address for correspondence _____

Postcode _____

Tel No: _____ Work _____

Email _____

If you **DON'T** want us to add your email address to the RaPAL circulation list (RAPALLIST) please tick here

Special interests:

I wish to join RaPAL. (Please see table of membership fees for 2005-06)

Please pay by one of the methods below (tick box):

- I enclose a cheque (made payable to RaPAL) for £
- I wish to pay by Standing Order/Direct Debit - please send me further information
- Please invoice me (institutions only)

Please send your completed application form and cheque (if appropriate) to:

Kathryn James
RaPAL Membership Secretary
Department of Educational Research
County South
Lancaster University
Lancaster LA1 4YD

RaPAL 2006 21st Anniversary Conference: Transforming Literacies

23rd - 24th June 2006

Title: _____ Male/Female _____

Name: _____
Family name First name

Name for badge if different from above: _____

Correspondence address: _____

City: _____ Post/Zip Code: _____

Country: _____ Home Telephone No: _____

Organisation: _____ Department: _____

Work Telephone No: _____ Fax : _____

E-Mail _____

Special Requirements: *e.g. vegetarian, access, any other requirements*

Terms & Conditions:

*An administration fee of £50 will be charged for cancellations confirmed in writing **by 1st May 2006***

We regret that no refund can be made after that date, for whatever reason, although substitutions will be acceptable if notified in writing before the event.

Please note details from your Registration Form will be recorded on the conference database.

Conference Registration Fees

RESIDENTIAL PACKAGE 23 - 24th June 2006 Attendance at conference, conference dinner & ceilidh with en-suite accommodation on Friday 23rd June 2006	RaPAL Member	£ 195.00	£
	*Non-member	£ 210.00	£
NON-RESIDENTIAL PACKAGE 23 - 24th June 2006 Attendance at conference and conference dinner & ceilidh	RaPAL Member	£160.00	£
	*Non-member	£175.00	£
CONFERENCE ONLY 23 - 24th June 2006 Attendance at conference (incl. of refreshments)	RaPAL Member	£125.00	£
	*Non-member	£140.00	£
Attendance at free pre-conference seminar 22nd June 2006	Attending		<input type="checkbox"/>
ADDITIONAL OVERNIGHT ACCOMMODATION Thursday 22nd June 2006 £29.80 per person per night		£29.80 per night	£
TOTAL			£

*The additional £15.00 will be subtracted from the membership fee for those joining RaPAL at or before the conference.

Presenting Workshop		Yes	<input type="checkbox"/>
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A small number of bursaries to cover delegates' conference costs are funded through the NRDC (England & Wales) and Learning Connections (Scotland). Applications for bursaries should be received by 31st March 2006. Please send a brief letter with your registration form indicating why you should receive a bursary. Applicants will be informed by mid April 2006. Preference will be given to individuals willing to run a workshop at the conference.

RaPAL



Pro forma Invoice

N.B. This is a proforma invoice therefore individual invoices cannot be issued

Method of Payment: Fees must be paid in sterling. Forms will only be accepted with full remittance.

Please indicate type of payment:			
<input type="checkbox"/> UK Cheque made payable to 'University of Glasgow'. Sorry we do not accept Eurocheques or BACS payments.			
<input type="checkbox"/> By Credit/Debit Card – Please provide details below (5% handling charge will be added to all credit/debit card payments) Sorry we do not accept American Express			
<input type="checkbox"/> Mastercard Switch	<input type="checkbox"/> Access	<input type="checkbox"/> Visa	<input type="checkbox"/> Euro-card <input type="checkbox"/>
Card Number: □□□□ □□□□ □□□□ □□□□ □□□□			
Expiry Date: _____ Issue Date: _____ Issue Number (for Switch Cards) _____			
Name of Cardholder: _____			
Signature of Cardholder: _____			

Send completed form to:

**Conference & Visitor Services
RaPAL 2006
University of Glasgow
No.3 The Square
Glasgow G12 8QQ
Telephone: 0141 330 5385**

Forms cannot be accepted by fax

Registration Forms should be submitted no later than 1st May 2006

Date Form Received:	Date Payment Received:	Processed By:	Date Receipt/Letter Sent:
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**RaPAL Conference 2006
Pre-Conference Seminars**

**Professor Steve Reder
Portland State University, Oregon**

We are delighted to announce that Steve Reder, who will act as both discussant and keynote speaker at the RaPAL 2006 Conference, has agreed to present two pre-conference seminars in the Faculty of Education, University of Glasgow on

Thursday 22nd June 2006

4.00 - 5.30 pm Seminar One:

**"Portraits of Learners and Learner Interactions
from the Adult ESOL Classroom:
Multimedia-Based Research on Second Language Acquisition"**

5.30pm - 6.00pm Light Buffet

6.00 - 7.30 pm Seminar Two:

**"Time for Change: Longitudinal Research in Adult Literacy
and Numeracy Learning"**

About Learning Connections
Learning Connections is part of
Communities Scotland,
the Scottish Executive's
housing and
regeneration
agency.



**Jointly hosted by Learning Connections and CRADALL,
the Centre for Research and Development in Adult and Lifelong Learning,
at the University of Glasgow.**

Information regarding registration, venues etc will be announced shortly
please check the RaPAL website <http://www.literacy.lancs.ac.uk/rapal/>

RaPAL



Conference 2006

Transforming Literacies

The Conference will examine the impact of literacies practices, critical perspectives and action research on our work.

Date: Friday 23rd to Saturday 24th June 2006

Whether you're a learner, practitioner, researcher whatever your interest in literacies you're invited to come to Glasgow. Workshops will be organised around the following four themes:

Literacies and Poverties

What is the impact of literacies on poverties in their many forms and contexts?

Action Research

How Action Research affects literacies practices, methods, theories and policies?

Policy and Practice links

What are the tensions, challenges and benefits when literacies theory, policy and practice come together?

Critical Literacies

Do critical perspectives help transform everyday literacies?

All workshop themes are intended to promote a diversity of exchange, participation and contribution from different cultures, sectors, disciplines and professions.

If you would like to run a workshop, send an outline of your workshop (no more than 250 words) indicating its fit with these themes to:

Kathy Maclachlan, St Andrew's Building, 11 Eldon Street, Glasgow, G3 6NH
or k.maclachlan@educ.gla.ac.uk by 31st March 2006

Please note: only workshops which are clearly related to one of the four themes will be accepted.

Inside this Issue

RAPAL

Research and Practice in Adult Literacy

Section 1

Focus on Numeracy - *Cath Smith*

Local to global - starting with the weather - *Alison McLachlan*

Fun with Numbers - *Helen Johnston-Morris*

Inspiring work with young adults in Glasgow - Creating hopes and dreams...
- *Ann Russell*

Can Playdough be fun and educational? - *Denise Hepplewhite*

Section 2

Maths4Life and other projects - Teaching, Learning and
Research Resources on Adult Numeracy from the NRDC - *Diana Coben*

Reducing Student Resistance to Using Math Manipulatives - *Kate Nonesuch*

Integrating formative/diagnostic assessment techniques into teachers'
routine practice in adult numeracy - *John Swain, Graham Griffiths and Rachel Stone*

The Scottish Numeracy energiser ...does what it says on the tin! - *Angela Valente*

Section 3

What motivates or demotivates adults to improve their numeracy skills?
A study of learners and non-learners in a range of sectors in Brighton and Hove
- *Alison Kelly*

'If you can make it, you can own it' - *Alison Tomlin*

Reports and Reviews