‘Beyond the Daily Application’: motivations for adults attending numeracy classes

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Introduction

Although there is a substantial body of research and theory about how people learn mathematics, the majority of this has focussed on schools and the teaching and learning of children. Although a nascent literature on adult numeracy research into teaching and learning has begun to develop [1] Coben et al. write that, in England, adult numeracy education remains ‘under-researched, under-theorised and under-developed’ (2003, p.7) certainly by comparison with education generally and adult literacy education in particular. However, under the government’s *Skills for Life* Strategy (DfES (2003) to improve adult numeracy and literacy in England [2], the National Research and Development Centre for Adult Literacy and Numeracy (NRDC) was established in 2002, and a series of theoretical and empirical studies of adult numeracy are beginning to emerge [3].

This paper reports findings from one of the projects commissioned by the NRDC called *Making numeracy teaching meaningful to adult learners* [4]. The remit of the project was to explore what makes mathematics/numeracy [5] teaching ‘meaningful’ to adult learners in the further education (FE) sector, and although the term ‘meaningful’ was given a broad definition, it was generally taken to mean what the student found ‘relevant’ or ‘worthwhile’. One of the research questions also concerned students’ motivations for attending numeracy classes. As the research unfolded, researchers’ understandings of the reasons students have for attending numeracy classes, and what makes numeracy teaching meaningful to them, became inextricably linked with the construction of students’ social identities as adult learners of mathematics, and therefore theories of

identity underpin the findings about motivations which constitute the main part of this paper.

Within the last twenty-five years or so it has become generally accepted in official reports (Cockcroft, 1982; HMI, 1985), and in much academic writing on 'good practice' (see, for example, Hayman, 1975; Cooper & Dunne, 2000; Cooper, 2001) that the teaching and learning of mathematics/numeracy should be related to its uses in everyday life and work settings. Cooper (2001) points out that this position assumes that the majority of individuals will find mathematics more interesting and relevant when it is set in, and related to, supposedly realistic settings and contexts. This is despite the fact that research (see, for example, Lave, 1988; Nunes et al, 1993) has convincingly demonstrated that out-of-school practices should not be regarded as merely the application of school techniques, and that the mathematical techniques used in specific everyday life contexts are deeply bound up with, and developed in, the socially organised activities and systems of meaning within that particular community. Moreover, along with Dowling (1998), Cooper also points out that it is working class learners who are seen as benefiting most from this approach [6]. However, one of the project's main conclusions is that mathematics does not have to be 'functional' to capture students' interest, involvement or imagination. What makes a piece of mathematics 'real' is the quality of an individual's engagement with a problem, rather than its utility or immediate application to their everyday lives (Ainley, 2000). Therefore, pure or abstract problems, or areas of mathematics such as algebra, can be very real in terms of the interests and commitment they engender.

Background and methodology

The research is part of the paradigm in contemporary theories of learning that places learner identities at the centre and comprises of the following elements: there is a focus on socially constructed accounts of learners' identity; there is a

concern with learners' agency that is located within a series of overlapping socio-cultural and political structures; and due attention is paid to the issues of 'voice', both of the research participants and the researchers themselves (Hughes, 2004).

The project began in December 2002 and was based in three colleges of Further Education in different geographical areas in England. It investigated 80 adult numeracy students who were working between Entry Level 1 to Level 2 (equivalent to the top three grades at GCSE), although the majority were working at Entry Level 3, which corresponds to the standards expected of an average 11-year-old. The average age of the students was 37 and the gender balance was 64% female and 36% male. The students were based in four classes, three of which were day classes and one an evening class (see Table 1 below for a more detailed profile of the student cohort).

Table 1 goes about here

While the students were almost exclusively White British in Gloscat, they was more of a mixture (mainly between White British and Asian) in Slough, while nearly three-quarters of the students in Hackney were Black Afro-Caribbean, which reflected the immediate surrounding area. There was also a big difference between the students in the three day time classes, and those attending the evening class. The majority of the evening students tended to have their lives more organised in the sense that they were either enrolled on another course, or

were in full or part-time employment, and they also experienced fewer health and social difficulties. Nearly half of the sample had either had a serious accident in the past, and/or had experience of poor health (physical and/or mental) which often affected their ability to learn. It is noticeable and significant that the greatest majority of these students were in the Entry Level class. While the majority of all the students in the study were unemployed, those that were in employment generally had jobs which were low-paid, unskilled, and non-standard, that is they were part-time, short-contract, temporary and without training.

Many of the adults, initially at least, viewed themselves as mathematical failures. They often only had partial understandings of mathematics and carried various types of emotional baggage acquired from the previous failure in school where mathematics was generally characterised by low-level activity, rule-following and procedures. Around two-thirds of the students spoke of their poor experience of schooling, in the sense that they were unhappy, bullied, and/or felt that they were written off by maths teachers, usually at an early stage.

Integral to the project were three teacher-researchers (TRs) [8] who were based in each of the three colleges, and who worked on the project for approximately one day each week. Whilst the TRs were experienced teachers in the field of adult numeracy with over 40 years teaching experience between them, they began the project as novice researchers, at least in terms of ethnographic and qualitative methods of research. Potter (2001) uses the term ‘synergy’ to connect the two cultures of research and teaching which together generates knowledge for teaching and reconstructs teachers as ‘knowers’ rather than as objects of study (Appleby, 2004). Indeed, the TRs collaborated in the design of the project and were involved in the conduct of the fieldwork (including observing and interviewing their own students), analysis of the data and early dissemination of its emergent findings [9]. They also provided invaluable information on their college’s ethos and managerial structure, detailed background information on each student and comprehensive weekly session notes. Lytle (1997) also refers

to the ‘insider perspective’ which means that teachers are often the experts in the setting and the academics the strangers. As ‘insiders’, the TRs not only helped by monitoring whether the project was asking the right questions, they also provided an important ethical check, ensuring that the students were treated respectfully, and, for example, were informed of the research findings.

It is important to stress two points that have implications for the generalisability of this project. Firstly, the students attended classes voluntarily; they told researchers that they enjoyed the numeracy classes, and the majority were people who were well motivated and who continued to want to learn: the project did not talk to people who were not attending classes. Secondly, the TRs were highly competent and experienced practitioners, and the students generally reported that they found lessons interesting, stimulating and often challenging.

The two principal methods of data collection were semi-participant observation within the classroom and loosely structured interviews, but data were also collected through teacher-researcher session notes, student diaries documenting feelings towards numeracy (including its teaching), and photographs taken with disposable cameras showing contexts involving numeracy. In total, the research team interviewed 70 learners, with some being interviewed up to 3 times. Although I carried out the majority of interviews the TRs also did about 30 interviews with their own students. Interviews were usually on an individual basis, and lasted between 15 minutes to almost an hour (the majority being about 40 minutes), and the interviewers saw their role as facilitators to establish a free flowing discussion in order to collect a wide range of opinions. Although some learners are also studying literacy and ICT, the questions were asked of learners during their numeracy classes and were directed towards the learning of numeracy.

Theories of motivation

Alexander (2004) writes that teaching makes little sense unless we address questions of human identity and purposes for learning. Osborn et al. (2003, p. 9) also note that many contemporary theories of learning have begun to appreciate

> the need to understand what it is that motivates and empowers an individual to take advantage of the learning opportunities available to them; to shift the focus of research concern away from the *provision* of educational opportunities, from the factors that influence the *ability* to learn and toward those that impact upon the *desire* to learn (Osborn et al, 2003, p.9; original emphasis).

There is much disagreement over the precise nature of motivation; definitions come from a wide range of theoretical perspectives (Pintrich & Schunk, 1996), and this paper does not have the space to do justice to this complex area. However, Ecclestone (2003) notes that many ideas about motivation remain confused, and that broad distinctions between behavourist and humanist research has introduce unhelpful but enduring dichotomies between extrinsic and intrinsic motivations [10], the latter of which most educators regard as inherently desirable.

The study conceptualises motivation as a process rather than a product, and something that can be influenced and changed. Although, in many ways, the term ‘motivations’ is similar to ‘reasons’, reasons are regarded as being more straightforward and on the surface, and motivations as deeper and underlying, and tending to emerge over time during in-depth interviews. Indeed, the findings would have almost certainly been different if the study had used questionnaires or structured interviews. When asked for their reasons for wishing to enrol in a short, initial, diagnostic interview, the TRs found that students typically responded with answers such as ‘so that I can do long division’, or ‘so that I can learn how to add and subtract fractions’. It is only when the students were given the chance to talk about their reasons/motivations at greater length that other

considerations began to materialise. Moreover, it was found that motives are generally complex and multiple and were scattered throughout the interviews as different areas of the students' lives were explored. However, this is also because the in-depth interviews, not only asked students about their original motivations for joining the course, but why they continued to want to attend every week. Analysis showed that, as well as their dispositions towards learning, student's personal motivations can also change over time as circumstances alter.

Just like other adult learners, the students came to the numeracy programmes with a mixture of hopes, fears, and expectations. Many thought that college was going to be an extension of school, and Christophel & Gorham (1995) maintain that the first three weeks is a critical time, when students are particularly likely to drop out, and when the teacher-student relationship is particularly important to sustain motivation (see also Quigley, 1997).

Many contemporary writers working in the field of learning in education also stress the role of the unconscious (see, for example Butler, 1990, 1993; Redman, 1996; Redman & Mac an Ghaill, 1996). There is also a strong tradition of work about motivations from a psychological perspective from Freud (1966) onwards. The study certainly does not pretend to gainsay the role of the unconscious (with all its emotional subtexts), and many of the social actions taken by adults in the study undoubtedly, stem from, and are driven by unconscious motivations and desires. However, the focus of the study is to try and *describe what is happening,* rather than trying to seek out 'inner' psychological/psychoanalytical explanations and reasons behind it. The intention is not to either dispute or deny the importance of the role of the unconscious, but merely to recognise that it was not a direct part of the research questions, and, as such, researchers did not ask the right questions to pursue this.

Theories of identity

Issues of identity are a fundamental aspect of learning because people's beliefs about self operate to select, refine and organise their perceptions of the world around them and influence their construction of meaning. As far as mathematics is concerned, identities fashion learners' beliefs about themselves as learners and as potential mathematicians.

Identity is not conceptualised as an unalterable and unitary quality that people possess, but as something that is constructed and performed in particular ways in specific contexts. We need to turn away from metaphors of innateness or pre-disposition; identity is not some core part of our personality that pre-exists us, nor is it something that we somehow acquire at some point at a certain age. Holland et al. (1998) write that identities do not just come into being without a great deal of work from the person involved; they also emphasise people's biographical past, and they refer to identities always forming as 'history-in-person', which gives their identities a foundation and durability to improvise and develop. A key point to make is that identities are unfinished and in process. As Hall (1992) says, identity belongs as much to the future as to the past for it is a matter of 'becoming' as much as 'being'.

In FE Colleges, adults also construct themselves as students. This is not to say that they abandon other identities – a mother is still a mother - but the identity of student may be fore-grounded in a particular context such as the classroom. Indeed, according to Rogers (2003), what often determines the effectiveness of a teaching programme, is how the learner positions him/herself as 'student' in relation to the subject matter and to the teacher, and the corresponding positioning of the teacher in relation to the learner and the subject matter.

Findings and discussion: adults' motivations for learning numeracy

In 2004, the director of the Basic Skills Agency, Alan Wells, was quoted as saying that:

> My experience over the years is that a lot of people who want to learn numeracy want it for a specific purpose… they've got to do a test to get a job – or something numerical regularly comes up in their job and it didn't used to (Whittaker, 2004).

This runs contrary to the findings of this project. Although students' motives are varied and intricate researchers found that the three main motivations students had for attending and continuing to attend numeracy classes regularly in this study were as follows:

- to prove that they have the ability to succeed in a subject which they see as being a signifier of intelligence;
- to help their children;
- for understanding, engagement and enjoyment;

These are in no particular order of importance. For some students, there was the additional utilitarian reason, of needing to obtain a particular qualification to get on to a particular course, and also a functional reason, that studying mathematics enables them to cope better with the mathematics they come across in their lives outside the classroom. However, the research found that both these were usually comparatively minor incentives to attend classes.

As I have written above, many of the students' motivations for attending classes were found sprinkled throughout the interview as researchers talked about different areas of their lives. Sometimes, though, they came together, one after

another, and the following quotation encapsulates many of the main motivations outlined above:

Iris: It's just exciting, I enjoy doing it, it helped me with my everyday life because sometimes you go out shopping and if you don't know your maths you can be short changed, which has happened to me many times. As well I've got my young son, I help him a lot and right now thank God it's paying off because he's above average in his maths, you know because I helped him, and most of all for myself so that I understand the different techniques of maths and what I didn't achieve in school. I never completed school, my education, so it's for me, what I didn't gain then I try to make up now.

The paper now takes each of the three main motivations in turn.

To prove I can study and succeed in mathematics

The study found that a major reason why students take up classes is that many have failed at mathematics at school and they want to prove that they have the intellectual capacity and durability to succeed in a high status subject.

Selena: I'm not really sure that I can use maths but I just want to learn it for me, it's just something that I want to achieve for myself, that I can do things. I never thought that I might be able to use maths in something, I know dividing you need to but I just want to teach myself something

Jon: Sure, so what, because you feel that you were left out?

Selena: Yeah

Jon: Do you want to prove something to yourself or/

Selena: Yeah that I'm not as stupid

Jon: But you're not stupid because you learnt to speak very good English/

Selena: Yeah

Jon: So is that not enough?

Selena: No I want to learn more. I want to be able to have some sort of qualification that shows me that I've done that because in my life I don't think that I've done anything, apart from growing up and having two babies.

Many students also see mathematics as a signifier of 'natural intelligence', (Mendick, 2005) and they want to be able to enter, and gain access to, what they see as being an esoteric and privileged practice. In some ways this is an exclusion issue, for they want to be able to open the door and join the mathematicians' club, with its connotations of eliteness. Dowling (1998, 2001) proposes that there are two different ways of viewing or interpreting mathematics – a *public domain* and an *esoteric domain.* School or college mathematics generates both kinds of practice, the generation of abstract and generalised skills and objects (esoteric domain), and the production of practical and localised skills and objects (the public domain). The research argues that mathematics is set in the esoteric domain, and numeracy in the public domain, and that many students in the study aspired to enter the esoteric domain; they wanted to study mathematics.

Rather than avoid school maths [11] they wanted to do school maths again, but this time succeed in it. Some students said that they felt that wanted to work on particular content areas of mathematics that they had either not covered, or had not learnt successfully at school; it was almost as if they saw the curriculum like a jig-saw puzzle:

Sarah: I want to fill in the bits I haven't been taught. To be complete.

Jon: So do you feel you missed out a bit?

Sarah: Yeah. Because it's like, what I should have learned then, I am learning it now.

One of the most important findings was students' liking of algebra, which some people might find surprising given its widely accepted lack of applicability to the practical world. However, for many of the students, this was part of the attraction. For many, algebra has the status of being like a foreign language, and with its abstract nature, and (seemingly) mystical codes, it is one of the starkest signifiers of Dowling's esoteric domain. Students in all three colleges told us how they felt a great sense of personal achievement when they began to understand its rules and concepts for the first time. The extracts below come from two different students.

Carrie: When I got to be able to do algebra, it was such a sense of achievement. Because I can do it! And it brought back memories of school when we were doing algebra and I didn't understand what the hell they were on about

Misha: Because maths has had the label of being hard and complicated, if a person feels like - oh I'm stupid - or anything like that, and you sit them down and get them to do an algebra problem and they realise – Oh wow, I can do it. It will make a person feel really good about themselves.

However, a caveat to this is that it may depend on how it is taught. The TRs went slowly, broke each concept down, and made algebra appear interesting.

To help their children

Another major reason why people came to numeracy classes was to help their children, but unlike in the other categories of motivations, all the adults in this group were women. Many students want to learn mathematics at college to be able to help their children with their schoolwork. Sometimes this was where they

have failed themselves and they do not want this to happen to their own child, and so this is another case of wanting to learn 'school' maths in order to help their child with their 'school' maths. Sometimes, though, students said that they did not want to feel inadequate, and, in the eyes of their children, seen as being incapable or lacking in know-how. There is also the role of being a teacher. This is not only an important element of being a parent, by helping establish closer bonds, it also helps adults with their own learning by making them reflect on their own work in a particular way. For example, 'I can do this, but how would I explain it to my child'; 'I understand this method, but what if they have a different method at school?'; 'which one is best?'; and 'how do the other methods work?' Some of these reasons can be seen in the conversation below with one of the TRs:

TR: Do you feel more confident about your maths now?

Susan: Since I had my daughter, yes

TR: What difference has that made to you, having a daughter who is at school?

Susan: Because, as she's started learning maths, and I was helping her, it taught me how to do it. And I practised with her, and what she couldn't do, I'd try and learn so I could teach her

[…]

TR: Right, and was that from pretty early on? From once she started school, that you began thinking about your own maths skills?

Susan: I was very worried that once she got to secondary school there was no way I was going to be able to help her. And that made me feel inadequate.

Another by-product of this process is that adults can be seen as acting as positive role models in their children's own learning. Students would say how they would sit down with their children around the table and study together.

Jane: She [*her daughter*] has watched me struggle with it (not very much it has to be said - but work at it) and go from having none to understanding. And she has watched me fall in love with it, get excited, punch the air over it, read books about it. I think it is a virus (a happy one), and she caught it. She seems to realise that it's OK to get things wrong, try again, be brave with it and enjoy it. Her teacher says that she can explain in words what she does with numbers. I think that's pretty smart for a 9 year-old.

For understanding, engagement and enjoyment

Almost without exception, the students reported that they wanted to understand the mathematical system, its principles and underlying relationships.

Jon: And are you one of these people who really wants to understand what you are doing?

Sue: I prefer to understand rather than people just give it to me on a plate. Like, if I've got a pain in the leg, there's no point me taking paracetamols if I don't know what's the matter with it. I want to know what the pain is, and then take the paracetamols.

A key point is that a major reason why the students come to classes is the quality of engagement with the activity; this is what makes the mathematics seem 'real' or worthwhile to them, rather than its supposed usefulness and application in their lives outside the classroom. This quote comes from the same student who was talking about her daughter above:

Jane: But actually it hasn't been the daily application that has caught me, has got me so … it's beyond the daily application, it's so exciting and I don't think you do have to make it daily, practical, mundane. It doesn't have to be just practical…

Besides, the vast majority of the students in the study felt that they could get by already with the mathematics that they knew; many also wanted to go on to study something a bit more challenging:

Georgia: I know basic maths but I want to be able to do some of the things I've seen with mathematics.
Jon: Such as what?
Georgia: Things they do when you go into uni. Like brain busting stuff.
Jon: Yeah. So you'd like to learn more of those sorts of things.
Georgia: Yeah, I'd like to learn it at a higher level.

They liked to be stretched and made to think:

Jon: Do you see that as a challenge, do you think?
Simon: It is. Because then you are pushing your brain around.

However, it is also important not to neglect the aspect of pure enjoyment of the subject which was a reason, perhaps, far more common than people might suppose. Once they get passed their initial anxieties about the course and the subject, nearly all the students began to find that they actually liked studying mathematics, and said that as well as being challenging it could be fun; indeed, the enjoyment was often linked to the challenge which could bring a great deal of satisfaction. Again, though, I would like to point out that this is dependent on good teachers who make mathematics interesting. Here are data from two students in separate interviews:

TR: So what would you say was your main reason for doing maths?
Viv: […] It's so interesting. I've been working on the tills all the time and calculating on top of my head, and I think for someone who suffered so much at school, if I put all my years in school I can say

for a year. It's just something... it gives you a buzz, it's exciting […] I think every day, whatever you learn, it's like a bonus.

Jon: So what's the main reason that you're here then?

Levina: I enjoy maths, I really love it, I'm no good at it but I absolutely love it […] I rave about it to everyone, honestly, I'm in bloom

Levina also told me that she sees maths as her hobby and compared it to being 'like my baby'.

Amongst two of the less frequently cited motivations were the desire to get a qualification, and wanting to use numeracy to help in the world outside the classroom.

To get a qualification

Although many students said they recognised that higher qualifications often provided greater choice in the labour market, there were very few who said that they wanted to obtain a specific qualification to increase their options in terms of employment opportunities. They did not feel that a Level 1 national numeracy test, or one below at Entry Level, had much currency with employers [12]. Moreover, few of the students' motivations were related to perceived needs in their employment, and only a very small number said that the numeracy they were learning in class helped them in their current job. If they needed help with a numerical operation at work, this was the context to tackle it in. A few students, in the evening class, said that they were studying numeracy in order to get on to an Access course, such as in nursing, but these were very much in the minority.

To help in the outside world

The great majority of the people in the study saw themselves as competent individuals without mathematics, and only a few students said that the mathematics they learnt in their numeracy classes had really helped them in their

lives outside the classroom. This generally referred to transactions involving money: they said they were able to work out their change better, estimate how much they will save in, say, a 20% sale, pay their bills and so on. Some students told researchers that before they came to classes, they were unsure how much money to hand over when they bought something in a shop, which even meant they ended up not buying the item they wanted.

Jon: So what would happen before, if you weren't sure which one to pay for, you'd have to give them a fiver or something?

Peter: Yes. I'd either give them too much money, or not enough.

Jon: So you weren't sure how much change, because you weren't sure which figure...

Peter: Yes. So if they were fiddling me I wouldn't know […] Sometimes I used to put it back. I'd get embarrassed about it. So yeah, you know, to me, this is where you need the maths.

Other students also recalled how they used to be embarrassed at their lack of mathematical knowledge and skills:

Beryl: I tell you the most embarrassing thing is when I had to send my children to the shop, or they came with me, and I used to say to them (*whispering)*

Jon: How much, right?

Beryl: Yeah, how much have I got to give them? I had to ask them and that's embarrassing for a mother, let alone an adult, asking a 7 to 8 year old how much money do I give them, how much change do I get back? I'm not so bad now, I can near enough do it but it *was* very embarrassing

Rija*:* I feel a lot more confident with my maths now, keeping budgets, knowing what bill to pay, amount and how much I will have left. I do it more fluently; I'm not fantastic but a lot better than what I used to be

The majority of this group of students came from classes working at the lower end of the range in this sample and findings varied. Some students were like Rija: they felt that they had gained in confidence, their maths had improved, and that they were able to use their skills more effectively than before. In some ways they were able to take more of an inclusive role in society, and become more active citizens. Others felt that the mathematics they had been studying had made little impact and they had made little progress. However, it can be argued that progress at this level has to be measured in small steps which may be imperceptible to the individual, and not significant enough for them to be able to apply new skills in real situations. Some of these students also have limited opportunities for practising their skills as everyday tasks are directed by carers and parents.

Conclusions

This paper has looked at the motivations behind adult learners returning to study numeracy in FE colleges, and has found them to be complex and multiple. One of the project's main conclusions is that mathematics does not have to be 'functional' to capture students' interest, involvement or imagination. Contrary to assertions that adults need to be 'lured back' into learning mathematics/numeracy by making it relevant and applicable to their everyday lives, the research finds that one of the main reasons adults attend their numeracy classes is in order to prove to themselves that they have the ability to study and succeed in a high-status subject which they perceive to be a signifier of intelligence. People want much more from their numeracy classes than learning how to read their gas bills. The other main reasons are for students to help their children, and for understanding and engagement which leads to enjoyment and sense of satisfaction. Data were analysed for differences in age, gender and ethnicity, but apart from all the students who wanted to study

numeracy to help their children being women, there were no discernable differences.

The findings have major implications for policy, and not only in terms of how numeracy courses should be designed and promoted. Over thirty-five years ago Bernstein wrote that the if culture of the teacher is to become part of the consciousness of the learner then the culture of the learner must first be in the consciousness of the teacher (Bernstein, 1971, p. 65). Although he was referring to school children the principle remains the same for adult education. In other words, adult numeracy teaching is likely to be more effective when teachers understand who their students are, their backgrounds, the contexts they bring with them, and their reasons and purposes for coming to study numeracy in their class.

* 5,555 words

Notes

1] See, for example, Coben, 1992, 2000a, 2000b, 2000c, 2002; Coben & Chanda, 2000; Coben et al, 2000, Coben et al, 2003; FitzSimons, 1994, 1997, 2002; FitzSimons & Godden, 2002, FitzSimons et al, 2002; Benn, 1997, 2000; Baker, 1998; Hoyles et al, 1999; Johnston, 1999, 2002, Johnson & Tout, 1995; Wedege, 1999, 2002; Evans, 2000a, 2000b, 2002; Gal, 2000a, 2000b, 2000; O'Donoghue, 2000; Tomlin, 2002; Sträßer, 2003; Tikly & Wolf, 2003; Van Groenestijn, 2003; Gustafsson & Mouwitz, 2004.

[2] The recent *Skills for Life* survey of need (DfES, 2003b) suggests that 6.8 million adults in the UK struggle with basic numeracy.

[3] NRDC reports are available on the NRDC website and a database of sources, with annotations, http://www.nrdc.org.uk.

[4] Swain, J., Baker, E., Coben D., Holder, D. & Newmarch, B. (forthcoming). '*Beyond the Daily Application': making numeracy teaching meaningful to adult learners.* London, National Research and Development Centre for Adult Literacy and Numeracy, http://www.nrdc.org.uk.

[5] The tendency in official documents is to treat the terms 'numeracy' and 'mathematics' as interchangeable, and in this paper is using the terms in a similar fashion. It may be interesting to note here that many of the people in the study had a very clear idea of the difference: they regarded numeracy as the low level basics, and mathematics as 'the proper stuff'' that they did at school and includes algebra and geometry.

[6] Student records and conversations with them suggest that very few of the students in the study came from professional middle-class backgrounds, and that the vast majority can be categorised as being working class.

[7] In the interest of confidentiality it is common practice in research reports to anonymise names of institutions and people. While all students have been given pseudonyms, the names of the colleges are real; this is because the contact details of the three teacher-researchers are given at the front of the report which links them to the institutions. The study was given permission by the Principals of the three colleges to use the real names.

[8] The three teacher-researchers were: Elizabeth Baker, East Berkshire College, Slough; Deborah Holder, Gloucester College of Arts and Technology (Gloscat); Barbara Newmarch, The Community College, Shoreditch (Hackney), London. Diana Coben was the principal investigator of the original project.

[9] Potter (2004) is a critical of many practitioners' research that does not include teachers in all stages of the research process such as constructing interview

schedules, the methodology, analysis and having a voice in the findings and dissemination.

[10] For example, Illeris (2003) maintains that all learning includes two basic processes: an external interaction process between the learner and his/her socio-cultural and material environment, and an internal psychological process of acquirement and elaboration.

[11] Ernest (1995) points out that many professional mathematicians distinguish 'school maths' as being a different subject rather than a subset of the discipline of mathematics.

[12] Researchers did not ask about a Level 2 test as not many in this study were taking it but I suspect that it would be the same.

Key to transcripts

[*text*]	Background information;
[…]	extracts edited out of transcript for sake of clarity;
/	moment when interruption begins;
...	pause.

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Name of College [7]	Time of class	General Level that students are working at	Average number of students attending classes each week	Age range; average age of students	Gender balance	Majority ethnic mix
Gloscat	Day	Entry Level 1 & 2	5	18-52 38 years old	48% M 52% F	95% White British
Gloscat	Day	Level 1	10	17-65 43 years old	22% M 78% F	95% White British
Slough	Day	Entry Level 3 – Level 1	8	17-64 32 years old	20% M 80% F	45% White British; 20% Asian; 15% Black African
Hackney	Evening	Level 1 – Level 2	12	17-47 35 years old	38% M 62% F	72% Black Afro-Caribbean

Total sample: 80 students

Table 1: Characteristics of students at the three sites

Abstract

This paper reports research findings from a 21-month empirical project called *Making numeracy teaching meaningful to adult learners* which was funded by the National Research and Development Centre for Adult Literacy and Numeracy (NRDC). It looks at motivations behind adult learners returning to study numeracy in three FE colleges, and finds them to be complex and multiple, and inextricably linked to their identity. One of the project's main conclusions is that mathematics does not have to be 'functional' to capture students' interest, involvement or imagination. Contrary to assertions that adults need to be 'lured back' into learning mathematics/numeracy by making it relevant and applicable to their everyday lives, the research finds that one of the main reasons adults attend their numeracy classes is in order to prove to themselves that they have the ability to study and succeed in a high-status subject which they perceive to be a signifier of intelligence. The other main reasons are for learners to help their children, and for understanding, engagement and enjoyment.

168 words