New Technologies and Adult Literacy and Numeracy in the UK

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Skills for life in the UK

In this paper I shall be concerned with the issue of adult literacy and numeracy, what is often now referred to in the UK as 'skills for life', and I want to look particularly at the application of new technologies to support learning in these areas.

The non-UK reader may not immediately think of the UK as having significant problems in the areas of literacy and numeracy, and although it is true that complete illiteracy is rare in the UK, it is estimated that one in sixteen adults if shown the picture on the left of Figure 1 advertising a concert cannot say where the concert is being held, and one in four adults cannot calculate the change they should get out of £2 when they buy the goods displayed in the picture on the right.
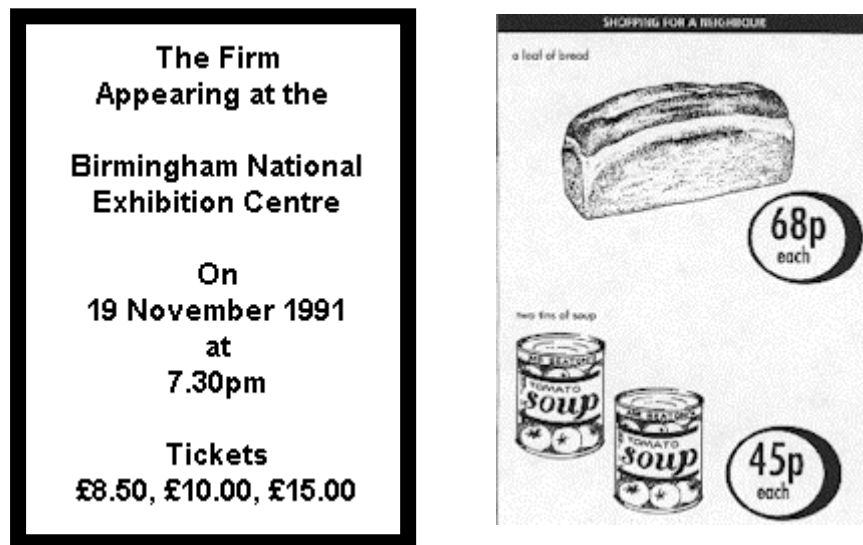

Figure 1: Test items

Whilst the contexts of adult literacy and numeracy in Brazil and the UK are very different, I hope that some of the issues that I will raise about the role of new

technologies in supporting adult literacy and numeracy will be nevertheless be helpful in the Brazilian context.

Lack of literacy and numeracy is claimed to be a key factor in disadvantage, high unemployment levels and social exclusion (e.g. BSA 1999). An international study of adult functional literacy carried out by the Organisation of Economic Cooperation and Development (OECD 1995 and 1997), the International Adult Literacy Survey (IALS), found substantial variation across countries in literacy and numeracy levels; Scandinavian countries showed small proportions of adults operating at the lowest levels (e.g. 7% in Sweden) whilst a number of English speaking countries such as the UK, Australia, Canada, and the USA showed much higher proportions (over 20% in some cases). Translated into numbers this means that within the UK, some 7,000,000 adults are operating at low levels of literacy and numeracy. The impact on personal economic prospects and the national economy are estimated at billions of pounds per year (Bynner 1999). Yet, despite the scale of the problem relatively few of these adults at that time were taking up any relevant training – in 1998 the number taking up training was about 250,000 (DfEE 2001).

The Pisa Report (OECD 2002) gives some clues as to how the UK got into this situation in its description of the UK education system as a high quality education system, with low equity; so, at least until recently, whilst it produced some very well qualified pupils, it also failed to meet the needs of large numbers of pupils and many left school with low levels of literacy and numeracy.

In the UK a working group (DfEE 1999) on adult basic skills (literacy and numeracy) set about developing a new strategy for repairing the skills deficit, and this led to a major national remediation programme, entitled 'Skills for Life', which set out to reduce, within ten years, the numbers of people with poor basic skills to half of the 1999 levels. This strategy set out national targets, a new curriculum and systems of qualifications, planned delivery, quality assurance mechanisms, improved teacher training and inspection, and promised to deliver the benefits of new technology.

Following on from the publication of this strategy the Department for Education and Skills (DfES) began a large-scale investment programme – some £1.5 billion pounds in the first three years. In November 2000 the Adult Basic Skills Strategy Unit (ABSSU) within the DfES was established with the goal of delivering the Skills for Life strategy, and in 2002 the National Research and Development Centre for Adult Literacy and Numeracy was established in order to provide a focus for the research and development work underlying this strategy.

Role of new technologies

The foundation of much of this effort lay in what has come to be known as the Moser Report (DfEE 1999) and this report had forseen a vital role for new technologies (usually referred to in the UK as Information and Communications Technology - ICT) within the Skills for Life strategy, and the report made the following claims about the possible role of ICT in this strategy:

- ICT is a powerful tool to raise levels of literacy and numeracy

- Computers and multimedia software provide attractive ways of learning

- The Web enables access to the best materials and the most exciting learning opportunities

- ICT offers a new start for adults returning to learning

- The Internet and digital TV technology can reach into the home

- Learners who use ICT for basic skills double the value of their study time acquiring two sets of skills at the same time.

These claims about the value of new technologies for addressing basic skills needs have three strands. The first three claims assert that digital technologies provide effective and exciting educational possibilities. The next two claims are about using digital technologies as ways of connecting with communities of learners who are seen as having been excluded by traditional education provision. In the last claim we see a third theme, which is that new technologies involve a new set of skills, that new literacy skills are involved.

Within the UK the use of ICT within the Skills for Life strategy has two major organizational structures. One is within adult learning centers and Further Education colleges, and the other is through Ufi/**learndirect.**

Ufi/**learndirect** is a public-private partnership set up to provide on-line training across a number of areas, including computer skills, business skills and skills for life. To give an idea of the size of this undertaking, for 2002-2003 there were 400,000 learners registered with **learndirect**, with over 100,000 of these taking Skills for Life courses. A learner's first contact with **learndirect** is usually through the telephone help line. Tutorial support is available at one of the more than 2,000 local centers. The learning centers, which are situated in colleges, libraries, museums, even bars, do not belong to **learndirect** but are in effect 'franchised'.

learndirect materials are chiefly interactive electronic teaching materials delivered either on-line or on CD ROM, and they can be accessed at local centres, at home or in the workplace. The materials vary in type, there are multiple-choice interactive exercises, exercises based around video-clips, sometimes of other learners at work, and sophisticated gaming environments[1]. The numeracy game *MaxTrax* is an arcade style car racing game with embedded numeracy activities. *Runner* is an adventure game with an urban, underground and futuristic setting typical of many commercial games, and which can be used to practice and develop literacy skills. Other approaches adopted by **learndirect** centres to using new technologies are outlined in a guide that the Institute of

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1 Sample materials are available at
http://www.learndirect.co.uk/personal/freestuff/tasters/# - last accessed 24 July 2004

Education prepared for Ufi - *Using ICT to develop literacy and numeracy skills for adults: a guide* (Ufi 2001)

I have used the phrases new technologies and ICT in much of the discussion so far, and what I have usually been referring to was computers, and what is often called e-learning. The technologies that I have described are principally being used by institutions. However there are a number of other technologies that are likely to have an important influence in this area in the near future, and which are likely to be much more informal and personal in their use. One is the use of interactive digital TV (t-learning), and a number of companies are looking at developing approaches here, in particular building on the increasing popular use of games on interactive digital TV in order to provide literacy and numeracy activities. The hope is to reach audiences who would not have access to computers, or be interested in attending courses. Another approach being developed uses mobile technologies: mobile phones (including video-phones), and personal data assistants (m-learning). Both of these forms of technology have implications for the way we think about learning – they tend to be associated with much smaller units of learning, bite sized, on-demand learning, and are intended initially at least in order to increase the learners' self-confidence in their own ability to learn, for this is seen as the key first step in involving this particular target audience in learning.

Research

Introduction

Whilst there is some evidence of the impact of new technologies on the learning of children, much less is known about the use of new technologies with adults with skills for life needs. In addressing the needs of this group of learners we need to bear in mind that they differ from school children not only because they are older, but because they generally have bad memories of their own schooling.

Over the last seven years the Institute of Education has carried out a range of studies looking at the role of new technologies in supporting adult literacy and numeracy. In this section I'll outline the main results of one these studies. This project[2] ran from April 2000 to March 2001 and set out to investigate whether new technologies can be used effectively to provide learning to people with basic skills (literacy and numeracy) needs. This study pre-dated the implementation of the **learndirect** skills for life provision, and was carried out in eleven centres with a good track record of the use of computers in adult literacy and numeracy. The centres identified included Further Education colleges, community colleges, outreach centres, learning shops, a prison and a refugee organisation. Within

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[2] This research project was supported by Ufi Limited, the organisation which, together with its partners, has established an e-learning network of over 2000 learning centres and set up **learndirect**'s national learning advice service.

A summary of the research report is available at:
http://www.ufi.com/press/papers/literacyguide.pdf - last accessed 24 July 2004

these centres we interviewed 71 managers and tutors and 124 learners. The majority of the learners interviewed were also tested on their literacy and/or numeracy skills and 70 of these were post tested some two and a half months later.

Use of new technologies

A large number (36%) of the learners in the study had access to computers at home. This figure was only a little below the UK national average ownership figure at that time which was estimated to be around 44%. This was interesting as it had been anticipated that the level of ownership would have been significantly lower than the national average, since these learners are likely to be relatively less well off. The reason learners most often gave for not owning a computer was actually the perceived fear of theft in the areas in which they lived rather than cost.

The computing facilities for basic skills learners in some of the centres visited were excellent, but in other centres they were poor in comparison with what was made available to other learners. Learners who were new to the use of computers had little difficulty in starting to use computers, and the technology formed a barrier only for a small percentage of learners. The chief applications in use were: a range of literacy and numeracy software, office software (principally Word and PowerPoint), and the Internet (both for email and for accessing the Web). The most experienced tutors stressed the importance of close integration of the new technologies with basic skills provision. However, our study showed that the use of new technologies use in basic skills provision in most centres was at an early stage of development, and that it had not yet reached the critical threshold in terms of access, development of pedagogy, or tutor training for really effective implementation.

We found that the distinction between using new technologies to teach literacy, and introducing learners to new technologies as a new literacy was blurred in the practice of many of the tutors and learners that we spoke to. The nature of these new literacies and learners' perception of the new technologies were also undergoing change, for example there was evidence that older learners (that is, those above 24 years of age) thought of the Web chiefly as a source of **information**, but younger learners saw it rather as a source of **entertainment**.

New technologies and teaching

Whilst there were a small number of tutors who were highly experienced in the use of new technologies to teach skills for life learners, many of the tutors described themselves as relatively new to the use of technology. Even the more experienced were unaware of the range of use of new technologies in education more generally (for example in the schools, university and corporate training sectors). The people we spoke to were on the whole the enthusiasts and they indicated a great deal of resistance to the use of new technologies amongst their colleagues, particularly part-time tutors, who only had a few hours of teaching

contact a week and felt that the use of new technologies would add to their workload.

One of the issues we were interested in exploring was the degree to which new technologies might enable this group of learners to work independently. Both tutors and learners expressed some support for the idea that new technologies might increase learner autonomy for certain learners, but they also saw the role of the tutor as crucial. A number of learners indicated their need for support whilst working with technology, and some even suggested that they might need more support than they needed with traditional approaches to learning. However there was a significant element – around 20% of the learners – who saw the greater autonomy in learning offered by new technologies as important for them.

Motivational impact

The use of new technologies in learning was attractive to learners, and this resulted in improved recruitment to courses. Ninety-two per-cent of learners in these centres said that they found the use of computers motivating. The learners who were being attracted through new technologies were often young men with low levels of literacy, and this was seen as a positive feature since young men are one of the hardest groups to involve in learning. However whilst new technologies were succeeding in attracting learners, there was a danger of centres promising learners more than they could deliver in terms of job opportunities.
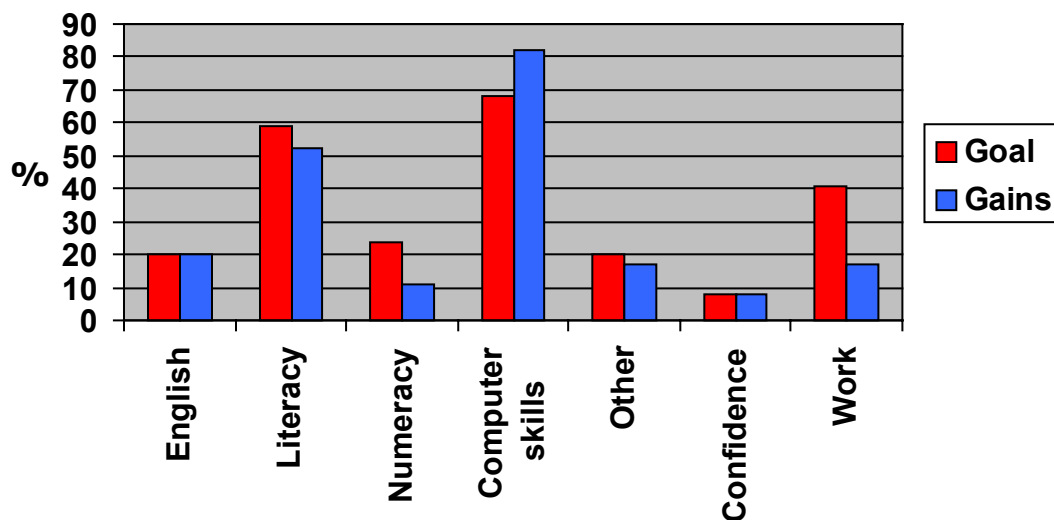
Learning impact

Figure 2: Learning goals and gains

Sixty-four percent of the learners said that computers helped them to learn, and in particular that computers helped them to concentrate and provided feedback.

Figure 2 shows the percentage of those who identified specific learning goals during the first interview and the percentage of those who indicated that they had made gains towards these goals at a second interview some eight weeks later. Most felt that their literacy goals were being met, and in particular that computers enabled them to produce better presented work and to do it more quickly, however many felt that their numeracy goals were not being met and that their expectations about preparation for specific vocational areas were not being met. Many felt that they had made gains in computer skills even when this had not been one of their initial learning goals, and indeed 26% indicated that their work aspirations had altered to include a desire for a greater involvement with computers in their future work.

There was a statistically significant improvement between pre- and post-test scores in reading for learners with intermediate levels of literacy skill, but no significant improvements were found for those with very low levels of skill or for numeracy or ESOL (English for Speakers of Other Languages) though the numbers tested were small and hence less likely to show statistically significant changes. Case studies also indicated that computers could have a significant impact on the learning of some learners.

The significant improvement in reading scores is surprising in that the main activities reported by tutors were writing and preparing presentations, there was little discussion by tutors about teaching reading. There are at least two possible explanations for this difference. One possible explanation is that tutors were actually spending quite a lot of time teaching learners how to 'read the screen', but were not reporting this activity. Computer screens are considerably more complex reading environments than books, with icons, multi-layered menus, and multiple windows. Practice in reading the computer screen could well have had an impact on performance on the type of reading test item illustrated at the start of this paper where the reader has to identify a relevant piece of information amongst a number of other items. We have more recently carried out detailed observational studies of tutors teaching and have found that many tutors do indeed spend a lot of time teaching learners how to 'read the screen', but they do not necessarily describe this as teaching literacy skills. An alternative way of thinking about this might be to reflect on the idea 'omission design' (Fraser et al 1991), a principle of educational software enunciated some years ago that suggested that in designing educational software a designer needs to determine what the learner is required to do, and then take this element out of the software, so that the software can not do this for them, and as a consequence the learner is required to develop the skill.

In examining the effectiveness of computer use in skills for life provision the important pedagogic factors were found to be: assessment of learning needs, consideration of learning styles, careful integration of ICT into teaching and intensity of ICT use. Important organisational factors were found to be: availability and training of tutors, accessibility of ICT resources to basic skills learners, level of technical support, and prevailing institutional culture with respect to basic skills, ICT and learning.

Ongoing research

Three key issues were identified at the start of this paper:

- Can new technologies be used in such a way as to enable greater access to literacy and numeracy provision for adults?

- In what ways can new technologies be used with this group of learners to enhance their learning?

- What *are* the new basic literacies of the 21st century?

Perhaps the single biggest issue for new technologies for skills for life provision is the issue of access and motivation. Computers and interactive multimedia have been seen to be a powerful incentive for learners to get involved with learning. Often learners come into provision looking for computer skills but then find that they have literacy and numeracy problems that get in their way, and so are helped to begin to focus on these. Others are motivated to stay within a course because of the computer skills element. For some learners, computers and interactive multimedia provide an alternative route into education where traditional classroom approaches have failed them in the past. The flexibility of access promised by new technologies is a major attraction. Can new technologies genuinely help to widen provision, are they in fact enabling us to address the learning divide, or is the digital divide simply replicating the learning divide? On the negative side, Gorard (2002) in an analysis of survey data on adult education came to the conclusion that:

> …access to ICT does not, in itself, make people anymore likely to participate in education and (re)engage with learning. Access to ICT continues to be largely patterned according to long-term pre-existing social, economic and educational factors. Thus, like educational qualifications, access to ICT is a proxy for the other, more complex, social and economic factors that pre-date it rather than as a direct contributory factor in itself.

However, it is not surprising that "access to ICT … in itself" will not achieve any of these things, but what we need to is to explore ways in which new technologies can be used to improve access. In one project for Ufi we have looked at the potential of computer games for attracting learners (Kambouri, M. Schott, G. Thomas, S., Pavlou, V. and Mellar, H., 2003). In a range of ongoing projects the National Research and Development Centre has looked at the use of laptop computers in outreach community provision (National Research and Development Centre for Adult Literacy and Numeracy, 2004), the use of multimedia authoring in prison education, and the use of mobile phones in literacy provision.

Turning from the access issue to the learning issue, it is clear that the majority of skills for life learners need considerable support in their use of technologies, and that tutors also need to further develop their skills in the use of technologies in teaching. In one project we have examined the level of support that is needed to support learners working with e-learning materials (Kambouri, M., Mellar, H.,

Kinsella, K and Windsor, V. 2003), and in other projects we have involved teacher-researchers in classroom observation studies (Mellar, H., Kambouri, M., Sanderson, M., and Pavlou, V. 2004), and in intervention studies examining the impact of a range of forms of use of new technologies with these learners.

The third issue concerns the changing nature of literacies. Many authors have argued that digital technologies have implications for our ideas about literacy more generally and these debates have to some extent been reflected within the discussions around skills for life. So, for example, ICT is coming to be seen as a basic skill in its own right, as one UK government think tank (Post-16 E-learning Strategy Task Force 2002) writes:

> Reading and writing are universally accepted as basic entry requirements for social inclusion. However, it is clear that a lack of ICT skills, including not having the skills to learn through ICT, is potentially now as great a barrier to employability and social inclusion as a lack of achievement in literacy and numeracy have been to date.

> ICT user skills include those most frequently required in employment, for example, those associated with the Internet, email, word processing and other commonly used business packages. We also include an element of e-learning skills in the definition of ICT user skills; no individual who has undertaken ICT basic user skills programmes should struggle to engage with the basic principles of e-learning.

Others within the basic skills area have argued for a much wider view of technological literacy, for example humanITy (2003) writes:

> Traditionally we have emphasized traditional, autonomous, discrete literacy which says: The more complex the set of skills to complete a task the fewer those who can perform them all. ICT, inclusive, collaborative literacy says: The more complex the set of skills to complete a task, the greater the number who can become involved. We need to think much more of the second and much less of the first.

Carvin (2000) developing from a definition of basic literacies distinguishes a number of elements of relevant new literacies, including:

- Technological Literacy: the ability to utilize common ICT tools, including hardware, software, and Internet tools like search engines.

- Information Literacy: the skills to ascertain the veracity, reliability, bias, timeliness, and context of information.

- Adaptive Literacy: the willingness to learn new tools and to apply previous ICT learning to new situations.

How we define these new literacies will be extremely important in determining whether we genuinely manage to address the issue of skills for life needs, or whether we succeed in solving the last century's problems only to fail to solve those of the present century. The UK Department for Education and Skills has now designated ICT as a Skill for Life and published draft standards, and the

process of developing appropriate curriculum has begun. However these standards seem to have been more carefully aligned with the demands of the workplace rather than those of learners everyday lives and these standards is likely to remain an area of controversy for some time to come.

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