Literature Review of the Effects of Improvements in Adult Basic Skills

Report Prepared for the National Assembly for Wales

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Executive Summary

Introduction

Basic skills are defined as the ability to read, write and speak English (and Welsh where appropriate) and use mathematics at a level necessary to function and progress in work and in society in general.

The most recent figures for Wales, based on surveys conducted in the period 1996-1999, suggest that 28% of adults have low or very low literacy skills, and 32% of adults have low or very low numeracy skills.

Britain as a whole performs quite poorly on international comparisons of adult basic skills.

The Ideal Study of the Impact of Basic Skills

The aim of any study of the impact of basic skills should be to determine the gains made in basic skills through the use of pre- and post-programme testing, and then to relate these gains to changes in the final outcomes of interest (for example labour market outcomes).

The pre- and post-programme testing is important in order to show that the basic skills training has actually raised literacy and numeracy levels. In order to prove causality, it is important to have a control group of otherwise similar individuals who have not participated in basic skills training, to thus show that basic skills would not otherwise have risen without the basic skills training.

Once the effectiveness of the programme in raising basic skills has been established, it is then important to link these improvements to changes in the final outcomes of interest, in order to reveal the impact of the basic skills training. The 'changes' or 'first difference' approach is preferable to a 'levels' or cross-section approach, since the change in the outcome variable can then be related to the change in basic skills. If

all that is observed is a cross-section of individuals with better basic skills also having better outcome variables, then causation is not proved, and it could be that other variables, such as unobserved characteristics of individuals, are influencing both basic skills and outcome variables. These unobserved characteristics, if fixed over time, would drop out of a first differenced equation.

No study has been found that calculates the change in basic skills amongst course participants relative to a control group of non-participants, **and** then relates this change in basic skills to changes in final outcome variables of interest.

The Impact of Basic Skills Courses on Test Scores – Quantitative Evidence

The best study identified is that by Brooks *et al* (2000), who assess the literacy gains made by adults attending dedicated basic skills provision in Further Education Colleges.

The median amount of tuition received by participants in Brooks *et al*'s study was 31-40 hours. Thus the courses are quite short.

The average gain in reading scores following programme involvement was 11.1 points, which represents one-quarter of a standard deviation of the scale used. This seems a worthwhile educational improvement from such short interventions. There was no control group used in the study to provide a comparison.

There were also statistically significant improvements in word length and handwriting quality, though not in the number of errors in written answers.

No characteristics of participants (gender, age, first language, labour market status, formal qualification level) were associated with the magnitude of the basic skills improvements made. All made similar gains, on average.

Similarly, few course characteristics were associated with the magnitude of basic skills gains, with the exception of significantly larger gains where tutors had qualified teacher status, and where tutors benefited from having teaching room assistants.

A limited number of other studies, less extensive than that of Brooks *et al*, also reveal gains from involvement in basic skills learning.

The Impact of Basic Skills Courses on Educational Outcomes– Qualitative Evidence

A larger literature has examined the success of programmes in raising basic skills via a more qualitative approach based on case studies, much of it undertaken by or on behalf of the Basic Skills Agency. The following factors have been suggested as being important for effective basic skills learning:

Recruitment of learners – personal contact has proven to be the most successful approach. Broadcast media has also been effective, though the print media less so, perhaps understandably. Accessible location can have a big impact on recruitment.

Programme characteristics – the following have all been suggested as improving the effectiveness of basic skills teaching: clearly structured programmes, discussion of real world contexts to maintain interest, high expectations of learners, the use of a learning plan for each learner, regular assessment and progress reviews, and the availability of accreditation.

Materials – course materials such as handouts should be appropriate for adults, and not recycled materials for schoolchildren. They should be organised into study guides, allowing self-study. Computers and ICT can aid learning.

Assessment – should be a continuous process, from screening to identify those in need (amongst captive audiences such as FE students or unemployed benefit-claimants), to diagnostic testing to identify areas of most need, and then ongoing assessment of progress throughout the course.

Quality of staff – full-time staff, well-trained staff, and the use of volunteers in addition to course tutors are suggested as being associated with better learning outcomes.

With respect specifically to workplace learning, some further factors identified with successful training are:

- the inclusion of basic skills within the firm's overall training and development programme.
- the use of real life work situations as part of the training.
- the inclusion of workers in the development of the training programme, rather than having it imposed upon them.
- support from senior management.
- free to workers, and takes place in work time.

The Impact of Basic Skills on Economic Outcomes

Individuals:

There are a limited number of data sets available with which to empirically study the impact of basic skills on particular outcomes. In terms of large scale national data sets, researchers are restricted to the birth cohort data sets (National Child Development Study and the British Cohort Study) and the International Adult Literacy Survey.

These data sets have been used to investigate the associations between basic skills and economic outcomes, although since they are cross-sectional in nature, causation is not proved, since other factors, unobserved and thus uncontrolled for, could be affecting both basic skills levels and economic outcomes. The birth cohort data sets are useful in this sense, since they at least control for a large number of background characteristics.

The results suggest that, in the raw data, those individuals with numeracy skills at Level 1 earn on average 15-19% more than individuals with numeracy skills below this level. Even after many characteristics are controlled for, including age 7 and age 16 ability scores and qualifications achieved, this pay off to Level 1 numeracy skills is still 6%.

Again in the raw data, individuals with literacy skills at Level 1 earn 15% more than individuals with literacy skills below this level. However, different data sets tell different stories, once control variables are added to the estimating equation. The NCDS data set suggests that there are no returns to Level 1 literacy skills, after all control variables have been added to the model, although the IALS data set suggests returns of 11% even after the inclusion of the control variables, which are admittedly more limited in IALS but still include highest qualification achieved.

Better basic skills are also associated with a higher probability of employment. Level 1 numeracy skills are associated with a probability of employment 5-6 percentage points higher in the raw data and 2-3 percentage points higher after full controls are included, relative to below Level 1 skills. For literacy, there is again a difference across data sets, with IALS suggesting a 10 percentage point higher probability of employment for Level 1 literacy skills after full controls are included, while the NCDS suggests no benefit.

Machin *et al* (2001) attempt to investigate the impact of the *change* in basic skills on *changes* in wages, using variables such as comparisons of test scores at two points in time (but over 20 years apart), changes in formal qualifications, and self-reported measures of skill improvements. The results are not at all robust, however, probably due to the small number of skill level 'changers' in the data sets. Therefore dedicated data collected to investigate basic skills issues will probably be needed to successfully estimate first difference equations, rather than relying on general data sets.

Firms:

In the absence of linked worker-firm data sets that include basic skills measures, there are no reliable estimates, using objective data, of the impact of basic skills on firm level outcomes.

Surveys of subjective opinions find that respondents believe that basic skills training has a positive effect on firm level variables such as productivity and profitability.

The Economy:

A 1993 ALBSU study estimated the cost of poor basic skills to industry was £4.8 billion, which has been updated to £10 billion in the present day. This result is, however, based upon the responses of relatively few firm owners/managers who could answer a question about the cost of poor basic skills to their firm (the answers to which will be very rough estimates), and then grossed up to represent all firms who could not give an answer, even though the reason for a lack of response could have been the absence of any such costs to them.

Bynner *et al* (2001) use micro estimates of wage and employment effects of basic skills for individuals, to derive an estimate of the total change in the wage bill and employment if basic skills targets are met. They also estimate what the net impact of this change in employment would be on government finances. The results suggest that if the numeracy target is met, employment would rise by over 100,000, the wage bill by £7.27 billion, and government finances would save £2.54 billion. If the literacy target is met (and it is closer to being met than the numeracy target, thus allowing less room for improvement), employment is estimated to rise by 45,000 and the wage bill by £1 billion, thus reducing government spending by £0.44 billion.

Robinson (1997) uses data on the basic skills of 13-14 year olds in 40 countries, but finds insignificant relationships between such variables and the level of growth of GNP.

On the other hand, Coulombe *et al* (2004), using the data on adult basic skills found in IALS, find that basic skills are significantly related to economic growth. In particular, a country that achieves literacy scores 1% higher than the average ends up in a steady state with labour productivity 2.5% higher and GDP per capita 1.5% higher.

The Impact of Basic Skills on Non-Economic Outcomes

Individuals with low level basic skills are:

- less likely to participate in further learning or training, and so have lower levels of a range of other skills.
- less likely to be in good health, and more likely to be depressed.

- less likely to be married or cohabiting.
- less likely to vote in General Elections, less interested in politics, and less likely to be involved in their local community.
- more likely to have a higher frequency of being stopped and questioned or arrested by the police (used as an indicator of involvement in crime).
- less likely to have a bank account, or a range of other financial products such as life insurance policies, ISAs or a mortgage.

Evaluations of Basic Skills Programmes

The Pathfinder Areas:

The new basic skills teaching and learning infrastructure inspired by the Moser Report was initially tested in 9 pathfinder areas.

There are a number of problems with the various evaluations that have taken place, such as no control group, possible non-random selection of sample, small samples and the use of subjective rather than objective data on the whole.

The views expressed in the surveys are generally positive. Learners report being strongly motivated to participate, that they learned 'a great deal', that their teaching was very good, and that they got more out of their course than they expected.

With respect to outcomes, most passed their course. The benefit most often reported was 'gained confidence'.

The Pathfinder Extension Activities:

These were evaluations of new ways of providing basic skills teaching, such as residential courses, intensive course, highly structured courses, the provision of financial incentives for learners, and grants to employers to cover employee absence whilst attending courses.

Bonjour and Smeaton (2003) offer a careful evaluation of these activities, relative to a control group of participants on 'normal' basic skills courses, using propensity score

matching to compare individuals in the treatment group with their most similar counterpart in the control group.

Individuals on the extension activity courses were less likely to complete their course than those on traditional courses, and less likely to start another course afterwards.

With respect to intermediate outcomes, there were no significant differences in self-reported self-confidence or lifelong learning interest between individuals on the extension and traditional courses.

Individuals on the extension activity courses were, however, more likely to be in employment following completion of their course, again compared to graduates of traditional courses.

The Family Literacy Initiative

This is literacy teaching for parents of young children who want it, with both separate classes for the adults and the children, and some classes together.

Adults were tested before and after the course. Their average reading scores increased by 5% of the maximum score, while writing scores increased by 10% of the average score.

Other benefits (self-reported by participants) included increased self-confidence, increased involvement with their children's school, and an improved ability to help their children with literacy learning.

The Basic Skills Programme for the Unemployed

This is an evaluation of the basic skills training for those on various schemes for the unemployed, such as the New Deal.

Individuals who were recommended for, but turned down the chance of, basic skills training were actually more likely to be employed at the time of the follow-up survey than individuals who did undertake the training.

The Tripartite Course

This is the simultaneous learning of literacy, numeracy and IT, developed as part of the Basic Skills Strategy for Wales.

The evaluation is based on observation and interview rather than data, and is positive of the programme, with the materials, use of IT and the personal study component being praised.

The Union Learning Fund

This is used to support trade union activity in providing training and learning.

There is no hard data with which to evaluate the Union Learning Fund. However, the general impression of the evaluations is that, although the numbers on the basic skills courses organised have been lower than the targets set, unions have persuaded more workers to get help with their basic skills than otherwise would have been the case.

Local Community Projects

These projects involved basic skills teaching, linked to other topics of interest to learners, and provided in local communities, for example in pubs, schools and churches.

The projects are difficult to evaluate since few involved accreditation, but a majority of participants reported making progress, and an even larger majority reported planning to take another course. Teaching was observed and in most cases deemed to be good or satisfactory.

The community projects seem to be a good way of attracting hard-to-reach individuals with basic skills problems.

The Adult and Community Learning Fund

Similar to the previous evaluation, the ACLF also hopes to attract hard-to-reach potential learners who would otherwise not attend normal basic skills provision, through community programmes. Again, it seems to have been successful in this.

Impact seems to be greatest on learners' personal development (self-confidence, motivation etc). Subjective self-reporting of basic skills improvements was also observed.

International Evidence

United States

Even in the US, no studies matching the ideal outlined above could be found.

Pre- and post-course testing has identified literacy and numeracy gains being made by learners, although most studies have been troubled by data problems, in particular attrition of sample members between the two test points.

Looking at impact on final outcome variables, most studies find positive and significant links between attending a basic skills course and:

- the probability of employment.
- job quality
- wages
- further involvement in education
- reduced welfare dependence
- self-image
- ability to help children

Australia

Rahmani *et al* (2002) evaluate basic skills training programmes for the unemployed in Australia.

They use a mixture of survey and administrative data, which are not always consistent with each other.

Pre- and post-programme testing revealed only a minority moving up a level on the skills scale used, although many more self-reported having made improvements.

Individuals who complete their basic skills course are *less* likely to be in employment at the time of the survey, compared to non-starters and early leavers (as was found for the basic skills programme for the unemployed in England). Those who self-report improved basic skills are, however, more likely to be employed.

There was no significant effect of course completion or self-reported skills improvement on wages.

Individuals who complete their basic skills course are more likely to participate in further education or training programmes.

1. Introduction

This report looks at the available research assessing the impact that improvements in adult basic skills can have. This impact may be felt by the individuals making the improvements, their employers if they are employed, and the national economy as a whole. The impacts to be considered are economic, such as wages, increased employment, productivity, and profits, and non-economic, such as self-confidence, increased learning and greater civic involvement.

At the outset, basic skills should be defined, to make clear what this report deals with. The most common definition of basic skills in use is that supplied by the Basic Skills Agency (BSA), which defines basic skills as:
The ability to read, write and speak in English and use mathematics at a level necessary to function and progress in work and in society in general. In Wales basic skills includes the ability to read and write Welsh for people whose mother tongue is Welsh (Basic Skills Agency, 1997).
The key phrase in this definition is '*at a level necessary to function and progress in work and in society in general.'* Thus, the definition of basic skills most widely used in Wales, and throughout the UK, is based on the concept of *functional literacy*. It is therefore important to keep in mind throughout this report that low level basic skills does not imply total illiteracy, but a level of literacy and numeracy skills that make certain tasks in everyday life and work difficult, which would be considered routine by individuals with good basic skills. Individuals with low basic skills therefore cannot function *effectively* in their social and work lives, although this is not to say that they cannot function at all, since many devise alternative coping strategies to deal with their lack of good basic skills.

In order to classify individuals' basic skills, they are usually banded into levels, defined by the BSA as Entry Level, Level 1 and Level 2. Recently, Entry Level has been sub-divided into its own three levels, to further differentiate the abilities of those at the lower end of the distribution. The basic skills levels have been mapped onto the Qualifications and Curriculum Authority (QCA) National Framework of

qualifications (and NVQ equivalents) and the National Curriculum, used for schoolchildren, as follows:

Table 1: Basic Skills Levels and Comparisons with other Classification Schemes

BSA Basic Skills Standards	QCA National Framework of Qualifications	Equivalent Vocational Qualification	Equivalent Level in Schools
Entry	Entry	-	National Curriculum Level 2
Level 1	Foundation	Level 1 NVQ	National Curriculum Level 4
Level 2	Intermediate	Level 2 NVQ	GCSE Grades A-C

Thus, Entry Level basic skills are considered to be those that a 7 year old should achieve, and this is the level being referred to usually when we talk about people with low skills. As an example, the BSA reports:

'*Employees with Entry reading skills will only be able to understand the main points of simple, familiar texts with short sentences and familiar words.'*

'Employees with number skills at Entry can only manage the most basic calculations in number and can tell the time in 12-hour clock' (Basic Skills Agency, undated, *Making it Happen: Improving the Basic Skills of the Workforce*).

Level 1 basic skills are those skills that an 11 year old should achieve, while Level 2 basic skills are those that a 16 year old with GCSEs at grade C or above in English and Maths should achieve.

In Wales, the need for improvement in basic skills has been established by a Basic Skills Agency investigation into the literacy and numeracy skills of the Welsh population of working age (Basic Skills Agency, 1997). In that report, basic skills are defined as very low, low, average and good, which correspond broadly to below Entry Level, Entry Level, Level 1 and Level 2 respectively. The proportions of the Welsh population at each of these levels, based on tests administered to 2853 individuals, are

given in the table below, although note that the survey was undertaken in 1995, and the proportions are likely to have now changed.

Table 2: Basic Skills Levels in Wales, 1995

	Literacy	Numeracy
Very low	6%	15%
Low	10%	29%
Average	34%	23%
Good	51%	33%

(BSA 1997)

These figures clearly illustrate that poor numeracy skills are more widespread than poor literacy skills, with 43% of the Welsh adult population having low or very low numeracy skills, compared to 16% for literacy skills[2]. Background characteristics of the survey participants were also collected via a questionnaire, enabling an analysis of the scale of need for various sub-groups of the population. In summary, women had lower scores than men for numeracy and reading, though not for spelling. With respect to age, individuals at both the young end and the old end of the working age spectrum had lower level basic skills than middle-aged people. Regional variations in skills exist within Wales, with the lowest reading scores being recorded in Gwent and Mid Glamorgan, and the lowest numeracy scores being observed in Mid Glamorgan and Gwynedd. Finally, with respect to language spoken at home, fluent Welsh speakers were less likely to have low reading skills than non-Welsh speakers, while the lowest numeracy scores were obtained by those who spoke both English and Welsh at home, compared to those who spoke only one language.

The BSA report argues that it is difficult to compare the Welsh survey results with those of surveys conducted in the whole of the UK, because of differences in the basic skills tests. The exception is the spelling test adopted in the Welsh survey, which was identical to one used in an England and Wales survey. A comparison of results reveals 'a rather higher level of errors' in the Welsh survey. Nevertheless, the official report into basic skills in England (The Moser Report, Department for Education and

[2] The report suggests that these figures could underestimate the scale of need since those individuals who refused to participate in the survey are excluded from all analysis, and people with low level skills may be less willing to be tested.

Employment, 1999) reveals similar, or even slightly higher, levels of poor basic skills than observed in Wales. Based on the results of Bynner and Parsons (1997), Moser reports that 6% of the working age population in England have very low literacy skills, and a further 13% are classified as 'low'. The equivalent figures for numeracy are 23% and 25% respectively.

The most recent results available for Wales are to be found in a recent National Assembly Statistical Bulletin (Welsh Assembly, 2004a), although these figures relate to the period 1996-1999, and no more recent estimated are available[3]. During this period, the Basic Skills Agency undertook a series of nine surveys of basic skills competencies in selected local authority areas in Wales, covering 4,352 individuals between the ages of 16 and 60. The results suggest that 28% of respondents have low or very low literacy skills, and 32% of respondents have low or very low numeracy skills. It is not clear from the given figures why many more of the surveyed respondents seem to have poor literacy skills in 1996-1999 (28%), compared to those surveyed in 1995 (16% as shown in Table 2).

The most recent figures for England, using the expanded scale devised by the BSA to further differentiate skills at the lower end, as defined above, are to be found in the results of the Skills for Life Survey. This was conducted in 2002 and 2003, again assessing working age adults living in England. The number of tested individuals was 7,873 for the literacy test and 8,041 for the numeracy test. The proportions of the population with skills at each level are as follows.

Table 3: Basic Skills Levels in England, 2002/3

	Literacy	Numeracy
Entry Level 1	3%	5%
Entry Level 2	2%	16%
Entry Level 3	11%	25%
Level 1	40%	28%
Level 2	44%	25%

DfES (2003)

[3] The results of the BMRB study into the extent of basic skills problems in Wales, based on a sample of about 2,400 16-65 year olds, are expected in April 2005.

International comparisons of basic skills levels were made possible by the International Adult Literacy Survey (IALS), conducted initially in twelve countries in the mid-1990s. Although the skill levels used in IALS are not exactly comparable to those created by the BSA[4], comparing IALS levels across countries reveals that Britain had one of the worst basic skills levels, amongst the countries participating in the survey, as the table below makes clear.

Table 4: The Proportion of Working Age Adults Scoring at Level 1 or Level 2 and Below for Literacy and Numeracy

	Literacy		Numeracy	
	% at level 1	% at level 1&2	% at level 1	% at level 1&2
Sweden	7	28	7	25
Germany	14	49	7	33
Netherlands	11	41	10	36
Canada (English)	15	40	16	39
Belgium (Flanders)	18	47	17	40
Switzerland (German)	19	55	14	40
USA	21	46	21	46
New Zealand	18	46	20	49
Britain	**22**	**52**	**23**	**51**
Ireland	23	52	25	53
Poland	43	77	39	69

Source: IALS

The effect of these numbers has been to persuade the various British decision-making bodies to try to improve basic skills levels. There has been a twin strategy of improving the basic skills levels of those young people currently leaving school, and those who have already left school and are of working age. It is the later case, raising

[4] Considering the test questions used in the IALS test, if, with some justification, IALS level 1 is considered to be the cut-off point for low level literacy skills, and IALS levels 1 and 2 are the cut-off point for low level numeracy skills, then the proportions of the British population defined as having low basic skills in IALS are similar to those in the other surveys discussed above.

the basic skills of adults, that is subject matter of this report. In Wales, the policy has been framed as the National Basic Skills Strategy for Wales (Welsh Assembly, 2000). There are various strands to this policy, including:

- continuous promotion of the need to improve basic skills and the means of doing so
- the development of action plans (including assessment, setting of targets, provision of diverse learning opportunities, protocols for quality assurance, resource allocations and procedures for monitoring and reviewing outcomes)
- the improvement of existing basic skills programmes
- better training for teachers
- the creation of new basic skills qualifications.

This strategy has recently been evaluated, in terms of its success in establishing a basic skills support infrastructure, though not in terms of the outcomes experienced by learners, which is the focus of this report. The evaluation (Welsh Assembly, 2004b) is generally positive, with respect to post-16 basic skills learning describing the growth in the numbers receiving basic skills training through Further Education, employers and community programmes. Much of this growth in learning activity does not seem to displacement or deadweight, and is thus training that would not otherwise have taken place. The report concludes with the proviso of increased funding necessary for the new demand for basic skills training from individuals to be met.

It is hoped that individuals who receive such basic skills teaching or learning will be successful, in terms of raising basic skills levels and consequently improving their economic and non-economic well-being, as well as creating productivity and profitability gains for the employers of those in work. Since the current policy initiative has not been evaluated in this way, this literature review describes the available research on the impact of basic skills, with the aim of allowing an assessment of how successful the National Basic Skills Strategy for Wales will be.

The next section describes the ideal study with which the impact of adult basic skills improvement could be assessed. Such a study would consider the impact on actual skill levels of a basic skills programme, and then analyse to what extent other

outcomes are affected by this change in skill level. Unfortunately, however, no such perfect study seems to have been undertaken so far. The likely reason is the high demands in terms of data collection that such a study would make, in particular collecting the actual basic skills scores. In fact, as we shall see, the whole area is rather under-researched. However, there are numerous studies to be considered, which are examined below. Section 3 considers the quantitative evidence on the first link in the causal chain, namely to what extent skill levels improve following a period of learning or training in basic skills. Section 4 describes more qualitative evidence on this issue, as well as outlining some of the characteristics associated with successful basic skills courses. Sections 5 and 6 then consider the second link, and look at studies that have analysed the impact of basic skill levels on outcomes of interest, focussing on economic and non-economic outcomes respectively. Section 7 reviews evaluations of specific basic skills initiatives. The penultimate section then looks at international evidence on these issues, mostly originating from the US. Finally, some conclusions will be offered in Section 9.

2. The Ideal Study of the Impact of Basic Skills

In principle, the study of the impact of basic skills training on certain outcomes could be a very fruitful area of analysis and evaluation. This is because, with testing of course participants before and after a course, the actual improvement in basic skills as a result of taking a course can be measured. Thus the researcher knows the exact gain in skills that results from the educational programme, and such gains can then be related to changes in outcome variables of interest, such as employment likelihoods, wages, or other non-economic outcomes. Compare this to the study of, say, the impact of obtaining a degree on wages. A large literature has shown that individuals with a university degree earn more, on average, than those without. The problem in interpreting this evidence is that we cannot definitely say that the higher wages are a payment for the skills learnt on the degree course, since we have no measure of such skill gains, but only that a degree was obtained. The higher wages could alternatively be earned because of contacts made at university or changes in self-confidence or motivation of the former students, for example. Moreover, the theory of signalling suggests that academic qualifications are merely a way for the already more able to signal their higher abilities. The higher wages earned by graduates are then a payment for these higher natural abilities, rather than for skills learned on the degree course. In principle, therefore, estimates of the impact of basic skills courses, when related to gains in test scores, could be much more direct and 'pure' than estimates of the impact of formal academic qualifications. The returns to education literature, however, is huge, while the number of studies estimating the impact of basic skills, as this review will show, is much smaller. The reason for this, of course, is data, since it is much easier simply to ask someone if they have a degree, compared to testing their basic skills before and after a literacy or numeracy course. If data was no object however, this section discusses how researchers should best use it to study the impact of basic skills. If such studies were carried out, it could be argued that the evidence they supply would be stronger than evidence of the returns to formal qualifications, although as we will see in this review, no perfect study of basic skills impact has yet been undertaken.

The aim of any research into the impact of basic skills is to establish to what extent an improvement in basic skills will affect other outcome variables of interest. In order for the changes in outcomes to be attributable to changes in basic skills, it is important to have a control group who are the same as the 'treatment group' of learners, except for the fact that they have not received any training. The use of the control group allows for any 'deadweight' to be identified, that is changes in outcome variables that would have occurred even if the basic skills training had not been undertaken (as evidenced by the outcome changes for the control group.

In principle, therefore, the impact could be measured by comparing the outcomes, for example wages, of individuals who have undertaken a basic skills course with those who have not. Such a comparison would only give a true indication of the likely effect of the basic skills course, however, if participation in a basic skills course is randomly allocated. In reality, this is unlikely to the case, and it is easy to think of other characteristics that will affect both the likelihood of participating in a course and the outcome variable of interest. For example, more motivated, ambitious, better resourced, better connected or simply more able individuals may decide to participate on basic skills courses, while those with low basic skills who do not participate do not have these characteristics. Given that all of these characteristics are also likely to influence an outcome variable such as wages, then any difference in wages observed between the course participators and non-participators could be due to the differences in these other characteristics across the two groups, and not to the actual basic skills programme. This is the classic endogeneity or selection problem that occurs in econometrics, and which frequently emerges in evaluation work. The solution for the physical scientist would be to perform a careful experiment in the laboratory, randomly assigning observations to either the control or the treatment group. Such a solution is much more difficult for the social scientist, however, particularly with an issue such as basic skills, where to randomly allocate basic skills training only to some of group, all of whom need such training, would raise serious moral questions. The solution usually adopted by the social scientist is to make more careful and clever use of data.

In the present context, a solution to the problem could be found if a natural experiment exists in the data, such that some random event determines whether an

individual receives basic skills training. Equivalently, if an exogenous variable can be found that effects the likelihood of participating in a basic skills course, then this can be used to help determine the impact of such participation (in the jargon of the subject, such an exogenous variable is known as an instrument). Such an approach is increasingly used in the returns to general education literature, where, for example, exogenous variables such as date of birth and changes in school leaving ages are used to provide purely random variation in the amount in schooling that individuals receive, so that any differences in wages between groups can be attributed to this random variation in schooling received, rather than systematic differences in other variables. In basic skills research, however, such natural experiments are less likely to occur, since there are no laws governing attendance on basic skills courses, and so no policy changes creating random variation[5]. Thus, the most common approach is to use regressions analysis, where control variables are included in the estimated equation to control for any differences between those that have received the training and those that have not. Data must therefore be collected on individuals who have undergone a basic skills course and those who have not, as a control group, including information on outcomes and background characteristics for both groups. The following equation could then be estimated:

$$W_{it} = \beta BS_{it} + \delta X_{it} + \varepsilon_{it}$$

where W_i is the wage of individual i at time t, BS_i is a dummy variable indicating whether individual i has been on a basic skills course, X_i is a vector of observed characteristics of individual i respectively, and ε_{it} is a random error term.

A potential problem with results derived from such an equation, however, is that information on all the important background characteristics of the two groups might not be observed. Consider a vector, Z, of other important determinants of wages, which are not observed in the available data set. The true relationship is then

$$W_{it} = \beta BS_{it} + \delta X_{it} + \lambda Z_{it} + \varepsilon_{it}$$

If the unobserved characteristics in the Z vector are correlated with the likelihood of the individual participating in a basic skills course, then omission of the Z vector from

[5] One possibility is if participation on basic skills courses was made compulsory for some unemployed individuals seeking benefits who have a low level of skills. The participation of such individuals on the course would therefore be determined by such a policy, rather than any difference in background

the estimated equation will bias the estimated coefficient, β, on the basic skills variable.

A more profitable approach is to consider changes over time. If the above equation holds at time t then it also holds at time t+1. Subtracting the former from the latter will give the first differenced model (where Δ is the first difference operator):

$$\Delta W_i = \beta \Delta BS_i + \delta \Delta X_i + \lambda \Delta Z_i + \Delta \varepsilon_i$$

The advantage of such a 'first differenced' model is that, if the unobserved characteristics in the Z vector are constant over time, then their first difference is zero, and hence the Z term drops out of the estimating equation, leaving the coefficient on the change in the basic skills variable as an unbiased estimator of β. This coefficient is therefore identified from people who change their basic skills status, which basically means individuals who participate in a basic skills course between time t and time t+1, since ΔBS_i is always equal to either 0 or1. It cannot equal -1, since individuals cannot 'undo' attendance on a course. Of course, individuals who have not participated in a basic skills course must also be in the sample (providing the '0' observations on the change in basic skills variable, so that the change in wages for the participants can be compared to something). The non-participants therefore represent the control group, and the coefficient β therefore indicates the average change in wages for individuals who undertake a basic skills course, compared to individuals who do not undertake such a course, controlling for changes in other variables, in the X vector, over the same period.

An alternative non-parametric approach, which would therefore relax the restrictions imposed by the classical linear regression model, would be the 'difference-in-difference' estimator. This estimator would consider the change in wages for individuals who have participated on a course and then compare this to the change in wages for similar (according to observed characteristics) of individuals who have not participated on a course. The impact of the basic skills course is then given by this 'difference in the difference.'

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characteristics between individuals so obligated, and individuals not. Although pilot compulsory

One question, however, is how we can be really sure that the change in wages observed is actually due to changes in basic skills, and not due to changes in other variables experienced by those on a basic skills course. For example, those attending a basic skills course may build up their self-confidence, or make some useful contact for finding a better job, or obtain a renewed motivation for working hard. To the extent that these changes will not be observed in the data set, the change in basic skills coefficient will pick up their effects, and so overestimate the true impact of the change in basic skills. In order to increase the plausibility of the basic skills story, one could therefore also collect data on basic skills levels before and after the course, via tests administered to the participants, to determine whether basic skills levels have really changed following participation on the course. The change in the basic skills score could even be entered into the estimated equation rather than the yes/no dummy variable for participation, to determine whether the size of the change in wages is related to the size of the increase in basic skills, again controlling for changes in other characteristics in the X vector. This is the advantage of research into the impact of basic skills, compared to research into the impact of formal qualifications where measures of skill gains would not be available, as described at the beginning of this section.

To summarise, a careful econometric evaluation of the impact of basic skills training on any outcome would collect data on the basic skills test scores of the participants both before and after the course, as well as the test scores of non-participants at the same point in time, to provide a control group. A questionnaire would also need to be administered at the same time as the tests, both before and after training, to obtain information on the outcome variables of interest and background characteristics that need to be controlled for.

Unfortunately, no study could be found in the literature that matched this ideal. The problem is likely to be the difficulty in obtaining a suitable data set. Data on basic skills are inherently difficult to obtain, since they involve administering a sometimes lengthy test to participants, which will make data collection very costly and is also

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schemes have been imposed, no econometric evaluation has emerged as yet.

likely to deter many potential respondents from participating. The fact that a first differenced model is needed means that the whole process must be undertaken twice. At a national level this is probably beyond individual researchers to organise, and will require government action to collect the necessary data. A small-scale study probably could be undertaken, however, considering participants on a single study course, perhaps using tests administered by their place of study, if permission to use such information can be obtained. Such a research project does not seem to have been undertaken, however, at least in the UK.

The research that is available, and that will be reviewed below, has considered either one of the two links in the causal chain described above, but not both at the same time. That is, research has either considered the impact of basic skills training on test scores, or considered the impact of basic skills training on outcomes (such as wages) without collecting information on test scores both before and after the course, which would have allowed the outcomes to be more conclusively related to changes in basic skills. The evidence on each of these links will therefore be considered separately below. In each case, the type of evidence that is available varies between qualitative and quantitative studies. Both will be considered in this review.

3. The Impact of Basic Skills Courses on Test Scores – Quantitative Evidence

The most detailed UK study that could be found that set out to estimate the impact of general basic skills courses on basic skills test scores is that of Brooks *et al* (2000). In fact, the authors claim that their research is 'the first in the English-speaking world to provide reliable evidence of progress in adult literacy based on an adequately representative national sample,' a claim that this literature review cannot refute. Some time will be spent, therefore, discussing this study.

The aim of the paper is to assess the literacy skills progress made by adults attending a dedicated basic skills 'provision' provided by a Further Education (FE) College or a Local Education Authority (LEA) in England and Wales, and to identify the factors associated with such progress. A dedicated basic skills course means that basic skills are the main focus of the course, rather than a basic skills support course, where skills are being provided that will be of use for some other subject. The term 'provision' is deliberately used rather than 'programme' or 'course', since the research team also consider individuals who receive 'drop-in' provision, or one-to-one tuition.

The value of the research lies in the fact that detailed testing of respondents' literacy skills (both reading and writing) were undertaken both before and after the basic skills training. The tests were designed to test literacy tasks that individuals are likely to face in everyday life, rather than specific workplace tasks. A large sample of 2,135 respondents took the pre-test in reading, representing students of basic skills provision at a randomly selected group of 77 FE colleges or LEAs. Similarly, 1,724 individuals participated in the writing pre-test. As ever with longitudinal studies, the key problem that researchers face is keeping in contact with their sample, and persuading them to participate in the survey again. In Brooks *et al*'s case, 1,224 respondents took the post-test in reading, and 937 the post-test in writing, representing retention rates of 57% and 54% respectively. The fact that almost as many individuals were not re-tested as were re-tested is obviously a worry, and if the likelihood of being re-tested is non-random, then this can seriously affect the results. For example, if the least able,

or the people who got the least out of their basic skills training, are the most likely to refuse the re-test and drop out of the survey, the impact of the basic skills provision on skills could be seriously overestimated. Brooks *et al* therefore devote quite a lot of attention to showing that the sample of respondents who were re-tested was representative of the full original pre-test sample, both in terms of their initial test scores and also in terms of other background characteristics, such as gender, age and occupational status. This is an important fact, which adds greatly to the reliability of the final results.

The sample of respondents in the study was dominated by individuals taking part in 'normal' ongoing basic skills provision. The authors stress that their study is not, therefore, an evaluation of a specific policy, but a study of the impact of normal basic skills teaching. However, in the sample there were 206 students who had taken part in experimental, highly intensive courses of basic skills training. Most of the report simply considers the full sample of respondents, but at various points, this intensive group are considered separately, to determine whether intensive courses yield different results.

It should be noted that there is no control group in Brooks *et al*'s study, and so we cannot be sure that any basic skills gains would not have been made anyway. For example, non-training individuals may be improving their basic skills by a similar amount as those receiving training over a similar period. These gains would then be attributable to normal adult development, rather than an outcome of the basic skills course. Only if a study observes greater gains amongst a treatment group than amongst a control group can it truly say that there is evidence that the course *caused* changes in basic skill levels. Without the control group we therefore have no way of estimating the 'deadweight' of the course, that is the gains that would have been anyway.

This caveat notwithstanding, the key result of the Brooks *et al* study is that literacy scores did increase, on average, after attending the basic skills provision. In the full sample, the mean reading score in the pre-test was 214.3 (the test scores were scaled to have a mean of 300 and a standard deviation of 50), and the mean reading score in the post-test was 225.4. Thus the gain, 11.1 points does not appear to be large, but it

is approaching one-quarter of a standard deviation, and Brooks *et al* suggest that this is a worthwhile educational improvement from such short interventions. It is, moreover, statistically significant at the 0.1% level. The results implied that the average respondent was at the 19th percentile of the full reading skill distribution before the training, and at the 22nd percentile after the training. Again, although this seems a small shift, it would be unreasonable to expect previously functionally illiterate individuals to move up into the higher echelons of the skills distribution following a short course (the longest time in learning observed was 20 weeks), and at least participants are clearly moving in the right direction.

The sub-sample of participants undergoing the intensive courses had an average pre-test reading score of 237.8 and an average post-test reading score of 246.3. Thus, although the gain for this group, 8.5 points, is smaller than for the full sample, the intensive course students were starting from a higher base, and this gain is still statistically significant at the 1%. Based on these results, there is therefore no evidence that the intensive courses were more, or less, effective than the normal provision.

The discussion of basic skills held by individuals in the Introduction was in terms of levels rather than test scores, and the BSA classification was introduced of 3 Entry Levels, Level 1 and Level 2 skills. Brooks *et al* also discuss at which level each of their respondents was, prior to and after the learning period. The following table, taken from their report (Table 5.5) shows the reading skills level of the respondents both pre-test and post-test, for the full sample.

Table 5: Number of Students at Each Level Before and After Basic Skills Provision Participation

		Pre-test level						
		Entry 1	Entry 2	Entry 3	Level 1	Level 2	Level 3	Total
Post-test level	Level 3	1	0	2	7	19	**0**	29
	Level 2	6	5	41	114	**166**	12	344
	Level 1	12	25	76	**121**	89	1	324
	Entry 3	27	57	**78**	55	22	0	239
	Entry 2	55	**40**	34	20	2	0	151
	Entry 1	**101**	18	6	3	4	1	133
	Total	202	145	237	320	302	14	1220

Source: Brooks *et al* (2000)

The numbers highlighted in bold on the diagonal show that the largest proportion (41% of the total) did not change their reading skills level following completion of their learning period. However, 37% of the sample did move up at least one level, and amongst these, 10% moved up two or more levels. It should be admitted that a significant number of these movers were already at Level 1 (a level deemed an acceptable level of adult basic skills), although it is true that proportionally the most successful initial levels were Entry Level 2 (with 60% moving upwards) and Entry Levels 1 and 3 (both with 50% moving upwards). A more worrying statistic is that 22% of the sample actually scored at least one level lower in the post-test than in the pre-test, amongst whom 5% of the full sample dropped two or more levels. Brooks *et al* attribute this to 'turbulence' arguing, quite reasonably, that the skills of these people will not actually have declined, but that scores can change according to random luck factors, how students are feeling on the day, etc. If this is the case, however, we might query how many of the 'improvement' results are also due to turbulence rather than actual better skills. Nevertheless, and as the authors point out, there are significantly more students moving up levels than moving down, which indicates benefits, on average, of these basic skills provisions.

Turning to writing skills, these were assessed in terms of number of words, number of errors and quality of handwriting. Somewhat disappointingly, there was no

statistically significant reduction in the average number of errors in the post-tests compared to the pre-tests. There was a statistically significant (at the 1% level) increase in the word length of answers, from 23.0 to 25.1 words. The improvement in handwriting quality was also statistically significant, at the 5% level, though appeared small in terms of the scale used, from 2.61 to 2.67 (with individual scores ranked as 1, 2 or 3). For the intensive course students, there was also a statistically significant increase in the number of words used, though not in handwriting quality. It therefore appears that the benefits of the basic skills provisions for writing scales were small in quantitative terms, though in statistical terms some of the improvements were significant.

The final section of Brooks *et al*'s research investigated factors associated with progress, although this was less successful than identifying the actual progress, above, in terms of statistically significant findings. In terms of background characteristics of participants, all made statistically significant gains in average reading scores (men and women, different age groups, those with English as a first or as an additional language, those with different labour market statuses, those with and without formal qualifications and those with different amounts of previous basic skills training). It did not appear, therefore that any of these factors were associated with making more, or less, progress, although the good news for the students, of course, is that all groups made gains on average.

A similar story of a lack of correlates emerges when characteristics of the course were considered. A consideration of the length of the provision, in terms of tuition hours, yields the following results (Table 6.3 in original report).

Table 6: Changes in Reading Scores Against Hours of Tuition

Hours of tuition	N	Pre-test mean (s.d.)	Post-test mean (s.d.)	Gain
More than 60	164	197.8 (79.4)	217.1 (74.2)	19.3
51-60	172	195.9 (71.8)	219.7 (68.0)	23.8
41-50	89	228.6 (73.0)	236.4 (62.6)	7.8
31-40	154	214.6 (70.1)	225.5 (63.2)	10.9
21-30	192	206.1 (83.9)	227.9 (76.8)	21.8
20 or less	211	204.9 (79.6)	222.6 (75.1)	17.7

Source: Brooks *et al* (2000)

Brooks *et al* argue (and indeed make it one of their key, highlighted, conclusions) that these results, with the largest effect of 23.8 points (or almost half a standard deviation) being for the 51-60 hours of tuition category, show that 'very regular attendance was associated with greater progress.' This seems to be putting quite a favourable interpretation on the results, however. The increase in scores is statistically significant for all teaching frequency categories except the 41-50 hours category, which has the lowest frequency in the sample in any case. It could also be pointed at that the gain in reading score from 21-30 hours of tuition is greater than the gain from 60 or more hours of tuition. In fact, ignoring the middle two duration categories, there does not seem to be much difference in score improvements between courses involving infrequent meetings and courses involving frequent meetings. Add in the fact that the students on the infrequent courses were starting from a higher initial skill level, on average, and it is difficult to agree with the authors' assertion that frequent attendance is associated with greater improvement.

Information on a number of other aspects of the basic skills provision was also collected via a tutors' questionnaire. However, all but two of these factors were not statistically significantly related to improvements on the reading test. The two significant factors were whether tutors had teaching assistants, and whether tutors had qualified teaching status. Since this part of the analysis was at the provider level

rather than the individual tutor or student level[6], results were defined in terms of average scores in institutions where all tutors have the support of assistants, where some have such support and where none have such support. The average gain in reading scores in institutions with support for all tutors was 15.8 points, compared to 11.4 points in institutions where some tutors had such support, and 0.3 points in institutions where no tutors had support. These are large and significant differences, implying that students do not make any improvement to their reading scores if they attend courses in institutions where no teaching room assistants are employed. Similarly, the average gain in institutions where all tutors had qualified teacher status was 17.1 points, compared to 9.4 points in institutions where only some tutors had qualified teacher status.

The long list of statistically insignificant factors include:

- Tutors having a degree or not
- Tutors having a basic skills qualification or not
- Tutors' years of teaching experience
- Frequency of students' access to IT
- Proportion of time using textbooks rather than tutors' own materials
- Amount of management support for tutors
- Frequency of staff meetings
- Whether tutors followed a defined curriculum, and if so, its basis
- Teaching individuals versus small groups.

What are we to make of these results? This list contains a number of items that we would have expected to be related to teaching quality, and therefore to skill gains. This is, however, only one study, and given the numerically quite small gains in test scores observed, it might have been too optimistic to expect that the size of these gains would differ significantly across student or course characteristics. If numerous other studies were to replicate these results then we could then begin to conclude that these characteristics really are unimportant for student outcomes. In the absence of other such studies, the safest statement to make from Brooks *et al*'s results is that they

[6] Information was not collected on which tutor taught which student, since such information could have been used to identify tutors with poor results, fear of which could have reduced co-operation in the survey from tutors. The only way tutors and students data can be linked is therefore at the institution level, since the researchers knew the institution attended or worked at by both groups.

do not provide sufficient evidence to show that these characteristics **are** important for skill gains. The exceptions are the use of tutors with qualified teacher status, and the use of classroom assistants to support them, which have been shown to be significantly associated with greater improvement in test scores. Even here, however, as the authors acknowledge, the key phrase in the previous sentence was 'associated with', which was used instead of 'cause'. Results such as those in Brooks *et al* are suggestive of the importance of these variables, but they cannot prove that they are providing a causal mechanism, since the distribution of such characteristics is not distributed randomly across institutions. It could be the case, therefore, that colleges that hire more qualified tutors or more assistants are also doing other, unobserved, things right, and it is these other things that are helping students to improve their scores. Unless a controlled experiment can be undertaken whereby institutions are randomly assigned qualified tutors and assistants, and then student outcomes are compared, or longitudinal data can be obtained whereby institutions change the number of qualified tutors and assistants they hire, holding other things constant, it will be difficult to absolutely prove the causal link.

A considerable amount of time has been spent describing the paper by Brooks *et al*, because, as pointed out above, there is not really any other such carefully designed, well-executed quantitative research study available on the impact of basic skills courses on student test scores. There are a small number of earlier studies on this topic, which were, however, not as successful as the Brooks *et al* study. The first of these is Gordon and Moss (1979), which looked at improvements made by basic skills students on reading, writing and spelling tests, administered prior to the learning period in December 1977, and after the learning period in June 1979. The set-up is therefore very similar to the Brooks *et al* study described above. The main limitation of the earlier study, apart from its age and therefore reduced modern day relevance, is the data collection difficulties that the study encountered. Pre-test materials were distributed to 1,831 students, of which 1,238 (68%) were returned. There was then quite severe attrition between this initial contact and the follow-up survey. The numbers who completed each of the post-tests were 541 for reading, 485 for writing and 440 for spelling. These numbers therefore represented only between one-third and one-half of the pre-test sample, which itself only received a two-thirds response rate. It is therefore very questionable how randomly selected the final useable sample

of individuals with both pre- and post tests is. Bearing this caveat in mind, the results reveal statistically significant improvements (at the 0.1% significance level) on each of the tests, of 5.4 points for reading, 12.4 points for writing and 11.4 points for spelling. The latter two effects, being over one-quarter of one standard deviation, appear to be effects of a reasonable size.

Another earlier study is that by Abell (1992). The aim of this study was to examine how much variation in skill gains could be observed across different types of basic skills provision. Again, however, this study suffered from low response rates and attrition, and given that it was only a small scale survey in the first place, the numbers involved are not large. Specifically, 221 questionnaires were distributed in September 1989, of which 174 (79%) were returned. Of those who were pre-tested, only 78 (45%) completed the follow up questionnaire in April 1990. Given a sample of just 78 observations, it is not very surprising that Abell failed to find any statistically significant differences in skill gain across different types of basic skills provision. Overall, however, the research found that 96% of those surveyed believed that they had made progress. Such self-reports are always of less value than hard data on improvements obtained through test scores, since individuals' self-reports of their improvements are likely to be biased upwards, so that improvement might be claimed when none has been made, as a psychological self-defence mechanism to allow individuals to justify the time that they have spent on basic skills courses. However, in the case of the study by Abell, the students' self-reports are backed up by reports from tutors and independent assessors. The evidence, limited as it is, does therefore seem to suggest overall that real gains are made by students on basic skills courses.

4. The Impact of Basic Skills Courses on Educational Outcomes – Qualitative Evidence

In addition to the, somewhat limited, quantitative evidence on the success of basic skills courses described above, there is also a larger literature that has qualitatively assessed basic skills provisions, in attempt to identify the characteristics of the more successful courses. Much of this work has been conducted by or on behalf of the Basic Skills Agency and its predecessors over the previous thirty years or so, and mostly involves case study analyses of specific courses or interventions. For reasons of space, these studies will not be described individually here. Instead, summaries of this evidence as supplied by the Basic Skills Agency itself (BSA 2000)[7] and by Brooks *et al* (2001) will be used heavily in the following paragraphs.

The evidence to be discussed in this section describes the aspects of basic skills provision that are effective in terms of recruitment of learners, quality of teaching, materials used, assessment and staff. Considering recruitment first, one of the most effective recruitment methods to get students onto courses is through personal approaches. This means that providers of basic skills need to have links to the communities that they are serving, either directly through placement officers, or indirectly through other community institutions such as libraries, schools, benefit agencies, health centres or housing associations. Use of broadcast media has also been shown to be a very effective recruitment method. For example, the *On the Move* campaign in the 1970s, with the accompanying BBC television programme, attracted 125,000 adults into basic skills provision over its three year lifespan. The use of print material (posters, flyers, press advertisements) has proved a less effective recruitment tool, however, although this should not come as a surprise when the target audience is people with literacy problems. The provision of attractive courses can be a useful recruitment device, with the integration of basic skills provision into other learning activities being one method of increasing attractiveness. Basic skills training on its

[7] A full set of references can be found in this report in particular, and will not be repeated here. The BSA report is available online to download at http://www.basickills.co.uk/site/page.php?cms=1&p=1145&product=239

own may not be a very attractive option to individuals who need it most, but if it can be offered as part of a course that meets other needs and interests of this client group, it is more likely to attract students. Increasing the diversity of provision, for example providing individual drop-in provision, short courses, workshops on particular topics and distance learning, can increase the attractiveness of provision and therefore recruitment. Finally, placing basic skills provision in accessible locations has proved popular and is a useful recruitment device. For example, the placing of some Open Learning Centres in high street shops has attracted learners.

Various characteristics of good quality programmes, which are most effective in supplying basic skills teaching and raising basic skills levels, have also been identified in the literature. These include:

- Programmes that deliver clearly structured teaching in literacy and numeracy. A blend of approaches, such as whole word recognition, phonic and word structure and knowledge of context, has been shown to be more effective than a single approach.
- Programmes that deliver skills acquisition in a range of contexts that meet the motivation and interests of learners. Transferable skills that will be of use in a range of employment and everyday situations are the most worthwhile skills to develop on a basic skills course.
- Programmes that have high expectations of learners' achievements. Surveys of students' opinions have shown that an important cause of drop-out is goals not being met by a course. This seems to be particularly the case for effective workplace programmes.
- Programmes that produce for each learner a learning plan that lists and provides activities and materials to meet the specified individual needs. This has been identified as crucial for successful learning, so that students have a clear idea of where they are going and how they will get there.
- Programmes that regularly assess and review learner progress, and adjust individual learning plans accordingly. Feedback is a useful tool, not only for making changes to learning plans where needed, but also as a motivating tool for students, who can see the progress that they are making.

- Programmes that enable learners to gain credit and accreditation for their learning, and enable progression. Again, the possibility of achieving an award at the end of programme can be a good motivating tool to students, and can also be of use after the course as proof of achievement, for example when applying for jobs.
- Programmes that adjust their length according to the level of skills required. For basic skills support courses, for students starting from a low attainment base, intensive courses sometimes over a long period of time have proved most successful in helping students up to Entry Level or Level 1 skills. The recommended total hours of learning for students below Entry Level are 330-450 hours. Students already at Entry Level require 210-329 hours, while those already at Level 1 may only need some brushing up of their skills, and this can be completed in 120-209 hours. When working with the unemployed, the BSA recommends about 500 hours of direct basic skills training. Finally with respect to open learning, studies have shown that learners tend to achieve their aims within a shorter time frame, presumably because the type of student that open learning attracts is more able in the first place. In this case, the majority of open learners participate for 4-6 months, for an average of about 4 hours per week.

Turning to the most effective materials that should be used on courses, research has shown that these:

- Meet minimum criteria for effective use with adults. The range of suitable teaching materials for adults is less than that available for children, and is often amended from materials developed for secondary schools. Such nationally available published materials should be supplemented by materials such as worksheets produced locally by the provider. Materials specifically developed for work with the unemployed should have some occupational relevance, for example actual workplace written materials such as memos or reports, with suitable adaptation to make them useful for teaching purposes.
- Are coherently and adequately resourced by programmes. One study, conducted in 1991, suggested that programmes should be spending about £7-£10 per learner on learning materials per year.

- Are organised and made available through the use of study guides to increase learner autonomy and self-study. Such study guides have been identified as a key feature in successful courses, particularly open learning, and can reduce the amount of time required to be spent in formal instruction.
- Include the use of computers and ICT applications as tools of learning. The use of computers can be an effective teaching tool, and can also make courses more attractive to potential learners, since such learning will seem different to traditional classroom learning that such individuals will associate with their school days, which are unlikely to be recalled with fondness by this group.

As has already been mentioned, assessment is a key part of effective basic skills provision, and fulfils a role at various points in the process, specifically in:

- Screening, to identify those in need. This is most often used in basic skills support, where a captive client base of college students already exists to study other subjects. Screening can then be used to evaluate who in this group has low level basic skills, which will need to be improved if the students are to be successful in the principal course. It seems that general screening of all students is more effective than waiting for students to volunteer to be screened, since those most in need may be the least likely to volunteer to be tested. Studies have shown that those who are identified through screening, and receive the support that they need, are more likely to stay in college, and achieve the qualifications they are aiming for. Screening is also of use to the Employment Service, in identifying those job-seekers who require basic skills support, who would otherwise be difficult to place in jobs.
- Diagnostic testing should then take place after the initial screening assessment, in order to identify the particular areas in which the learner is struggling, be it in reading, spelling, numbers etc. The results of this assessment can then be used to devise the learning plan, described above as a key aid to learning and motivation.
- Assessment then needs to be ongoing throughout the course, to check that progress is being made, to identify the reasons if not, and to motivate the students to remain on the course if they see progress being made, and to strive

for further progress. Research suggests that assessment of progress should take place at least every 40-60 hours of instruction.

Finally, the quality of staff can have a big influence on the success or otherwise of basic skills provision. Issues involved here include:

- The existence of basic skills organisers amongst the staff, to relieve tutors of such tasks, freeing up more time for teaching. The BSA suggests that there should be a ratio of at least one full-time basic skills organiser to every 70,000-90,000 adults in a programme's catchment area.
- The presence of full-time staff. Studies suggest that teaching is less effective overall when conducted mostly by part-time staff, teaching only a small number of hours per week, since this can lead to a lack of consistency in teaching methods, and less continuous professional development amongst staff.
- It seems an obvious point that courses with better trained staff will be more effective, but basic skills education has one of the lowest proportions of staff holding appropriate qualifications in the education sector. The BSA is therefore developing its 'Quality Mark' for courses, which requires that staff hold a nationally recognised qualification in basic skills teaching.
- Staff should have expertise in meeting the needs of the sector in which they are working. For example, those working with the unemployed should have an occupational focus, while those working in the community should have a knowledge of the characteristics and values of that community.
- The use of volunteers can help a course achieve its aims, for example with volunteers helping learners with remote access and providing intensive one-to-one help. However, it is important that volunteers undergo a vigorous selection procedure, offer a minimum commitment to the course, are well-trained, have sufficient materials, and are used to support, rather than replace, paid staff.

Most of the evidence discussed above relates to basic skills provision in formal contexts such as in FE colleges. Payne (2002) provides a similar review of studies describing the characteristics associated with effective basic skills provision in

workplaces. Briefly considering this evidence here, workplace basic skills provision can be made more effective when:

- Basic skills are considered as part of the firm's overall training and development programme.
- The course uses materials that are based on real-life work situations, rather than theoretical examples.
- Workers (and their representatives if they have any, for example a trade union) are involved in the development of the training strategy, rather than feeling that it is imposed upon them.
- There is clear visible support for the training provision from senior management.
- The training is well-marketed within the firm, to make it attractive to workers. This can include matching the needs and interests of workers, and if possible avoiding reference to the term 'basic skills,' which can lead to embarrassment.
- There is no charge to the worker, and the training takes place during work time.
- There is continuous evaluation
- Accreditation is offered.

5. The Impact of Basic Skills on Economic Outcomes

(i) Individuals

The report now turns to the second part of the causal link from basic skills training to outcomes, namely the impact of basic skills acquired on those outcomes, having examined the link between basic skills training and basic skills acquired in the previous two sections, and in the absence of any research combining the two links into a single study. This section will consider economic outcomes, primarily wages and employment likelihoods for individuals, as well as some economy wide effects. The following section will consider non-economic outcomes.

A literature search, focussing for now on the UK, yielded disappointingly few quantitative studies on the impact of basic skills on outcomes, however. It may be that the topic has not grabbed the attention of the research community, but a more likely reason is a lack of good data. The idea of devising appropriate tests with which to go into the field to assess the basic skills of a sufficiently large sample of individuals will appear quite daunting to researchers, whose data needs in other areas are increasingly being met by large scale national data sets that are collected by official bodies and made publicly available. For basic skills, however, few data sets have emerged, and once the outcomes have been related to basic skills in these data sets, there is little more that can be done with them. A direction which the research agenda could take is to obtain data on skills from training providers, if their students undertake initial screening, as well as continuous and final assessment tests. So far this route does not seem to have been followed, however, perhaps because the providers are unwilling to release their data.

The data sets we are left with, that include hard data on basic skills levels, are therefore the National Child Development Study (NCDS) and the International Adult Literacy Survey (IALS).

The NCDS is a survey of a birth cohort, that is, a survey of individuals born in the UK in a particular week, namely a week in March 1958. Information has been collected on members of this cohort at various points in their lives, most recently in 2000, thus building up very rich data sets containing a wealth of information on the participants throughout their lives. The original cohort size was about 17,000, although this number has declined over time as people drop out of the survey. It has been established that the likelihood of dropping-out of the survey is not random across individuals, although it has yet to be agreed how seriously this affects results. Certainly the NCDS continues to be used extensively in social science research in many areas. Aside from this attrition, the key limitations of the NCDS are that any results obtained are, strictly speaking, only applicable to this cohort rather than a broad cross-section of the population. Also, the cohort, like of all us, are not getting any younger, and were aged 42 at the last sweep of data collection. Particularly for education research, therefore, where most policies revolve around children and young adults, the relevance of results from the NCDS cohort is declining for decision-making about today's cohorts of young people. For our purposes the most useful aspect of the NCDS is that a basic skills test was administered to the cohort members, as part of a specially designed survey given to a randomly selected 10% of the full cohort in 1995, when they were aged 37. This survey was therefore not part of the normal periodic sweeps of data collection from the full sample, but of course the basic skills results can be linked to information obtained from other sweeps of the survey. After losing observations for individuals still in education, or not providing full information on the key variables, and a sample of 1,570 remains with which to analyse the impact of basic skills.

IALS has now been undertaken in around twenty countries since 1994. Identical tests of literacy and numeracy (or 'quantitative literacy in the IALS language) have been administered to a random selection of the adult population in each country, which therefore allows international comparisons to be made. IALS has been criticised for variations in the difficulty of the questions across countries after translation, for failing to allow for different customs in test procedures across countries, and for the quantitative literacy tests (essentially asking quantitative information based on texts and documents, rather than pure numerical tasks) not being a good measure of numeracy. Nevertheless, the survey remains the only internationally comparable

measure of adult basic skills. Another limitation of the IALS data set is that the wage data that were collected only identify in which quintile of the wage distribution individuals are, which is clearly quite a limited indicator of variation in wages across individuals. Great Britain took part in IALS in 1995. The usable sample that emerges comprises 1,533 individuals.

Research has been undertaken to relate scores on the NCDS and IALS tests to economic outcomes such as wages and employment. Results can be found in Dearden *et al* (2000) and McIntosh and Vignoles (2001). It should be stressed at the outset that these studies fall somewhat short of the ideal research project outlined in Section 2 above. Basically they are cross-sectional studies, relating basic skills and economic outcomes at a point in time. Strictly speaking therefore, they do not prove causality from basic skills to the outcomes, but only show that basic skills are *associated with* higher wages or a greater likelihood of employment, for example. There could be other factors, not controlled for in the analysis, that are affecting both basic skills and wages, such as individual motivation, family circumstances etc. For this reason, the NCDS results are more reliable than the IALS results since they can control for many more factors using the wealth of information on the cohort (though recall from above the limitations of results based on NCDS data as well). A range of models were estimated, differing in the control variables that they included, as can be seen in Table 7 below (Table 7.3 in Dearden *et al* (2000)), which shows the wage effects associated with having Level 1 literacy and numeracy skills. These wage effects are measured relative to the omitted category which was all individuals with Entry Level skills. A dummy variable for Level 2 skills was also included in the estimated equations, although the coefficients are not shown in Table 7 for reasons of space. Invariably, the wage effects associated with Level 2 skills were greater than those associated with Level 1 skills. Since the dependent variable in these equations was the log of earnings, the coefficients can be interpreted approximately as percentage differences in earnings between those with Level 1 and those with Entry Level skills.

Table 7 Wage effects associated with level 1 numeracy and literacy skills

	No controls	**Family history and personal controls**	**Family history, personal + age 7 ability controls**	**Family history, personal + age 7 and age 16 ability controls**	**Family history, personal+ education controls**	**Full spec'tion with all controls**
Numeracy level 1						
IALS estimates	0.187	0.114			0.066	
	(0.050)	(0.044)			(0.043)	
NCDS estimates	0.147	*0.108*	0.089	0.077	*0.069*	0.057
	(0.041)	*(0.038)*	(0.038)	(0.039)	*(0.036)*	(0.037)
Literacy level 1						
IALS estimates	0.152	0.176			0.114	
	(0.061)	(0.056)			(0.054)	
NCDS estimates	0.148	*0.085*	0.071	0.047	*0.026*	0.013
	(0.044)	*(0.040)*	(0.041)	(0.042)	*(0.039)*	(0.041)
Controls						
Family background / demographic controls		X	X	X	X	X
Age 7 ability			X	X		X
Age 16 ability				X		X
Education level					X	X

Notes: Standard errors are given in parentheses.
Source: Dearden *et al* (2000).

The results show that, taking no account of any other factors that might influence wages, individuals with numeracy skills at Level 1 earn on average 15-19% more than individuals with numeracy skills below this level. There is clearly a substantial difference in the earning power of individuals with and without good numeracy skills. The subsequent columns present the results from increasingly strict specifications, including successively more control variables and so holding more factors constant when we make this comparison across skill levels. This range of results is presented, since it is not obvious which is the most appropriate specification, and this may depend on the question we want to answer. The results in column (b) are fairly straightforward, and control for a range of exogenous background characteristics such as gender, ethnicity, age in the IALS sample (the NCDS cohort are by definition the same age), region of residence and family background such as parent's education and occupation, which should certainly be controlled for in any analysis of the impact of basic skills. As mentioned above, the range of control variables is much broader in the NCDS than in IALS. The results reveal that the estimated coefficients do decline, but remain statistically significant, suggesting that some, but by no means all, of the

difference in earnings between individuals with Level 1 and Entry Level skills is due to different background characteristics of the two groups. Thus, even after controlling for all of these other factors, individuals with Level 1 numeracy skills still earn on average 11% more than individuals with Entry Level numeracy skills. This again seems a very sizeable effect. After column (b) it becomes a matter of debate whether the subsequent addition of more variables, measuring childhood ability at age 7 and 16[8], and formal qualifications, should be added to the specification. The full list of results is therefore provided to allow readers to make up their own minds. To the extent that these ability and qualifications variables could (and probably will) be affected by basic skills, then their inclusion in the estimating equation will take away some of the explanatory power of those basic skills. For example, if better literacy and numeracy skills allow individuals to obtain higher qualifications, and these higher qualifications then lead to greater earning power, then by holding qualifications constant, we are closing off one of the routes by which basic skills might increase earnings. On the other hand, some might argue in this case that if we wanted to prove that the basic skills effect does not simply occur through greater access to further education, but that basic skills have their own impact on wages and productivity, then it would be necessary to control for qualifications held, in order to get the pure effect of basic skills on earnings. Similarly, to the extent that age 7 test scores are influenced by basic skills ability that has been taught, and are not simply a measure of inherent natural ability, then again holding age 7 test scores constant will take away some of the explanatory power of basic skills. Certainly by age 16, we would expect that ability test scores being achieved are going to be influenced by literacy and numeracy skills. However, a case can still be made for including such ability test scores, for example if we wanted to measure the impact of basic skills at age 37 on earnings over and above the influence of basic skills acquired in childhood, i.e. testing whether additional skills acquired in adult life are associated with higher earnings.

The results show that, as expected, the explanatory power of basic skills does decline as these variables are subsequently added to the estimating equation. However, the coefficients remain quite sizeable, and suggest that after controlling for age 7 ability (plus all the other background characteristics), individuals with Level 1 numeracy

[8] There childhood ability variables are only available in the NCDS data set.

skills still earn 9% more on average than individuals with Entry Level numeracy skills. The wage gap remains at 8% after age 16 ability scores are entered, and is still 6% even after qualifications are added. Although the last coefficient is statistically insignificant, its size does suggest some economic significance. Thus, comparing 2 individuals with different numeracy skills but all other background characteristics, childhood ability scores and formal qualifications the same, the one with Level 1 skills will still earn about 6% more than the one with Entry Level skills. Although this is a simple cross-section result, the range of control variables included does suggest, though not prove, that this is a true causal relationship, rather than a statistical association.

Turning to literacy skills, the two data sets agree that in the raw comparison, individuals with Level 1 literacy skills earn 15% more than individuals with Entry Level literacy skills. There is therefore little difference in the payoff to numeracy and literacy skills. Unfortunately, the two data sets differ in their literacy estimates, once controls are added to the model. With basic background characteristic controls, the IALS results suggest an 18% wage gap between those with Level 1 and Entry Level literacy skills, while the NCDS suggests an 8.5% gap. This problem reveals the need for more basic skills research to be undertaken, with new data sets, so that a body of evidence can be established which will hopefully start to give a clearer overall picture, rather than have to rely on the contrasting results from just two data sets. We have no way of knowing which, if either, is the true effect of literacy skills. While the IALS result seems implausible, given that the wage gap actually widens after basic controls are added, there are also problems with the NCDS literacy test, which failed to differentiate successfully amongst those at the higher end of the skills distribution[9]. It is a well known result in econometrics that measurement error in an explanatory variable can lead to a downwardly biased estimated coefficient.

Further adding variables to the NCDS results, the Level 1 / Entry Level literacy wage gap remains at 7% when age 7 scores are included, but falls to statistical and economic insignificance once age 16 test scores and qualifications are added to the estimated equation. The IALS results, on the other hand, continue to point to a

[9] One in five of the sample respondents achieved the highest mark possible on the literacy test.

healthy wage premium of 11% attached to Level 1 literacy skills, even after qualifications are held constant.

The Dearden *et al* and McIntosh and Vignoles reports go into much more detailed analysis, considering a number of breakdowns of the overall sample. Some key results that emerge include the fact that, although gender differences are not large, there is some evidence that the numeracy wage premiums are higher for men, while the literacy premiums are higher for women. While it is tempting to try to explain this result in terms of the different types of work undertaken by men and women, basic skills are so ubiquitous in modern jobs that gender differences in numeracy and literacy skill requirements are probably not large. Another experiment investigated whether the size of the basic skills pay premium depended on the general ability of the individual, as measured by age 7 test scores. There was, however, no systematic evidence that this premium was higher, or lower, for high ability individuals.

The next set of results to be considered examines the relationship between basic skills and the likelihood of employment. Table 8[10] below summarises the results, with the equation specifications matching those for the wage equations above[11].

Table 8 Employment effects associated with level 1 numeracy and literacy skills

Controls	**Numeracy**				**Literacy**			
	IALS		**NCDS**		**IALS**		**NCDS**	
(a) None	0.056	(0.028)	0.045	(0.023)	0.134	(0.027)	0.051	(0.026)
(b) Family background / demographic controls, ability at age 7 (NCDS only)	0.033	(0.029)	0.048	(0.022)	0.122	(0.028)	0.039	(0.026)
(c) Family background / demographic controls, ability at ages 7 and 16			0.042	(0.023)			0.030	(0.027)
(d) Family background / demographic controls, ability at ages 7 and 16 (NCDS only), education level	0.020	(0.029)	0.029	(0.024)	0.095	(0.029)	0.002	(0.027)

Notes: Standard errors are given in parentheses.
Source: Dearden *et al* (2000).

[10] This is Table 7.8 in the Dearden *et al* report.
[11] Since the dependent variable was a 1/0 dummy variable indicating whether the respondent was in employment or not, these equations were estimated with a probit regression. The numbers quoted in Table 8 are the marginal effects.

The interpretation of these numbers is, for example, that an individual with Level 1 numeracy skills is 5-6 percentage points more likely to be in employment than an individual with Entry Level numeracy skills. After controlling for background characteristics, this effect falls to 3-5 percentage points, and then to 2-3 percentage points once controls for childhood ability and qualifications are added. Although these latter results are statistically insignificant, and apparently small in size, a 3 percentage point difference in the probability of employment can mean a big difference to an individual. Turning to literacy, the results again differ across data sets, with IALS suggesting a raw 13 percentage point difference in the likelihood of employment between those with literacy skills at Level 1 and Entry Level, compared to 5 percentage points in the NCDS. With full controls, the literacy effect falls to zero in the NCDS, but remains a very strong 9.5 percentage points in IALS. Although it is difficult to come to definite conclusions based on such conflicting evidence, there does seem to be some evidence that literacy skills have a larger effect on the probability of employment than numeracy skills.

Although this research controlled for a large number of other possible influences on wages and employment probabilities, especially in the NCDS equations, there remains the possibility that these results are caused by a third variable, unobserved and influencing both basic skills and economic outcomes. A prime candidate for such a variable would be individuals' motivation, or other 'soft' skills that they might hold, which could very well be correlated with both basic skills and wages/employment. A study by Machin *et al* (2001) therefore extended the NCDS results considered above by including measures of 'soft' skills, as well as making some attempt at estimating 'change' equations. Considering firstly the addition of the 'soft' skills, variables used included individuals' attitudes to school and to learning in the age 16 survey, as well as parents' and teachers' subjective opinions of individuals' social skills as a child, and finally their self-reported adult soft and social skills at age 37. A great many specifications and equations are estimated in this study, with the general result being that controlling for people's 'soft' skills such as their motivation, attitudes to learning and social skills, does not significantly affect the relationship between literacy/ numeracy and earnings/employment. The results obtained above are not therefore caused by basic skills variables proxying a range of softer skills.

Possibly a more important addition to the literature is provided by Machin *et al* in the second half of their study where they consider changes in basic skills. Section 2 above described why such evidence can be much more compelling than simple cross-section associations, no matter how many variables those cross-section equations control for. Unfortunately, the NCDS is not a data set that measures improvement by testing basic skills immediately before and after a period of learning, which would be the ideal data with which to test for the impact of basic skills on other outcomes. Instead Machin *et al* have to construct their basic skills change variables from what is available in the NCDS data set. They consider four options.

1. a question which asks whether respondents have been on a basic skills course between two sweeps of the survey. Problems, however, exist with such a variable, firstly because less than 1% of the sample actually go on such a course, and so there is little data with which to estimate an effect. Secondly, those that do go on a course will not be randomly selected, but will have chosen to participate, presumably because they are the most motivated or can see more benefit than those who choose not to learn, or on the other hand are the least able and so the most in need of an improvement in skills. Any bias caused by such selection effects could therefore go either way.
2. a comparison of literacy and numeracy test scores at age 16 and age 37. The main problem here is that the tests are so far apart in time, and any change in test scores could be picking up anything else that has changed over the intervening period but is not controlled for in the analysis. Basically, an individual can be a completely different person at age 37 compared to what they were at age 16, and changing attitudes or motivation to testing or learning could be picked up by changes in test scores.
3. a comparison of formal qualifications held at each sweep of the survey, to identify those who have acquired qualifications in the intervening years. Of course, this measure is not directly picking up changes in basic skills, and could suffer the same selection issues as discussed in measure 1, above.
4. self-reported measures of skill improvements. In the 1991 survey, respondents were simply asked whether their maths and writing skills had improved since the last sweep of the survey. In fact, 32% of males and 26% of females claimed to have improved their numeracy skills, while 40% of males and 30% of females thought their literacy skills had improved. The obvious problem

with these measures is their self-reported, subjective nature, with the possibility that individuals might exaggerate their improvements to make themselves look good, for their own self-esteem.

All of these measures therefore have some problems, but they are the best available in the absence of a careful before and after study of the impact of basic skills learning, and if the results for each measure all point in the same direction, then this will be indicative of a true effect. Unfortunately, this is not the case, although this is probably a result of the quality of the measures, rather than the absence of any true effect of basic skills improvements. Tables 9 and 10 below display the results, for males and females separately, when the change in wages between the ages of 23 and 33 for the NCDS sample are regressed against these various skill change variables. In such a first-differenced model, most of the control variables, such as family background when a child, parental interest in education, schooling, age 16 reading and mathematics skills and early age 7 ability drop out of the model, since their change between the ages of 23 and 33 is obviously zero.

The disappointing nature of these results is clear. For men, the change in wages is **not** significantly related to the acquisition of qualifications between 1981 and 1991 (column 1), or whether they have been on a literacy course in this time (column 2), or whether their place in the literacy and numeracy skills distribution has changed in this time (column 3). One interesting finding is obtained in column 4, when the change in the skill distribution position is interacted with the initial position. The results show that men who move up at least a quintile in the distribution of numeracy skills between the ages of 16 and 37 see a significant increase in their wages, but this effect is wiped out for those who begin in the lower two quintiles of the numeracy skills distribution. Gains in numeracy skills therefore only seem to benefit those men already in a good position in the numeracy skills distribution. Finally, column 5 shows that men who believe that their literacy skills have improved between 1981 and 1991, and men who believe that their numeracy skills have also improved over the same period, both see statistically significant increases in their earnings over this period. This re-assuring result is spoilt somewhat, however, by the fact that men who claim that their numeracy skills have worsened since the last survey also see a significant increase in their earnings, which casts doubt on the reliability of the skill

Table 9: Change in wages and skill improvement for males: dependent variable 1991 – 1981 change in log hourly wages

	(1)		(2)		(3)		(4)		(5)	
Low qualification person who gained more qualifications by 1991	0.023	(0.103)								
Literacy course taken by 1991			-0.142	(0.319)						
Numeracy course taken by 1991			-	-						
No. of quintiles literacy skills improved between 16 and 37					-0.162	(0.108)	0.078	(0.259)		
No. of quintiles numeracy skills improved between 16 and 37					0.124	(0.150)	0.492**	(0.235)		
Improved literacy skills and in quintile 1 or 2 at age 16							-0.221	(0.275)		
Improved numeracy skills and in quintile 1 or 2 at age 16							-0.637**	(0.298)		
Self-assessment: numeracy skills improved since last survey									0.158*	(0.092)
Self-assessment: numeracy skills worsened since last survey									0.385**	(0.161)
Self-assessment: literacy skills improved since last survey									0.277***	(0.086)
Self-assessment: literacy skills worsened since last survey									-0.046	(0.179)
Constant	0.998***	(0.046)	1.005***	(0.041)	1.001***	(0.048)	0.991***	(0.048)	0.820***	(0.060)
Observations	660		660		515		515		660	
R-squared	0.00		0.00		0.00		0.01		0.03	

Standard errors in parentheses
* significant at 10% level; ** significant at 5% level; *** significant at 1% level

Table 10: Change in wages and skill improvement for females: dependent variable 1991 – 1981 change in log hourly wages

	(1)		(2)		(3)		(4)		(5)	
Low qualification person who gained more qualifications by 1991	-0.026	(0.155)								
Literacy course taken by 1991			0.896	(0.797)						
Numeracy course taken by 1991			-0.051	(1.127)						
No. of quintiles literacy skills improved between 16 and 37					-0.215	(0.173)	-0.372	(0.239)		
No. of quintiles numeracy skills improved between 16 and 37					-0.228	(0.207)	-0.111	(0.553)		
Improved literacy skills and in quintile 1 or 2 at age 16							0.302	(0.331)		
Improved numeracy skills and in quintile 1 or 2 at age 16							-0.141	(0.584)		
Self-assessment: numeracy skills improved since last survey									0.184	(0.119)
Self-assessment: numeracy skills worsened since last survey									0.594***	(0.174)
Self-assessment: literacy skills improved since last survey									0.401***	(0.111)
Self-assessment: literacy skills worsened since last survey									0.456**	(0.198)
Constant	0.675***	(0.053)	0.669***	(0.050)	0.741***	(0.057)	0.743***	(0.058)	0.415***	(0.067)
Observations	504		504		368		368		504	
R-squared	0.00		0.00		0.01		0.01		0.05	

Standard errors in parentheses
* significant at 10% level; ** significant at 5% level; *** significant at 1% level

improvement results. For women, the results, in Table 10, look even more suspect, with many negative coefficients, and the largest two positive coefficients being on the two variables indicating a self-assessed worsening of literacy and numeracy skills.

The most likely reason for these disappointing results is the small numbers of individuals in the sample who are actually changing their skills. Less than 1% of the sample actually attend a basic skills course during the period in question, and very few obtain new qualifications or change their position in the skills distribution either. Only the self-assessed improvement variables have significant numbers reporting a change, and such self-assessed variables are notoriously unreliable. It is therefore asking a lot of the data for the very small number of changers to be sufficient to identify significant wage changes. It would appear that general population data sets such as the NCDS therefore do not have enough skill-upgrading occurring to successfully estimate first-differenced equations. We are therefore left for now with the cross-sectional results relating skill levels to individuals' economic outcomes that were described above. While these results did show significant differences in wages and employment probabilities between those individuals with and without good basic skills, the possibility remains that these differences reflect other uncontrolled for differences between the two groups. We cannot therefore guarantee that the high wages received by those observed with good basic skills would also be paid to those currently with poor basic skills, if they were to improve them. A final point is that these studies do not allow for general equilibrium effects. If all those with poor basic skills were suddenly to improve them, so that everyone in the country had good basic skills, it is very unlikely that everyone would earn good wages, or indeed even all be employed.

(ii) Firms

The benefits to firms of raising the basic skills of their workers are even less well established than the individual benefits, as reported in a literature review of the subject by Ananiadou *et al* (2003). A proper analysis of this subject would have data on individual workers, particularly their basic skills levels, and at two points in time so that the effect of changes in skills can be observed, and also information on the firms where they work, such as productivity or profits. However, linked employer-

employee data sets are very rare in the UK, and none exist with basic skills measures included, and so such a study is not possible in the UK. Indeed, Ananiadou *et al* could find no such study anywhere in the world, including full information on the basic skills of workers through test scores taken before and after basic skills training, and 'hard' data on productivity or some other measurable outcome. They do report the results of a very limited number of studies in which survey respondents give their subjective opinion as to whether basic skills training has improved productivity, and while the results are generally positive, there is always the danger that such self-reported subjective data merely report good outcomes in an attempt to justify the time and money spent on the training.

In the absence of good firm level studies, therefore, the evidence on the benefits to firms of basic skills improvements are usually extrapolated from individual level studies such as those described above. Specifically, to the extent that the wages a worker receives are a good indicator of his or her productivity, the impact of basic skills on wages therefore also provides an indication of the impact of basic skills on productivity. However, there are many reasons why wages and productivity differ. In a monopsonistic labour market, which may well characterise low-skill employment, employers can use their power over workers to drive wages below productivity levels. Another reason why wages may understate the full productivity gain of basic skills training is if the firm and the worker divide the benefits of the higher productivity between them (thus raising wages and profits, but neither by the full amount of the productivity change). Finally, there could be so-called 'externality' benefits of the improved basic skills to the firm, such that the newly skilled worker might increase the productivity of colleagues by being more able to help them. The total gains to the firm would in this case be greater than the productivity gain of the newly trained worker, and thus the latter's higher wage will not pick up the full productivity impact to the firm, even if it does accurately measure the individual's own improved productivity. Wage changes would therefore seem to represent at best a lower bound for the productivity gain to the firm.

(iii) The Economy

As far as the economic impact of basic skills at the economy level is concerned, by far the most frequently quoted result is that of the Adult Literacy and Basic Skills Unit

(1993). This study attempted to estimate the cost to the country of poor basic skills. This was done through a survey of employers. The survey asked employers a series of questions, including how many customer orders were cancelled per year because of errors/problems, how many orders were despatched/produced incorrectly, and the number of customers lost per year through problems or misunderstandings. The next set of questions asked what proportion of these problems could have been avoided if employees had had better basic skills, and then the typical costs of these problems to the firm was requested. A final set of questions ask about the cost of hiring any supervisory staff that are needed because of the poor basic skills of the firm's workforce, and the cost of recruiting externally because none of the internal staff have the skills required to be promoted. Four hundred companies with at least 51 employees were surveyed. From the responses received, the overall cost to such firms was estimated to be on average £166,000 per year (in 1993 prices, which equates to over £200,000 in today's prices). The authors then scaled these answers up to give total costs to all firms in the country with over 51 employees, which came out as £4.8billion. This very large-sounding number has been quoted often in the press, official reports and academic papers, and over time has been inflated to allow for the effect of rising prices, as well as to allow for costs to firms with fewer than 51 employees. The Moser Report (Department for Education and Employment, 1999) quoted a figure of £10billion for the cost of poor basic skills to industry.

We have to be quite careful with such estimates however. The questions asked in the survey are very difficult questions to answer with any degree of accuracy, particularly the estimate of the proportion of problems such as cancelled orders being caused by low basic skills. In fact, only 15% of the sample, of just 400, could provide such information, and so the estimate is based on a very small number of responses (about 60). Moreover, to take the average cost to these 60 firms, and then gross it up to give a national figure for all firms could be very misleading, if these 60 firms are not typical of all firms. There is a good possibility that the firms that bothered to work out these costs due to poor basic skills are more likely to be companies for whom basic skills are more of a problem. These firms may therefore have a much higher cost of basic skills than the typical firm, and so the aggregate figure above could be an overestimate of the true cost to the economy of poor basic skills.

A different approach to estimating the national impact of basic skills improvements is taken by Bynner *et al* (2001). This paper takes as a starting point the microeconomic impact of changes in basic skills, on individuals' earnings and probability of employment, as estimated in studies such as Dearden *et al* (2000) and McIntosh and Vignoles (2001) described above. The authors then gross up these estimates to estimate how much total employment and the wage bill in the country would increase if the Moser Report targets were to be met (i.e. 90% of the population reaching Level 1 literacy and 70% reaching Level 1 numeracy by 2010). They then use tax/benefit models to calculate the financial implications of these changes for the economy.

The results suggest that if the numeracy target were to be met, employment would rise by 100,300, and the wage bill by £7.27billion. This would generate a net increase to government finances over benefits paid out of £2.54 billion. The impact of reaching the literacy target is less, since the current level of literacy skills is already closer to its target than numeracy skills, and the impact of numeracy skills in the micro evidence is estimated to be larger than the impact of literacy skills. Thus, if the Moser literacy targets are achieved by 2010, this is predicted to increase total employment by 45,200, and the aggregate wage bill by £1billion. The net benefit to government finances in this case is estimated to be £0.44billion[12]. To perform a proper cost/benefit analysis it would be necessary to obtain data on costs of basic skills provision, which this study does not do, although the size of these benefits to government finances would suggest that they will outweigh any reasonable level of costs.

A study of this kind, using individual level effects to predict macroeconomic outcomes, and predicting wage and employment structures into the future (in this case to 2010) necessarily has to make a number of assumptions and simplifications, and the reliability of the results can depend on the validity of such assumptions and simplifications. One of the key simplifications made in this study is the absence of general equilibrium effects. The microeconomic results relating wages and employment to basic skills levels reveal average wage difference between those with good basic skills and those with poor basic skills, and are used to predict how much

[12] Note that if both literacy and numeracy targets are met, the total net benefit will be less than the sum of the two individual net benefits, since there is substantial overlap between literacy and numeracy

the wage of an initially low-skill individual will rise when they acquire good basic skills and so move from one group to the other. The Bynner *et al* report assumes that all individuals who raise their skills so that the Moser targets are met will receive similar increases. However, while the microeconomic results may be plausible for suggesting how much a single learner can expect to gain should they increase their skills, if a large number of individuals all raise their skill levels, this is certainly going to affect the supply of labour by skill level, and possibly also the demand for labour by skill level, and so altering the market-clearing wages to these skills. In particular, a large increase in the supply of workers with good basic skills could be expected to drive down the wage premium that workers with good basic skills receive. To the extent that such mechanisms are not built into the results above, they will provide an overestimate of the true increase in the wage bill, and so the increase in tax receipts to be expected. In the extreme, the total wage bill may not rise at all, but simply be distributed differently amongst the workforce according to the new distribution of skills.

On the other hand, the above results could under-estimate the true net benefits to the country as a whole, because they do not consider non-economic benefits of improvements in basic skills[13]. For example, evidence suggests that improved basic skills are associated with lower crime and improved health, amongst other things. An improvement in basic skills could therefore reduce the amount government need to spend on crime-fighting and the health service, thus raising the aggregate benefits above the estimates provided above.

A study by Robinson (1997) takes an international focus and examines the relationship between basic skills and economic performance, where the unit of observation is countries. Robinson uses for his basic skills data the maths results from the Third International Mathematics and Science Study (TIMSS), which tested 13-14 year olds in 40 countries, and then correlates the average score on these tests with the countries' Gross National Product (GNP). Thus, for the only time in this review we are talking about basic skills of schoolchildren rather than adults. The

problems across individuals, and if an individual improves both their literacy and numeracy, they can still only move from unemployment to employment once.

[13] The evidence for such non-economic benefits is considered in the next section of this review.

results of Robinson's, admittedly simple, correlation are disappointing as far as the importance of basic skills is concerned. Although the correlation between TIMSS scores and GNP is positive, it is not statistically significant. Robinson also investigates whether good basic skills can lead to future GNP *growth*, by correlating the attainment on the Second International Mathematics Study in 1982-83 with subsequent GNP growth during the period 1985-94, for the 16 countries who took part in the earlier study. This correlation coefficient turns out to be almost zero, and certainly statistically insignificant however. The only significant result is found when scores in the First International Mathematics Study in 1964 are correlated with subsequent GNP growth in the period 1965-89, although this is based on a sample of only 12 countries who participated in the first study.

As mentioned above, IALS data were not available to Robinson in 1997. However, a recent study has used IALS data to investigate the relationship between basic skills and economic growth at the country level (Coulombe *et al*, 2004). The aim of this paper was actually to show that measures of literacy and numeracy are better measures of human capital differences across countries, with which to explain international differences in economic growth. It yields interesting results as to the importance of basic skills, however.

In the literature examining the impact of human capital on economic growth, it is common to use panel data, that is multiple observations through time for each country in the researcher's sample. This provides the researcher with more variation in human capital, both across countries and over time, with which to identify its impact on economic growth. It is particularly important for Coulombe *et al* to have such panel data, given that there are only 14 OECD countries in the IALS data set, and a cross-section analysis with just 14 observations would not yield any usable results. Unfortunately, IALS has only been conducted once, in the mid-1990s. To get around this problem the authors construct a 'synthetic time series' in each country. For each time period, they calculate the average basic skills levels of 17-25 year olds, derived from IALS, and use this as a measure of the new human capital being supplied to the economy at that time which affects economic growth. The IALS data set contains individuals of all ages between 16 and 65. Each individual's numeracy and literacy scores at the time of the survey are applied by the authors to the years in which they

were aged 17-25. Therefore, for example, if IALS was undertaken in 1995 in a particular country, then the average basic skills score for that country in 1960 will be the average score of all individuals aged 52-60 in the IALS data set, since these people would have been aged 17-25 in 1960. Similarly, the basic skills score for 1970 for this country will be the average score of all those aged 42-50 in the IALS data set, since these people would have been aged 17-25 in 1970. This process is continued to provide a time series of basic skills in each country. The big assumption behind this methodology is that people's basic skills remain the same throughout their lives. Thus, the basic skills scores of 42-50 year olds in IALS in 1995 is taken as a measure of these individuals' scores when they were aged 17-25 in 1970. To the extent that people's basic skills change over time, either increasing with experience or decreasing with time out of education, then this methodology will not provide an accurate picture of basic skills levels in a country in previous time periods.

The results reveal important effects for basic skills scores. Using the very latest in econometric techniques, the authors show that the IALS measures of literacy and numeracy have big effects on economic growth, whether measured by GDP per capita or GDP per worker. In particular, the coefficients suggest that a country that achieves literacy scores 1% higher than the average ends up in a steady state with labour productivity 2.5% higher and GDP per capita 1.5% higher. These elasticities are greater than for physical capital investment, which has elasticities of 0.73 and 0.57 for labour productivity and GDP per capita respectively. Thus, the importance of basic skills for economic growth is revealed, although it should be noted that these results do not definitely mean that basic skills investments have higher economic rates of return than physical investments, since no information on the costs of the investments are included here, and it may be that the basic skills investments, with their higher elasticities, are also more expensive.

Another interesting finding of Coulombe *et al* is that, consistently in all of their specifications, the impact of female literacy on economic growth is greater than the impact of male literacy, with the latter often being statistically insignificant. The reason for this result is not that more educated women have fewer children, reducing a country's head count across which GDP must be divided, or that more educated women are more likely to participate in the labour market, since fertility and female

participation are both controlled for by the authors. The authors discuss various possible reasons for their result, mostly based on an assumption that female literacy began the period at a lower level. For example, if all men but only some women were taught basic skills, then the women chosen to receive the training might have been the more able, so that female basic skill investment is more targeted than male investment. Alternatively, if men are used more in jobs using strength, while women are used more in occupations requiring human capital skills, then female investment in basic skills will be more effective for economic growth. Finally, female literacy could capture omitted variables such as the level of social infrastructure. The assumption here is that all countries provide their men with skills, but only the most developed also provide their women with skills. All of these explanations rely on gender differences in access to education or jobs that are perhaps not very plausible, given the sample consists of OECD countries in the late twentieth century. The true explanation may be a simple statistical one, with, as the authors report, there being more variation in female test scores than male test scores in the sample over time and across countries. Whatever the reason for this, and perhaps it does include an element of female catch-up, greater variation in an explanatory variable is going to make it more able to explain differences in dependent variables. Whatever the explanation, the conclusion probably should not be drawn that only female human capital investment is important and women should be trained at the expense of men.

6. The Impact of Basic Skills on Non-Economic Outcomes

In addition to the studies described in the previous section, a literature has emerged examining the link between basic skills and a variety of non-economic outcomes. This body of work is mostly associated with the Centre for Longitudinal Studies (CLS) at London University's Institute of Education, and in particular with John Bynner and Samantha Parsons. These studies tend to use the same data sets that were used in the economic outcome studies, for the simple reason that these are the only nationally representative data sets that contain basic skills information, with which quantitative analysis can be undertaken. In particular, the CLS team, as their name would suggest, have made extensive use of the two birth cohort data sets available in the UK, namely the National Child Development Study (NCDS) described above, and the British Cohort Study (BCS) which is of a similar design, following a later cohort of individuals, born in a particular week in April 1970, throughout their lives. The literacy and numeracy skills in each cohort were assessed by means of a test administered to a random 10% of the full cohort, in 1991 for the BCS and in 1995 for the NCDS. The most recent sweep of data collection for both data sets was in 2000.

The analyses used in the non-economic impact literature have used simple averages/correlations (i.e. the proportion of each basic skill level having a particular outcome), or cross-section regressions, using the many control variables available in the birth cohort data sets. The same limitation identified above with respect to cross-section regressions therefore once again applies, namely that they do not prove causation but only show association, since the possibility remains that another variable, unobserved and so not controlled for, is driving the changes in both basic skills and the outcome variables. This section will describe a selection of studies, each investigating the relationship between basic skills and a separate non-economic outcome.

(i) Further Training

The first outcome to be considered is access to further education and training (see Bynner and Parsons, 1997). This study uses only data from the earlier, NCDS, birth

cohort data set. There are no regression results presented, and so no other variables are held constant, with the exception that the authors only consider individuals who left school at 16, so that those in the high skills categories have the same level of formal education as those in the low skill categories, in attempt to keep comparisons fair. The results reveal that 58% of both men and women in the very low literacy group have *never* been on a training course by the age of 37, compared to 30% of men and 43% of women in the low literacy skills group, and just 20% of men and 30% of women with good literacy skills. Good basic skills therefore open up doors to further training. The result is that those with poor basic skills are also less likely to have a good level of a number of other skills, as shown by Parsons and Bynner. There are big differences on some of the most important skills. For example, there is over a 20 percentage point gap in each case in the proportions having good writing skills, computing skills and maths skills, between individuals with good literacy skills and those with low/very low literacy skills. The only workplace skills that low literacy individuals are more likely to report having are 'using tools' amongst men, and 'caring' and 'selling' skills amongst women.

(ii)Health

Parsons and Bynner (1997) also report on the association between basic skills and health. Overall, 75% of men in the NCDS reported being in good health at the age of 37. However, this percentage drops to only 50% amongst men in the very low literacy group.

Psychological health was also assessed, by combining responses to 24 questions into a psychological Malaise Inventory. Using this measure, 36% of women with very low literacy skills were diagnosed as being 'depressed' compared to just 7% of women with good literacy skills. The equivalent figures for the numeracy groups were 18% and 5%. For men, the differences were less dramatic, but still significant.

(iii) Family Life

Parsons and Bynner (1997) also show that those with poor basic skills are less likely to form attachments. By the age of 37, just 11% of men and 7% of women in the NCDS are not married or cohabiting. However, 20% of men with poor basic skills are not married or cohabiting. Those with low basic skills who do marry, tend to marry

earlier, while amongst the women, those with very low literacy skills have their first child at age 22 on average, compared to age 25 amongst women with good literacy skills. They also tend to have more children. Individuals with very low literacy or numeracy skills were about 8 times more likely than those with good skills to be living in a house with no wage-earner present, while this ratio is 4 times more likely for individuals with low basic skills. Finally, 61% of individuals with very low literacy skills, and 67% of individuals with very low numeracy skills own their own homes, compared to over 90% of those with good skills.

A picture of poorer quality home and family life therefore emerges for individuals with low level basic skills. Given that such people were more likely to come from a disadvantaged background too, an intergenerational cycle of poor basic skills, poverty and deprivation therefore takes hold.

(iv) Political and Community Participation

Parsons and Bynner (2002) investigate the relationship between basic skills and various measures of social activity, such as involvement in the political process and community participation. They use data from both the NCDS and the BCS surveys, in particular the information in the recent sweeps of both surveys, undertaken in 2000, and estimate regression equations, to control for other factors that may affect the social activity, such as family background, qualifications, employed/unemployed status, occupation and own family formation. It is easy to imagine situations where all of these variables measuring people's background and their current educational and job status will affect how much they participate in the community, and since basic skill levels are also strongly related to the same variables, the measured impact of basic skills could be heavily biased, if these variables were not controlled for.

Political information was measured by voting participation in General Elections, as well as the answers to more attitudinal questions concerning interest in politics (measured on a four point scale) and cynicism to politics (measured on a five point school). The usual caveat about self-reported subjective variables, and the inaccurate information that can be supplied by individuals wanting to show themselves in a better light, applies.

Considering first voting in General Elections, the authors identify whether the NCDS cohort (born in 1958) voted in the 1987 election and 1997 elections, and whether the BCS cohort (born in 1970) voted in the 1997 election. Overall, the younger cohort were less likely to vote, suggesting a falling of political interest among younger people. Within in each cohort, however, those people with a low level of basic skills were less likely to vote. For example, in the BCS survey, approaching half (43%) of the men with poor literacy skills did not vote in the 1997 General Election, compared to a third (34%) of the men with good literacy skills. The equivalent figures for women were 42% and 30%. There is a similar pattern of voting behaviour across skills groups for the NCDS cohorts in both the 1987 and 1997 General Elections, albeit at a lower level of non-participation for all groups, suggesting this behaviour of the low-skilled is not a new phenomenon. However, the multiple regressions revealed that, for both cohorts, this behaviour was an outcome of social upbringing, background and current status, rather than poor basic skills per se, since there was no statistically significant impact of basic skills scores on voting participation, once these other variables were controlled for.

Given such voting likelihoods, it comes as no surprise to find that those with poor basic skills are much more likely to report being 'not at all' interested in politics (in the BCS, 42% for men with poor basic skills and 17% for men with good basic skills and 50% and 21% respectively for women), and more likely to have a higher degree of political cynicism. In this case, political interest and cynicism did seem to be affected by basic skills scores, over and above any association they have with the control variables, since both literacy and numeracy scores in both cohorts attracted statistically significant coefficients in the multiple regressions.

In the same paper, Parsons and Bynner also considered community involvement, as measured by membership of various organisations such as voluntary groups, parent/teacher associations and residents' associations. Similar to political participation, the incidence of such community participation was also lower in the younger, BCS, cohort, compared to the NCDS cohort. Within each cohort, however, poor basic skills were associated with a lack of involvement. Thus, in 2000 at age 30, just 7% of men with poor literacy skills were members of any community organisations, compared to 17% of men with good literacy skills. Amongst the

NCDS group, in 2000 at age 42, 9% of men with poor literacy skills and 38% of men with good literacy skills participated in the community. Women are more likely than men to get involved in the local community, but the same patterns emerge (13% and 26% with poor and good literacy skills respectively in the BCS, and 25% and 54% with poor and good literacy skills respectively in the NCDS). Controlling for the same list of background characteristics as above, in almost all cases for both literacy and numeracy, men and women and BCS and NCDS, basic skills are associated with a statistically significantly lower probability of community involvement. There seems to be an independent effect of basic skills on such involvement, therefore, which works over and above the influence of the low social and economic status of individuals with poor basic skills.

(v) Crime

It is well-known that poor educational outcomes and experiences are positively related to involvement in crime. For example, Home Office research with official statistics reveal that individuals with low or no qualifications, who are/were poorly behaved at school, disaffected with school, played truant or were excluded from school, are all more likely to offend (Flood-Page *et al,* 2000; Graham and Bowling, 1995). There is less evidence using official statistics that directly links basic skills to crime involvement, presumably because of the difficulty in measuring basic skills levels amongst a population to see who are most likely to offend. A potentially more captive sample, in more ways than one, is the prison population, and there has been a growth in the testing of prisoners for basic skills needs. A study by the BSA (1994) found that, amongst their sample of 414 inmates, the proportion with low level basic skills was substantially higher than in the general population. More recent figures from the BSA's initial assessment test[14] of prisoners at the start of their prison term reveal that 48% have reading problems and 65% have numeracy problems. This suggests a strong link between poor basic skills and involvement in crime.

This link has been researched more thoroughly in a multivariate context by Parsons (2002). Official crime statistics do not contain measures of basic skills, and so to establish the link, Parsons again uses data from the year 2000 sweeps of both the

NCDS and the BCS. Crime is measured by self-reported contact with the police, such as ever being 'moved on', being stopped and questioned, being warned, being arrested, being formally cautioned and being found guilty in court. While obviously there is the possibility that individuals will not reveal the trouble that they have been in with the police to the surveys, they are probably even less likely to mention any crime they have committed that has not been detected by the justice system, and so the police contact method seems to be the best approach to take, even though it is going to omit undetected crime, and so underestimate total crime.

Investigating whether the probability of ever being in contact with the police varies by basic skill level, the differences are statistically insignificant. However, looking at the number of times that individuals have been in contact with the police, so investigating persistent crime, does reveal statistically significant differences. In particular, men with lower level basic skills are more likely to have had more contact with the police in almost every contact category, amongst the BCS cohort. There is lower overall police contact rates amongst the older, NCDS cohort, and so fewer statistically significant differences are observed. Nevertheless, men with low basic skills are more likely to report more arrests and cautions then men with good basic skills. In both cohorts, the relationship between numeracy and crime was slightly stronger than that between literacy and crime. Amongst women, who have a much lower police contact rate overall, significant negative correlations between numeracy scores and serious police contact (arrests, cautions and guilty verdicts) were observed in the BCS, though literacy scores had no effect. Women in the NCDC had a very low crime rate, and so the observed results in that case were more erratic.

Parsons then estimates multiple regression equations to determine the causes of police contact, controlling for a long list of other possible determinants, such as family background, family cohesion and behaviour at home and school when young, as well as current qualifications held and employment status. Even after controlling for all of these factors, however, which go a long way towards explaining involvement in crime, literacy scores for men in the BCS still have an independent effect over and above any effects that work through these other variables, with better literacy scores

[14] Based on the testing of 97,000 prisoners between April 2000 and March 2001. Details available

being statistically significantly related to a lower frequency of being stopped and questioned, or arrested by the police. A similar effect on the frequency of being arrested is observed amongst NCDS men. Surprisingly, however, given its stronger correlation in the raw data, numeracy has no statistically significant independent impact on police contact for men in either cohort, once other factors are controlled for. For women, good numeracy scores (though not literacy scores) were associated with fewer arrests even after controlling for all other factors.

Poor basic skills therefore seem to be another, independent, indicator of social deprivation that can be shown to be linked to involvement in crime.

(vi) Financial Exclusion

Finally in this section, a report by the Basic Skills Agency (2003) investigates the links between basic skills and ownership of various financial products. This study undertook its own survey of 2,089 adults in 2001, asking respondents about the financial products they have, and also asking them to complete a short basic skills test of 10 literacy and numeracy questions. These questions were all simple, and tried to relate to concepts that people have to deal with when buying or owning financial products, such as asking respondents to give their date of birth at an appropriate place on a form, asking them whether to use a withdrawal or deposit form to place money in an account, or asking them to divide an annual bill of £120 into four quarterly payments. The proportion getting each question wrong varied between 2% and 12%, although only 68% of the sample got all questions correct, and 12% of the sample got fewer than 9 questions right. A small minority (of 3%) only got 0-6 answers right. Examining ownership of certain financial products, by these various levels of success on the basic skills tests, reveals quite dramatic differences. Amongst the majority group who get all 10 questions correct, 93% have a current account. However, this falls to just 70% of those individuals who got 2 or more of the, simple, questions wrong. Similar figures for different financial products for the 10/10 group and for the 0-8/10 group are 63% and 40% for life insurance policies, 60% and 35% for a savings account, 24% and 7% for an ISA, and 42% and 14% for a mortgage. Unfortunately the report does not present any multivariate results, so we do not know whether there

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from the Prisoners Learning and Skills Unit, DfES.

are independent effects of basic skills over and above the impact of poor social background, but if so, financial exclusion represents a further disadvantage of poor basic skills.

7. Evaluations of Basic Skills Programmes

So far, this report has examined the impact of general basic skills training on outcomes such as basic skills levels themselves, and then various economic and non-economic outcomes. There has been no evaluation of specific policies involved. However, particularly since the Moser Report, a number of specific policy initiatives for raising basic skills have been introduced, and the official evaluations of these schemes provides further evidence on the impact of basic skills, and what works in basic skills provision. In fact, the introduction of new programmes can be very beneficial for impact studies, if the programmes are initially introduced as a trial or pilot, and if selection of participants onto the trial is random. Then, if data are collected on both those involved and those not involved in the trial, comparing outcomes across the two groups will provide an indication of the impact of the policy initiative. As we shall see, however, such possibilities are not always exploited.

(i) The Pathfinder Areas

The natural place to start in this section is a discussion of the overall basic skills policy that was introduced in England after the publication of the Moser Report. The *Skills for Life* policy set out a number of ways in which basic skills provision was to be improved, including:

- A new set of national standards for literacy and numeracy
- A core curricula developed for teaching literacy and numeracy.
- A standardised screening tool for identifying basic skills problems (Fastrack).
- A set of national tests for literacy and numeracy at Levels 1 and 2
- A programme of intensive training for basic skills teachers, in the use of the above new provisions.

This new teaching and learning infrastructure was to be tested by introducing it initially in nine 'Pathfinder' regions, before rolling it out nationally[15]. Various case studies of providers and learners in the Pathfinder areas have been undertaken. These will not be discussed here, although the views expressed were generally positive[16]. What will be discussed here are the quantitative analysis results of a survey designed to obtain views on the new basic skills provision, as reported in Department for Education and Skills (2002b). Unfortunately, this evaluation did not make use of the potential natural experiment in the policy design, by comparing outcomes in the Pathfinder regions with outcomes in similar non-pathfinder regions, for example examining whether basic skills scores improved more, or whether basic skills training had more impact on wages or employment probabilities, in the Pathfinder regions. A further limitation of this study is that rather than collect 'hard' data on actual test scores and outcome variables of interest, preferably before and after involvement in the new basic skills training, almost all of the data collected are subjective, asking individuals for their opinions about the course that they have completed. Thus, the value placed on the basic skills provision could be an over-estimate of the true value, as respondents, consciously or unconsciously exaggerate the benefits of the course, to justify the time and money that they have spent. Finally, there are some issues of concern relating to the sampling in this study. The intention was to obtain the contact details of all 9,000 individuals who had been through a basic skills course in one of the Pathfinder areas by the time of the survey (December 2001), and then randomly select 1,000 of these to include in the survey. However, many of the providers wanted to be involved in the selection of the sample, and the report's authors admit they do not know what criteria were used for selection. The possibility exists, therefore, that providers chose to survey those former learners whom they knew would give the most favourable report on their course. It also seems that one of the criteria used by providers to select the sample was whether the learner had continued their studies on another course, since a very high 77% of the obtained sample were continuing students. This was done presumably because such learners were easier for the provider to contact. Those learners who go on to another course are unlikely to be representative of all learners, however, and are probably the higher achievers, who

[15] Further details of the initiatives introduced and of the Pathfinder regions chosen can be found in Department for Education and Skills (2002a).
[16] Again, see Department for Education and Skills (2002a) for further details.

will no doubt have the best opinion of their course. Finally, it should be pointed out that the final sample was only 415 respondents, and so again there are issues of how representative the respondents will be of the full population of learners.

All of these caveats notwithstanding, the views expressed in the survey are generally very positive. Summarising the findings:

- Learners were strongly motivated to undertake their basic skills training, 67% overall reporting to be 'very keen' to do their course. Females were more motivated than males, and those aged over 30 were more motivated than those under 30.
- 62% of learners felt that they learned 'a great deal' during the training, and a further 30% thought they learned 'a fair amount.' Women (68%) were more likely than men (53%) to report learning a great deal. There were also smaller differences in favour of the unemployed versus the employed, white versus black, and those aged over 30 versus those aged under 30.
- 78% rated the overall quality of their teaching they received as 'very good' and a further 17% said 'quite good.' Tutors were mentioned most often as the factor that helped students the most.
- 60% of respondents got 'much more' out of their course than they expected, and a further 22% a 'bit more'. There were some big differences across subgroups in the proportion getting much more out of their course than expected, for example women (64%) compared to men (53%) and the over 30s (64%) compared to the under 30s (48%).
- Turning to outcomes, the vast majority of the sample, 79%, passed all examinations that they sat, with a further 6% passing some examinations and 8% still awaiting results. Very few had failed, therefore.
- Respondents were asked to say what the benefits of their training had been (as many as they wanted). The most popular responses were 'gained more confidence (44%), 'improved writing skills' (21%), 'improved numeracy skills' (17%) and 'improved reading skills' (17%). The gain in self-confidence was therefore mentioned as a benefit more frequently than improvements in the basic skills themselves.
- Learners were then given a list of possible outcomes, and asked how much impact their training had had on each one. The outcome that was most often

helped 'a great deal' by the basic skills training was 'encouraged to get other qualifications' (54%), followed by 'helping children with school work' (46%) and 'being put in a stronger position to get a job' (35%).

Overall, therefore, those interviewed thought very highly of their basic skills training in the Pathfinder regions, although we must question whether these views are representative of all views, given the sampling issued described above.

(ii) The Pathfinder Extension Activities

As well as the evaluation of the new basic skills policies in the Pathfinder regions, as discussed above, an evaluation was also undertaken of the various 'Pathfinder extension' activities. The idea was to test the effectiveness of various ways of providing basic skills course. Specifically, these extension activities were:

- Residential courses – traditional courses supplemented by a 2 or 3 night residential programme of intensive learning.
- Intensive courses – all teaching was intensified into a 4 week period.
- Highly structured and prescriptive courses – based solely on commercially available teaching material and therefore highly structured.
- Individual financial incentives for learners – provided participants with grants of up to £250 conditional partly on course attendance, partly on test attendance and partly on assessments and tests achievements.
- Fixed rate replacement costs provisions – provided employers with a fixed daily rate as an incentive for sending employees on a basic skills course.

A series of reports set out to evaluate these extension activities. These involved a survey of the attitudes, opinions and experiences of learners and teachers[17], and more in depth case studies of a small number of learners[18]. Of most interest here, however, is a quantitative analysis of outcomes for learners on Pathfinder Extension courses. This is reported by Bonjour and Smeaton (2003). This is a particularly interesting study, in that detailed information was also collected on a control group. This group was formed of individuals who had been on traditional basic skills courses, not including one of the Pathfinder Extension activities. Thus, this study does not tell us about the impact of basic skills training per se, but the impact of the new initiatives in the Pathfinder Extensions, relative to traditional provision. Of course, this is not a

[17] White *et al* (2003).

natural experiment with random allocation to the treatment and control groups, and there may be selection issues relating to the choice of extension activity or traditional course. Bonjour and Smeaton allow for this, however, by performing a 'propensity score matched' analysis. This methodology is currently very much in vogue, and represents state-of-the-art as far as policy evaluations are concerned. The methodology relies upon sufficient data on background characteristics of the respondents being available. The average impact of the treatment is then measured by comparing the outcomes of each individual in the treatment group (in this case those who have undergone an extension activity) to those of the person in the control group (in this case those who have been on traditional courses) who looks most similar, in terms of the observed characteristics in the data set. This study is therefore one of the best available for evaluating the impact of basic skills courses, since it is one of the few to include a control group, and therefore in effect to net out of the observed impact that which would have had occurred anyway (the 'deadweight') by observing the outcomes for the control group too. The study also collected data both before and after the learning experience, in early and late 2002, which would allow changes in outcome variables to be considered, which as described above can give more accurate estimates of impacts than simple studies of the level of outcomes after participation, since first-differenced models can net out fixed effects. In fact, however, little use seems to be made of the data collected in the first sweep. In addition, this study still does not match the theoretical ideal study described in Section 2 above, since there is no data on actual test scores collected which can be related to outcomes.

A point should also be made about the quite small sample size in the study. In total, 468 individuals were observed on Pathfinder Extension courses. Of these, 210 took part in the residential course, so that all other types of activities had fewer than 100 observations. This should be borne in mind when the results by type of activity are considered. There is also the problem of attrition between the two sweeps of the survey, although the authors try to allow for this by weighting the sample in the second sweep to make it representative of the sample in the first sweep.

[18] Barnes *et al* (2003).

The authors consider three types of outcomes, namely learning outcomes, intermediate outcomes and labour market outcomes. Considering each in turn, learning outcomes involve success on the course. Comparing the matched treatment and control groups, as discussed above, amongst those who are not still on their course, individuals on extension courses were significantly less likely to have finished their course than individuals on traditional courses, by six percentage points. Similarly, learners on traditional courses were 9 percentage points more likely to have started a new course after the basic skills course, than learners on an extension course. The proportion failing to obtain a qualification is similar across both groups. The new extension activities therefore do not seem to raise educational outcomes compared to traditional courses, and if anything reduce them. Within the new extension activities, the highly structured courses had the largest incidence of dropout (24%) and the intensive and individual learner incentives the lowest (4% each), though no type significantly outperformed traditional courses. The type of extension activity most likely to be followed by another course was the residential courses, with the intensive courses and the employer replacement cost schemes being the least successful in this respect. Again, no single type outperformed traditional courses. The learner incentive scheme had the highest proportion acquiring a qualification out of the extension activities, with the highly structured courses having the lowest success rate.

Intermediate outcomes included self-efficacy (self-confidence) and interest in lifelong learning. With respect to the former, the average self-efficacy scores in the matched sample were the same for extension activities and traditional courses. There was some difference within the group of extension activities however, with those from individual incentive schemes having the highest score, and those from highly structured courses having the lowest. Similarly with the second intermediate outcome, there was no significant difference in lifelong learning interest between the extension activities and traditional course groups, and only small differences within the categories of extension activities, though highly structured courses again came off worst.

Finally considering labour market outcomes, this is the biggest area of success for graduates of the extension activities, since, in the matched sample, this group are 9 percentage points more likely than the traditional course group to be in employment at

the time of the second sweep of the survey. They had also spent significantly more time in employment than the traditional course group between the two survey dates. It might be thought that these results are a result of one of the extension activities (the replacement cost for employers scheme) being for employed workers only, but even when such individuals are excluded from the analysis, those from extension courses are still significantly more likely to be in employment than the traditional course group, although there is no longer any significant difference in time spent in employment. Within the group of extension activities, not including the employer scheme, the individual incentive scheme has the highest employment rate and the highly structured course the lowest.

The report then goes on to investigate the job characteristics of those in employment, such as length of time in current job, the receiving of work-related training in the current job and the permanent/temporary status of the current job. Since all of these things could have happened or been determined before the basic skills course, however, it is not clear how to interpret these results, and certainly this is one place in the report where the *change* in job status following the basic skills course might have been more interesting.

Overall, however, this is one of the most careful evaluations of basic skills courses available. The results reveal that the new extension activities do not seem to have any advantage over traditional basic skills courses in terms of learning outcomes, but they do seem to lead to a significantly higher likelihood of employment after the course. Within the group of different extension activities, the incentive schemes for individuals appear on the whole to be the most successful in terms of the various outcomes considered here.

(iii) The Basic Skills Agency's Family Literacy Initiative

Although now slightly dated, another programme evaluation, interesting for its tests of individuals both pre and post programme, is the National Foundation for Educational Research's (NFER) evaluation of the BSA's family literacy initiative (Brooks *et al*, 1996). The aims of this initiative were threefold, namely to improve parents' own literacy skills, to improve parents' ability to help their children with the early stages of learning to read and write, and to boost the children's acquisition of reading and

writing. The programmes were community based, often held in the children's schools, and funded by grants. The only condition to meet for inclusion was that the adults had to have a child between the ages of 3 and 6, although naturally the programme attracted those with basic skills problems. The structure of the programmes was quite precise, running for 12 weeks and involving 6 hours per week basic skills instruction for adults, 6 hours per week language and literacy development for children and 2 hours per week of joint adult-children sessions on supporting early language and literacy. Adults therefore had a total of 96 hours contact time. These programmes were therefore quite involved, and certainly were not of the 'drop-in when convenient' type often used for family literacy programmes in the US. The adult classes were a mixture of whole group, small group and individual teaching. Usually, in each class, the topic was introduced in the whole group setting, before practical work using information sheets and worksheets took place in smaller groups.

The NFER evaluation described here was of the four initial demonstration or pilot programmes set up in Cardiff, Liverpool, Norfolk and North Tyneside. These programmes were deliberately located in deprived areas. The research evaluated the programmes in four terms from summer 1994 to summer 1995 inclusive. Background information was collected on each term's participants at the beginning of each term, including testing basic skills levels. Participants were then re-tested at the end of their programme 12 weeks later. If time was available within the project timescale, participants were also re-tested 12 weeks and 9 months after the end of the course. The tests involved a reading and writing test. The reading test was a three-part 'cloze' test, which involves participants filling in blanks in prose with appropriate words. The three parts were of increasing difficulty, with more able students not even entered for the first two parts. The test of writing attainment involved participants writing out answers to three questions and their answers being studied. The children were also tested with the aim of identifying their own skill improvements. Since this review has focussed only on the basic skills of adults, however, the results for parents only will be discussed below. In addition to these test results, more qualitative data was also collected through interviews with participants.

The key result is that adults' average reading scores were statistically significantly higher at the end of the courses than at the start, on all three parts of the test. The

improvements were, on average, about 5% of the maximum score, and therefore quite substantial. Although there was no control group who did not take part in the programme in this study, the authors argue that such gains are unlikely to have happened anyway, over such a short period of time (12 weeks), amongst adults who would otherwise not have been learning. The authors therefore feel confident in attributing these gains to involvement in the programme.

The differences between the average end-of-course reading scores, and the average scores at the 12 week and 9 month follow-ups were very small and statistically non-significant. Therefore, there is no evidence that the adults went on improving after the end of the course, but neither is there any evidence that they lost their new-found skills, once contact with the course had ended.

The assessment of writing supplied by the participants also showed improvement between the start and the end of the course, with statistically significant gains of about 10% of the average writing score being observed. As with the reading scores, the subsequent follow-ups did not reveal further gains, but neither do they suggest slipping-back.

Other gains are made after the end of the course, however, with analysis suggesting that grammatical or stylistic errors in writing were significantly less frequent in the follow-ups than in the end of course test. This suggests that participants got to grips with the basics of reading and writing during the course, and then turned to more advanced material such as grammar after their involvement with the course ended.

As well as the reading and writing tests, participants were also interviewed, which provided more qualitative evidence of the benefits of the course. Such evidence was usually self-reported and subjective, and so as usual must be treated with caution, given the possibility of individuals over-estimating the benefits in order to justify to themselves their involvement with the course. This caveat notwithstanding, the results reveal that, when asked how they have benefited from the course, over half (52%) of participants said that they had grown in confidence. Other changes reported included involvement with children's schools, with a substantial rise in the proportion of parents reporting attending school activities and a smaller but still strongly

significant rise in the proportion actually helping with school activities, at the end of the course compared to the start. These changes continued into the subsequent follow-up surveys. Parents also changed their lives in other ways, with the end of course interviews revealing a majority intending to continue studying, and the follow-up interviews revealing that a majority of these actually did take another course.

One of the main reasons for the existence of the courses in the first place was to improve adults' ability to help their children's literacy learning at home, and so an assessment of this is a key part of the evaluation. Again, this part of the evaluation is based on self-reported subjective responses. Firstly parents were given a long list of literacy-related activities that can take place in the home, such as writing a shopping list, using a computer, reading stories, and so on. With respect to every item, there was a statistically significant increase in the frequency of the activity taking place after the course, compared to before it. These gains were the most part sustained, or in some cases increased further, in the two subsequent follow-up surveys. Such improvements were also evidenced in the more open discussions that took place as part of the interviews, with parents reporting an increased ability to help their children and an increased confidence about doing so.

The remainder of the evaluation is devoted to identifying the reasons why the programmes were successful. Here the evidence is very much qualitative rather than quantitative, as there is not statistical examination of the factors related to successful course outcomes, but rather a discussion of the factors thought to be important by the participants, course tutors or the report authors themselves. These include clear aims and objectives of the programme, good teachers and high quality teaching, responsiveness of teachers to parents' agenda, good planning, committed participants, and successful group cohesion on the 'human' factors side, and good premises, proximity to participants' homes, crèche provision, appropriate staffing levels, good materials, collaboration between providers and schools, effective recruitment of trainees, and the time devoted to the programme on the 'material' factors. Above all amongst the material factors are the finances devoted to funding the project. Unusually amongst evaluations, this one calculates unit costs of providing the programme and comments upon value for money. The literacy courses cost about £8,000 each to put on, with on average 24 participants involved (9 parents, 10

participating children, plus 5 children in the crèche). Dividing the cost by the number of participants, and then by the number of hours of provision, 96, gives a cost per participant learning hour of £3.47. Although no other comparison programmes are costed to give an idea of the cost effectiveness of the family literacy initiative, these unit costs seem to be low enough to suggest value for money.

(iv) The Basic Skills Programme for the Unemployed

A report by the Department for Work and Pensions (2003) focuses on the National Basic Skills Programme in England that targets unemployed people with basic skills needs. Specifically, individuals who have been unemployed for a given period of time and become involved in the various New Deal schemes are screened for basic skills needs. As a result of such screening, some are sent for a more thorough independent assessment (IA), and as a result of this, some are recommended to receive basic skills training. The DWP research used as a basis for study all those unemployed individuals who were screened for basic skills needs and referred to IA during the period January to May 2002, and surveyed a sample of these. However, the fact that they were referred to IA did not mean that all individuals attended. Some did not attend IA (referred to as comparison group C2 in the report), while others attended IA and were recommended basic skills training, but did not take it up (comparison group C1). Thus there are natural control groups in the data, of individuals in a similar state (unemployed and referred to an independent assessment of basic skills needs) who do not receive any basic skills training. The usefulness of this control group is heightened by the fact that the authors report that most of those who undertook basic skills training did so out of a fear of losing benefits. Thus, the 'treatment group' are apparently not differentiated by unobserved characteristics that led them to undertake a course, such as motivation, which could also affect outcome variables and so lead to biased estimates of the impact of the basic skills provision, but simply by a fear of losing benefits. In addition, the study is of a longitudinal 'before-and-after' nature, with surveys being undertaken at two points in time (September/October 2002 and January/February 2003), allowing changes to calculated. The study therefore sounds very close to the ideal study described in Section 2 above. Unfortunately, however, the usefulness of this report is less than perhaps anticipated. Firstly, little use is actually made of the control groups. This is presumably because, as the authors report, some of those identified by official records

as not attending basic skills training self-report that they actually have, while some of those who according to official records did undergo training self-report not doing so. The distinction between the treatment and control groups is therefore not as clear as might have been hoped. The authors therefore distinguish more between those who do and do not report completing a basic skills course. Unfortunately this distinction throws up some apparently perverse findings, as described below, which suggest that there is some selection effect occurring that is determining whether individuals complete their course. The final factor limiting the usefulness of the results in this study is a small sample size, with only 201 individuals providing responses to the follow up, stage 2 survey (the number of individuals surveyed at stage 1 is not reported, and so the extent of attrition cannot be determined). This sample was split almost equally between treatment and control groups.

Turning to the results, and using the authors' split between those reporting starting and not starting a basic skills course, 85 of the 201 stage 2 respondents report starting a basic skills course. Of these 85, 53 individuals completed their course. There are no tests of basic skills administered in this study, and so we do not know whether the basic skills of the attendees actually are improved. However, one indicator that perhaps not too much was learnt is that only 5 individuals in the sample acquired a basic skills qualification at the end of their course, although we do not know how many were actually aiming for certification.

Given the defining characteristic of individuals in this study was long-term unemployment, the extent to which employment chances are improved following completion of a basic skills course is obviously a key outcome of interest. The results show that 69 members of the sample (34%) were in work at the time of the stage 2 interview, or had been employed between the first and second interviews. However, when classified according to level of involvement with basic skills tuition, 43% of those who had not attended basic skills provision were working/had worked, compared to 31% of those who began a basic skills course but did not complete it, and just 17% of those who completed a basic skills course. This is the apparently perverse result hinted at above, that involvement in basic skills training apparently seems to lower employment chances. The answer, of course, is that non-attendees, non-completers and completers are different in some ways, and thus there are some

selection effects on these unobserved differences in characteristics that are causing the pattern of results observed above. Intuitively, those individuals who do not bother with attending or completing a basic skills course are the one's who know themselves that they have a reasonable chance of a job, while those who see the course through to the end are the one's who know they are the least able and so the most in need of skills improvement to find work. More directly, the reason some of these long-term unemployed individuals did not attend or complete basic skills training could be actually that they found a job, which was of more interest to them than the course. Thus, the non-attendees and non-completers do not seem to be a good control group for the course completers, since they seem to differ in terms of unobserved characteristics, and so the situation of the former group does not provide a good indicator of what would have happened to the completers if they had not completed their course. This counterfactual is therefore basically left unobserved, and so we cannot get an idea of the employment impact of the basic skills course for those who do complete it.

The remainder of the study looks at soft outcomes of basic skills training, such as confidence and self-esteem. These are measured by subjective self-reports, which could introduce an element of bias/measurement error. Respondents who completed a course did report improved confidence, self-esteem and motivation, although the original source of low confidence etc was multi-faceted and not linked only to poor basic skills, suggesting that other things in the individuals' lives need to improve as well as their basic skills if their self-confidence and motivation is to increase. There was also some evidence that such positive outcomes of basic skills courses could be reversed if the basic skills gain is not reinforced, for example, through individuals finding work. Thus, in the end, although the set up of this report initially seemed promising, the main advantages of basic skills training that are identified are possibly temporary increases in some subjective, self-reported variables.

(v) The Tripartite Course

No other policy initiative has been evaluated in as much depth as those above, certainly in terms of quantitative evidence. We will therefore consider other evaluations more briefly, starting with the Tripartite Course and Award, developed as part of the Basic Skills Strategy for Wales. To achieve the award, learners have to

gain Level 1 qualifications in literacy, numeracy and IT and undertake a personal study using the three skills. A pilot of the scheme has been conducted in seven organisations between January and June 2004. An evaluation report is supplied by the Basic Skills Agency (2004). This report represents an initial evaluation, before the students take their tests in September 2004, based on observation and interviews. Various conclusions are presented in this evaluation.

- The materials used are generally good.
- There was a large investment required of tutors in preparation, although most reported it to be worthwhile.
- There is no 'hard' data on retention rates, although tutors reported very low rates of drop-out.
- The IT component was very popular, both for teaching literacy and numeracy and as a skill in its own right.
- The personal study component was very popular, allowing learners to demonstrate the skills they had learned.
- From what they saw, the evaluators considered that the students were successfully learning new skills, and expected a high success rate in the final test, probably above that on conventional courses.
- Overall, the Tripartite course seems to add value over and above the sum of what would be expected in three single strands of learning. There was also evidence that employers would value the Tripartite approach, and in particular the personal study component.

(vi) The Union Learning Fund

The Union Learning Fund (ULF) came into being in 1998, and is used to support 'innovative activity by trade unions to support the creation of the learning society.' Such activity can include basic skills work. In particular, Round 2 of the ULF had a specific focus on basic skills and was used to fund several basic skills project. These are discussed in an evaluation report of the second round of the ULF (Department for Education and Employment, 2000).

This report reveals that the number of workers engaged on ULF basic skills courses in the study year was considerably lower than targeted, and suggests that recruitment to

courses was more difficult than anticipated. The report goes on to suggest some methods of recruitment that could be more successful in the future, such as renaming courses to avoid use of the words 'basic skills', informal encouragement from union reps, with management being supportive but keeping a low profile, and putting learning into a relaxed, non-threatening environment. Overall, the report suggests that union involvement can be beneficial in getting workers onto courses, compared to situations where employers take the lead. Unions can also be beneficial for keeping workers *on* courses, via work colleagues acting as 'mentors'.

In terms of progress, there is no hard data with which to evaluate the ULF basic skills provision, although case study and anecdotal evidence suggest positive benefits for both workers and employers.

The evaluation of the fourth year of the ULF contains a survey of employers that had been involved in Years 2 and 3 (Department for Education and Skills, 2002c). This survey had many problems obtaining a sample, and of the 1,730 employers known to have been involved in the ULF, only 195 could be identified by unions, and of these only 94 responded to the survey. With such a low response rate, there is a worry that only those most favourable to the ULF may have responded. The views expressed by managers do turn out to be positive, although whether this is the cause cannot be proved without information on non-respondents. The survey was concerned with all types of learning projects, although basic skills courses were the most common type.

The results of the survey make clear that managers' primary motives for supporting ULF courses were to improve relationships and the culture of workplaces, rather than 'harder' benefits such as productivity or profit gains. The most common involvement that employers had was to give access to rooms and equipment, and to give employees time off to engage in learning. Benefits to employers were self-reported and subjective, and included items such as a more confident or enthusiastic workforce (the most common answer at 37%), a workforce more receptive to training (22%), and a workforce with more of the skills necessary for promotion (19%). Again, therefore, the 'bottom line' in terms of higher productivity or profits is not seen as the largest benefit of the ULF. It should be noted that only 13% of employers in the survey did

not identify any benefits, and a majority saw benefits to the firm and not just to the individuals involved.

Finally with respect to sustainability, a large majority of employers hoped, and expected, that the activities initially funded by the ULF would continue. Thus, although the ULF covers areas other than basic skills, and although there is no hard data to provide evidence of what unions add to the skills provision process, there seems to be a perception that unions can be usefully involved, and that the ULF greatly helps to set up such involvement.

The Union Learning Fund has also been evaluated in Wales (Armistead *et al*, 2002). Not all of the projects funded by the ULF have been focussed on basic skills, but looking at those that have, the report says that the target for learner outcomes has not been met, with the main problem being the difficulty in signing up learners to basic skills courses in the workplace, because of a fear of owning up to low basic skills and being stigmatised, victimised or ridiculed. Nevertheless, the evaluation does report that some progress has been made, and argues that unions have 'achieved greater success in reaching this target group than some providers and employers that have previously attempted to address this issue' (p.46). The advantages of union provided training are that union reps can informally encourage those known to have basic skills needs, training can be provided in a relaxed and non-threatening environment, and that the employers can keep a low profile and so do not put off potential learners from coming forward.

In terms of actual numbers, Armistead *et al* report that 12 WULF projects supported basic skills learners. 5 of the 9 projects in year 2 of the WULF programme report learners starting courses. 4 projects report improvements in the basic skills of the learners, and in addition, 4 projects report basic skills accreditation, and 3 report learners progressing onto other courses. Little more can be said in the evaluation, however, since unfortunately there are no data collected on actual basic skills levels themselves, with which to evaluate the programme, a fact that the evaluation itself draws attention to for change in the future.

(vii) Basic Skills and ESOL in Local Communities Projects

The final two basic skills provisions to be evaluated will move away from the formal education sector that has been discussed in most of this report, and instead look at basic skills provided in the community. The first project to be evaluated will be the 'Basic Skills and ESOL (English as a second or other language) in Local Communities Projects'. The evaluation is conducted by Grief and Taylor (2002).

The scheme allows the Further Education Funding Council in England to allocate some of the basic skills budget to fund outreach provision in local community settings. Initially, 49 institutions were awarded funding during the period March-October 2001, to run a total of 63 pilot projects, with about 2,500 students involved. These were soon followed by, and overlapped with, the 'summer projects', in which 191 institutions were funded to run 220 projects for around 15,000 students, running from May-October 2001. These pilot and summer projects form the basis for Grief and Taylor's evaluation. The types of projects that were funded were innovative in nature, linking basic skills to, amongst other things, DJ skills, healthy eating and car maintenance. The locations of these projects included pubs, schools, churches, cafes, football clubs and nurseries. The aim behind the projects was to get 'hard-to-reach' people into basic skills learning, that is people who are not likely to voluntarily enrol at a Further Education college. To this end, each project developed a target group of hard-to-reach learners, such as people living in poor areas, new ESOL learners and parents.

Grief and Taylor evaluate the projects in terms of their success in attracting learners, learners' achievements and progressions, and the quality of provision. Considering first recruitment, across all pilot and summer projects, total recruitment was below targets, reflecting the difficulty, somewhat underestimated by the project designers, of reaching these groups. However, the projects were at least targeted correctly, with 82% of all projects reporting that *all* of their learners were from their target group. Various factors are identified by Grief and Taylor in their research as having a positive impact on recruitment. These included:

- Venues – these should be local, familiar and easily accessible.
- The nature of the programme offered – the most successful projects linked literacy and numeracy to subjects they thought the client base would be

interested in, for example car maintenance for young men from disadvantaged areas. The disadvantage of this approach of linking basic skills to other subjects, is that the quality of the actual basic skills training given could vary enormously across projects. The use of IT, residentials and outings were also features of projects that proved successful in generating interest.

- The role of individual project workers – those who already work closely with the community, such as community centre staff, can be useful in encouraging those in need to join the projects.
- Word of mouth – this was actually viewed as the most effective recruitment device. Thus demand for a successful course could quickly increase, if news of this success spread through the community.
- Responding to the needs of learners – for example, regarding time and location of courses, the delivery method and course content.

Turning to learners' achievements, these were more difficult to measure than in normal basic skills courses, since only a small minority offered formal accreditation. Rather, project co-ordinators were asked to provide information on the number of learners who had covered the material required of the various levels of the national standards. Such responses will therefore be subjective opinions of material covered, rather than objective testing, and in any case, the worth of such data is limited, since no information on learners' skill levels before the course was collected, and so there is no evidence on the improvement made by learners. It was felt that initial assessment might have deterred potential learners in these hard-to-reach groups. Note that, in surveys of actual participants, the majority thought that they had made progress during the course, with 66% saying a lot and 33% a little, and only 1% saying they had made no progress. As usual, however, we must treat such subjective views carefully, since individuals can try to convince themselves that what they have been doing is worthwhile.

Just as important as progression during a course is continued progression after a course. Surveys show that 85% of learners who responded to the survey (and therefore may be more keen in the first place) planned to take another course soon. Although many of these will not fulfil this plan, at least the interest has been

generated. Unfortunately there is again no 'hard' data on actual progression, but only these subjective views.

The final part of the evaluation concerned the quality of provision. Project advisors were asked to comment on the quality of teaching they observed. In the majority of cases this was good or satisfactory, in a few cases it was judged to have been poor. The use of qualified and experienced teachers was identified as a key predictor of teaching quality. It may be that a specific qualification for teaching basic skills in the community could be usefully developed, given the special nature of such courses.

(viii) The Adult and Community Learning Fund

The final provision to be evaluated will be the Adult and Community Learning Fund (ACLF), as performed by, amongst others, McMeeking *et al* (2002). The ACLF was launched in 1998 to fund innovative ways of expanding provision of and recruitment to local community-based learning programmes. The aim is again therefore to develop programmes that can attract hard-to-reach people. All types of learning can be included, although basic skills represent a significant proportion of the funded programmes (for example, 59 out of the 118 bids funded by Round 5 of the ACLF, between April 2001 and March 2002). The report by McMeeking *et al* was only concerned with evaluating these 59 basic skills programmes. As with the previous evaluation, the aim was to identify characteristics of the programmes that were associated with high recruitment and retention, and good student outcomes. The research was conducted through case studies of 9 different programmes, interviewing 13 programme managers, 11 tutors and 37 learners.

The findings of the case studies showed that the community programmes are reaching the target client groups of people who would be unlikely to attend normal Further Education basic skills provision, such as individuals who are unemployed, have health problems, have insecure housing, or no home at all, etc. In order to reach such groups, a range of marketing methods, such as leaflets and posters in community locations and open days, have been used, although like the previous evaluation, this study concluded that the most effective marketing for these programmes was word-of-mouth.

Once learners have been attracted to a programme, it can still be difficult to keep them on the course. Reasons for drop-out were varied, and reflected the circumstances of the individuals, such as poor health, housing difficulties, unstable lifestyles or financial problems. Various methods have been used by programmes to retain their learners, including paying transport costs and providing childcare facilities. The most effective ways to retain learners, however, are revealed by the case studies to be:

- Providing a quality learning experience, relevant to learners' needs.
- Foster a good social atmosphere, within which learners can make contacts and friends.
- Encourage close tutor-learner relationships.

In terms of impact on learners, the study found that impact was greatest on learners' personal development, such as their self-confidence, self-esteem and motivation. More concrete gains, in particular improvements in literacy and numeracy skills are also reported, through subjective evaluations of programme staff, although these seem to emerge only when the improvements in self-confidence and self-esteem are also made (although the direction of causality is difficult to identify here). Finally, in terms of future progression, some evidence for increased aspirations was observed, as well as some actual instances of progression to further education.

Overall the community-based basic skills provisions seem to fulfil a vital role, supplying basic skills teaching to particularly disadvantaged individuals who are least likely to attend college, but also probably amongst the most in need. Although such programmes struggle to attract learners, it seems that once they do, they are of benefit to them. There is no hard quantitative evidence on the improvement in basic skills levels, but in this particular case, the subjective evidence is probably just as important, because as long as these learners *think* that they are achieving something of value, then this on its own could have profound impacts on their lives, following years of failures.

8. International Evidence

(i) United States

All of evidence discussed in this review has been of UK-based studies. We therefore finish the review with a brief look at evidence from other countries, focussing in particular on other English-speaking countries. Naturally, the largest source of evidence is the US. Rather than review a number of US studies separately, for reasons of space this report will summarise an existing literature review of the US evidence. The best such review that could be found was that by Beder (1999). Even in the US, however, there do not seem to be any studies that match the ideal methodology for investigating the impact of basic skills, as developed above in Section 2. In his search of the literature, Beder identifies 68 basic skills studies that included an outcome measure. He then sees how many of these studies match his criteria for a good study, which include the use of random sampling, objective measures and a control group. No study, however, fulfils all of his criteria, and he instead goes on to describe the 23 'most credible' studies.

Dividing Beder's analysis up into studies that analyse the impact of basic skills courses on actual basic skills attainment, and studies that analyse the impact of basic skills on other outcome variables of interest, as was done in this report, the first step is to consider the 8 studies that measure basic skills attainment. Two of these were large-scale national studies, and so should be considered in more detail. The more recent of these was the National Evaluation of Adult Education Programs (NEAEP), conducted in 1990-4. This was a major programme, with the budget for the research evaluation alone being almost 3 million dollars. Unfortunately, the results produced were almost worthless, because of the data problems encountered. Out of the target population of 19,796 students to have completed a literacy course in one of the chosen programmes, 11,354 responded pretest. Already, therefore, only 57% of the chosen sample had responded. As usual in longitudinal studies, the biggest problem came in the subsequent sweep of data collection. Only 2,333 respondents underwent post-testing, and of these only 614 proved usable, representing just 5% of those pre-tested and 3% of the original chosen sample. In addition, no control group was considered.

Any inferences based on this much reduced sample are therefore very suspect. For what they are worth, the results suggested that gains were statistically significant, with learners on Adult Basic Education programmes gaining 15 points on the test of adult basic education (TABE), while those on adult secondary courses improved by 7 points.

The second national US study to investigate basic skill improvements considered by Beder was the 1973 Longitudinal Evaluation of the Adult Basic Education Program. Only 1,108 students were pre-tested, which is a small proportion of the total population of learners, and again attrition was a problem, with just 441 returning for post-test. Any conclusions from this study are therefore based on small numbers, but again, for what they are worth, the results revealed that 26% of the students had gained one grade or more in reading, 41% had some gain but less than one grade, and only 33% had a zero or negative gain. In mathematics, the equivalent percentages were 19%, 46% and 35% respectively. Further analysis suggested that those learners starting from a lower level were more likely to make improvements.

The remaining 6 studies identified by Beder as measuring basic skills improvements were all evaluations of localised programmes. Three of these studies reveal statistically significant gains in basic skills scores, although the remaining three include control groups, and find no statistically significant difference in score improvements between the treatment and control groups. A number of these studies have very small sample sizes, however, and doubtful sampling procedures. The safest conclusion to take from all of these studies seems to be that there is insufficient evidence at present to conclusively prove any benefit of basic skills courses for basic skills attainment.

Beder goes on to summarise the evidence provided by his 23 studies on the impact of basic skills courses on other outcomes of interest. Considering the outcomes in turn, out of the 14 studies to consider employment effects, 11 obtained positive effects, 2 were inconclusive and 1 found no employment gain. Beder reports that few of these studies use control groups, and so it is difficult say whether any changes in employment status observed is actually due to the basic skills course, or whether there have simply been changes in the aggregate labour market affecting employment

outcomes. Two studies do use a control group, however, and also 'hard' data on employment status rather than self-reports, and both still find statistically significant improvements in the probability of employment following completion of a basic skills course, compared to a control group of non-learners.

Five of Beder's studies considered quality of jobs, once in employment. Four found evidence of an improvement in job quality for basic skills learners, with the other finding no such gain. In all cases, however, the evidence on job improvements are based on self-reports, and so the importance that should be attached to such results is questionable.

Five out of six studies found that basic skills courses had a statistically significant positive impact on wages, with the other finding no effect. Two of these studies again used a matched control sample, and still found the significant result, so there seems to be good evidence that completion of a basic skills course can lead to higher earnings.

Ten studies considered further education involvement, and although none contained a control group analysis, and some were based on self-reports on intentions to continue, that fact that all ten found a positive impact of basic skills courses and future education involvement suggests that there is a real effect here.

With respect to welfare dependence, studies of welfare-sponsored adult literacy programmes revealed a significant reduction in dependence on benefits, although two control-group based studies of *general* basic skills courses found no such effect.

Self-image was investigated by ten of Beder's studies, and all ten find statistically significant impacts, including the one based on the Rosenberg self-esteem scale rather than self-reports. Again, therefore, there seems to be a real effect here.

Eight studies found that basic skills learners reported being in a better position to help their children with homework, or get involved in some other way in their children's education. However, one study also found a negative link, while two studies proved inconclusive. Perhaps importantly, the one negative result was obtained using 'hard' data, while all the others were based on self-reports. Perhaps parents think, or tell

themselves, that their involvement in their children's education is greater than it actually is.

Finally, of seven studies considering personal goal achievement, six found a significantly positive impacts of basic skills learning, which therefore seems to be seen a route through which goals can be achieved.

Overall, therefore the American evidence does suggest numerous positive outcomes that can emerge from involvement in basic skills courses. It should be pointed out that most of these studies relate such outcomes merely to involvement in the courses, rather than to actual improvement in basic skills acquired. There is also often a lack of a control group, and extensive use of self-reported variables. Nevertheless, taken as a body of work, it does suggest a large range of economic and non-economic benefits of basic skills learning.

(ii) Australia

An interesting study to consider here is an evaluation of the literacy and numeracy training programme for job seekers in Australia (see Rahmani *et al*, 2002), in that it comes closer to the ideal study described in Section 2 above than any other study found as part of this review. All of the key elements for a proper, full evaluation are present in this study, such as information on test scores measured before and after participation on the basic skills course, the use of a control group, and various outcome measures. Unfortunately the study is not quite as successful as it might have been due to several data problems. It is still, however, of great interest.

The main data problem alluded to in the previous paragraph is that data are used from a variety of sources, such as Department of Employment administrative records, official Post Programme Monitoring surveys, and the authors own telephone survey on former programme participants. The use of different data sources results in conflicting answers to some of the research questions. Administrative data in particular are notoriously difficult to use, and often come with omissions and inconsistencies, since due to their sheer scale, some errors are bound to creep in. The control group element of the study comes through the specially commissioned telephone survey, where in addition to former programme participants, individuals

who had been unemployed long enough to be eligible for the programme but chose not to participate were also surveyed. Of course, this is not a purely random allocation of individuals into the participant and non-participant groups, since a choice is exercised by individuals. The authors also therefore run a two stage Heckman procedure in an attempt to control for these selection effects.

The first outcome to be considered is completion of the course. This is one example where the estimated completion rate differs, quiet dramatically, according to the data set used. According to one of the administrative data sets and the telephone survey, however, just under half of participants on these basic skills courses for job-seekers complete the course. Of those who drop-out between 40% and 60%, dependent on which data set is used, withdrew before reaching the mid-point of the course.

As mentioned, this study had available actual test scores before and after involvement in the programme, although these data were found in the administrative data sets, and the information was missing for many respondents. Of those for whom scores were observed, only 17% were recorded as moving up a level on the National Reporting System (NRS) scale. Further analysis reveals women, older participants and those with longer prior unemployment durations were more likely to achieve successful NRS outcomes. In the telephone survey, however, 85% of respondents claimed that their course had been useful in improving their reading skills, with similar percentages of 81% and 79% for writing and maths skills respectively. The difference between these results and the NRS results can be partially explained by subjective self-reporting overestimating self-improvement, although the difference seems too large to be explained only by this. It has been suggested that the NRS levels are not sufficiently sensitive to pick up some of the improvements that participants might have made.

Because of such problems with the administrative test scores, the authors unfortunately feel that they cannot use them to relate outcome variables to changes in test scores following course completion. Most of the analysis of the outcome variables is therefore done using the telephone survey data, with outcomes contrasted for non-starters, early leavers (before the halfway point of the course) and late leavers/course completers.

Multivariate equations, controlling for gender, age, education level, prior unemployment duration and region, reveal that those learners who complete their course are statistically significantly *less* likely to be in employment at the time of the survey[19] (which could be up to two years after the course was actually completed), compared to non-starters and early leavers (who have similar employment likelihoods). The authors attempt to explain this somewhat surprising result by the fact that non-starters may have found a job specifically to avoid going on the basic skills course, while early leavers may have left the course specifically because they had found a job. It probably should not be concluded, therefore, that participation in the full basic skills course actually reduces an individual's chances of finding a job.

The authors do try to link course outcomes with subsequent employment outcomes, by considering the self-reported improvement variables. The results show that those individuals who claim that their literacy and numeracy skills have been improved the course are more likely to be in employment at the time of the survey (although there is the possibility of reverse causation explaining this relationship, with those individuals who have found a job thinking that their skills must have improved).

In terms of earnings outcomes, the report could find no statistically significant difference in earnings between course starters and non-starters. There was also no relationship between earnings at the time of the survey and self-reported improvements in basic skills.

Overall, these labour market results are a bit disappointing, and do not reveal evidence of any labour market returns to successful completion of the basic skills courses. The authors speculate that job seekers face multiple barriers to finding employment, and that the removal of one such barrier, the improvement in basic skills, does not automatically guarantee employment if the other barriers remain.

Better news for the basic skills programme is found in the final result of the report, which reveals that, even after controlling for all of the factors listed above, those

individuals who leave late or fully complete the basic skills course are more likely to participate in another education or training programme, compared to those who do not start a basic skills course or leave early. Thus, even if the employment effects are not too impressive, the basic skills courses for the unemployed could still be important in providing the first stepping stone to further education for this group.

[19] Recall that a similar effect was observed for the basic skills programme for the unemployed in England, reviewed in Section 7 (iv) above.

9. Conclusions

This review has considered a range of evidence on the impact of basic skills. The first conclusion that should be drawn is that the amount of evidence is disappointingly small. In addition, of the evidence that does exist, no studies were found that undertook a careful before and after measurement of basic skills levels of trainees, compared this change to a carefully constructed control group in order to net out changes that would have occurred anyway ('deadweight'), and then related this change in skill levels to changes in other outcome variables. The most probable reason for the lack of such a 'perfect' study is a lack of good data. Such a project would make very high demands of the data collection process, and although some studies, particularly the national US studies described above, set out with this sort of project in mind, they were ultimately defeated by these data demands. The most difficult demand to meet is that for accurate test data of individuals' basic skills, both before and after a basic skills course for trainees, and over the same period for a control group. Studies that have attempted to do this have suffered serious sample attrition problems, it proving very difficult to contact and then re-test the same sample of individuals after the training as were surveyed before the training. The cause of this difficulty is the often fluid nature of basic skills courses, and the unstable lives of many participants.

Despite these difficulties, some interesting results have still emerged in the literature. The most careful study of learning outcomes of basic skills courses in the UK (Brooks *et al* (2000), suggests small, but nevertheless worthwhile, gains in basic skills levels following participation on a basic skills course. These gains seem to be similar for all sub-groups of the population, divided for example by gender, age and ethnicity, although more evidence is probably required on these issues. This study, and the empirical literature in general, has been less successful in identifying characteristics of courses that are associated with successful outcomes. The results of Brooks *et al*'s research reveal the importance of having qualified teachers and the use of teacher assistants, although no evidence can be found for the importance of many other factors. The safest conclusion at this stage appears to be, not that these other factors

are unimportant, but that the hard statistical evidence for their importance has yet to be provided. In the meantime, the identity of the factors associated with successful courses seem to be best revealed by the many case studies of basic skills courses available in the literature, as summarised in Section 4 of this report. The key characteristics seem to be initial and ongoing assessment of learners, the development of a learning plan based on these assessments, high quality teaching and good use of available materials.

The second half of this report has considered the impact of basic skills on other outcomes of interest. Given that no study exists that measures changes in basic skills before and after a learning experiences, and then relates these skill gains to changes in outcome variables, all relative to changes for a control group, most of the evidence discussed above simply relied on cross-sectional evidence. Such studies relate variation in outcomes across individuals to variation in their basic skills levels. The key economic results are that those individuals with better literacy and numeracy skills are more likely to be employed than those individuals with poorer skills, and earn significantly more once they are employed. A host of non-economic benefits of good basic skills have also been identified in the literature, such as further study, good physical and mental health, family life, significant participation in the community, a lower involvement in crime and greater access to financial products. The problem with this evidence is that it only reveals associations between basic skills and these outcomes, rather than proving causation, and the possibility remains that other unobserved variables, such as individuals' motivation, influences both basic skills attainment and the various outcomes, which would then be the true causal mechanism. In defence of the studies, most have been undertaken using data sets that have tracked individuals throughout their lives, and so have a great deal of background information on respondents with which to control for differences between those with and without good basic skills. Until the 'perfect' study is done, therefore, these studies provide the best information we have, and they certainly do reveal the important association between basic skills and many economic and non-economic outcomes, even if they cannot prove causation.

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