National Research and Development Centre
for adult literacy and numeracy

SUMMARY REPORT

"You wouldn't expect a maths teacher to teach plastering…"
Embedding literacy, language and numeracy in post-16 vocational programmes – the impact on learning and achievement

Helen Casey, Olga Cara, Jan Eldred, Sue Grief, Rachel Hodge, Roz Ivanič, Tom Jupp, Desiree Lopez and Bethia McNeil

Leading education and social research
Institute of Education
University of London

EUROPEAN UNION
European Social Fund

"You wouldn't expect a maths teacher to teach plastering…"
Embedding literacy, language and numeracy in post-16 vocational programmes – the impact on learning and achievement

Helen Casey, Olga Cara, Jan Eldred, Sue Grief, Rachel Hodge,
Roz Ivanič, Tom Jupp, Desiree Lopez and Bethia McNeil

Contents

Summary

This research project explored the impact of embedded approaches to literacy, language and numeracy (LLN) on 79 vocational programmes. The courses were based in 15 further education colleges and one large training provider located in five regions of England.

The 1,916 learners who took part were preparing for national vocational qualifications at Levels 1 or 2 in one of five areas of learning:

- Health and Social Care
- Hair and Beauty Therapy
- Construction
- Business
- Engineering

Photo: Grant Lynch

The sample was selected to ensure a balance of the five vocational areas, the two levels of courses, and those with and without embedded approaches.

Higher retention and course success rates on embedded courses

Learners on the embedded courses had better staying-on rates than those on non-embedded courses, and more positive attitudes to the value of LLN study. On the embedded courses, retention was 16 per cent higher.

The embedded courses also had higher success rates than the non-embedded courses. When these data are analysed by vocational level, the increase in success rates associated with embedding is particularly strong for Level 2 (L2) courses, with a 26 per cent difference between fully embedded and non-embedded.

Increased learner achievement in literacy/ESOL and numeracy qualifications

For learners on fully embedded courses, 93 per cent of those with an identified literacy need achieved a literacy/ESOL qualification, compared to only 50 per cent for those on non-embedded courses. That is, on fully embedded courses, 43 per cent more learners achieved literacy qualifications. For learners with an identified numeracy need on fully embedded courses, 93 per cent achieved a numeracy/maths qualification, compared to 70 per cent for those on non-embedded courses. On fully embedded courses, 23 per cent more learners achieved numeracy qualifications.

One negative note amongst these findings was that, where a single teacher was asked to take dual responsibility for teaching vocational skills and LLN, the probability of learners succeeding with literacy and numeracy qualifications was lower. Learners were twice as likely to fail in these circumstances.

Adult LLN are complex areas to teach. Managers should not assume that the benefits of embedding can be achieved by simply adding LLN to the vocational teachers' responsibilities. This research shows that learners benefit from being taught by teams of staff, each with their own areas of expertise, working closely together.

Features of embedded programmes

The research team judged courses on a range of features before ranking them on a scale from non-embedded to fully embedded. Four main groups of features emerged as being significant:

- Teamwork between LLN and vocational teachers
- Staff understandings, values and beliefs
- Aspects of teaching and learning that connect LLN to vocational content
- Policies and organisational features at institutional level

Fully embedded courses all showed features from each of these groups. However, individual courses achieved the same effects in different ways.

1

Introduction

The practice of integrating or embedding LLN into vocational study is not new, but has recently been given a focus as part of the DfES *Skills for Life* strategy.

Many learners are motivated to learn vocational skills to access employment, but much less motivated to improve their LLN. They are often not keen to return to studying English or maths, which may have negative associations with school. However, many vocational qualifications require learners to pass English and maths examinations. Learners need to develop the LLN required for the job, for the vocational study and assessment, and for separate LLN assessments.

Learners who do not have English as their first language may be more motivated to develop their language skills. For those who already have vocational skills, the embedding of language learning within their own subject area can offer an efficient route to learning the vocationally relevant language they need to progress with employment.

Many practitioners believe that, where learners' main goal is vocational or other than LLN, the most effective way of providing LLN learning opportunities is to embed. But this practice has not been

systematically developed or supported.

Definitions

"Embedded" has become a widely used term in relation to LLN, but there are often different interpretations of what this means in practice. The various uses of the term always share the concept of bringing together the vocational teaching with LLN teaching. This project uses a broad definition of the term, which allows for different organisational and structural features to be used to achieve an integrated experience for learners.

A fully embedded course may or may not include structural features that have often been associated with embedding, such as two teachers timetabled to teach together. In some cases observed, embedding was being achieved through separate LLN sessions within an integrated whole. It was clear that a simple definition was not possible or appropriate.

One of the findings reported here is that structural features alone are unlikely to secure the benefits of embedding, and that crucial attitudinal features were also present in the embedded courses.

The research team concluded that embeddedness requires a range of

features and has to be described from the perspective of both learners and teachers. This report explores the key processes of embedding and how they work together, as well as the necessary organisational support.

Aims

The project aimed:

- to produce robust, quantifiable and qualitative evidence about embedded and non-embedded LLN provision from a large sample
- to examine whether embedded provision is associated with more positive learner attitudes and better retention and achievement in both LLN and vocational qualifications
- to examine and describe the key characteristics of effective embedded LLN and the organisational arrangements that support them.

Terminology

The LLN learning undertaken by learners in this study was described in various ways in the institutions in the sample. For some it was known as 'key skills', for others 'essential skills' or 'basic skills'. For the purposes of this report all forms of literacy/language/ESOL/English/ communications learning are referred to as 'literacy'. Similarly, maths/numeracy/ application of number are referred to as 'numeracy'.

The sample

Socio-demographic data on participating learners are summarised in Table 1.1 overleaf.

Over 50 per cent of learners on vocational Level 1 (L1) courses began at Entry Level in literacy and numeracy. For learners on vocational L2 courses, 21 per cent were starting from Entry Level in literacy and 32 per cent in numeracy. It should be noted that these same learners, joining vocational courses with LLN skills at Entry Level, went on to succeed at their vocational qualifications while achieving literacy and numeracy qualifications at Entry Level or L1.

Research methodology

The use of mixed methods

The study used a mixed methods approach, in which analysis of qualitative data enabled the team to identify the features of embedded LLN against which the courses could be measured quantitatively. A questionnaire was administered in order to register learners' attitudes, and the team conducted interviews, focus groups and observations.

Analysis of data

The team devised a set of 30 questions in order to code aspects of the qualitative data. These questions related to features considered important to effective embedding. The resulting codes provided the quantitative data against which data ▷
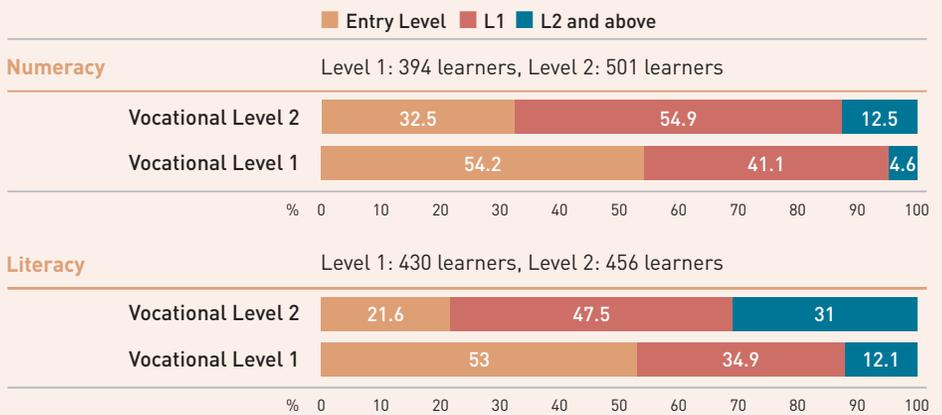
TABLE 1.1→ | **LEARNERS' CHARACTERISTICS**

		percentage	number[2]
Gender	Male	45.6	874
	Female	54.4	1,042
Age	16–17	31.5	597
	18–20	47.2	894
	21–25	8.3	157
	26–35	7.5	142
	36–45	4.2	80
	over 45	1.3	25
Ethnicity	White British	62.3	1,159
	Asian or Asian British	8.5	158
	Black or Black British	17.9	333
	Chinese	0.2	4
	Mixed	2.9	54
	White Other	5.5	102
	White Irish	0.9	17
	Other	1.7	32
Disability	Yes	7.8	129
	No	92.2	1,527
Additional Learning Support	Yes	18.4	300
	No	81.6	1,328
Vocational qualification Level	Level 1	52.2	1,000
	Level 2	47.8	916

2 Figures reported in the table do not include missing values.

FIGURE 1.2 → | **LEARNERS' INITIAL ASSESSMENTS IN LITERACY AND NUMERACY**

■ Entry Level ■ L1 ■ L2 and above

Numeracy — Level 1: 394 learners, Level 2: 501 learners

	Entry Level	L1	L2 and above
Vocational Level 2	32.5	54.9	12.5
Vocational Level 1	54.2	41.1	4.6

% 0 10 20 30 40 50 60 70 80 90 100

Literacy — Level 1: 430 learners, Level 2: 456 learners

	Entry Level	L1	L2 and above
Vocational Level 2	21.6	47.5	31
Vocational Level 1	53	34.9	12.1

% 0 10 20 30 40 50 60 70 80 90 100

on individual learner retention, achievement and attitude could be set.

A four-point scale for the overall degree of embeddedness of courses was devised:

4 Fully embedded or integrated Learners experience LLN development as an integral part of their vocational studies.

3 Mostly embedded Learners mostly experience LLN development as part of their vocational studies, but some aspects remain unco-ordinated.

2 Partly embedded Learners experience LLN development and vocational studies as integrated to some degree.

1 Non-embedded Learners experience LLN development and vocational studies as entirely, or almost entirely, separate.

Analysis suggested that the distinction between mostly embedded and fully embedded provision was less significant than the others.

A fuller discussion of the methodology and examples of all the instruments used in the collection of data can be found in the appendix to the report, to be posted on the NRDC website: www.nrdc.org.uk

2

How embedding affects achievement, retention and success rates in vocational qualifications

Retention

The figures suggest that learners were less likely to drop out if LLN was embedded.

→ SEE FIGURE 3.1

As Figure 3.2 shows, the increase in retention was more marked for courses at vocational L2, with an increase of over 26 per cent between classes with separate LLN provision and those with embedded provision. For vocational courses at L1, the increase was not statistically significant.

→ SEE FIGURE 3.2

It is important to remember that the degree of embedding of LLN may be just one of many factors impacting on retention. However, our interview data support the findings from the analysis in suggesting that, for L2 learners, making an explicit link between LLN learning and the vocational subject can help to overcome the stigma associated with LLN classes. It can also help learners to cope with their vocational course.

At L1, it is possible that learners may have been more ready to accept their literacy and numeracy needs, even where links were not made between LLN and vocational content.

The relationship between retention and ▷

FIGURE 3.1 → **THE PERCENTAGE OF LEARNERS COMPLETING COURSES**

For all learners in the sample

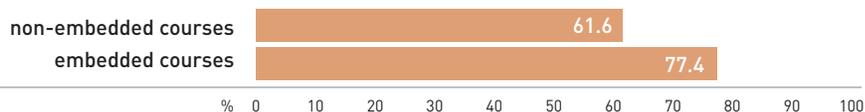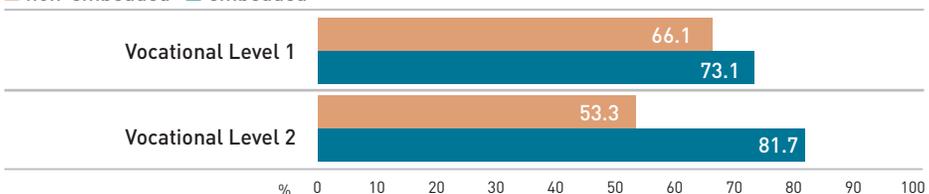|	%
non-embedded courses	61.6
embedded courses	77.4

FIGURE 3.2 → **THE PERCENTAGE OF LEARNERS COMPLETING VOCATIONAL COURSES AT LEVEL 1 AND 2**

For all learners in the sample

■ non-embedded   ■ embedded

	non-embedded	embedded
Vocational Level 1	66.1	73.1
Vocational Level 2	53.3	81.7

embeddedness varied between vocational subjects. Embedding appeared to have the most significant impact in engineering courses. However, the numbers of courses within each vocational area were too low for the findings to be reliable in this area.

Vocational success
The success rate of a course is the number of learners achieving a vocational qualification as a percentage of those who started. The results show a significant relationship between success rates and the degree of embedding of LLN.

→ **SEE FIGURE 3.3**

Comparison with national benchmarking data
A comparison between the success, retention and achievement rates for the courses in the sample and national benchmarking data is shown in Table 3.1.

The success rates for courses in the sample are generally higher than the national average, and reference to Figure 3.3 shows that only the non-embedded courses fell below the average. This may be partly because good teachers are drawn towards embedded approaches.

The national average success rate in 2003-04 was 57 per cent; the average rate on non-embedded courses in our sample was 55.5 per cent, but the average rate on embedded courses was 70.5 per cent.

→ **SEE TABLE 3.1**

LLN success
Literacy achievements
The analysis indicates a strong link between the degree of embedding of LLN and literacy achievement (Figure 3.4). The proportion of learners gaining a qualification was more than 35 per cent higher where there was some embedding. Where LLN was fully integrated, this difference rose to over 42 per cent.

The steep rise in achievement between non-embedded and partly embedded reflects the view of learners that on L2 courses, the LLN teachers' understanding of the demands of the vocational subject and of the professional goals of learners were vital. It would seem that even partial links between subject areas can impact on learners' perceptions of the relevance of LLN.

→ **SEE FIGURE 3.4**

Numeracy achievements
The analysis also indicates a clear association between the degree of embedding and numeracy achievement. The difference between the proportion of learners obtaining a qualification on courses with separate provision and that on fully embedded courses was over 20 per cent.

→ **SEE FIGURE 3.5**

Levels of literacy and numeracy achievement
The data for learners' literacy/ESOL or numeracy achievement were also analysed separately by the levels gained, ▷

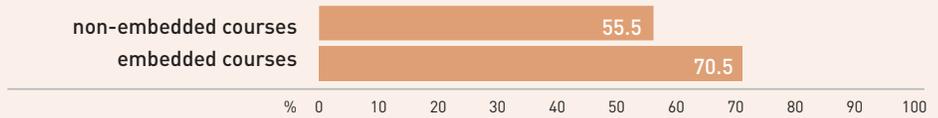**FIGURE 3.3 →** **THE MEAN VOCATIONAL SUCCESS RATE FOR COURSES**

non-embedded courses	55.5
embedded courses	70.5

% 0 10 20 30 40 50 60 70 80 90 100

FIGURE 3.4 → **LEARNERS ACHIEVING LITERACY/ESOL QUALIFICATIONS**

non-embedded	50.0
partly embedded	85.5
mostly embedded	91.4
fully embedded	92.8

% 0 10 20 30 40 50 60 70 80 90 100
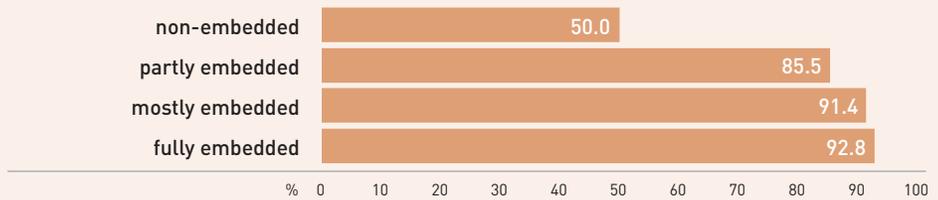
FIGURE 3.5 → **LEARNERS ACHIEVING NUMERACY QUALIFICATIONS**

For learners assessed below L2 in LLN on initial assessment

non-embedded	69.6
partly embedded	78.6
mostly embedded	90.1
fully embedded	93.4

% 0 10 20 30 40 50 60 70 80 90 100
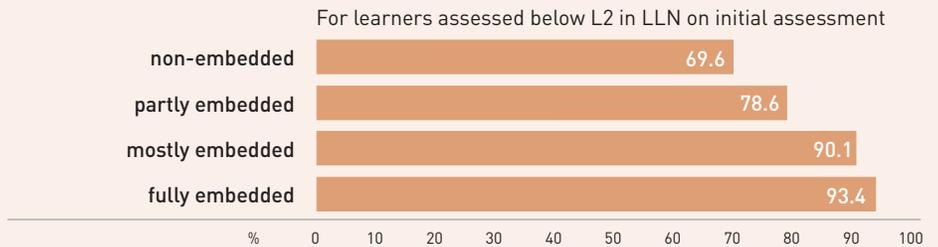
TABLE 3.1 → **COMPARISON WITH NATIONAL BENCHMARKING DATA**

		Courses in the sample			National benchmarking data 03/04		
		Success rate %	Retention rate %	Achievement rate %	Success rate %	Retention rate %	Achievement rate %
VOCATIONAL AREA	HSC	71	80	90	56	–	–
	HBT	66	75	91	61	–	–
	ENG	65	74	93	53	–	–
	BUS	64	79	89	57	–	–
	CON	68	73	94	47	–	–
VOCATIONAL QUALIFICATION LEVEL	LEVEL 1	66	74	93	59	75	79
	LEVEL 2	70	79	90	56	72	78
	ALL	**67**	**76**	**91**	**57**	**74**	**78**

Achievement rates show the percentage of learners passing qualifications. Retention rates show the percentage of learners staying on to completion of their courses. Success rates combine the two, and show the percentage gaining qualifications of those that started a course.

Entry Level or L1 or L2. The resulting graphs indicate that embedding is associated with an increase in achievement of LLN qualifications across the range from Entry to L2 in literacy and at Entry and L1 in numeracy. These figures, however, need to be treated with more caution as the sample sizes are smaller.

→ SEE FIGURE 3.6
→ SEE FIGURE 3.7

When the LLN achievement data for vocational courses at L1 and L2 were analysed separately, differences emerged (Figures 3.8 and 3.9). While again smaller sample sizes call for caution, the figures suggest that, for L2 courses, the embedding of literacy or numeracy was associated with increased achievement of LLN qualifications.

On L1 vocational courses, there were differences between the patterns of achievement in literacy and numeracy. In literacy, separate provision appeared to be linked to low rates of achievement, whereas in numeracy, it was associated with a higher rate. Possible explanations that would repay further investigation might include:

- greater stigma attached to separate literacy provision
- the importance of context in literacy learning
- more responsive teaching of numeracy in separate provision.

→ SEE FIGURE 3.8
→ SEE FIGURE 3.9

Other important factors

Analysis was undertaken to identify which, if any, of a range of variables were most strongly associated with positive learner outcomes. It appears that vocational area is a significant factor in relation to completion, and that learners who receive Additional Learning Support (ALS) are more likely to complete.

Dual responsibility

One question concerned whether or not the LLN and vocational teaching were provided by the same teacher. A small number of teachers taking dual responsibility were dual-qualified, but most were vocational teachers taking additional responsibility for LLN. Where one teacher was given dual responsibility, learners were less likely to achieve LLN qualifications. Learners taught by non-specialist LLN teachers were twice as likely to be unsuccessful with LLN qualifications.

A small number of teachers were dual-qualified and/or highly committed to both the vocational subject and LLN. However, these were the exception, and the evidence suggests that vocational and LLN specialists working together are likely to be more effective.

▷

FIGURE 3.6 → **LEARNERS ACHIEVING A LITERACY/ESOL QUALIFICATION BY LITERACY/ESOL LEVEL**

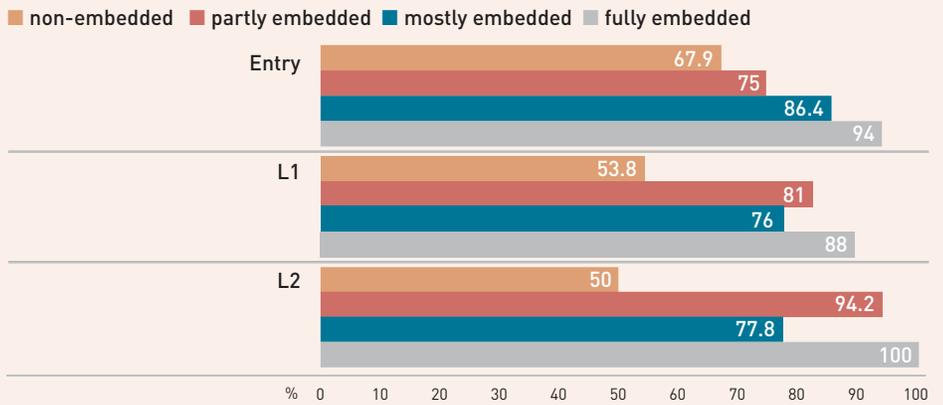For learners assessed below L2 in LLN on initial assessment

■ non-embedded ■ partly embedded ■ mostly embedded ■ fully embedded

Level	non-embedded	partly embedded	mostly embedded	fully embedded
Entry	67.9	75	86.4	94
L1	53.8	81	76	88
L2	50	94.2	77.8	100

% 0 10 20 30 40 50 60 70 80 90 100

FIGURE 3.7 → **LEARNERS ACHIEVING A NUMERACY QUALIFICATION BY NUMERACY LEVEL**

For learners assessed below L2 in LLN on initial assessment

■ non-embedded ■ partly embedded ■ mostly embedded ■ fully embedded

Level	non-embedded	partly embedded	mostly embedded	fully embedded
Entry	83.3	84	89.7	100
L1	53.1	63.6	65.6	91.8

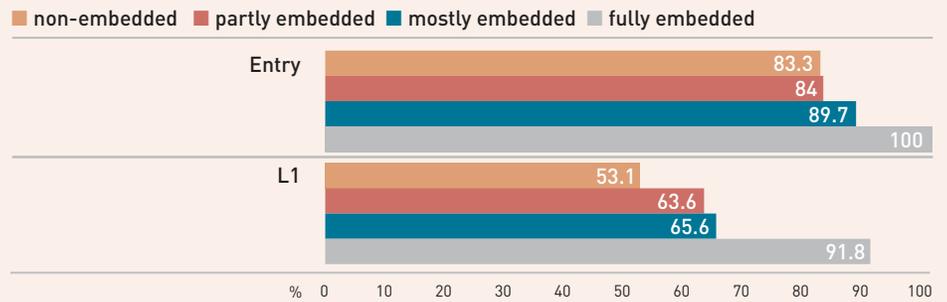% 0 10 20 30 40 50 60 70 80 90 100

FIGURE 3.8 → **LEARNERS ACHIEVING A LITERACY/ESOL QUALIFICATION BY VOCATIONAL LEVEL**

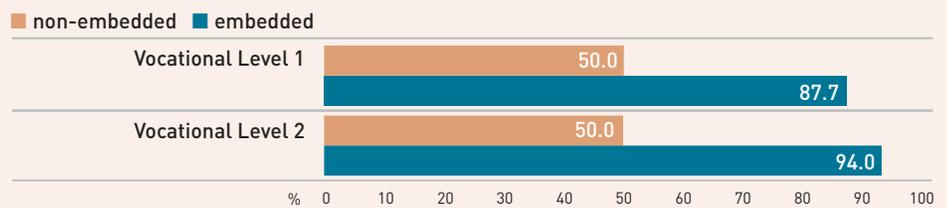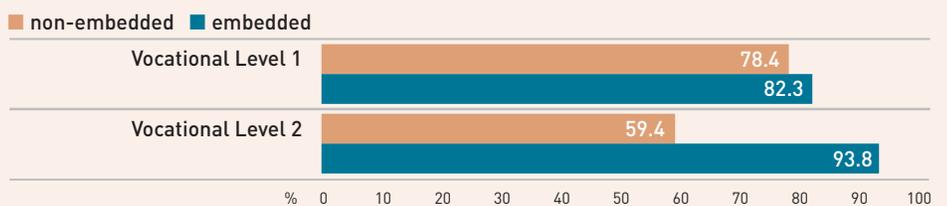For learners assessed below L2 in LLN on initial assessment

■ non-embedded ■ embedded

Level	non-embedded	embedded
Vocational Level 1	50.0	87.7
Vocational Level 2	50.0	94.0

% 0 10 20 30 40 50 60 70 80 90 100

FIGURE 3.9 → **LEARNERS ACHIEVING A NUMERACY QUALIFICATION BY VOCATIONAL LEVEL**

For learners assessed below L2 in LLN on initial assessment

■ non-embedded ■ embedded

Level	non-embedded	embedded
Vocational Level 1	78.4	82.3
Vocational Level 2	59.4	93.8

% 0 10 20 30 40 50 60 70 80 90 100

15

How reliable are these findings?

In any research carried out in real classrooms, many factors cannot be controlled. However, sample sizes here were large, and the strong associations found in the analysis of literacy and numeracy achievements present a consistent picture. This suggests that the findings can be treated with confidence.

Analysis

The results of the analysis presented above provide evidence of a positive relationship between the degree of embeddedness of LLN in vocational courses and each of the three outcome measures.

- Achievement of literacy qualifications was 43 per cent higher on fully embedded than on non-embedded courses.
- Achievement of numeracy qualifications was 23 per cent higher on fully embedded than on non-embedded courses.

Analysis of the data by the level of the vocational course indicates a more complex, but less statistically reliable, pattern of relationships:

- Retention is positively associated with the degree of embeddedness on L2 courses, but not for L1 courses.
- On L2 vocational courses, there is a difference between non-embedded and embedded, with the most significant difference being between separate provision for LLN and some degree of embedding in relation to both achievement of numeracy qualifications and retention.
- On L1 vocational courses, a rise in achievement in LLN qualifications is associated with LLN teaching that is progressively more embedded/ integrated.

The evidence also suggests that:

• giving individual teachers responsibility for both vocational and LLN teaching may not be the most effective approach unless they are highly skilled in each area. Vocational and LLN specialists working together to embed LLN is preferable.
• learners who receive ALS are more likely to complete their course than those who do not.

3

What do learners think?

Many young adults on vocational courses have negative attitudes towards the key skills courses that are often mandatory aspects of their programmes. This study collected insights on the attitudes of learners regarding LLN content, embedded provision and vocational identity. Data were collected via questionnaires, individual interviews, and more than 25 focus groups. Learners were asked about:

- their reasons for choosing the course
- their vocational aspirations
- the degree to which they felt the course would help them reach these goals
- their views on the role of developing LLN skills and vocational success
- the degree to which they felt the current vocational and LLN teacher interaction was effective.

The value of strong LLN skills
The majority of learners who completed the questionnaire indicated that LLN was very important for their chosen jobs, and they attached even more importance to LLN at the end of their courses.

→ SEE FIGURE 4.1

English/Maths as important for the job they want to do

This view was supported by focus groups in which learners described the necessity for strong LLN:

"**I need to have strong communication skills not only to deal with customers but also to set up my business. I need to know maths in order to set up a salon, like looking for a space, and dealing with all the orders and contracts...** "

"**I have worked with my dad, he has his own business, and so I have seen how strong maths skills are not only important for technical plumbing work** ▷

FIGURE 4.1 →   **LEARNERS RATING ENGLISH/MATHS AS IMPORTANT FOR THE JOB THEY WANT TO DO**

For learners assessed below L2 in LLN on initial assessment

■ Before starting the course ■ After completing the course

Literacy/English	79.0
	94.0
Numeracy/Maths	72.0
	85.0

% 0   10   20   30   40   50   60   70   80   90   100
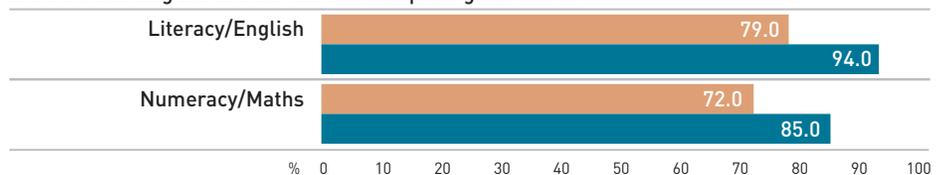
but also for dealing with business stuff like invoices... "

Focus group respondents often acknowledged that their vocational programme was a second chance in education, and some spoke about the challenges they had faced in gaining employment without further qualifications. However, not all learners were convinced of the value of LLN qualifications:

"Key skills qualifications are not what you need when you're learning a trade."

"Learning to be a plasterer, no one cares whether you've got qualifications in English and maths."

Learners spoke about the need to develop stronger LLN skills to improve their lives overall, although many questioned the value employers put on such qualifications.

"Practical experience is more important."

"Employers are not bothered about key skills."

Learners were sceptical about English and maths provision being related to their vocational goals if they felt they were being taught in a school-like manner, highlighting the need for the relevance and connections to be made explicit by staff.

Structure, delivery and a unified team

The sensitivity of learners to the quality of teamwork between their teachers was clear.

"It is clear that our key skills teacher knows nothing about our [vocational] course, so then how can they help us make sure we succeed in our course? I mean, that is what we are here for. Our (vocational) teacher tries to help us with our key skills work, but it is clear they don't work together."

The significance of the way timetables are organised was also clear:

"It doesn't take a lot to work out that if key skills was scheduled in between our [vocational] sessions more people would attend... now they are on days when we don't even have to be here [in the college] for any [vocational] sessions. We pay for travel and some of us work... if it is meant to be one programme, they should structure it that way."

Learners gave positive feedback in another institution, where they understood how their vocational and LLN tutors worked together:

"[ESOL teacher] knows what we need to deal with in our course. He comes and sits in with us every week [in the vocational session], he asks our [vocational] teacher questions, he sees what we need to know, the vocabulary and stuff... then we have our class with him, it feels like he can totally support us."

Learner attitudes

Correlating data from the learner questionnaire and the study's four-point scale of embeddedness showed that, as the degree of embeddedness increased, learners became more likely to say that the course had prepared them well for work.

→ SEE FIGURE 4.2

Learner recommendations

Learners who participated in focus groups recommended:

- More coherent, seamless scheduling of vocational and LLN provision.
- Strong working relationships between vocational and LLN teachers. Many learners felt it was important to have different specialist teachers for LLN input due, in part, to their own perceived weaknesses in these areas.
- Better recognition by employers of LLN qualifications, and better integration of qualification aims.
- LLN teachers who clearly understand the demands of the vocational course and learners' vocational goals.
- Better induction processes to prepare them for the LLN input.
- Early, explicit and continual discussion of links between LLN development and vocational success.
- A shared professional attitude by all teachers supporting both LLN and vocational achievement. Learners felt their own negative attitudes towards LLN were often reinforced by teacher attitudes.

Conclusion-learner data

Researchers frequently received the negative feedback on LLN input that is commonly associated with young adult learners. However, both data from focus groups and questionnaires suggest that LLN that is well integrated with vocational content is highly valued.

For learners, it is important that educators make strong connections between LLN, vocational success and personal development. Learners may be suspicious of input which is not vocationally aligned or valued. LLN must therefore be perceived as valuable, not only by learners but from organisational, pedagogical and practitioner viewpoints. An embedded approach may be seen as an effective methodology for supporting learners' vocational and more holistic learning needs.

FIGURE 4.2 → POSITIVE LEARNER RESPONSES TO HOW THEIR COURSE HAS PREPARED THEM FOR THEIR FUTURE WORK

non-embedded	70.2
partly embedded	79.1
mostly embedded	83.5
fully embedded	88.8
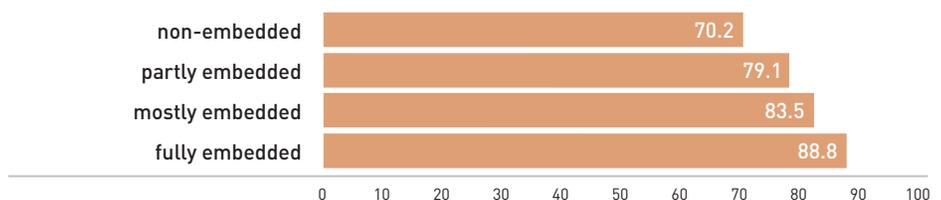
4

The key factors in embedding LLN

This section aims to explain and illustrate the features that were identified as making a difference between provision being embedded or not. From the 30 features identified, four thematic groups emerged as significant: features of teaching and learning; teamwork; staff understandings, values and beliefs; and organisational features.

Features of teaching and learning
This grouping combines the following features:

- LLN teaching linked to practical, vocational content.
- LLN materials contextualised to the vocational area.
- Initial/diagnostic assessment contributing to integration of LLN.
- Differentiation according to LLN needs in the way the vocational subject is taught.
- LLN seen as essential in the development of learners' professional identity and success.
- LLN development treated as relevant to all learners, not only those with LLN needs.

What these mean in practice varies between curriculum areas. On a L2 Health and Social Care course, the vocational teacher uses her experience as a nurse and quotes real-life situations to demonstrate the importance of literacy and numeracy when measuring drugs or report-writing. On an Entry/Level 1 Motor Vehicle course, the LLN teaching is carried out in practical sessions and differentiated to three levels. On this course, literacy and numeracy are taught by a multi-skilled vocational teacher.

In a Health and Social Care department, which integrates literacy and numeracy with vocational teaching, LLN is taught by a course team in different sessions. One teacher states:

"When I look for passages [for reading] they are all health-related. I try to find magazines and newspapers that relate to the course content. So this is literacy with health and care in the literacy session, and then I put it back into a health and care vocational assignment as well."

This type of provision is driven by experience, commitment, language awareness and recognition of learners' holistic needs.

On a L1 Hairdressing course, participation in activities requiring LLN is treated as part of the vocational training

and essential to achieving the qualification and progressing into employment. One mature learner said:

"At our age, if you could read and write it was a bonus, but now to get any kind of employment you've got to be computer literate and you've got to be able to do CVs ... there is a lot of support from the teachers, the salon teacher and [the key skills teacher]."

In fully embedded provision, the differing LLN needs and trajectories of all learners are considered. For example, some learners who were aiming for a GNVQ L2 in Construction were entered for a full L2 key skills accreditation, while another learner on the same course was entered for an Entry 3 *Skills for Life* qualification in Literacy, and a L1 key skills qualification in Application of Number (AoN).

Teamwork

This grouping included the following features:

- Formal shared planning, in officially allocated time, between vocational, LLN and ALS staff.
- Informal shared planning.
- Team-working.

These features were illustrated in one college within both Health and Social Care and Engineering, where all but one of the five courses in the sample were mostly embedded. Vocational and LLN teachers and ALS staff had a high level of informal contact and saw themselves

as a cohesive team. They had a high degree of understanding of one another's delivery demands, and a shared sense of responsibility for overall learner achievement. Learners felt part of a team, due in part to this highly visible collaboration.

All teachers spoke of the need for more shared planning time, and one new ESOL teacher who was housed in a separate department, with little or no planning time with the vocational teachers, struggled to support her learners.

Staff understandings, values and beliefs

This grouping included the following features:

- LLN teachers viewed by staff and learners as contributing to learners' vocational aspirations.
- LLN teachers understanding and engaging with the vocational area.
- Vocational teachers understanding and engaging with LLN.
- LLN teachers willing to develop skills in relation to vocational area.
- Vocational teachers willing to develop skills in relation to LLN.

Positive staff attitudes can make a real difference. In one large Construction department, having a basic skills co-ordinator with a background in the building industry has been key to a change in attitudes. The learning support and basic skills teachers undertake Construction courses, while ▷

the vocational staff see the relevance of LLN.

A positive attitude to LLN on the part of vocational teachers has been repeatedly indicated as a key element in learner success in other NRDC studies*.

Working this way requires both interest and commitment, and has implications in terms of time for training, classroom observation and meetings. The evidence of this study, however, suggests that such efforts are repaid in terms of learners' achievements.

Organisational features
This grouping included the following features:

- Departmental and institutional managers and policies supporting embedded provision in both principle and practice.
- Organisational arrangements, resourcing and working conditions all supporting embedded provision.

These features underline the importance of a whole-organisation approach to embedding. Support for embedding from senior and middle managers through institution-wide policies makes it easier to direct resources in ways that will support embedded LLN.

In one college, an ad hoc group led by the vice principal was working towards a formal strategy to ensure the implementation of the college's *Skills for Life* framework. This was seen by the staff as critical to moving towards an effective framework for embedding on a practical and strategic level.

The college embeds ESOL into childcare, business and engineering courses, and the head of school for ESOL and the head of school for curriculum support and education worked closely together. The college provided extensive training for ESOL teachers, and vocational teachers were receiving basic skills-awareness training.

---

*See for example: C. Roberts, M. Baynham, P. Shrubshall, J. Brittan, B. Cooper, N. Gidley, V. Windsor, J. Eldred, S. Grief, C. Castillino and M. Walsh (2005). *Embedded teaching and learning of adult literacy, numeracy and ESOL. Seven case studies.* London: NRDC; O. Sagan, E. Waite and S. Cowan, with H. Casey and K. Evans (2007). P*utting good practice into practice: literacy, numeracy and key skills in apprenticeships. Part two: Revisiting and re-evaluating* (May 2005). London: NRDC.

5

How do embedded programmes work as a whole?

Course A: Motor Vehicle Level 1

Two features have contributed to the successful embedding of LLN in this course. One is the belief that improved literacy and numeracy, together with key skills qualifications, are essential for the learners in relation to their course, their future employment and their wider lives. The other is the in-depth knowledge and understanding of the vocational subject on the part of the key skills teacher, who has worked in the motor industry.

The key skills teacher introduces the learners to practices she knows will be required on the job, so that they can apply these in the workshop. She explains the vocational relevance of key skills:

"We took our MV learners to Jaguar... robots taking human jobs and the amount of paperwork their staff have to do ... MV was always a hands-on, largely male-dominated environment where jobs were safe. Not now! So for our [learners] to continue, they need high IT skills and good literacy skills."

Planning for learners' LLN progress
Course teachers in this department use their own system of continuous review to record value added. These records feed into learners' self-assessment books, and are available for everyone to consult. The key skills teacher uses the initial diagnostic assessment report to check progress, and has devised her own individual learning plan (ILP). Every scheme of work and lesson plan is profiled to show how literacy and numeracy are going to be addressed for every learner. She treats LLN development as relevant to all learners from Foundation to L2.

Teamwork
Formal planning is generally undertaken electronically, but informal planning is carried out face-to-face as needed. The key skills teacher is invited to contribute to weekly department meetings.

Another way in which vocational and key skills teachers work as a team is by sharing and exchanging schemes of work. The key skills teacher explained how she uses the material vocational teachers give her to integrate her work:

"If you look at the whole package you can identify a lot of skills that occur naturally... For example, for one part of

an assignment they have to buy parts... They might not get that part in this country, so I get them to research using the internet for car parts. We look at the price in pounds sterling, in American dollars, in Euros."

She explained how this work is valuable for vocational and maths qualifications, but also when holidaying abroad.

Joint planning helps provide mutual support. The key skills teacher said:

"As the standards change, we need to have a very strong relationship."

Staff values and beliefs
The key skills teacher has further developed her understanding of the vocational subject through discussion with staff, familiarity with teaching materials and workplace visits.

Organisational factors
Senior management and the cross-college head of essential skills set up the whole-organisation approach to embedding. The course leader spoke of "total support" for the essential skills curriculum.

The course leader takes a strong lead on staff development. He gave the vocational teacher on this course a light timetable so that he could shadow the key skills teacher, and paid for the latter to provide staff development over the summer. He is keen to bring essential skills and vocational qualifications together into a single award.

Course B: NVQ in Admin and IT, Entry/Level 1
In this course, there are opportunities for literacy and numeracy practices to arise naturally within a real work environment, and the learners' LLN development is integral to working in this context. The classroom is set up as a training office doing real work such as photocopying, filing and handling mail for college staff and outside clients. While separate literacy/numeracy classes are held in the same room, LLN learning also takes place continuously alongside practical activities in the training office. For example, the learning of multiplication tables is linked to the process of ordering stock.

Several learners have learning difficulties, disabilities and/or social/life issues. There is a wide range of skill in the group, with half at L1 and six at Entry Level.

Planning for learners' LLN progress
A key feature is the use of initial assessment, more detailed diagnostic assessment, ILPs and various forms of ongoing formative assessment to fine-tune the course to individual needs. The course team treats LLN as relevant for every learner, undertaking holistic initial assessments which identify not only literacy/numeracy needs but also life factors. More in-depth diagnostic assessment is done by the ALS team, and each learner has an in-depth interview. As a result, each person's timetable is different, and learners are streamed for the separate literacy and numeracy sessions.

▷

Photos: Photofusion

25

ILPs and ongoing assessment in practical sessions are used to monitor individuals' progress, and all staff attend weekly programme meetings. Here, discussion around the ILPs informs what each teacher focuses on.

One consequence of the use of ongoing progress reviews was that learners could be entered for qualifications when it suited them.

Flexibility in course completion time (one or two years) means even the less able learners can qualify.

Teamwork
Staff collaboration facilitates the embedding of LLN. The team comprises the course leader/vocational teacher, key skills and ALS teachers. The course leader has dual responsibility. She is the essential skills co-ordinator, teaching literacy/numeracy alongside the vocational content, providing a model for embedded LLN.

There is continuous joint planning between vocational, LLN and ALS staff, some of it timetabled, but most spontaneous and informal.

Staff values and beliefs
Most of the teachers teach both business and aspects of LLN, so they have shared objectives for the learners' holistic development.

A high level of mutual respect exists between all staff and between staff and learners. Strong leadership is provided by the course leader. An experienced teacher of LLN and of business studies, she believes that LLN is key to the learners' achievement, not only in their work, but in life.

Organisational factors
The embedding of LLN is facilitated by departmental structures and arrangements, with all planning and teaching conducted in the same place.

Reflections on the course
This course offers highly-integrated provision, with holistic support of the learners and their learning. Their wide range of skills and individual needs mean that different things count as success for different people. For example, the course leader said:

"It has become apparent that the vocational qualification is of secondary importance to personal and social skills, and we have built it into the course because the typical group of learners has issues like working with others and the need to function [holistically] in today's society. Darren, when he came two years ago, would not walk in without his Mum. We have worked with him to build his confidence. He has poor literacy skills, a speech impediment which has hindered his progression, he's shy with a low self-esteem. He had his first argument with me last week. Fantastic success!"

Course C: NVQ Hairdressing, Level 1
This course demonstrates an interesting model of embedded provision. ESOL learners receive discrete language provision from practitioners within the ESOL department. However, their ESOL input is fully contextualised and firmly linked to the vocational programme. This occurs through intensive development work on the part of the ESOL practitioners, who also sit in on one vocational class each week.

Planning for learners' LLN progress
Both vocational and ESOL practitioners discuss learner assessment, placement and progression. Learners perceive strong working relationships between vocational and ESOL teachers and can describe the ways in which ESOL input strengthens their participation in the vocational course:

"[Our ESOL teacher] is learning about the language of hairdressing, like us. We see him in our vocational class... this makes me feel I can ask him any question. He understands what we are going through..."

Teamwork
In addition to timetabled time to work alongside vocational teachers, ESOL teachers have paid development time to familiarise themselves with vocational content and delivery. Both vocational and ESOL practitioners would like to see more time devoted to such exchanges, also ensuring that vocational practitioners can see ESOL delivery in action.

Staff values and beliefs
This course represents a group of professionals actively developing strong working partnerships. However, as the responsibility of embedding is seen as coming from the ESOL department, some tension arises in terms of increasing the value of ESOL input from vocational practitioners.

Organisational factors
This site has benefited from an embedded champion post at department management level.

Reflections on the course
This course provides an example of an effective model of embedded provision which takes into account a developing and considered approach to practitioner partnership, organisational buy-in and learner progression.

▷

Course D: Plastering, Level 2

Planning for learners' LLN progress
On this course, LLN is brought into the plastering workshop, and embedding is seen as "...working it in without them really knowing".

Teamwork
The plastering teacher and key skills teacher team-teach on Monday afternoons during the time nominally allotted as a key skills session. Team teaching allows one teacher to teach from the front and the other to support individuals. Learners perceive that there is no differentiation, and that everyone does the same, no matter how good they are. But they also acknowledge that teachers give more help to those who need it. The plastering teacher sets exercises/problems, and the key skills teacher tries to highlight elements of the task relevant to the key skills scheme of work.

Both teachers see the benefits of working in this way:

"It works best when you have a teacher from the subject and a teacher from key skills. If [the learners] had to do English and maths unrelated to the subject, they would be asking 'Why are we doing it?'"

Both teachers acknowledge that their good working relationship makes their roles easier, and they value each other's expertise. The plastering teacher lacks confidence in his ability to teach key skills and has sought tuition to improve his own

key skills. He was ready to quit the job before the key skills teacher arrived:

"... because of that pressure. You wouldn't expect a plasterer to go and teach English and maths, and you wouldn't expect a maths teacher to teach plastering."

Staff values and beliefs
The key skills teacher is convinced that LLN has a central role in the vocational course and value to learners in their lives. But the plastering teacher, who until recently worked as a plasterer, voiced doubts and experienced a conflict of values when a visiting representative from the Construction Industry Training Board told learners: "You don't need to put dots or capitals where they should be." He finds it difficult to underline the importance of key skills when he doesn't always perceive it himself. His views are echoed by the learners, many of whom consider key skills to be of little practical use on site.

This case study provides an example of a course with many characteristics of embedding LLN. However, it also highlights the distinctions between the different purposes for embedding, illustrating how these distinctions can lead to tensions for practitioners, as here, between the requirement for learners to gain a key skills qualification, and the beliefs of the vocational teacher about the role of LLN in practice. However, as the quote from the teacher in course A shows, literacy practices in an industry can change quickly.

Course E: Certificate in Administration NVQ, Level 2

This course illustrates the pressures that can be put on vocational teachers when it is assumed that they can simply add LLN to their repertoire. The organisation previously had separate provision for key skills, but was in transition. Vocational teachers sat in on key skills sessions with the intention of preparing them to teach Communication and AoN the following year.

Planning for learners' LLN progress
The group had one hour-long session per week on AoN. This was part of the timetable for the whole group. In 2004-05 this was taught by a key skills teacher with the vocational teacher observing.

Vocational teachers point out that it can be difficult to embed either literacy or numeracy fully into certain vocational subjects because the vocational skills and knowledge do not afford opportunities to integrate numeracy to a sufficiently high level. The key skills teacher put considerable effort into contextualising AoN assignments, but acknowledged that there were aspects of key skills AoN that were difficult to link to secretarial studies. The secretarial teacher stated that learners did not believe they would need numeracy.

Quite the opposite was true for literacy. The administration course provides ample opportunities to embed literacy. The vocational teacher was already responsible for key skills communication and was confident in this role.

Teamwork
The key skills teacher was a qualified *Skills for Life* teacher. He encouraged the vocational teacher to learn by watching and taking notes and to get involved herself by checking learners' answers.

Although the vocational teacher had the opportunity to observe the key skills teacher, no time had been allocated for meetings. In addition, teachers had to use their own time to train for their new roles.

Staff values and beliefs
Mutual respect existed between the key skills and vocational teachers, and it appeared that the dual-staff model worked well for AoN. But while the vocational teacher had been willing to develop her skills and had attended a L2 course in numeracy as well as the training on numeracy teaching, she did not feel confident to take over responsibility for key skills AoN. She was aware of her limitations, and felt that AoN would be much better taught by a specialist. She was also aware of the challenges of embedding AoN.

Organisational factors
The college has a *Skills for Life* strategy, and from September 2004, introduced a new policy of embedding key skills. Its plan states:

"key skills will be embedded into the main course structure and a programme of staff development devised to ensure the standards are met and learners get a high-quality learning experience."

▷

One document states that in 2004-05:

"key skills delivery will be integrated into learners' main programme... All teachers will develop learners' literacy, numeracy and IT through their lessons."

Separate provision of key skills had been unpopular with the learners, who had been reluctant to attend the weekly sessions, and the key skills/*Skills for Life* manager believed that the change in policy was for the best. However, while the key skills staff would still be available to support the vocational staff, little time was set aside for this, and teachers were expected to undertake further training in their own time.

Reflections on the course
This course illustrates the dangers of requiring vocational teachers to take responsibility for LLN. A policy for embedding LLN teaching which depends solely on this model is likely to meet problems.

6

Conclusion and recommendations

Outcomes for learners

The findings of this study provide a clear and consistent message: vocational courses at Levels 1 and 2 in which LLN is embedded are linked to more positive outcomes than courses for which the LLN provision is separate. Where LLN was embedded:

- retention on programmes was higher, particularly at L2
- success rates in the vocational subject were higher
- learners were more likely to achieve LLN qualifications
- learners believed that they were better prepared for their work.

For vocational L2 courses the figures suggested that even a small degree of embedding of LLN makes a significant difference to retention and achievement. For courses at vocational L1, on the other hand, a rise in achievement was associated with higher degrees of embedding.

The analysis also showed variations between the five curriculum areas covered, and further exploration of these variations might be valuable.

Characteristics of embedding LLN

The research presents an analysis of the key features of embedding LLN in vocational programmes, which can be grouped as follows:

- Teamwork between LLN and vocational teachers
- Staff understandings, values and beliefs
- Aspects of teaching and learning that connect LLN to vocational content
- Policies and organisational features at institutional level.

Some of the features associated with LLN achievement were quite specific to the process of managing embedded LLN provision, but others, such as the use of diagnostic assessment as the basis of differentiation, are recognised principles of good practice.

There is no single model of embedded provision. In particular, the researchers found successful embedding was not just a question of putting structural features in place, but also of teamwork and shared understandings and beliefs.

▷

Staffing and resources

Embedding should not be seen as a cheap option. But while the evidence suggests that it is more, rather than less, resource-intensive, the initial investment can be very productive. To make embedding work well, institutions need to ensure:

- easy access for LLN and vocational teachers to each other and opportunities for joint planning
- opportunity for LLN teachers to become familiar with the content and style of vocational teaching and learning
- opportunity for vocational teachers to understand the role of LLN skills in learning and work for their vocational areas
- occasional opportunities for team teaching and/or observation
- appropriate professional development for staff.

These requirements make both organisational and resource demands. However, if institutions can achieve increases in qualification outcomes along the lines found in this research, the investment may be well worth it.

Giving one teacher responsibility for teaching both the vocational subject and LLN is often seen as the route to full embedding. However, the findings of this study indicate that, where this was the case, learners were less likely to succeed with their LLN qualifications. The effective solution seems to be for teachers with different specialisms to work together.

For successful embedding of LLN teaching to be sustainable, it is important that it has the support of senior management and that senior managers fully understand its implications. Without this support, excellent examples of embedding can be difficult to maintain and may not spread within the institution.

Recommendations

- Embedded LLN provision should be recognised and implemented as the norm, not the exception. This will require consistent change to many institutional and professional practices.
- The current emphasis on whole-organisation approaches to LLN should be strengthened and continued. An understanding of the most effective whole-organisation approaches should be drawn together.
- Managers with responsibility for staff timetables need to understand the crucial importance of ensuring that staff who are to work together have dedicated time to plan together and the opportunity for more informal discussions.
- Research should be established to investigate further some of the issues emerging from this study. These would include possible differences for embedding LLN in relation to L1 courses and for different curriculum areas.

- Professional development for vocational and LLN teachers to support embedding should be made more widely available.

  - **Vocational teachers** need support to increase their awareness of the needs of LLN learners, and to develop their vocational teaching styles to cater for the differentiation required to meet the needs of LLN learners. They also need to be fully confident in their own literacy/numeracy skills.

  - **LLN teachers**, especially those new to embedding, need support to adapt their teaching approach to one which is led by the vocational curriculum. They also need opportunities to gain an understanding of the relevant vocational areas and the requirements of vocational curricula.

  - **All teachers** need professional development activity to encourage the growth of collaborative teamwork.

"YOU WOULDN'T EXPECT A MATHS TEACHER TO TEACH PLASTERING..."
HELEN CASEY, OLGA CARA, JAN ELDRED, SUE GRIEF, RACHEL HODGE,
ROZ IVANIČ, TOM JUPP, DESIREE LOPEZ AND BETHIA MCNEIL

www.nrdc.org.uk