

Lambeth Case Study

Overview:

The focus of this project was to pilot the embedding of Functional Maths within the new 14-19 Technology Faculty. A small group of tutors were chosen to carry out a mini action research project in order to establish whether increased collaboration between SfL tutors and vocational tutors would have an impact on learner retention and success rates. If so, could a similar model be implemented across the whole organisation to enhance embedding/blended learning and improve functional skills achievements?

Provider – Key Information

Lambeth College is a large inner city general further education college in the London Borough of Lambeth. The college has a wide range of provision for learners 14-16 (through link programmes), 16 – 18 years and adult learners. The college has established embedded and integrated programmes with embedded vocational schemes of work (with references to LLN). Nevertheless, Lambeth was still struggling to see any significant impacts on success rates as a result of their embedding. The pilot was carried out with a group of NEET learners (16-18), many with additional learning and social needs.

Provider's issues prior to SfLIP involvement

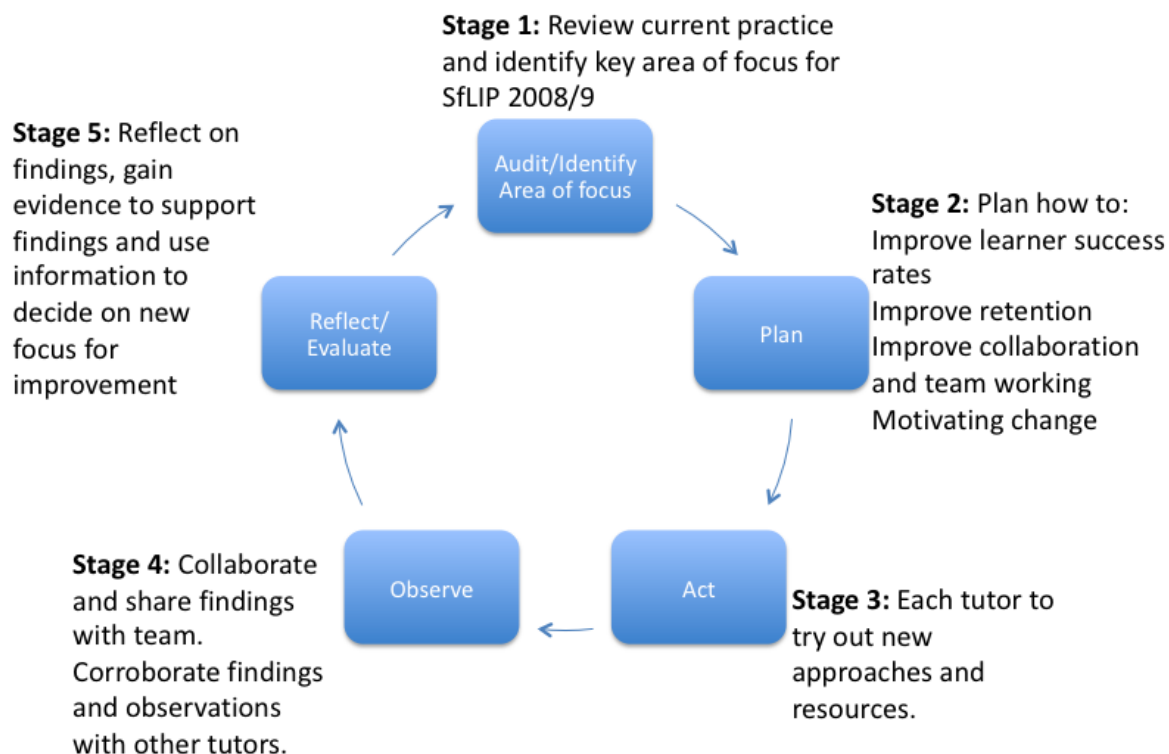
The Ofsted inspection (published April 2008) reported that '*Practical standards are high in engineering and construction*' and there was evidence of '*marked improvements in achievement rates at Level 1 for learners aged 16-18*'. Lambeth wanted to measure the impact of a more collaborative embedded approach in the hope that this would increase learner engagement, improve learners' attendance and success rates for learners aged 16-18 at entry level 3 and adults at L1.

What the Provider did (in the SfLIP context)

Lambeth College chose a small group of tutors to pilot the delivery of Functional Maths with one group of learners, in one vocational subject area in the 14-19 Technology Faculty. The project team was made up of one vocational tutor (motorcycle engineering), one numeracy tutor, one numeracy learning support tutor and one literacy tutor. The Deputy Faculty Director (SfL) and the Technology Faculty Director contributed to the pilot by sharing resources and organising workshops and meetings (including lunch). The team began working on the pilot 'action research' project in January 2009. Refer to the action research model below for more details.

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Action research model:



How the Provider did this

Stage 1: Julia Hoyte (Deputy Faculty Director SfL) decided that the specific area of focus would be the embedding of functional maths. The aim of the project was to evidence the impact of effective embedding practice. The performance criteria were decided and clearly identified project outcomes were identified as follows:

Performance Criteria - Responsiveness: Learner views, attendance, retention

The planned impact would be improved student motivation and engagement and this was measured through the completion of a 'before and after' survey of learner views and attitudes towards maths. Julia Hoyte adapted the NRDC Embedded Research Phase 2 Learner Questionnaire to collect learner views and attitudes - see an example question below:

9. How important is good maths for the job you want to do? (Tell us what you think **now**.)

(PLEASE MARK ONE NUMBER)

1	2	3	4	5	6
not		quite			very
important		important			important

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Attendance and retention statistics for the pilot group was compared with that of a similar group (age, academic levels and background) on the same course (Motorcycle Level 1).

Performance Criteria - Effectiveness: Data – success rates, outcomes, achievements

Unfortunately there is limited data available on success rates, outcomes and achievements at this stage. However, formative data indicates that 90% of the group achieved Numeracy at Level one on the NCFE on-line test. Additional vocational qualification achievement data is still being collated and will be provided.

Stage 2: The first session included a general introduction to Functional Skills and a bespoke Embedding CPD session (adapted from the SfLIP CPD 4b). All tutors were asked to establish individual 'starting points' and were set specific objectives/tasks to complete before the next facilitated group session. Tutors shared SoW, worked collaboratively and shared resources and activities between sessions.

A sample of weeks from the motorcycle embedded SoW:

Motorcycle Engineering
IMI VRQ Level 1

Version - Sep 1 2008/9 NS/TC

Week	Date	Workshop 1 Workshop Tasks	Workshop 2 Workshop Tasks	Theory 1 Units 1 Health and Safety Unit 2 Foundation Skills	Theory 2 Unit 4 Chassis Unit 8 New Assembly	Theory 3 Unit 5 Engines	Theory 4 Unit 6 Transmission Unit 3 Routine Maintenance	Theory 5 Unit 7 Electrics	Skills for Life Lit/Num and ALS Lit/Num timetabled for these groups
4	29.09.08	Remove and refit rear wheels 4.0.0 Drive chains	Two Stroke Top End Task 21	1.1.3 Labels	8.3 New motorcycle assembly	3.1.1 Different engines/two strokes	6.1.2 Clutches	2.1.3/7.1.1 Basic electrics/ Basic circuits and symbols	Understanding diagrams
5	06.10.09	Rear Wheels/Chains Task 4	Compression Test Task 13	1.1.1 Intro H&S Acts	8.4 New motorcycle assembly	5.1.1 Two Stroke Cycle	6.2.1 Clutch service	2.1.3 Ohms law	Writing. Reading. Pressure
6	13.10.08	Control cables - Clutch	Four Stroke Top End Valve clearances	1.1.1 Acts cont	New motorcycle assembly revision	5.1.1 Rotary Engines	6.2.2 Clutch faults	2.1.3 Parallel and series circuits.	Measurement and word recognition
7	20.10.08	Control cables - throttle	SOHC Timing Task 18 Valve clearances Task 22	1.1.5 Codes of conduct	New Motorcycle Assembly Test	5.1.2 /3.1.1 Engine Layouts	Intro to gearboxes Multiple Gear ratios	7.1.1 Basic components/ cables and connectors	Measurement. Ratio Area Volume
	27.10.08	HALF TERM							
8	03.11.08	Control cables - choke	SOHC Timing Task 18 Valve	1.1.6 Precautions	Intro to chassis parts	3.1.1 Engine size (cc)	6.1.3 Manual Gearboxes	7.1.1 Basic components	Reading, writing and basic

Examples of card sort activities produced for functional maths engineering pilot:

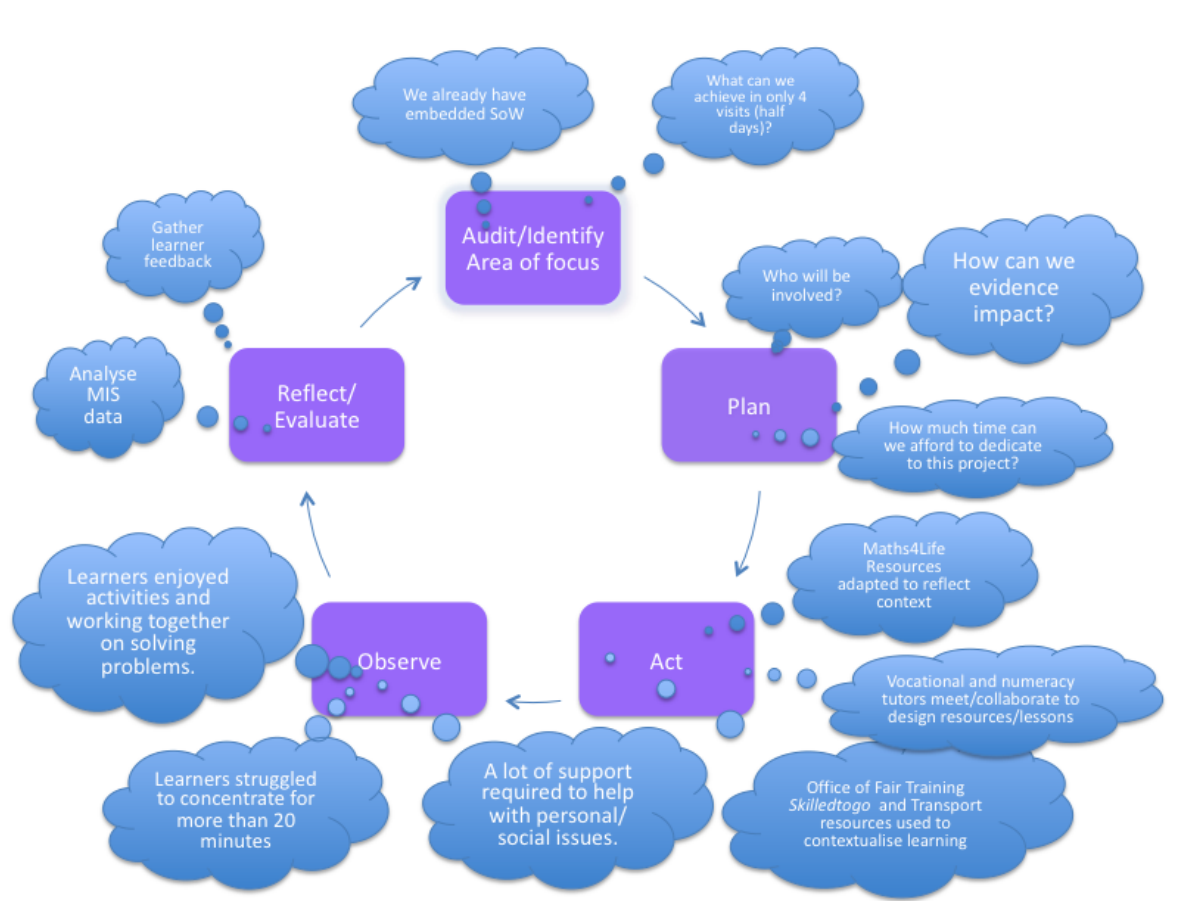
1 gallon	4.5 litres
½ gallon	2 ¼ litres
1 ½ gallons	6 ¾ litres
2 gallons	9 litres
2 ½ gallons	11 ¼ litres

1 litre	1.75 pints
½ litre	0.88 pints
1½ litres	2.66 pints
2 litres	3.5 pints

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Stages 3 and 4:

The follow-up workshop took place in March 2009 and tutors provided feedback on their individual actions. They described resources developed and brought in example to share with the group. The workshop also gave tutors the opportunity to share observations of learners' engagement in the learning process. Tutors explored common observations about learners' likes and dislikes (in terms of activities and resources).



Tutors shared observations about learners' difficulties with tasks. The concentration difficulties and problems with group tasks mirrored the learners' personal and social needs. These continued to present significant barriers to learning throughout the year. The tutors discussed how activities could be adapted to work to learners' strengths and to ensure learners could remain engaged and motivated throughout the lessons. Tutors agreed to try new approaches and activities and decided to focus on tackling some of the more difficult mathematical concepts that learners would need to grasp for motorcycle maintenance. These included compression ratios, swept volumes, metric conversions and scaled diagrams. Tutors also agreed that they would need to spend more time exploring the language of maths and would request additional support from the literacy team to help with this.

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Examples of activities produced as part of the pilot:

Card sort activities:

⊕ Swept Volumes, Clearance Volumes,

Cylinder bore "d" 5cm	Clearance depth "x" 1cm	Stroke "h" 3cm	Clearance volume, 19.6cm ³	Swept volume 58.9cm ³
Cylinder bore "d" cm 6cm	Clearance depth "x" 1cm	Stroke "h" 4cm	Clearance volume, 28.3cm ³	Swept volume 113cm ³
Cylinder bore "d" cm 6cm	Clearance depth "x" 1.5cm	Stroke "h" 5cm	Clearance volume, 42.4cm ³	Swept volume 141cm ³

Examples of PowerPoint produced to start discussion about maths within motorcycle maintenance:

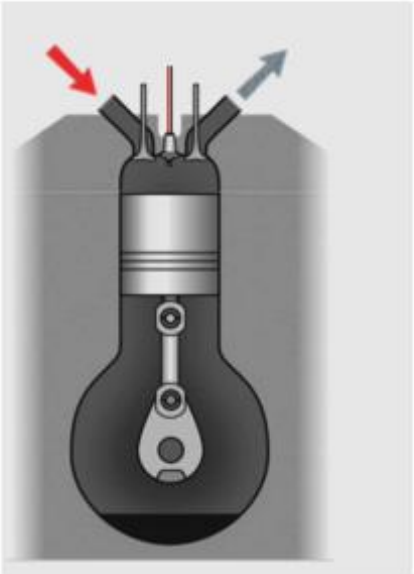
This short animation shows a four-stroke engine running

It also gives the names of most of the parts in the engine

Finally it will help you understand what is meant by 'Clearance Volume' and 'Swept Volume'

Once you understand the terms and can see what is happening it becomes easy to work out Compression Ratios.

Click on the picture to start ...



Impact achieved

Qualitative data:

A survey of learner views was carried out at the beginning of the project, in January (their second term on programme). The on-programme survey questionnaire responses were compared with end of project (and end of course) survey responses.

Initial survey responses show that learners were aware of the importance of maths and valued maths as a means to improve job prospects and progression (score 5). The end of course results indicates an increase in appreciation of this as a fact (5.5) and a continued commitment to learning maths.

Learner responses indicate that learners believed that working on maths had helped them achieve (score 4). This score remained that same.

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Learner responses indicate that they believe that their vocational tutor became more involved with their learning of maths. This indicates a higher level of vocational tutor input as part of the embedding process.

In general learners believed that their attendance had improved and that they had attended more classes as a result of the pilot. Scores show an increase in their confidence that the entire programme had prepared them for taking their qualifications and that the qualifications were easier than they had first anticipated. This indicates improved confidence in their ability to succeed.

Overall the learners rated the programme 4.8 (out of 6) for satisfaction. There was no change in this score.

Impact on teaching and learning:

The motor vehicle tutor reported that he could see that the pilot had made an impact on his learners understanding. Fortunately, he had two groups of learners on the motorcycle maintenance course and could therefore make a comparison between the pilot group (Group A) and the other group (Group B). Both groups had very similar class profiles i.e. in both groups there was a high percentage of students with ALS and ASN support needs. Both groups had mixed ability levels and 'spiky' profiles for language, literacy and numeracy. The ability levels varied from entry level 2 - level 2 in literacy and numeracy.

As a result of the pilot both groups will now have more numeracy and literacy embedded in motorcycle classes. The tutor was happy to report that there will be increase in Key Skills/Functional Skills teaching (and teacher) involvement across the 14 -19 programmes.

The motor vehicle tutor reports good progression rates and said that he expects all learners on the pilot to progress to L2.

MIS Data

Retention: Overall the data shows an increase in attendance from January through to July. The overall attendance rates were as follows:

Activity/Class	Pilot Group A	Group B
Numeracy	72.41%	50.32%
Motorcycle IMI Award	82.61%	68.18%

The table above illustrates that learners were engaged and motivated to attend numeracy classes. There was a marked improvement in retention in both numeracy and motorcycle classes. There is a significant difference between the attendance rate of Group A (the pilot group) and Group B.

Summary

In general the pilot has been a success and has produced a case study and 'model' that can be shared across the whole organisation. Both the vocational tutor and maths tutors have identified 'natural occurrences' of functional skills within motorcycle assignments/tasks. Tutors have produced relevant, motivating and engaging resources for motorcycle students.

Feedback from tutors (see below) is evidence of how collaborative approaches can lead to sharing and transfer of good practice.

Retention of learners in both the motorcycle and numeracy classes was higher in the pilot group (Group A) than in the 'comparison' group (Group B). The average attendance rate

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across the pilot motorcycle group was significantly higher in ALS (numeracy), numeracy and vocational classes.

The numeracy tutors have worked hard to produce a range of multi-sensory resources for the motorcycle programme and the high attendance rates show that these resources are engaging and differentiate well for this group of learners.

Next steps and lessons learnt

Changed practice 'in light of the reflections and evaluations' **Stage 5:**

Lambeth continues to invest in professional development planning and this has helped make the project a success. The majority of the SfL tutors are now L5 subject specialists and 7 qualified vocational tutors are currently enrolled to complete a Literacy or Numeracy Additional Diploma.

Meeting and planning time remains an issue but this has been partially resolved through early timetabling for next year and clear linking of SfL tutors to specific faculties/departments i.e. providing more opportunities for collaborative working. In general tutors feel that there is a need for more time to be allocated for developmental work and suggest that at least half a day (per term) is spent on collaborative working.

Lambeth recognises that initial assessment results should be used more frequently (and robustly) to inform lesson planning. This has been resolved through trying to ensure initial assessments and feedback of class profiles be completed as early as possible to inform planning.

Functional Skills assessments were difficult to pilot due to lack of communication from the awarding body regards assessment windows. This led to learners not being entered in time for functional skills assessments. Nevertheless, learners have completed their National Adult Literacy and Numeracy tests and are awaiting their results. Julia is looking to engage another awarding body to avoid disappointment and frustration in the coming year.

Quotes

"Both groups will now have more Numeracy and Literacy within their Motorcycle classes. For me, this [project] has opened my eyes to ways of helping the less able learners achieve higher goals than anyone could have foreseen... The whole of the year group will benefit from this trial."

Motor Vehicle Tutor

"The pilot was a useful means of getting together with other colleagues and working collaboratively. In particular finding ways of identifying areas which link with the numeracy or the literacy and how to better support/deliver of a given topic - sometimes proved quite challenging, however with a variety of mixed-bag resources/tactile etc. proved to be a positive and effective way forward."

Numeracy Tutor

"The pilot was a useful means of getting together with other colleagues and working collaboratively. In particular finding ways of identifying areas which link with the numeracy and literacy and how to better support/deliver a given topic. This was proved to be a challenging group but with a variety of mixed-bag resource (especially tactile resources) we found a positive and effective way forward."

Numeracy Support Tutor

Tutors agreed that the following were all useful approaches to ensure embedding was

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effective across the programme:

- *Joint use and reference to vocational workshop manuals*
- *Mini whiteboard (for formative assessments)*
- *Use of visual organisers e.g. flow charts*
- *Shared glossary of motorcycle engineering words*
- *The ability to deliver numeracy classes in the practical working areas*
- *Use of visual cues e.g. sort cards and storyboards*

Links and Resources:

Maths4Life resources <http://www.maths4life.org/>

FSSP teaching and learning resources <http://excellence.qia.org.uk/functionalskills>

Resources produced by LLU+ for the Office of Fair Trading: www.offt.gov.uk/skilledtogo

Action Research and the 'Reflective Practitioner' www.actionresearch.net

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