Getting ready for the specialised engineering diplomas: work placements for the 14 to 16 age phase

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Getting Ready for the Specialised Engineering Diplomas: Work placements for the 14 to 16 age phase

Tim Lewis and Gary Drabble, Sheffield Hallam University

Abstract
In the UK there is considerable activity at national level in developing the interface between school and training for employment. The intention is to introduce new Specialised Diploma courses into schools starting in 2008. Early in the planning it became clear that several diplomas offer opportunities for design and technology (D&T) in schools. A key feature of these diplomas is that the structure consists of learning lines comprising of several subjects coming together for the delivery in schools. However, a significant feature is the integration of work placement into the student learning experience. Sheffield Children and Young People Directorate (CYPD) has a strong commitment to ensuring diplomas are implemented successfully in schools therefore this research was undertaken to assess both the provision and opportunities for work placement in the 14 to 16 age phase. The research focused on commercial providers of education and training. Motor trade training was selected as an industry with the potential to contribute to the emerging specialised engineering diploma (www.engineeringdiploma.com/).

The research consisted of:
• a review of current qualifications for all aspects of the motor trades industry including those provided by the Institute of the Motor Industry;
• semi-structured interviews, using Wiersma’s (2000) methodology, with motor trade commercial training and further education (FE) providers;
• observation and informal interviews with a group of Year 10 students on a motor trades work placement;
• informal interviews with teachers and tutors responsible for the above group.

The research outcomes identify issues concerning the provision of work placement within diplomas and particularly how it is integrated into the learning experience. Additionally there are implications for subject teaching of D&T, science and mathematics to ensure that students are prepared prior to work placement. The conclusion identifies examples of good practice but also raises issues about organisation and capacity. While this research concerned engineering the implications and issues are likely to be similar for other diplomas currently being prepared such as Manufacturing, Construction and the Built Environment and Hospitality and Catering.

Key words
design and technology, D&T, 14 to 19 age phase, work placements, vocational diplomas, Engineering diploma

Introduction
In UK schools work experience features as part of the Year 10 (age 15) student experience. This is facilitated by organisations such as Trident (www.trident-edexcel.co.uk/) as well initiatives by local education authorities or consortia of schools. These placements are usually of ten days duration with experiences provided by industry, commerce, retail and service providers. Currently the interface between school and training for employment is under scrutiny and development at a national level with the intention of introducing new diploma courses into schools for the 14 to 19 age phase. The first of these courses are to be available in 2008. All proposed diplomas courses include work experience. This research was established to explore how this could be developed to ensure the experience is relevant and meets the needs of students as well as the exacting standards expected by the qualification awarding bodies. Work placements are common to all diplomas but this research focuses on the motor trades sector which will contribute to the engineering diploma learning line. At this stage many D&T teachers are engaged in planning engineering diplomas.

Research method
There are four aspects to this research:

1 Study of issues concerning recruitment, employment, current qualifications used by the motor trades industry, and the emerging engineering diploma learning line.

2 Focus interviews with three motor vehicle commercial training providers and one further education (FE) provider using Wiersma’s (2000) methodology. Interviewees were either directors or training managers. The purpose of the interviews was to establish:
• background information regarding employment trends, qualifications and recruitment opportunities;
• the level and nature of current provision for motor trades work placements in the South Yorkshire region;
• experiences of working with students on work placement.
The schedule consisted of questions to promote discussion about the following:

- the present position of recruitment and training for motor vehicle trades;
- knowledge of the emerging diploma system;
- 14 to 16 age phase work experience courses;
- managing pupils from schools;
- details of work experience for the 14 to 16 age phase;
- training facilities.

3 Additional information obtained by observation and informal discussions with a group of year 10 students on a motor trades work placement.

4 Discussion with teachers and tutors responsible for the above training placement.

Results and discussion

Definitions

Early in the research it became clear that there was confusion about expressions relating to both motor trades and work placements. A concern of training providers interviewed is that schools and teachers misunderstand the term motor trades. They claim the norm is to adopt a narrow definition which focuses on servicing cars in the local garage. The Institution of Motor Industry (IMI) has a comprehensive definition and this research confirms this broad definition which includes employment in a tyre fitting and exhaust centre through the more specialised, and technological based employment to management positions within large franchise dealerships. Interviewees also pointed out the misunderstanding about the motor trade service industry and the motor manufacturing industry. This research focuses on the motor trade service industry.

Interviewees also considered there was confusion in the use of the expression work placement used for many years by education. The confusion arises as the words work–based learning and work-related learning are appearing in documentation. In the new specialised diploma documentation work–based learning refers to clearly defined tasks with learning outcomes achieved during a placement. Work-related learning refers to the school-based curriculum which should be focused towards the knowledge and skills for a particular learning line, in this case engineering. Work placement refers to students being placed in industry, a service provider or business.

Employment opportunities and the qualifications structure in the motor trades sector

The basic grade of employment is in tyre and exhaust fitting however the industry has a qualifications structure from this level to management levels in large franchise dealers. While the basic levels are concerned with skills an important aspect at all levels is communication and customer relations. The Institute of Motor Industry (IMI) report a shortage of people entering training with an understanding of the importance of this attribute.

Currently there are a confusing number of qualifications in motor vehicle trades with a further difficulty of non-conformity to the level descriptors used by the Qualifications and Curriculum Authority (QCA). The on-going work on the new diploma learning lines being developed mainly for schools adds a new level of confusion. Interviewees commented that in their view teachers and parents had little understanding of this complex system and schools seem to be concerned mainly with the GCSE and A level qualifications.

Table 1 from the QCA National Qualification Framework (NQF) describes the outline of entry, level 1 and level 2 qualifications for any subject. Table 2 shows the level NQF level indicators together with the descriptors of each level interpreted and described by the IMI.

Two interesting points emerge. The first is that entry level is a more general experience for 14 year olds and could be part of a broad-based work experience. The second is that the IMI references its descriptors to GCSE performance. While this may seem to be helpful it can be interpreted that these GCSEs are entry qualifications. It is this interpretation that leads to the confusion regarding qualifications. This is not helpful to teachers, students and careers advisors. The current work on developing the new diploma qualifications should provide opportunity to clarify this situation.

Commercial training organisations and further education (FE) colleges provide courses for the 14-16 age phase often negotiated with schools to meet the needs of particular groups of students. These are usually described as work experience or work placements. In most cases a certificate of attendance is issued to students but usually the experience is not integrated into the curriculum.

While the main qualifications provider for the motor vehicle sector is the IMI, the national awarding bodies such as Oxford, Cambridge and RSA (OCR) provide a range of qualifications which focus on the business aspects rather than technical aspects of training. Edexcel also provide motor vehicle Business
<table>
<thead>
<tr>
<th>Level</th>
<th>Intellectual Skills and Attributes</th>
<th>Processes</th>
<th>Accountability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Entry level</td>
<td>Employ recall and demonstrate elementary comprehension in a narrow range of areas with dependency on ideas of others. Exercise basic skills. Receive and pass on information.</td>
<td>Operate mainly in closely defined and highly structured contexts. Carry out processes that are repetitive and predictable. Undertake the performance of clearly defined tasks. Assume a limited range of roles.</td>
<td>Carry out directed activity under close supervision. Rely entirely on external monitoring of output and quality.</td>
</tr>
<tr>
<td>Level 1</td>
<td>Employ a narrow range of applied knowledge and basic comprehension. Demonstrate a narrow range of skills. Apply known solutions to familiar problems. Present and record information from readily available sources.</td>
<td>Show basic competence in a limited range of predictable and structured contexts. Utilise a clear choice of routine responses. Co-operate with others.</td>
<td>Exercise a very limited degree of discretion and judgement about possible actions. Carry restricted responsibility for quantity and quality of output. Operate under direct supervision and quality control.</td>
</tr>
<tr>
<td>Level 2</td>
<td>Apply knowledge with underpinning comprehension in a number of areas. Make comparisons. Interpret available information. Demonstrate a range of skills.</td>
<td>Choose from a range of procedures performed in a number of contexts, some of which may be non-routine. Co-ordinate with others.</td>
<td>Undertake directed activity with a degree of autonomy. Achieve outcomes within time constraints. Accept increased responsibility for quantity and quality output subject to external checking.</td>
</tr>
<tr>
<td>Levels 3 and above</td>
<td>While outside the scope of this study these qualifications at these levels can lead to degree level courses.</td>
<td></td>
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</tr>
</tbody>
</table>

Table 1: Qualifications and level applicable to 14 to 16 age phase qualifications
From the National Qualifications Framework, QCA

<table>
<thead>
<tr>
<th>Framework level</th>
<th>NVQ Level indicators</th>
<th>Institute of the Motor Industry Descriptor</th>
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<tbody>
<tr>
<td>Entry level</td>
<td>Entry level qualifications recognise basic knowledge and skills and the ability to apply learning in everyday situations under direct guidance or supervision. Learning at this level involves building basic knowledge and skills and is not geared towards specific occupations.</td>
<td>Level 1 Vocational qualifications are Pre-Apprenticeship programmes for students from 14 years old, in school or further education. These qualifications teach basic knowledge and routine tasks.</td>
</tr>
<tr>
<td>Level 1</td>
<td>Level 1 qualifications recognise basic knowledge and skills and the ability to apply learning with guidance and supervision. Learning at this level is about activities that mostly relate to everyday situations and may be linked to job competence.</td>
<td>Level 2 suitable for those who have a Level 1 qualification, or are likely to achieve GCSE grades D-F in English and mathematics and a science based subject. These qualifications cover routine tasks and require previous knowledge or work experience.</td>
</tr>
<tr>
<td>Level 2</td>
<td>Level 2 qualifications recognise the ability to gain a good knowledge and understanding of a subject area of work or study, and to perform varied tasks with some guidance or supervision. Learning at this level involves building knowledge and/or skills in relation to an area of work or a subject area and is appropriate for many job roles.</td>
<td>Level 3 suitable for those who have achieved a Level 2 qualification, or are likely to achieve grades A-C in English, mathematics and a science based subject. These supervisory level qualifications cover non-routine, more complex tasks and require previous knowledge of work experience.</td>
</tr>
<tr>
<td>Levels 3 and above</td>
<td>Not applicable to this study however can lead to degree level qualifications</td>
<td>Level 4 – Not applicable to this study but enable progression to higher education, and/or management and business qualifications.</td>
</tr>
</tbody>
</table>

Table 2: NQF level indicators together with the descriptors of each level as interpreted and described by the Institute of the Motor Industry. From the QCA National Qualification Framework (NQF) (www.qca.org.uk/493_15773.html) and the Institution of Motor Industry (www.motor.org.uk/qualifications/index.html)
and Technology Education Council (BTEC) awards. Teachers in schools are likely to be more familiar with OCR and Edexcel examination system than that of the IMI. The Edexcel courses seem to be relevant for co-operation between schools and training providers.

Of particular importance to D&T is that interviewees had little understanding of design and technology as an appropriate qualification even though providers saw technological understanding and competence as an important attribute. Two interviewees admitted that they did not understand 'what D&T was about', the third reverted to his own out-dated school experience of D&T expressing that 'we should still be teaching craft skills'. The FE college interviewee was knowledgeable about D&T but expressed doubts about the validity of the technological content. All expressed the importance of mathematics and science although their understanding of the current nature and content of these subjects was limited.

Discussion about experiences of working with students from schools revealed interesting information about the personal attributes required for employment. Words such as initiative, self-motivation and ability to communicate emerged in addition to more basic attributes such as being a good timekeeper and honesty. Standish (2001) uses the expression 'work place know-hows' for these skills adding further desirable attributes such as literacy and numeracy, thinking skills and personal qualities of responsibility and self management. These skills are often referred to as 'soft skills'. Interviewees considered that many 14 to 16 year old students did not have a background on which to build these skills although they did acknowledge there had been some improvement recently.

Development of the school curriculum
While this study focused on work placement it is important to recognise that successful placements require teachers to be active in integrating work-related learning into schemes of work. Interviewees commented that they need to work more closely with schools initially developing a curriculum which initiates learning that can be enhanced during the placement. All considered it important that students develop 'soft skills' which make them suitable for employment. Additionally they considered teachers, particularly those advising students, need to be more knowledgeable about employment pathways.

Employment situation in motor trades
Interviewees and information from the IMI described current recruitment into the motor trades as variable. It is difficult to provide an exact figure of the shortage, however a likely national figure given by the Institution is between 25,000 and 35,000. In South Yorkshire the shortage is described by interviewees as acute with two training providers stating that currently 40% of job advertisements did not attract a single applicant. It is relatively easy to recruit into trades such as body work repair, tyre and exhaust fitting and general maintenance technician levels, however all interviewees made specific comments about the shortage of more able applicants suitable for the higher grades of employment. All commented on the rapid technological improvements in motor vehicles and the need for young people to enter the profession with good technological understanding. A major point of discussion was the recent creation of the diagnostic technician grade requiring technologically capable people to keep pace with industry developments. Electrical and electronics capability was quoted as being important and likely to become more demanding as the sophistication of vehicles' increases. All interviewees commented that the industry had difficulty recruiting the calibre student required for this work.

The emerging 14 to 19 Diploma structure
Vocational diplomas are scheduled to be phased into the school curriculum from September 2008. Representatives of the motor trades industry were involved in the initial planning stage of the engineering diploma. The following is the vision statement for the engineering diploma:

'The diploma will provide a new and exciting way for learners to experience and succeed in engineering. Learners will discover and apply engineering principles to the real world through work related study.'

'Learners will be given an accurate picture of exciting careers and potential rewards within engineering, enabling them to make better informed choices about careers in engineering.'

It is important to establish that the engineering diploma is not a subject but a learning line that involves several subjects. There are three diploma levels with levels one and two being relevant to this research.

- **Level 1 (ages 14-16)** is broadly comparable, in terms of average length of study, to a programme of four to five GCSEs
- **Level 2 (ages 14-16)** is broadly comparable, in terms of average length of study, to a programme of five to six GCSEs
- **Level 3 (ages 14-19)** is broadly comparable, in terms of average length of study, to a programme of three GCE A Levels.

Work experience is an important feature of diplomas, with engineering recommending two weeks (one week each in
different branches of engineering) at level one and a more specialised placement at two weeks at level two.

A feature of the engineering diplomas is that they are an integrated educational experience for students consisting of mathematics, science, design and technology; soft skills and work experience. Interviewees were particularly knowledgeable about diplomas through regular circulars issued by the Science, Engineering and Manufacturing Technology Alliance (SEMTA), the lead organisation developing the engineering diploma.

Capacity for work placements
During discussion about diplomas interviewees raised the issue of coping with an increase in demand for work placements. As engineering diploma learning lines are in the first phase of implementation they considered it important that provision for engineering, and the motor trades’ subset, is planned well in advance of the 2008 implementation date. While training providers offer good opportunities for work placements interviewees considered that there is a limit on capacity. This research has shown that they have the expertise and structure to provide placements but interviewees considered it unlikely that they could meet the demand in the South Yorkshire region. They also had concerns about the costs of providing these placements. This was expressed as ‘Who is going to pay for this work?’

14 to 16 age phase work experience courses
All organisations represented by interviewees provide work experience courses for the 14 to 16 age phase and had a history of working with schools. All visited career events in schools with displays and promotional material. The work experience organisation varied with best practice being negotiated courses (usually one week) designed to meet the needs of students with reference to ability level. Interviewees commented that they did not feel schools, and particularly careers teachers, understood changes taking place in the industry. It seems that interviewees regularly work with teachers who have pre-conceived ideas that this industry does not require students of middle to higher ability. All made specific comments that it seems schools are geared to students aspiring to university education. One interviewee said ‘There seems to be lack of understanding that it is possible to progress to university level within motor trades often in a management training role’. One interviewee commented that a parts and service manager in a Mercedes dealership is likely to be educated to degree or equivalent level and would receive a high level of re-numeration. The consensus view is that many schools are geared to meeting targets based on A* to C at GCSE and seem unwilling to consider other qualifications and employment routes.

Interviewees expressed concern that they had experienced schools sending students with little motivation and while they had been able to cope with this it was not good use of resources. Similarly they were critical that too often students arrive for the placement with little or no prior preparation. All interviewees acknowledged that they had dealt with some poor behaviour by small numbers of students. However, they stressed that they would not tolerate unacceptable behaviour and felt that they had been successful in modifying poor behaviour when necessary. They considered that the more adult working environment plus strict codes of practice regarding health and safety puts them in a good position to deal with these difficulties.

Facilities offered by the four training providers varied. One provider’s facility was new provision with state of the art teaching facilities, a second had an exceptionally well developed facility supported by a number of franchise dealers. The remaining two had good facilities which, while maintained, reflected the traditional image of motor vehicle engineering. In all cases classroom provision was seen as important as well as access to information technology. One provider had recently invested in new e-learning facilities as motor trades training is well supported by this teaching and learning technology. In the newer facilities classrooms were adjacent to workshops and included a wide range of information and communication technology (ICT) based teaching equipment. Also available were numerous teaching aids and test rigs to facilitate learning.

Two interviewees commented on the need to lift motor vehicle training from the ‘oily image’ into the ‘high tech’ era which reflected the nature of the work going on in franchise dealers. All interviewees considered that the environment for learning was important and needed to reflect the working conditions found in franchise dealers rather than the ‘back street garage’.

Observation of students on work placement
The observation was of a negotiated course for year 10 pupils at one of the motor trades training providers’ premises. The group consisting of two girls and eight boys, three of ethnic minority origin. The five day experience consisted of:

- introduction and tour of the facilities followed by health and safety teaching;
- identifying vehicle components;
- basic inspection and maintenance (checking fluids tyres etc.);
- engine servicing – practical tasks;
- motor vehicle electrical systems including practical work on simulators and accompanying e-learning material;
- tyre fitting - practical session;
the capacity of industry, service providers and business to
cope with the increased demand as the new diplomas are
implemented;
the cost of providing placements and how they are
funded;
students lack of technological capability;
selection of students for specific placements;
ensuring a work placement is a coherent educational
experience with clearly defined work-based learning and
work-related learning in school.

The key features of a successful work placement seem to be:
detailed planning between the placement provider and the
school;
students working with people who have a good
understanding of education and are able to motivate
young people;
a working environment which reflects best practice in a
particular industry sector.

Finally, while this is a local initiative it highlights the importance
of individual schools and industry working together on detailed
planning for diplomas to ensure their success.

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