Hosting industrial placements in chemistry

Guidance and best practice

July 2012

RSC | Advancing the Chemical Sciences

www.rsc.org/ipg

About this publication

This industrial placement guide was produced to facilitate the process of increased participation of employers in industrial placement schemes. It was commissioned by the Royal Society of Chemistry in partnership with the National HE STEM Programme, and written by the Careers Research and Advisory Centre. The guide was produced in response to recent research with over 500 employers across a series of sectors that identified some of the key barriers that employers perceive when considering whether to offer placements, and also the most valuable support that Higher Education Institutions can provide.[1]

This guide is intended for an audience of employers in chemistry-associated industries, potential host companies for industrial placements, as well as industrial placement coordinators based in universities, providing guidance and best practice on hosting industrial placement students.

About the RSC

The Royal Society of Chemistry is the leading society and professional body for chemical scientists. We are committed to ensuring that an enthusiastic, innovative and thriving scientific community is in place to face the future.

The RSC has a global membership of over 48,000 and is actively involved in the spheres of education, qualifications and professional conduct. We run conferences and meetings for chemical scientists, industrialists and policy makers at both national and local levels.

We are a major publisher of scientific books and journals, the majority of which are held in the RSC Library and Information Centre.

In all our work, the RSC is objective and impartial, and we are recognised throughout the world as an authoritative voice for chemistry and chemists.

The RSC and industrial placements

This report is supported by a range of ongoing RSC activities to promote and enhance industrial placement opportunities, including a dedicated industrial placement site (www.rsc.org/iplacements) which allows companies to advertise their placements free of charge on the *Chemistry World Jobs* website.[i]

i Free at time of publication (2012)

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1. INTRODUCTION

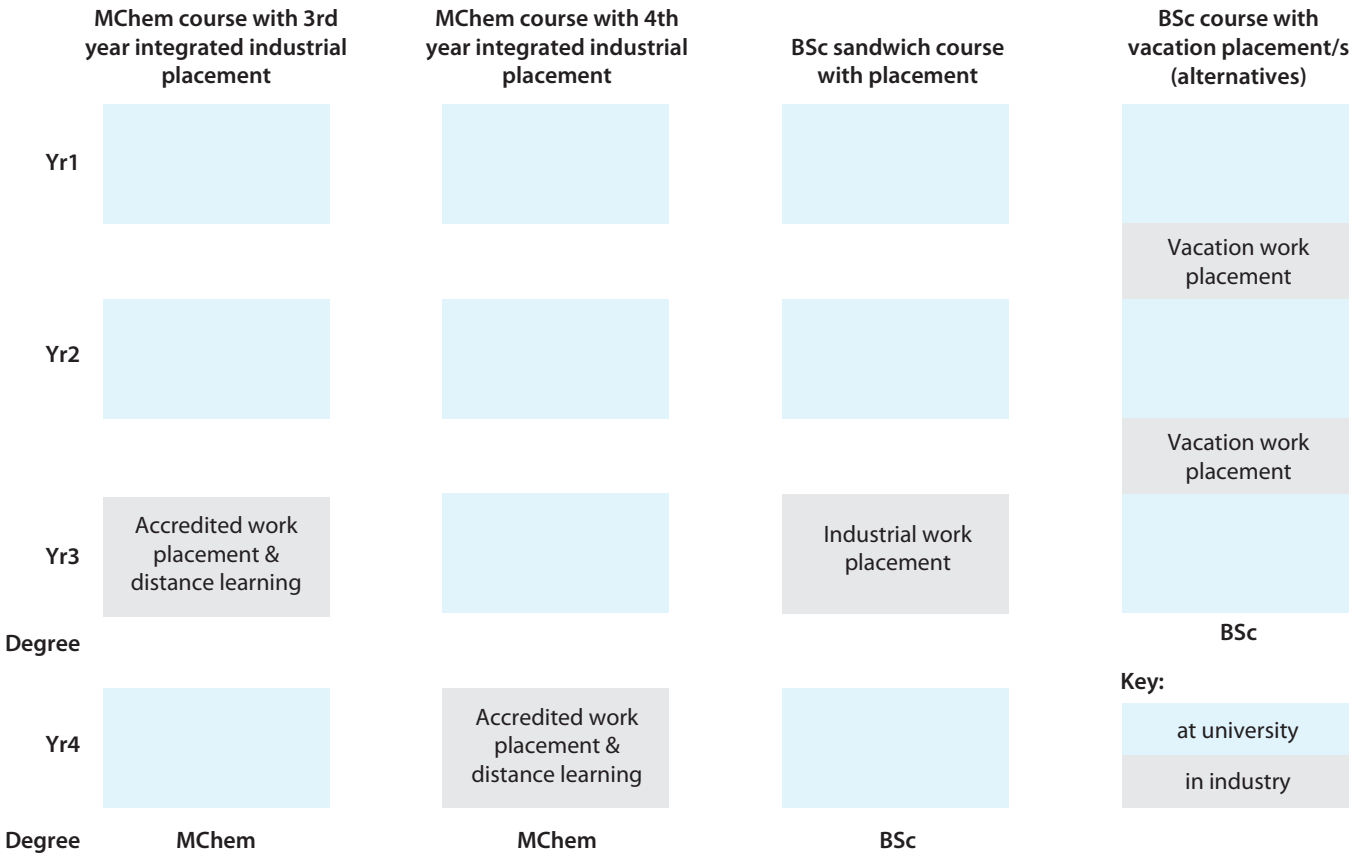
1.1 Aims and focus

This guide provides guidance on best practice to companies hosting year-long industrial placements for students on degree programmes in chemistry and related subjects. It clarifies common misconceptions about placements, and collates all relevant information into a single resource.

The guide is intended both for employers in chemistry-associated industries and placement coordinators in universities. It follows from research and consultation involving employers (both those who do and do not offer placements). It aims to help increase the number of chemical sector employers that host these placements, for the benefit of students who will form a critical part of our future workforce.

1.2 Placement types

The diagram below depicts the main types of work placement for chemistry degree courses.



This guide focuses on industrial placements that form an integral part of university chemistry courses culminating in MChem/MSci and BSc (sandwich) degrees. Alternative guidance is available on shorter or vacation work placements and also on internships.[2]

Some current general trends and observations in relation to industrial placements include:

- Demand from students for placements generally exceeds the supply of opportunities, although the extent of participation in placements by chemistry students varies markedly between different universities.
- There has been a reduction in the number of large companies in the UK chemical sector, particularly in pharmaceutical research, which traditionally have offered many placement opportunities.
- A wider range of companies, especially in the small to medium sector, (SMEs), is needed to host placements if chemistry students are to continue to gain valuable skills and experience to help them with future employment.
- Recent research has identified key barriers that employers perceive when considering whether to offer placements, as well as the most valuable support that universities can provide.[1] Smaller companies often have distinct and different issues to take into account when considering placements.

Background – why placements are important to students and universities

Although many universities have held close relationships with industrial partners for decades, they are paying increasingly greater attention to developing the employability of their students. This is resulting in a desire for more widespread engagement with employers. A new government review of interactions between business and industry recommends that every undergraduate should undertake a structured, university-approved 3-month 'internship' [placement] during their period of study, and also an expansion of sandwich course degrees.[3]

With a new funding environment in England (ie, where students will pay up to £9000 annual tuition fees), it is expected that students too will become even more concerned with how they are developing their employability during university.

The potential benefits to the universities and their students of more widespread and effective interactions with chemical sector employers include:

- an improved relevance of the 'employability' and other skills gained by HE students in relation to skills needs identified by the chemical industry;[4]
- improved careers awareness amongst students, particularly of career opportunities and occupations relating to chemical science;
- an increased likelihood of the students choosing to pursue graduate careers relating to their degree subject;[5]
- better mutual understanding between industry and universities, which can in turn support growth in research collaboration.[6]

Many universities also cite another key benefit as students returning to university with an improved performance in their final year.

UK businesses are also recommending that students obtain more highly developed employability skills that are relevant to the twenty-first century workplace.[7] Gaining relevant work experience is a very tangible way for a student to interact with an employer. There are numerous calls and projects to increase participation in work experience by different groups in and outside formal education, but these all depend on employers making the opportunities available. This guide aims to distil the benefits to chemical sector employers of participating in this particular form of work experience provision.

The benefits of relevant work experience to the student are well documented in terms of developing employment-related and employability skills, improving employment outcomes, improving understanding of career opportunities and of the workplace, and increasing commitment to successful completion of their academic studies.[8]

2. WHY HOST AN INDUSTRIAL PLACEMENT?

2.1 Potential benefits

Although there is no single reason that will apply to every employer, participating companies report a consistent range of both perceived and measurable benefits. Employers will prioritise different benefits according to their individual circumstances.

The most common benefits cited by employers are:

- **Improved university linkage** – contact with the student's academic supervisor and/or placement coordinator can lead to other productive relationships within the university, from which the company can derive useful research collaborations or access specialist knowledge.
- **Raising company profile with students and universities** – smaller and growing companies especially may lack presence or visibility in the universities from which they will need to recruit their future graduate workforce, and where they will compete against established firms; students returning from a successful placement act as powerful ambassadors.
- **Additional staff and/or project capacity** – for smaller companies simply another pair of competent hands may be vital, while for others a student on placement provides capacity for research or other project work that they would like to undertake but for which they do not have sufficient permanent workforce capacity.[ii]
- **Potential recruitment** – a placement can be seen as an extended 'test drive' of a potential graduate employee. Students on placement tend to be both strong academically and well-motivated; once they have also been trained up and tested, it is no surprise that many companies subsequently hire them for the long-term.
- **Staff development opportunity** – some companies actively introduce their research staff to management by supervising a student on placement, and see this as a relatively low-risk and cost-effective staff development opportunity.
- **Energy and enthusiasm** – many employers report the influx of energy, enthusiasm and new thinking that a good student can bring to the company.
- **Supporting employability is 'a good thing'** – some employers state that their involvement is motivated not by any distinct potential value to their own organisation, but a belief that it is healthy for the industry and sector as a whole if more students gain this kind of practical industry experience.

Some of these potential benefits apply more to placements within accredited degree programmes that include industrial placements while others may be more relevant for BSc sandwich course placements. More detail is supplied in the best practice section and case studies in this guide.

2.2 Potential barriers

Companies without industrial placement schemes perceive the main barriers to participation to be:

- **Cost** – the salary and related costs of employing a student for a year.
- **Type of work** – can they offer the type and level of work they perceive a university requires for a placement?
- **Timing and planning** – that placements may have to be set up a long way in advance and unreasonably long-term commitments made.
- **Management capacity and effort** – fear that they have insufficient capacity amongst relevant staff to hire, train and supervise the student satisfactorily and that this will distract their staff from more profitable work.
- **Company environment** – very small and recent start-up companies may simply lack the stability or scale to plan, invest in or manage a placement, irrespective of its perceived value to them.
- **Economic circumstances** – particularly in the current climate, survival strategies may prevent any consideration of new staff or new opportunities.

The next section contains detailed treatment and information about these and other issues. This should provide a better understanding of current circumstances and requirements so that a decision can be made on a well-informed basis.

ii In a different field, Microsoft Research doubles its research capacity worldwide for substantial periods of the year using its research internship programmes

3. BEST PRACTICE GUIDANCE

3.1 Type of work

The accreditation of placement-bearing degree programmes allows flexibility in the type of placement deemed appropriate, and the universities also reflect this flexibility when setting requirements for the placement year. Therefore, a wide range of chemistry-associated employers will be able to provide placements that are suitable for these programmes.

One of the greatest stumbling blocks perceived by employers not offering placements is whether they can offer the right type of work for the student. Specifically, can they offer work suitable for a placement which is assessed as part of the student's accredited MChem or other degree course? What flexibility is there in the type or level of work required and/or the proportion of the placement requiring work of a certain type?

The key issue underlying this is the type of work required during a placement which is integral to an MChem degree course or other degree programme placement. Does the student have to undertake research work, which will include a project on which they will be assessed? Many universities have traditionally sought placements in pharmaceutical and other research laboratories where a student could undertake one or more discrete research projects. However, the number of such workplaces in the UK is insufficient to host all the placements needed by universities. Research with university placement coordinators underpinning this Guide reveals that universities are flexible in the type of placement work they seek and none make absolute requirements for an entirely research-focused project; all understand that a student's time might need to be shared between project and other work.

The RSC criteria for accreditation of degree courses explicitly anticipate agreement between the university and placement employer to ensure consistent standards:

"For purposes of accreditation, placements need to be carefully selected on the basis of an agreed programme of work acceptable to both the home university and the external partner"

A range of work programmes will offer the necessary learning characteristics for a placement on an accredited MChem degree course, often addressed through project work or research work. For example:

- a single research or other project comprising the placement
- a series of 2-3 smaller projects, one or more of which is reported
- a combination of a research-related or similar project (which could be under half of placement time) and other more routine work
- more routine analytical work from which a project is derived (eg, applying or adapting existing method and techniques to solve a range of unfamiliar problems, or comparing different analytical techniques or instruments).

The accompanying case studies highlight a range of work programmes agreed by host employers and universities across a range of the chemical industry.

The principal aim within BSc sandwich course placements is to gain employment- and employability-related skills in a relevant work environment. Usually, there is no formal assessment of a specific project so appropriate experience can be obtained in a wider variety of roles (although there will generally be some assessment of the experience). The most successful BSc sandwich placements do, however, incorporate some specific project-related work which can be agreed before the placement starts or which emerge during the placement.

In summary, universities will offer some flexibility in their requirements for the type of work undertaken during the placement and the student's project, as they understand that the placement needs to be of value to the host employer too. A wide range of chemistry-associated employers (not just those conducting research) will be able to provide placements that are suitable for accredited degree programmes containing a placement. That said, not every enterprise or workplace will be able to offer the right kind of role. A company which can only offer relatively routine work may be more suitable for a BSc sandwich course placement rather than one for an MChem degree placement. Of course, the nature and background of the student that is appropriate for these types of placement roles may also differ considerably.

3.2 Costs and employment status

Employers incur significant direct and indirect costs in hosting students on placements, but remunerating the student is strongly recommended. A placement student is an employee with a contract and certain benefits.

Some industries have a reputation for unpaid internships and work experience placements, perhaps taking some advantage of high demand from young people to join those sectors. However, most science- and technology-based industries in the UK have an established culture of paying students on placement and other work experience, and this is certainly the expectation for most industrial placements in chemistry. Not doing so carries reputational risk for companies when it comes to future staff recruitment.

Currently, in strictly legal terms, a company hosting a student undertaking a placement which is an integral part of their higher education does not have to pay them at national minimum wage level.[9] On the other hand, a year's placement is a significant period of employment and most employers believe that the student should be well motivated and reasonably remunerated. Currently (2012) the gross salary paid by chemistry-associated employers to a student on placement is typically around £14-17,000 per annum (pro rata, since many placements are for less than a full year).

There are some instances of unpaid industrial placements, although certain expenses or other forms of partial remuneration are usually offered. Offering an unpaid placement will also restrict the type of student that can participate.

A student on an industrial placement will be a company employee with a fixed-term employment contract and therefore should be eligible for basic employment benefits – potentially many of the same entitlements as other fixed-term employees – and similar access to workplace facilities. This status means there is no question in relation to employer liability insurance or other liabilities. Section 3.6 describes in more detail the nature of the 'partnership' between employer, university and student, and its practical implications.

There are of course substantial indirect costs in hosting a placement; these will become clearer from some of the following sections including 3.7 on management and supervision.

In summary, good practice recommends that a placement must be underpinned by a genuine employment contract and job description and should be remunerated at or above minimum wage level. This will guarantee clarity with regard to potential insurance and liability issues and help to ensure that the student remains well-motivated.

3.3 Schedules and planning

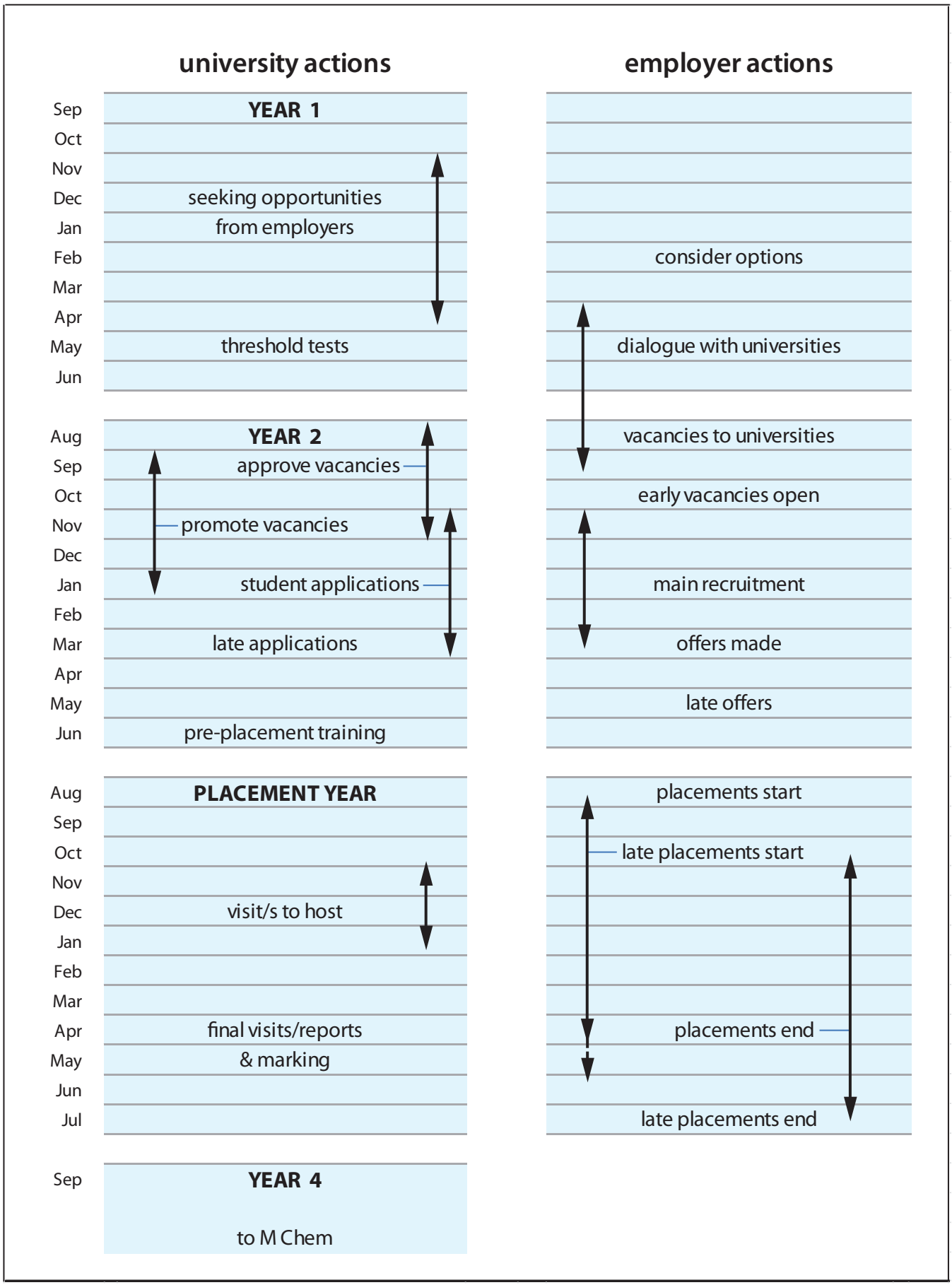
There is no fixed timetable to which employers have to work. Good students are likely to be available even with shorter set-up arrangements. It is useful to understand the way in which universities approve and promote placement vacancies and also the broad timetable to which the students are working.

Most industrial placements integrated within MChem or BSc sandwich chemistry or related degree courses tend to start in the period July to September following the end of the student's second year. A number of universities use a different structure with the MChem placement positioned after the end of the third year instead.

HE funding rules require a placement to be at least 30 weeks in duration (roughly equivalent to the length of the university teaching year); in reality many are 36 weeks and some as long as 44 weeks.

The diagram on page 7 gives a generalised representation of the timeline of university and employer actions involved for a four year MChem in England, Wales and Northern Ireland with the third year spent in industry, however, other models do apply. It should also be stressed that timings within any individual university may differ considerably from this, and many will aim to have their processes underway as early as they can.

Most chemistry university departments will have a designated industrial placement coordinator who will generally start their placement processes at the beginning of the academic year which precedes the placement year – ie, September or October in the year prior to a July/August placement start. Some start even earlier. At this time the coordinator will be liaising with potential hosts to confirm likely opportunities, collating knowledge to pass on to students and approving placement opportunities (see section 3.4).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The university may also provide some selection and training of students, to try to ensure that those students applying for placements have the right competencies.

The application process by students, which may be supported by their placement coordinator, may start at any time after this, and many in universities share the aspiration that most placements will have been offered and agreed by around Easter, although many more are formalised during the summer term.

The inference for employers is that the earlier they can publicise upcoming vacancies, in relation to this timetable, the better. Employers that announce placement opportunities early allow university placement coordinators plenty of time to consider and 'approve' their placements and promote them to their students. Some employers that have announced their placement schemes early, planning them well in advance, may subsequently make some adjustment to numbers or offers due to changing business requirements.

Particularly for smaller companies, planning this far in advance may simply be impossible. In reality, universities have to be flexible and will accommodate employers who offer their placement opportunities somewhat later. Because student demand tends to outstrip supply of placements, there will almost certainly be good placement students available at almost any time. University placement coordinators can almost always accommodate some 'later' employers, possibly as little as 1-2 months prior to placement start. However, not all students will be able to take up a placement at very short notice and there will of course tend to be fewer students between which to choose, than for earlier opportunities.

It makes sense for employers to agree and promote vacancies as early as possible, but there is flexibility. It is useful to be aware of both the way in which universities approve and promote placement vacancies and also the broad timetable to which the students are working. The generalised timeline presented here should help this.

3.4 Offering an 'approved' placement

University placement coordinators need to approve the placement vacancies that their students undertake to ensure that the type of work and environment are suitable. This has benefits to the employer because the coordinators promote vacancies to their students and will help the most appropriate ones to apply.

Although there is nothing to prevent an employer setting up and offering a placement without dialogue with universities, there are considerable benefits in discussing it beforehand with one or more university placement coordinators. Universities delivering MChem degree programmes with an integrated placement – which is an assessed element of the course – will need to 'approve' the potential placement vacancies that their students undertake. This ensures that the student will undertake a placement which encompasses the right type of work, in the right sort of environment and with sufficient supervision and support, for it to be fairly assessed towards their degree. University placement coordinators will actively help companies, particularly smaller ones, to facilitate this approval.

In turn the university's coordinator will promote the approved vacancies to its students, and is likely to discuss opportunities with the students and support them in applying to the most relevant vacancies.

The RSC lists the contact details of the industrial placement coordinators at all the universities offering its accredited chemistry degrees.[10] RSC members are also able to join an online group specifically for industrial placements, which facilitates the sharing of information and messages with placement coordinators.

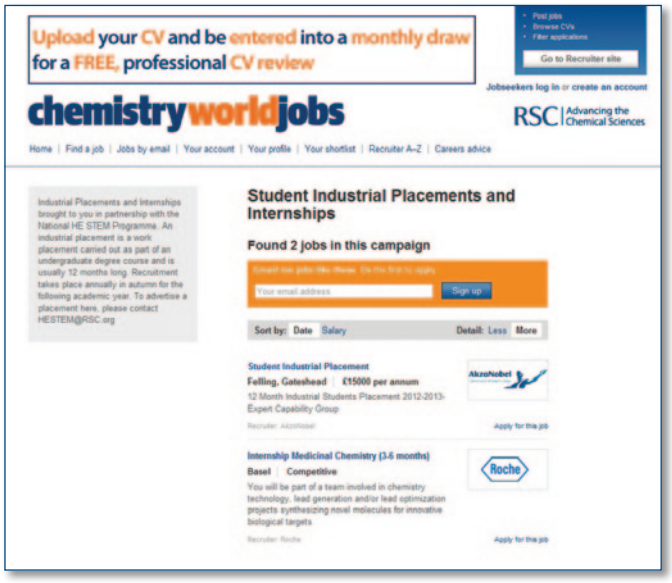
In the case of placements suitable for BSc sandwich courses, there is often a lower requirement for 'approval' by the university although a sandwich year is still an assessed component of a degree programme and needs to be assessed as satisfactory by both employer and university tutor. As part of a university's duty of care to students, it is likely to wish to approve placement opportunities in order to ensure that its students have the best possible degree-related experience during their placements.

3.4.1 Promoting vacancies

Companies will need to promote their placement vacancies and create a job description. A 'person specification' or statement of the competencies required will also pay dividends in terms of finding appropriate applicants. It may result in more focused applications which are easier to assess. Smaller companies may wish to stress the opportunity for a variety of work in the placement position for which they are recruiting, as this might appeal to students with a more entrepreneurial focus. Making it clear what differentiates the company and the position should help in attracting the most appropriate candidates.

There is merit in promoting placement vacancies through the universities as well as on the employer's own website. The RSC offers a free placement vacancy service through its ChemistryWorldJobs website, supported by the HE STEM Programme.[11]

A number of other websites and employment agencies will list placement vacancies. One such current service which focuses on work placements of different types (and internships) is RateMyPlacement.[12] As its name suggests this website encourages students and graduates to review and 'rate' their placement experience and employer, which offers a new student-based angle on placement experiences.



3.5 Applications and recruitment

Students on placement are company employees and it makes sense to apply many conventional recruitment practices in selecting them. 'Open' recruitment processes will lead to applications from a wide variety of students at different universities, and suitable competency-based selection procedures will help select the most appropriate students.

Employers will be keen to ensure they get the best student for the opportunity they have available but without expending excessive time and effort. It is useful to understand good practice procedures and how they are currently interpreted.

Until a few years ago, the case for many placements was that the employer would promote its vacancies to a few key universities it knew well, which would forward the employer a few carefully selected CVs from which it would select. Although this worked well within the selected universities, many good potential candidates in other universities would be missed.

For a variety of reasons, not least the internet, this is progressively being replaced by more open and 'professional' recruitment. Currently most employers promote their vacancies via certain universities and also online, and receive all applications online direct from the students. This may result in more applicants, and from a wider range of universities. However, it is common on MChem courses for the university to set a performance threshold, to assure the calibre of students applying for placements. This process is clearly more equitable and should result in finding appropriate students for the placements.

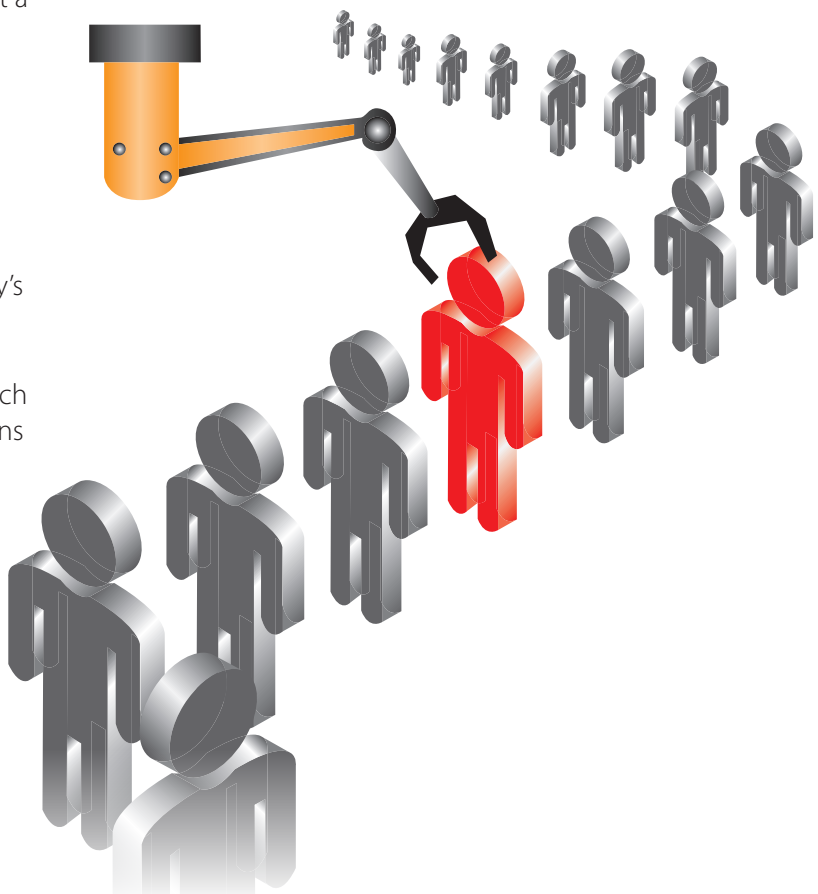
However, there is still benefit in maintaining a good relationship with a selection of universities and their placement coordinators. After 'approving' a company's placement(s), the university placement coordinator will generally promote them to their students. Students will often discuss with the coordinator which vacancies they should apply for, and their applications may be assisted to some extent by the coordinator.

Employers are advised to apply rigorous selection procedures to applicants, using appropriate competency-based application criteria. These procedures will generally mimic those used for recruiting other staff. The student will also benefit from going through a 'proper' application process, and the university should provide some training or support to the student in doing so.

If the employer does receive a large number of applications, good recruitment practice suggests:

- having a defined set of clear competencies against which students apply and their applications can be scored;
- using a bespoke application form with some inherent challenge, rather than a universal form or inviting a CV and covering letter, and including specific questions that can be scored;
- filtering applications externally (third parties can do this for a small fee, provided that competencies are clear);
- if necessary using telephone screening to reduce the number of face-to-face interviews.

There are benefits in applying many of the same 'professional' recruitment processes to selecting a student for a placement as for any other employee. Employing good HR practice will not only improve the chances of a successful placement but also minimise the effort involved.



3.6 The partnership between employer, university and student

Successful placements ensue when all three parties understand expectations and their respective responsibilities, usually in a 'Letter of Expectation' or similar. Contracts are needed for employment of the student and to ensure that intellectual property is secure. The university maintains certain responsibilities during the placement.

All parties have a role in a successful placement and it is important for each to understand their own role and responsibilities as well as having fair expectations of the limits of the others' roles and responsibilities. Most universities will give their placement students a handbook which covers placement processes and the procedures they need to follow.

The responsibilities and expectations made of all three parties should ideally be laid out in a 'Letter of Expectation' or similar which the university will provide to the employer for agreement and, potentially, for signature by the company and university, and perhaps also by the student.

Within these expectations will be responsibility for health and safety and the student's safe working practice. In most cases the student will be paying at least partial university fees during the placement, which means the university retains certain obligations with respect to the student's safety and academic progression. The university may well wish to undertake or obtain a brief risk assessment in relation to the proposed placement. It will almost certainly require the employer to confirm that it has employer liability and other conventional insurance policies in place for employees including student/s on placement.

The student will become an employee of the company and will need an employment contract, specifying the terms and conditions of employment and other benefits, potentially including a right to some induction and relevant training. This will also be the opportunity to outline procedures in the case of violation of company rules.

A separate contractual agreement is likely to be needed to cover the non-disclosure of information the company wishes to protect such as intellectual property (IP). Typically a Non-Disclosure Agreement (NDA) or similar will need to be signed with both the student and a university representative such as the student's academic tutor. It is through these that the company could place requirements on both the student and university staff in relation to IP and confidential information. This is addressed further in Section 3.10.

Although the placement is essentially a three-way partnership, the first duty of the student will be to the company through their line manager and/or supervisor. The student will need to know exactly what is expected of him/her:

- understanding specific objectives and their work programme;
- understanding the roles of their supervisor and/or line manager, and whom to ask for advice if they are not available;
- defining work and activity boundaries and responsibilities with the supervisor;
- understanding how performance will be assessed;
- clarity on issues such as working hours and any expectation of working overtime;
- familiarisation with Good Laboratory Practice (GLP) and Control of Substance Hazardous to Health (COSSH) regulations and other standard operating procedures;
- being open and frank about mistakes.

The main responsibilities of the supervisor and/or line manager are outlined in the next section on management and supervision but should be clear in the agreed statement of expectations. It is critical that they are appropriate and also acceptable to the designated supervisor or line manager.

A successful partnership is likely to develop if a clear basis is outlined in these statements of expectation and/or responsibilities, supported by a standard employment contract for the student and NDA agreements for both student and university if needed. This should be reinforced by regular but appropriate dialogue between the three parties, which will usually include one or more visits by the university academic tutor to the employer during the placement. Some universities have other physical points of contact such as placement conferences where the students return for a day or two and supervisors may be invited.

Typical expectations. The employer will:

- provide rich and rewarding opportunities and experiences that can stretch the academic, practical and interpersonal skills of the student;
- maintain contact with the university to report the progress of the student and raise any potential problems without delay;
- provide appropriate supervision and mentoring to allow the student to integrate into the organisation and undertake work individually and in a team;
- provide appropriate training in health and safety for the student and actively monitor this throughout the placement;
- identify other training needs with the student and support them so that they can undertake the programme of work effectively;
- enable the student to conduct substantial and significant research or other work of sufficient level and challenge (for MChem), motivating and enthusing them, to facilitate production of a project report (although their work could include tasks of a more routine nature balanced with the research/project work);
- remunerate the student with an appropriate salary during the placement period.

Typical responsibilities of the university and student:

- the university will provide adequate information regarding degree programme requirements for the placement;
- the university will work closely with the employer to ensure that the student is adequately monitored through one or two on-site visits by the student's academic tutor;
- the university will fully comply with confidentiality agreements pertaining to the work of the student;
- the student will participate in training in health and safety and other appropriate workplace training;
- the student will be both willing and capable of putting knowledge into practice and also identifying his/her gaps in knowledge and training, so as to meet the employer's expectations;
- the student will behave in a professional, well-mannered and open-minded way paying attention to line management and will comply with the employer's safety and other rules.

3.7 Management, supervision and training

Appropriate supervision and support for a student on placement should not be a burden if approached in the right way, and will ensure positive outcomes will be achieved. Many employers view supervision of a placement student as a good first-step in management for somebody ready to take on some people-focused responsibility.

Small companies in particular express concern about the level of supervision that might be needed during a placement. As for any employee, the company will need to assign a supervisor or line manager who directs and takes responsibility for the work of the student on placement and also their safety and wellbeing. The primary roles of the supervisor or line manager are likely to be:

- ensuring that the student is aware of the goals, expectations and job description for their placement work;
- meeting regularly with the student to agree plans for their work and review;
- liaising with the university according to an agreed plan but also reporting immediately on any major problems (such as poor timekeeping, unsatisfactory work, significant illness etc);
- participating in agreed visits by the student's academic tutor;
- completing certain forms as part of the assessment of the student's placement experience.

Some employers also find it valuable to appoint a separate individual to act in a mentor role, so that the student has somebody else they can turn to other than their immediate supervisor, and who takes an interest in the student and their placement. As the placement may be the student's first serious experience of the workplace, a mentor can reduce demands made on the supervisor and assist in the student's development, although it is by no means essential for the employer to provide one.

One of the reasons why chemical industry employers prefer year-long industrial placements to shorter work placements is that it takes time to train a student sufficiently in the relevant laboratory and other techniques required. The student should be provided with a suitable induction and programme of training appropriate to the project or work programme. This investment in the individual should be seen not only as necessary for them to undertake work of value to the company, but also a longer term investment as the company may subsequently wish to employ the student permanently. Provision of good training and supervision will be reflected both in the student's formal placement reporting and also in their informal reports back to fellow students, which can positively impact on the profile of the employer amongst students and graduates.

A successful placement experience, for both employer and student, requires fair supervision and support from the employer. This should be seen not just as a burden but an investment in assuring that positive outcomes will be achieved. Many employers actually view supervising a placement student as a good first-step in management, and that it is an effective development opportunity for a staff member beginning to take on management responsibility.

3.8 University support during the placement

Universities maintain certain responsibilities during a placement and it is useful to know the aspects of the placement in which the student's academic tutor will be interested, and the type of assessment process which they may undertake.

The university will assign an 'academic tutor' to the student who will be responsible for providing some pastoral care for the student while on placement. The emphasis of that support is likely to be:

- providing a clear point of contact in the case that something goes wrong;
- conducting aspects of the assessment required for the placement (including one or two visits to the employer);
- some oversight of general progress and wellbeing.

On this basis, it will almost certainly be 'light touch', so the consistent responsibility for and management of the student remains with the employer. The focus for contact may well be around the academic tutor's visits to the company. A typical visit might well incorporate:

- a short presentation by the student to the academic tutor and the supervisor;
- a private meeting between the academic tutor and the student;
- a private meeting between the academic tutor and the supervisor;
- a short tour of the working environment.

Based on this, the academic tutor will complete an assessment form. Obtaining a copy of the form in advance is instructive in understanding the nature and level of the tutor's potential interest and the information they will seek. The range of issues to be considered during assessment is likely to include recording the goals for the student (in relation to job description and project work), reviewing progress, discussion of format for student's and employer's reporting and deadlines, and any issues with the working environment.

Increasingly, students on placement are encouraged to access their university's virtual learning environment and/or use social media to maintain contact with their tutor and other students on placement, in addition to the formal communication and visits. This provides an easy, albeit informal, communication channel with the university, although it will be important to remind the student that requirements for confidentiality also apply when using social media and communicating informally.

Understanding the role of the academic tutor and the extent of communication expected tends to reassure employers that this aspect of a placement is not arduous for the company. Universities will almost certainly supply a copy of their placement handbook or letter of expectations, which will specify the roles, to an employer considering hosting a placement.

Example of a university's assessment form used on a visit to a placement host

SECOND VISIT - MSci

INDUSTRIAL TRAINING ASSESSMENT

Name of Student _____

Host Organisation _____

Department in which employed_____

Academic Supervisor _____

Industrial Supervisor _____ (email) _____

ASSESSMENT

1. Progress achieved since first visit
Mark reflecting how the student's work has progressed during the time that he/she has been with the organisation.

1 Very Poor
2
3
4
5 Very Well

Comments

2. General ability
Mark reflecting general aptitude including student's continuing attitude to work, his/her ability to cooperate with other members of staff, report writing etc.

1 Very Poor
2
3
4
5 Very Well

Comments

3. R&D Methodology Module (Progress Report)

4. Project (Detailed Planning)

Signed _____ Date of Visit _____

3.9 Employer reporting requirements

The requirements of the employer in respect of reporting on the student's placement experience and progress are generally very modest.

The employer will need to provide some level of reporting on the student's progress and their placement experience, which will be part of the assessment procedure for placements which are integral to accredited degree programmes. However this is often quite limited, as universities do not wish to place too much burden on employers. Short assessment forms will therefore be provided for completion by the supervisor or other employer representative, which may include some degree of assessment of the student's placement/project report.

It is a good idea to obtain a copy of sample assessment forms when considering working with a particular university, as this will indicate the level of input required. In most cases it will be modest and can be undertaken as part of the supervisor's appraisal of the placement student. However, it is important, because for placements which are integral to accredited programmes the information contributes to the assessment of the student by the university and their ultimate degree grade. On request, a university is likely to be able to supply examples of what it considers good (useful) assessment reports, as it has an interest in ensuring that the assessment made by the employer is adequate for its needs. An example of an employer assessment form is shown on the following page.

Example of an employer assessment form

INDUSTRIAL PLACEMENT ASSESSMENT

TO BE FILLED IN BY THE EMPLOYER

Name of Student _____

Placement Period _____ *from* _____ *to* _____

GUIDANCE FOR SUPERVISORS

It would be most helpful for our records if you could spend a few minutes completing this assessment of the student. The aim of the assessment form is to obtain an indication of the student's performance during his/her training and his/her potential on completion of the period spent with you.

Please place a tick in the box which you consider to be most appropriate to each criterion. In the column headed "weight", please mark H/M/L to indicate whether that criterion has high, medium or low importance in the assessment, bearing in mind the opportunities available to the student to satisfy such a criterion. If a given criterion has not been assessed, please indicate this.

INDUSTRIAL PLACEMENT ASSESSMENT Marking Sheet

	Very poor	Poor	Acceptable	Good	Very good	Weight
Ability to interpret complex information						
Practical skills and reliability of work						
Ability to communicate verbally						
Supervision required (tick very good if little required, very poor if an inordinate amount always necessary)						
Speed of work						
Development of student's technical knowledge						
Report-writing ability/ day to day record keeping						
Initiative and organising ability						
Originality (ie, generation of his/her own new ideas)						
Attitude and General Conduct (industriousness, conscientiousness, interest and enthusiasm etc)						
Timekeeping and absenteeism						
Relationship with others						

TO BE FILLED IN BY THE UNIVERSITY

Name of student _____

Host Organisation _____

Department in which employed _____

Academic Supervisor/ First Examiner _____

Second marker _____

3.10 Intellectual property (IP)

Universities are sensitive to employers' needs in relation to intellectual property, particularly where placement work involves research or working in a research environment. There will be some flexibility in the university's assessment processes to accommodate and protect companies' IP interests.

MChem students in particular are likely to be conducting some research-related work during their placement, in many cases hosted by research-intensive enterprises. This can raise fears amongst prospective hosts that there is inherent danger in relation to intellectual property (IP) leakage through the student.

Certainly some MChem students on placement will develop new IP themselves and also have access to, or visibility of, other potentially confidential information including valuable IP. Universities (which themselves are research organisations) fully understand the importance of IP and that it needs to be protected. They will expect the student and academic tutor to sign a non-disclosure (NDA) or similar IP protection agreement at the outset of the placement. It is also critical that attention to IP is highlighted in the initial training for the student.

When it comes to the student's reporting of their placement project and experience, the employer will need to make a judgement about its confidentiality. If the employer wants to minimise 'external' exposure of a report, in some cases it may be feasible to ask the academic tutor assessing the student/placement to read and assess the student's report during a bespoke visit to the employer's premises so that the report does not have to be transferred out of the company premises. However, in many cases this will not be possible due to university requirements for double-marking and/or external examiner assessments. In these cases, specific report control procedures can be set up to limit access only to those individuals who have signed confidentiality agreements and to require reports to be returned to the company afterwards.

The key point is that although companies may be very sensitive about potential IP issues, universities will almost certainly wish to accommodate the employer's needs and extend considerable flexibility in order to do so, although this will need to be agreed in advance. This flexibility is not surprising because the university may in future seek further research-based collaborations with the company, the benefit of which may well be in the form of IP developed together.

3.11 Students' distance learning

Although some academic work will need to be undertaken by the placement student through distance learning, it will be in their own time; there is no expectation of employers to provide 'time-off' to accomplish this.

During an accredited MChem placement, the student will be required to undertake some distance learning, as part of their academic instruction and assessment. This is intended to provide continuity in progression through their degree course and maintain their aptitude for learning. It helps their return to university after the placement, and may be necessary simply to complete sufficient learning to achieve a Masters-level degree in four years including the placement year in industry.

The practical implication is that the student will have to dedicate some time to 'bookwork', and undertake a small number of assignments which will be assessed. The student will usually access these through the university's 'virtual learning environment', using a mobile device, personal computer, or a company computer.

In the past there was some expectation that the employer would allow a placement student some time during working hours in order to accomplish these academic assignments. However, there should no longer be any expectation by either students or universities for this to happen, as it is now expected that students will undertake this work in their spare time.

It is worth the company acknowledging that the student has to do this work and being sympathetic to it, not least because this will help maintain the student's motivation and commitment. The employer might consider ways in which it can support the student practically, such as providing access to computing facilities or its own learning resources.

3.12 Disabled students

Since the Disability Discrimination Act of 1994 universities and other education providers have to take action to ensure that disabled students have access to placement opportunities.

Good practice guidance exists to support this (see references in section 6) although the guidance is addressed to education providers rather than employers. A number of specialist organisations can provide support to disabled students and employers in relation to work placements and internships.[13]

4. CASE STUDIES

4.1 Comparing costs and benefits

The costs of hosting a placement are diverse and include a combination of direct expenditure for the company and time and effort on the part of different individuals. But there are also benefits, which are perhaps harder still to quantify financially.

A company's decision to offer a placement, or not, should be made on its perception of value – ie, will the sum of the costs be outweighed by the accumulated benefits from the placement? This comparison is undoubtedly hard to undertake in a fully quantitative way.

Most employers that start to offer placements continue to do so on a repeated basis. Only one of the companies contacted in research for this guide had previously offered placements and then ceased. This presumably demonstrates that the majority of employers believe the benefits to them do outweigh the costs.

Understanding the experience of others may be one of the most convincing arguments for an employer considering whether to offer industrial placements or not. It will be particularly persuasive where such companies are reputable, successful and comparable.

The four case studies that follow demonstrate a range of placements hosted by chemical sector employers. We asked the companies to articulate their rationale for offering placements and the benefits they achieve. The case studies also shed some light on the flexibility available in practical arrangements.

The example at AstraZeneca is perhaps the 'classic' research placement within a large pharmaceutical laboratory, while Takeda Cambridge Ltd represent a smaller organisational environment and motives. Intrinsiq Materials is a recent start-up company in a different chemical sector and exemplifies how routine work and research work can be combined within a placement. Finally, the arrangement at Solvay Interox is an example of a BSc sandwich course placement programme, rather than an integrated MChem course placement.

Case study – AstraZeneca Pharmaceuticals plc

AstraZeneca is a global, innovation-driven biopharmaceutical business with a primary focus on the discovery, development and commercialisation of prescription medicines. As a leader in gastrointestinal, cardiovascular, neuroscience, respiratory and inflammation, oncology and infectious disease medicines, AstraZeneca generated global revenues of US $32.8 billion in 2009. AstraZeneca has around 7000 employees on its UK Cheshire sites where currently 65 students across all functions are undertaking a sandwich placement.

Two years ago Allan Dishington (Recruitment Manager) amalgamated the sandwich student recruitment and research bursary schemes within synthetic organic chemistry. The programme aims to provide research experience within the company for up to 15 UK-based MChem chemistry students either on a sandwich placement or a summer vacation position. The programme affords AstraZeneca direct project resource as well as providing the students with an excellent training in modern synthetic organic chemistry techniques. AstraZeneca aim to recruit the best students into a sandwich year; experience has shown that this minimises the time during which the students are becoming autonomous. Other sandwich placements are available in Analytical Chemistry.

The placements can be taken in either the Innovative Medicines (Research) or Chemical Sciences (Development) groups. A year-long placement is considered most beneficial as the student has the chance to fully deliver value back to the business after their extensive training. The student will work closely with an experienced chemist and be exposed to a wide range of modern synthetic methodologies and analytical techniques whilst working within a novel drug discovery project. The student is also able to learn about the drug design process and typically will be required to produce a report of their year for university assessment. The supervision of a sandwich student affords good development opportunities for AstraZeneca employees looking for management experience. The student will be fully integrated into a chemistry team and would play a full role in the synthesis and discovery of new drugs.

The placement also enhances the relationship between AstraZeneca and a university; its high standard of training of their students is recognised. Clare Gregson of Liverpool University started her sandwich year in September 2011, "My sandwich student placement has been a valuable and thoroughly enjoyable time in my degree. Having the chance to work full time in a state of the art lab alongside highly intelligent and helpful scientists has allowed me to progress my lab skills and confidence in the lab to an outstanding new level. Also it has given me an insight into chemistry within a business environment and helped me to gain perspective of possible career opportunities within chemistry."

Case study – Takeda Cambridge Ltd

Takeda is a research-based global pharmaceutical company which was founded over 230 years ago and is now the largest pharmaceutical company in Japan. Its main focus is the development of ethical drugs through innovation in drug discovery. Takeda Cambridge has around 120 researchers in the UK (and a further 30 in Singapore) and operates as a centre of excellence for R&D, focusing on key therapeutic areas of unmet medical need.

Three years ago, Linda Millett (Head of HR) implemented an industrial placements programme. This was chiefly as a means to raise Takeda's profile in the UK and support its recruitment strategy, but also to provide a training opportunity for students and to give them an insight into what a career in the pharmaceutical industry can offer and highlight the benefits of increased "employability" for those graduates with a year in industry.

The programme has been a great success with around 150 applications every year. Takeda runs recruitment "open days" and usually interviews around a dozen students, taking in six on placement annually. This includes two MChem students for Medicinal Chemistry and one for Analytical Chemistry (the other placements being in Discovery Biology and Pharmacology). Takeda does not currently host short placements, believing that the year-long model is preferable to embed and train the student sufficiently to generate real value for both parties. As a relatively small company, with a limited training budget, Linda also sees the supervision of a placement student as a good professional development opportunity for Takeda staff relatively new to supervision/management.

Although Takeda's initial motivation was using placements to raise their profile for recruitment purposes, they continue to provide benefit in terms of workforce capacity. In the chemistry department, placement students gain the opportunity to work closely with an experienced chemist in the laboratory either contributing to novel compound synthesis or, in the case of Analytical Chemistry, generating important data to aid decision-making and contributing to new assay development. Chemists in Medicinal Chemistry and Analytical Chemistry have the opportunity to learn about the drug discovery process as well as focusing on an individual project which is written up for assessment by their university.

Through the placements, and appreciating the high quality of the students who have worked with them, Takeda has developed strong links with a number of universities including Nottingham, Strathclyde and Bath. "We value the placement opportunity provided by Takeda (Cambridge) very highly indeed – our students placed there have worked on exciting projects with highly skilled and motivated staff, and within a stimulating, friendly and supportive environment" comments Professor Jonathan Percy at Strathclyde. "This investment by a fast-moving pharmaceutical company in training the next generation of chemists certainly pays off for us – our students return to Strathclyde with a real sense of the challenges posed by drug discovery, the motivation to join the industry and help to meet those challenges, and an awareness of the skills set needed."

Feedback from recent placement students at Takeda is very positive too: "Takeda Cambridge is a great place to work, with well equipped labs and really friendly people. The experience and knowledge to be gained from working in such a place is invaluable". "A really good opportunity to learn about working in industry and to improve my job prospects when I graduate".

Case study – Intrinsiq Materials Ltd

Intrinsiq Materials was spun out of defence and security company QinetiQ in 2007 and focuses on advanced materials for printed electronics. It researches and manufactures printable nanomaterial-based inks for applications including solar cells, touch screens and smart media. Based in Farnborough, Hampshire, with a further R&D facility in Malvern and an office in the United States, Intrinsiq is rapidly growing with around 30 staff, including many talented research scientists.

UK Managing Director and Global Chief Operating Officer Dr Richard Dixon is very positive about the role of the 4-6 chemistry students that Intrinsiq takes on placement annually. For Intrinsiq the attraction is that good chemistry students can work alongside its Principal Scientists and undertake some of the more routine work that can then free up the scientists' time. At the same time the students are undertaking cutting edge work. Intrinsiq's business is very project-focused and they often cannot predict for how long a project might be extended. Having the placement students adds capacity to their main workforce at relatively low cost – there is a very clear positive return on their investment.

Intrinsiq's work for its customers tends to involve developing bespoke solutions. Typically a student on placement will support a series of related 5-6 week projects formulating nanomaterial-based inks to print onto customers' substrates. The students are strongly encouraged to develop an inquisitive mindset; typically a student's project report will be based on their development work across a series of related projects, as they are likely to specialise in a particular material. In this way there is a good partnership where both the company and the student gain greatly from the experience. For the company the IP derived can be valuable but the universities respect this and work around it to ensure that Intrinsiq's development value is secure.

Intrinsiq seeks bright and able students from some leading universities; Reading and Surrey are both quite local, which suits all parties. Dr Andy Russell at Reading says that "the relationship with Intrinsiq has been very positive for us; the students have received an excellent grounding in applied nanotechnology as well as the experience of working in the chemical industry in the most general sense. The reciprocal relationships with staff from Reading, serving as academic supervisors for the placement students, have also been useful in assisting Intrinsiq with aspects of the projects."

Case study – Solvay Interox Ltd.

Solvay Interox Ltd, a subsidiary of Solvay SA in Belgium, manufactures hydrogen peroxide and related products and employs around 120 people in NW England. The Company was founded by Ernest Solvay who patented the ammonia-soda process in 1863 and the Solvay Group is now the world's largest producer of hydrogen peroxide.

In 2006 John McDonagh, Solvay's Health Safety and Environment Specialist at the Warrington site, contacted the Department of Environmental and Geographical Sciences, Manchester Metropolitan University. Solvay sought an undergraduate placement student who could provide additional technical support, at a reasonable cost, to assist with a ground remediation programme and also with further developing the site's environmental management system (EMS) to the ISO 14001 accreditation level.

Since that time, several MMU placement students have undertaken tasks including collection of groundwater data and samples from a large number of monitoring wells according to detailed protocols, laboratory analysis and routine activities associated with an *in situ* bioremediation system. Databases have been maintained and modelling programs run to monitor contamination levels and the remediation progress. Other tasks have included monitoring dust levels, outfall emissions and waste for recycling. As well as liaison with the Environment Agency and developing a good working knowledge of UK and international environmental legislation, placement students have also acted as company ambassadors and advisors for school visits, sixth form enterprise and undergraduate careers events.

These placements are most suited to undergraduates with some chemistry background now studying for BSc Honours in either Environmental Science or Geography. The placement duration has been a minimum of 36 weeks, with a one month probationary period, but has often been extended to 52 weeks in order to facilitate continuity with subsequent students.

The success of this annual placement programme can be measured by excellent and mature student academic performances on return to University and, for the company in the maintenance of high standards in the workplace, improvements to some of the environmental protocols / procedures and overall employer satisfaction.

5. FREQUENTLY ASKED QUESTIONS

How do we know which universities we should target to suit our particular business?

Most UK MChem degree courses are accredited by the Royal Society of Chemistry. This guarantees a breadth of fundamental chemistry content with specialisation in later years, and wide-ranging practical skills. Beyond this there will be detailed differences in what is taught. There is a list of accredited courses on the RSC website,[14] and obtaining detailed information on course content is possible through university websites, but it may be quicker to tell university industrial placement coordinators about your company's interests and see what reactions you get. See Section 3.4 for details of how to contact university industrial placement coordinators.

We're not a research company so how can we offer students the type of work that their university seems to require?

Not all universities or courses have the same requirements. Even those universities seeking MChem placements on accredited courses will offer some flexibility as they understand that employers also need to obtain value from placements. It may well be possible to agree a project which has a sufficient extent of research, level or challenge for the student/university's purposes while it is not actually a research project in the company's eyes. For example, certain analytical work could be written up as a comparison between different analytical tools. In general, students on BSc courses will have much more flexibility in terms of the type of work that they can do during a placement.

Does the student have to do a research project?

MChem students do usually have to write a report which is based on a project they undertake during the placement, and this is assessed as part of their degree. As indicated above, the nature of the project can be more flexible than first thought. It is also quite common for some companies to compromise with the university on a balance of work, perhaps half of the time on work towards the project and half on more routine work. BSc course placements do not have the same project requirements, although the student may still have to submit some kind of report about their experiences and what they have learnt.

What happens if we don't have enough work that would suit or fill a placement year?

There is often flexibility and in differing ways. Generally a placement "year" means a minimum of 36 weeks of work, but the placement project undertaken does not have to fill the entire time. Other options could be for the student to undertake a series of 2-3 small projects, or a mix of more routine work and some research-focused activity for their project.

How far in advance does a placement have to organised?

Every placement coordinator contacted during the research underpinning this Guide admits that they have to be flexible about timings in organising a placement, not least because demand from students tends to outstrip the supply of placements. The placement year itself conventionally starts in August (July in some universities), and it is probably possible to have a lead time as short as 2 months before this. However it is preferable to offer the opportunity earlier than this if at all possible, so that university placement coordinators can review the vacancy and promote it to their students. Within reason though, it will usually be possible to find a student with the correct competencies for a placement at almost any time in the placement cycle given in Section 3.3.

What does 'approval' by a university mean?

The university will want to be sure that the employer will provide the right sort of work and support for their student and so, particularly for 'first-time' hosts, they will want some dialogue with the employer before promoting the opportunity to their students. The extent of this dialogue will vary depending on the university, and might involve a placement coordinator visiting you briefly. This 'approval' process particularly applies to placements on accredited courses, where universities may insist that their students apply only for placements with employers they have approved. In fact there are benefits in developing a personal and sustained relationship with a number of universities – this helps ensure that the universities promote your vacancy to students with the right competencies, which will save you time in the long run.

How can we ensure that we will get the right kind of student?

What is the 'right' kind of student, for your particular placement opportunity and the type of work you are offering? It may not necessarily be the most academically talented student or one from a top university. This is one reason why competency-based recruitment is wise for placements (as it is for other employees – and the student will be one of your employees for up to a year). Setting out a good job description and a person specification with the competencies required will narrow the range of applicants you will get and make it easier to score them effectively. This is particularly important when you are inviting online applications, and could save you time wading through large numbers of poorly-focused applications.

Working with one or more university placement coordinators will also help. They can advise on how to relate your competency requirements to the likely attributes of students. They will also steer the most appropriate students to your vacancies and support their applications.

Also bear in mind that most universities apply a threshold before the placement process starts, which students have to pass to be allowed to apply for an accredited placement, so applications are likely only to come from relatively stronger and more motivated students anyway.

Do they have to become an employee?

In some work experience arrangements the student is not an employee of the host company. However, in an industrial placement it is necessary for the placement student to become an employee with a fixed-term contract. This ensures that issues such as insurance, risk assessment and health and safety are non-controversial. This is particularly important for placements in laboratories or involving other practical work. Although this aspect of the arrangements does involve effort on the part of the employer, the student's university may well have typical documents and know what really needs to be done. Your relationship with the student will be one of employer and employee, and all three parties will understand this.

Could a placement qualify for a regional or other government grant?

Placements are not generally allowed within subsidised 'job creation' schemes for young people or others. In fact some high-profile schemes only apply to people who have been unemployed for some time anyway, so students on university courses are unlikely to be eligible.

How much support does a student need?

If you are concerned about the level of supervision and support that a student will need, it can be reassuring to talk to an experienced placement host or a university placement coordinator. They will have experience of the relevant type of placement and what works in practice. The university coordinator will also know about any 'work-readiness' training that their students receive before placement (some universities offer intensive pre-placement programmes).

As a minimum, a placement student will simply need a supervisor. Some companies regard this as good first management experience for an established employee (ie, a good staff development opportunity). Best practice recommends the student also has access to another identified person such as a mentor, to whom they can turn occasionally.

The student will retain an academic tutor at the university, but the extent of their input will be limited. They may want to visit a couple of times during the year but will probably not require much other communication with you during the placement unless something goes wrong.

Would we have to give them time off to study?

The university does place demands on MChem students for some academic work during their placement year, in the form of distance learning. However, universities do not require placement students to be allowed time to study during working hours. They want to strike a reasonable balance with the employer in terms of the student's work – although there will be almost certainly be an expectation that the student will have to do some studying in their spare time. As with many things, the actual position will emerge in discussion prior to the placement.

We are worried about intellectual property; if the student comes up with something important in their project will we own it and can we protect it?

Universities with accredited MChem placements tend to be research-based and are well aware of intellectual property issues. They fully expect that non-disclosure agreements will need to be signed by both student and university and will have experience of arrangements to protect IP in the case that something valuable emerges. The universities like the idea of students doing useful research, so they are tuned into IP issues, even though some myths remain about this being a troublesome issue. Research with placement coordinators while preparing this Guide suggests this is not a current area of difficulty.

What happens if it goes wrong?

There is no doubt that from time to time a placement does not work out, usually because of some personal issue with the student (rather than with the placement structure). This is rare, possibly because it tends to be the most motivated and enthusiastic students that take up placements, and for MChem students the placement is an assessed part of their degree. But if things do go badly wrong, the university will be ready for it and will accept some responsibility – remember that they seek a long-term relationship with the employer and will be hoping for a succession of successful placements.

The first port of call would be the academic tutor, who can usually step in and bring the student into line, but failing that the contractual agreement between employer and student will make clear the process for termination if that is necessary. However, it is highly unlikely that the employer will get their money back, so there is good reason to maintain good contact and keep the university in the picture if difficulties are being encountered.

6. LINKS AND OTHER USEFUL RESOURCES

RSC *Chemistry World Jobs* industrial placement page:
http://www.rsc.org/iplacements
A dedicated industrial placement site which allows companies to advertise their placements free of charge.

RSC Industrial Placement Coordinator page:
http://www.rsc.org/Education/HESTEM/EmployerEngagement/IPCContact.asp
A list of the contact details of the industrial placement coordinators at all the universities offering accredited chemistry degrees.

Effective practice in industrial work placement, R. Wallace, R. Murray & T. Overton,
Higher Education Academy Physical Sciences Centre (2009)
A summary of good practice for universities engaging in accredited industrial placements.
Contains checklists for tutor visits and sample assessment forms.
http://www.heacademy.ac.uk/physsci/publications/practiceguides

'A good practice guide for placement and other work-based learning opportunities in higher education',
ASET Good Practice for Placements Guides Volume 2, ASET (2009).
Lays out expectations of university, student and employer for a wide range of work-based learning experiences but especially placements.
http://www.asetonline.org/documents/ASETCodeofPractice-Version2.1.pdf

'Health and safety for student placements', *ASET Good Practice for Placements Guides* Volume 3 (2010).
Detailed practical guidance for universities on managing the health and safety aspects of student placements. Includes sample risk assessment forms and potential content of letter of expectation between student, university and placement provider in respect of health and safety. [Not currently available online; printed copies for purchase from ASET]

Business Link guidance on national minimum wage in relation to work placements:
http://www.businesslink.gov.uk/bdotg/action/layer?topicId=1096811513
Clarifies the current legal position for payment of students on placement and in other work experience circumstances.

Providing work placements for disabled students: good practice guidance for FE and HE institutions.
Department for Education & Skills (2002).
Available at: *http://www.lifelonglearning.co.uk/placements*
Covers placements for disabled students, although aimed at education providers rather than specifically employer hosts.

Best practice guidance: disabled social work students and placements', University of Hull (2005).
http://www2.hull.ac.uk/fhsc/pdf/PEDDS%20best%20practice.pdf
Research-based guidance within a particular field, but much generalisable to other circumstances.

Common best practice code for high quality internships. Gateways to the Professions Collaborative Forum (2011).
Although focusing on student and graduate internships (not industrial placements), sets out the government-approved approach and desired 'culture' for potential hosts. Draws heavily on the CIPD's '*Internships that work: a guide for employers*' (2009).
http://www.bis.gov.uk/code-for-high-quality-internships

Learning through work placements and beyond, L. Harey & B. Little, Higher Education Careers Service Unit & Higher Education Academy (2006)
http://www.hecsu.ac.uk/learning_through_work_placements.htm
Perhaps the key published review of work placement provision and value to the student of this form of work-based learning.

The changing shape of academic collaborations with the pharmaceutical industry, Association for the British Pharmaceutical Industry (ABPI), 2010
http://www.abpi.org.uk/our-work/library/industry/Pages/academic-collaborations.aspx
A short summary and observations from the ABPI's Industry/Academic Links survey.

Cogent industrial placements factsheet
http://www.cogent-ssc.com/Higher_level_skills/Publications/Industrial_Placements_-_Rev_02.pdf
A concise summary of different types of placement and some of their benefits, chiefly focused on research-intensive opportunities for recent graduates and postgraduates as well as undergraduates. Cogent has been leading a group across the Sector Skills Councils on developing higher-level skills through industry-university collaborations.

REFERENCES

1 *Increasing opportunities for high quality HE work experience*, Oakleigh/CRAC for HEFCE, 2011

2 http://www.work-experience.org; http://graduatetalentpool.direct.gov.uk

3 *Review of business-university collaboration* (report of Wilson Review), available at: http://www.wilsonreview.co.uk/review

4 *The changing shape of academic collaborations with the pharmaceutical industry*, ABPI, 2010

5 *STEM graduates in non-STEM jobs, CRAC*, for the Department for Business, Innovation & Skills, 2011

6 *Connect and catalyse: a strategy for business innovation 2008-2011*, Technology Strategy Board, 2011

7 *Building for growth: business priorities for education and skills*, CBI, 2011

8 *Learning through work placements and beyond*, HECSU/Higher Education Academy, 2006

9 See Business Link website: http://www.businesslink.gov.uk/bdotg/action/layer?topicId=1096811513

10 http://www.rsc.org/Education/HESTEM/EmployerEngagement/IPCContact.asp

11 http://www.rsc.org/iplacements

12 http://www.ratemyplacement.co.uk

13 Shaw Trust (http://www.shaw-trust.org.uk/home); EmployAbility (http://www.employ-ability.org.uk)

14 http://www.rsc.org/accredit

Royal Society of Chemistry
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