
Returning qualified women engineers to industry

A feasibility study

The Daphne Jackson Trust

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Executive Summary

The Daphne Jackson Trust is a charity that returns Science, Technology, Engineering and Mathematics (STEM) researchers to careers in an academic environment, by offering 2 year part-time fellowships to individuals who have taken a career break of 2 or more years.

The feasibility study, commissioned by BIS, set out to investigate a possible extension of the Daphne Jackson Fellowship model to encourage more qualified engineers to return to an industrial engineering setting, having taken a career break, or transitioned into other roles or industries. The aim of the study was to attempt to provide some practical and pragmatic solutions to the problems of continued under-representation of women in professional engineering. There was a focus on understanding the barriers and potential issues to a returners scheme aimed at industry rather than academia.

The study aimed to generate information and responses from a range of companies across different sectors and sizes. 62 companies were invited to participate, and 20 individuals who had either successfully returned to industrial engineering roles, or hoped to do so. This report presents findings and analysis based on interviews and written responses received from 12 companies and 6 returners. Additionally meetings were held with Professional Engineering Institutions to assess what strategies and interventions are currently in place to address gender and diversity issues in the engineering workforce.

The report summarises the key findings from industry, professional engineering institutions, potential returners and specialist recruitment organisations. It summarises some of the work already being done in this arena and makes a recommendation for the way forward.

The highly specialised requirements of individual companies and roles to be filled, together with the timescales required by companies to recruit returners, make the Daphne Jackson Fellowship scheme, or any adaptation of it, an unsuitable model for returning women engineers to industry.

All company respondents saw value in an initiative to support women returners if it could expand the talent pool available for recruitment and encourage changes to industry culture and within organisations to accept the value of diversity.

This feasibility study recommends that bespoke schemes designed through close partnerships between a professional head-hunting/ coaching organisation and an individual company would provide a better model for supporting returners.

Background

In November 2013, Professor John Perkins, the Chief Scientific Advisor to the Department of Business Innovation and Skills (BIS), published a Review of Engineering Skills. The report highlighted the need for the UK – government, industry and academia – to support and improve the pipeline of skilled engineers joining and re-joining the workforce to ensure a sustainable supply of skills for the UK economy.

One way to address the issue could be to bring more women into the engineering workforce and encourage those already trained in engineering to return after a career break, or transition back from other areas.

Given its expertise in dealing with returning Science, Technology, Engineering and Mathematics (STEM) researchers to careers in an academic environment, the Daphne Jackson Trust was invited by BIS to investigate a possible extension of their Fellowship model. It was thought that this might offer a similarly successful intervention for those wishing to return to an industrial engineering setting.

The Daphne Jackson Trust

The Daphne Jackson Trust is a charity that has, since 1992, helped to return over 250 scientists, technologists, engineers and mathematicians (STEM) to careers after a break of two years or more for family, caring or health reasons.

The Trust offers two-year, part-time fellowships that combine a challenging research project with an individually-tailored, retraining programme held in a UK university or research establishment.

The Daphne Jackson Fellowship scheme is unique. The application process itself, which can take 6-9 months, involves a named member of Trust staff supporting the candidate on an individual basis, through the application process. This form of mentoring has proved very successful in giving the candidates the guidance they need to develop and write a research proposal, identify their own training needs, and build working relationships with their potential supervisor and host institution. The process includes at least one face-to-face interview with the candidate before they submit a full fellowship application. The application is then peer reviewed and assessed by an independent Awards Assessment Panel.

During the 2 year part-time Fellowship, Fellows are expected to undergo 100 hours retraining per year. This includes bespoke training depending on the individual's needs and area of STEM research, but also includes four 1-day training courses provided by professional trainers on behalf of the Daphne Jackson Trust, covering professional skills, work/life balance, media & PR skills and presentation skills. The fellowships allow individuals to re-establish their scientific credentials whilst retraining and renewing skills that are essential for a future career. At the same time

they draw on the skills they have acquired during their career break such as time management, flexibility and adaptability, conflict resolution and working under pressure.

To date, the Daphne Jackson Trust has helped over 250 STEM professionals return to their research careers, and one in six are qualified engineers.

Key Findings

The key findings from the responses of 14 companies, 4 institutions, one recruitment organisation, 15 Daphne Jackson Trust past Fellows and 6 returners, are presented below. Further details of the methods employed are presented in subsequent sections.

Industry

1. All respondents saw value in an initiative to support women returners if it could expand the talent pool available for recruitment and encourage changes to industry culture and within organisations to accept the value of diversity
2. One key driver for industry to increase diversity in the workforce is to increase their talent pool for recruitment. Some companies were looking to expand their workforce and struggling to find a sufficient number of suitable candidates.
3. Additional drivers for diversity were;
 - Increasing innovation and generation of new ideas
 - Improved safety and operational performance which leads to improved business performance
 - increased market access - ~50% consumer market is female
 - Long term sustainable talent pipeline
4. Companies where staff turnover is low were keen to develop a sustainable pipeline to address potential shortfalls as skilled employees retired. This retirement deficit is likely to become evident within 5 – 10 years. In these cases there was interest in using the current Daphne Jackson research fellowships. The intention was that the company would sponsor research in an area of interest and then that person could become a permanent employee 2 years later as employees retired.
5. 3 of the 14 responding companies and organisations expressed interest to be involved in a pilot of a returners programme. Most recognised that there could be long term value in such a scheme but were not willing to be part of a pilot scheme either because the organisation was risk averse, or because their staff turnover was so low they did not have an immediate need.
6. Companies of all sizes are making efforts to address issues of working culture to encourage workforce diversity (gender, disability, ethnicity and religion) that would help stimulate innovation and business performance. But all

those interviewed accepted that more needs to be done. Most are looking for practical solutions and advice on how to improve and increase returners – even those companies with a low turnover.

7. Opportunities to share best practice across sectors, companies and organisations were well received. One idea was for Professional Engineering Institutions (PEIs) to facilitate round table discussions enabling organisations and companies to share thoughts and ideas. Some were introduced to the Royal Academy of Engineering's (RAEng) Diversity Leadership Group via this project.
8. Many respondents acknowledged that there may be unconscious bias in reviewing applicants and interviewing. They recognised the importance of developing the business case for change and then changing management perceptions. They also acknowledged this could take time and the need for sympathetic management to support and promote cases for change and any returner programme.
9. There was also recognition of a need for initiatives within companies that encourage sustained and embedded change in working culture, such as flexible working opportunities and acceptance that up-skilling and additional mentoring may be required.
10. Smaller companies and those with leaner operating structures such as consultancies identified challenges to supporting returners such as:
 - lack of resource to provide appropriate training programmes
 - Time consuming mentoring and management of returners
 - Small HR teams
 - Need for new recruits to be able to 'hit the ground running'
 - Particularly those more consultancy focused may need to hire for specific projects
11. Companies preferring returners that can “hit the ground running” would also prefer:
 - Shorter up front training programmes,
 - Returners that are able to think laterally and entrepreneurially,
 - Returners transferrable skills, e.g. project and people management, international and leadership experience, not necessarily from STEM careers.
12. Embedding sustainable company-wide cultural change is likely to be more challenging in medium to large companies, but the necessary training programmes and opportunities for flexible working are more likely to be available.

13. Returners and transitioners were most likely to be recruited where there were gaps to fill and the lack of skilled capability was creating a crisis in the business performance of a company.
14. Timescales for recruiting candidates could be an issue when looking for returners. Where there is an immediate need for a particular project, the individual would need to be identified quickly and terms agreed within a few months of commencing the process.
15. In cases where transferrable skills could be considered, time will need to be spent with the company involved to fully understand the role description and individual returner description that would be acceptable. Some companies would need guidance on the possibilities open to them by engaging with returners.

Professional Engineering Institutions (PEI)

16. The Smith Institute [ref 1] report recommended all 37 science and engineering institutions to work more closely together to address the issue of attracting and retaining STEM skilled women.
17. Many science and engineering institutions have well documented strategies and plans to address the issue of under-representation of women in STEM at all levels, i.e. entry, progression and retention, although there is still further opportunity for co-operation. From an engineering perspective the Royal Academy of Engineering are attempting to lead this effort.
18. To increase their membership, the PEIs are trying to change their image of engineering as a male dominated career path and help increase diversity in gender, racial, disability etc. within engineering. Each of these institutions would have the potential to provide financially to a scheme that would facilitate returners/transitioners. They could also act as advisors for technical qualification assessment, sources of recruitment of returners/transitioners and industry supporters.
19. The Royal Academy of Engineering and the Royal Society could also provide advice and add value as umbrella institutions able to provide greater leverage to encourage industry and PEI engagement.
20. No single institution is clear about the number of potential returners. The Royal Society and the Royal Academy of Engineering have both been investigating and attempting to quantify diversity in the workforce.

21. There is an opportunity for, and in some PEIs, an appetite for greater and more effective collaboration, particularly around this issue. This appetite was not seen from all PEIs.
22. Industry would value PEI facilitation in the sharing of best practice, and suggestions were that these could be small round table events facilitating communication of ideas across sectors.

Potential returners

23. Many returners are restricted by their location and therefore found opportunities for returning to the engineering industry limited
24. A large proportion of returners have on-going caring responsibilities for children or elderly relatives, or are managing dual careers in a single household.
25. Individuals wishing to return to industrial engineering careers also identified the need for flexible working within a role, not necessarily part-time roles as the main barrier to returning to industry
26. Lack of confidence and lack of up-to-date skills are barriers to applying for roles
27. Once a returner had re-entered industry they identified further challenges to re-integration with the workforce and the company. Some took several months to re-familiarise and others disengaged to later start up their own businesses.
28. Those that took a pro-active and lateral approach to returning were more likely to successfully return

Specialist recruiters and returner schemes

29. Many other industries besides those in STEM industries have recognised an issue and a need to facilitate women to return to industry
 - Women Returners have recently launched a pilot in collaboration with Credit Suisse, the Real Returns programme. The programme will be a 10 week “internship” helping 11 highly qualified and experienced women up-skill and re-integrate into the financial services sector
30. More broadly there are a number of organisations that have been set up to ensure STEM skilled individuals are not lost from the workforce

- Talent Retention Solutions (TRS) was originally set up to help redeploy STEM skilled individuals leaving BAE Systems and MOD. They have recently identified returners as an additional opportunity. They have been investigating this area and considering options to extend their current offering which will need board approval. They have skills in recruitment, coaching and relationship management within STEM industries. Their challenge is in resourcing a scheme due to their not-for-profit status and the need to show value to their industry membership.
- Conversations with TRS confirmed that industry would prefer a simple, homogenous approach to this issue as far as possible but also a greater need for the institutions to collaborate around this issue.

Conclusions and recommendations

31. This study has identified that the specific and tailored requirements of individual companies and roles to be filled, together with the timescales required by companies to recruit returners, make the Daphne Jackson Fellowship scheme, or any adaptation of it, an unsuitable model for returning women engineers directly to industry.
32. Companies consistently stated that the desirable personal/professional profile of the returner would depend on each individual role. Coupled with this, each returner has a unique set of training requirements depending on their experience, length of career break and the specific role for which they are recruited.
33. As with Daphne Jackson fellowships, it is clear that mentoring and professional coaching are key requirements for individuals during the initial phase of their return to industry, but bespoke specialised in-house training would also be necessary in most cases.
34. There are a number of organisations that offer specialist recruitment and head-hunting services that have the potential to support women returning to engineering industries. These include TRS, Sagent Solutions, Women Returners, Transitions (qualified refugees) and Opportunity Now. (See appendix 4 for details.)
35. Bespoke schemes designed through close partnerships between a professional head-hunting/coaching organisation and an individual company, such as the pilot 'returnship' scheme, recently launched in the UK in a partnership between Credit Suisse and Women Returners should be explored as a suitable model for returning women engineers to industry.

Previous Studies

A number of studies have been undertaken to look broadly at diversity in STEM by a number of stakeholders, and these are discussed below.

The Royal Society and the Royal Academy of Engineering are funded by BIS to run programmes of work aimed at addressing the issue of diversity in the STEM workforce. The programmes run over four years from 2011 and have two strands.

The Royal Society activity is focussing on scientists while the RAE project is examining the engineering perspective.

The Royal Society published a report in March [ref 2] that gives a picture of the scientific workforce in the UK. Two conclusions relevant to this report are:

- Approximately 20 % of the UK workforce need scientific knowledge and training to do their current jobs,
- There is insufficient data on the scientific workforce's entry, progression and retention to enable an accurate picture to be drawn of the potential numbers of STEM qualified returners.

In Professor John Perkin's Review of Engineering Skills, Perkins states that his report "...exposes a series of structural and behavioural barriers that must be tackled in order to improve the longer-term talent pipeline...". The pipeline is a metaphor for an engineer's career. The concept is that talent flows along this pipeline, there are certain points where talent can "leak" from the pipeline if the "tap" isn't sealed or turned off properly – hence the term we will use in this report of a "leaky pipeline". The "tap" describes potential points in an engineer's career where there is an opportunity to ensure we don't lose skills from industry.

A number of other reports confirm the "leaky pipeline" issue and articulate generally what they see as solutions.

The 2011 Smith Institute report "Unlocking Potential" [ref 1] publishes case studies relating to women in STEM. The report highlights:

- Problems faced by women in STEM are no different than those faced by men and women working elsewhere that have caring responsibilities

The Smith report claims that the Institute of Physics conducted a poll showing that of the 34% of physicists that left to start a family, only 14% returned, and of those just over a half returned part-time. The Smith report concluded that

"Universities and businesses have to undertake the crucial changes in the culture of their organisations if they are serious about attracting and keeping skilled women."

....This means not just a commitment from the top but having policy embedded into the middle management layers.”

Opportunity Now and Bain & Company both recently published reports highlighting that the ‘leaking pipeline’ is not just an issue for STEM careers.

The Bain report [ref 3] “Gender equality in the UK”, discusses issues relating to increasing diversity in senior leadership and claims there are 3 issues impeding progress:

- Many male leaders believe the playing field is now level and that gender parity no longer needs to be a corporate priority. The data doesn’t agree with this view. And neither do women.
- Top executives, especially men with non-working spouses, need to better understand the challenges that women and dual-career couples face.
- Leadership behaviours and attitudes need to better reflect the importance of inclusion, and leaders need to have the confidence to promote individuals from a different mould.

Opportunity Now’s report “Project 28-40” [ref 4] highlights a number of key points that include:

- Women are actively seeking opportunities to advance their careers. Companies are also trying hard, but their efforts are often off-target.
- Not all women are the same. It is important for employers to recognise several phases and different evolutions of women’s careers and ambitions.
- Flexible working is essential to women in balancing their many and varied commitments, yet the stigma attached can be an obstacle to progression.

This is only a sample of some of the analysis undertaken around the “leaky pipeline” issue so far and a large body of work has been developed reconfirming the problem.

The aim of this study was to attempt to provide some practical and pragmatic solutions. The perception at the beginning of the study was that to do this we should focus our efforts on understanding industry’s perspective and ask their thoughts on how a solution could be achieved. In this report we articulate their feedback along with feedback from returners and recruitment organisations. Additionally we have spoken with some of the institutions and identified some potential partners to provide solutions.

The study and its methods

The study investigated the feasibility of a scheme based on the successful Daphne Jackson Fellowships but aimed at engineers who may wish to return to an industrial environment.

We sought to communicate with as wide a range of different companies as possible within the timescale of the project to investigate whether there was a universal scheme that would work in returning engineers to industry.

The study was conducted with both industry and returners on the understanding that their feedback would be confidential and summarised anonymously for this report.

The work programme involved:

- Interviewing potential employers from various industries, sectors and size all with a vested interest in UK
- Interviewing and meeting with Professional Engineering Institutions, the Royal Academy of Engineering , and other industry bodies to understand needs and opportunities as well as the challenges for a programme to facilitate returners
- Reviewing Daphne Jackson Trust information, knowledge and feedback from the current Fellowship programme
- Interviewing returners and potential returners/transitioners
- Reviewing the current available information around supporting returners – including other PEIs and Womens’ engineering organisations and gender diversity activities and reports
- Reviewing and identifying other activities that could support returners i.e. activities by WISE, PEIs, RAEng, the Royal Society and other recruitment organisations

Industry interviews

The instrument used to collect data was a structured interview conducted either face-to-face or via telephone, using a questionnaire developed for the industry interviews (see Appendix 2). Transcriptions of the responses were returned to the interviewees for confirmation. All original feedback documents are held confidentially by the Daphne Jackson Trust.

Email invitations were sent to 62 organisations which included companies, industry authorities and business organisations with potentially interested companies on their company lists. There were follow up telephone calls to 80% of these, where individual contact details were held. Additionally the study was advertised via the Daphne Jackson Trust website, WISE newsletter, Opportunity Now membership and Royal Academy’s Diversity Leadership Group. Overall, 14 companies and 1

recruitment organisation responded with either a completed written interview or general overview conversation (see Table 1 in Appendix 1).

A number of companies, that were interested, were unable to complete a questionnaire in time because they were unable to obtain internal approval in the time frame of the project. Some companies were concerned about confidentiality/anonymity and despite assurances decided not to participate.

Discussions with Professional Institutions

As part of the process, a number of meetings with PEIs were held - namely the RAEng, the Royal Society, the IMechE, WISE and the IChemE - and the study was discussed and promoted with other organisations. The intention for these meetings was to understand analysis already undertaken and the PEIs views on this information, activities already ongoing, obtain further interview contacts and encourage long term engagement. The Institution of Civil Engineers and Institution of Engineering and Technology were contacted but did not respond in the timescale of the study.

Returner interviews

A two-pronged approach was adopted. The final reports of fifteen Daphne Jackson Trust Fellowships were examined, nine of whom had Fellowships within an industrial environment. The other six were engineers within an academic environment. One was male, the remainder female.

In addition, twenty questionnaires developed for the returner interviews (see Appendix 3) were issued to people who had heard about and expressed interest in this study. Six completed questionnaires were received, five from females and one from a male.

Results and Analysis of Industry responses

62 organisations and companies were contacted initially by email and telephone to gauge their interest in this feasibility study.

1 in 3 companies showed interest in the study, but only 1 in 5 responded within the study timeframe. This appeared to be due to their internal company approvals process.

Companies that responded to the questionnaire ranged in size from 300 to ~90,000 employees. The majority considered themselves global except for a UK utility and a UK infrastructure company. This global position manifested in many organisations having sites overseas but was mostly due to their market interests and customer base.

Diversity profiles of companies

Diversity of the workforce is not measured quantitatively by all companies. Diversity information, beyond gender, is often recorded purely on a voluntary basis and therefore the information is unreliable.

The proportion of technical women in the work force ranged from 1 to 32%. It was clear that even those companies with a recruitment programme to actively encourage diversity were struggling to improve on this figure.

One in 3 companies recognised that their workforce was ageing and that as more individuals approach retirement it will be difficult to replace the skills. One company quoted a mean age of 50 years old for their workforce as a whole, and others said long service was common. Many had developed a wide pool of graduates but, either through retention issues or delayed succession planning, expected to be in a skills/capability deficit due to retirements in the next 5-10 years.

The business case for diversity

All companies acknowledged value in having a diverse workforce. They felt it would benefit innovation, safety and operational performance, therefore improving business performance.

Several had a written strategy and business case for diversity.

Some companies recognised that even with forward thinking in their diversity programmes, and with full board/CEO approval, they still had challenges in convincing broader management of the value of diversity and the need to have a “diverse attitude” in their hiring processes.

Responses were mixed when asked if there was a need for a special programme to support returners and transitioners. Even individuals within the same company had different perceptions of whether or not there was an issue or a leak in the pipeline at

a mid-career stage, and in some cases they could not accept that people may need assistance to return.

Generally however diversity was considered valuable for, in addition to innovation, improved safety and performance, the;

- Pool of talent becomes greater
- Different routes of talent access e.g. Transitions (qualified refugees)
- More sustainable long-term pipeline
- Greater understanding of customer demographics/needs - ~50% of market is female

Staff acquisition and retention

Most companies perceived that staff acquisition and retention were issues that needed addressing, but also felt that graduate recruitment programmes were sufficient.

Companies with a low staff turnover did not always see an immediate need to recruit mid-career staff however they did see a need for mid-career staff to support succession planning and replace losses expected in 5 – 10 years time through retirement.

For most companies however the recruitment market is highly competitive and it is sometimes difficult to compete particularly if they are unable, for business reasons to offer competitive salaries. They are also becoming more imaginative in their recruitment and retention techniques. TRS mentioned that companies they had been working with on re-deployment programmes post redundancy were taking more time in attempting to re-deploy internally. Other organisations were consulting organisations such as Transitions, a not-for-profit organisation specialising in the placement of qualified refugees.

Some companies have been looking at alternative ways to make their employment packages attractive, for example by offering flexible approaches to working (time and location), highlighting company cultural values and offering training programmes. Some are also opening their pool to transitioners from other sectors such as finance, military or management consulting. Still, in geographical areas where a number of companies compete for the same skills, the turnover remains high and there is a 'cannibalisation' of each other's workforce.

Where companies gave figures for staff turnover, these ranged from 7 to 10% per annum. Some companies claimed to have a low turnover, which appeared to be due to the company culture or less requirement for growth. Low turnover companies tended to be more concerned about attrition due to retirement. For those with growth plans, these levels of turnover were creating difficulty because of the need to replace and acquire at the same time.

Acceptance of flexible working

All respondents stated that their organisation followed the current regulatory requirements for flexible working and have policies that allow the employee to apply for flexible working. The take-up by employees varied and comments from some respondents suggest that many employees are not clear on their right to request flexible working and potentially have concerns about the impact of making a request.

There is still a general “presentee-ism” – term used by interviewees to signify a culture where people are expected to be present/seen in the office before they are believed, by management and peers, to be performing. How well flexible working was accepted varied from manager to manager in each organisation. There were some roles where it was accepted that because they were operational or manufacturing, individuals were expected and obliged to be present for set times of the day to provide engineering support. Companies that require 24/7 support have become more innovative and accepting of flexible hours through shift working approaches.

Some organisations have embraced a “mobile” working approach which combines home, office and customers’ sites. In other cases, companies are struggling to convince both employers and employees to be flexible in work location. For example, in one case an employer mentioned that they had offered flexibility over working location on the condition that the employee make themselves available to work for a short period, a few weeks to a month at the project headquarters with occasional later travel. The idea was that then the individual would be based near home for the duration of the project although lead was at another site. The employer still had challenges to find suitable individuals.

Supporting engineering staff development

Most companies have graduate programmes, many of which operate officially for 2 years. In most cases it is then left with individuals and their managers to develop and manage career plans.

Many have found formal mentoring programmes beyond graduate level difficult to set up and maintain, but in some cases, where they have been successful, respondents said they have added business value.

All agreed that any returner scheme should include mentoring, particularly if it is for both returner and employer. This would also help embed cultural change within the organisation.

While larger organisations – 10,000+ - tend to have their own in-house training programmes for core skills - usually, technical and regulatory - smaller organisations are utilising external training and creating programmes and training packages to suit their needs. This does include training provided by PEI organisations and chartered accreditation schemes such as IMechE’s MPDS.

Larger organisations have agreed that for any scheme developed they are likely to utilise their in-house training which would include technical and non-technical skills plus in some cases practical training through apprenticeship academies.

A few companies already offer female-only training programme in non-technical development skills, high potential leader programmes and “sheep dip” (offering breadth rather than depth) induction programmes for mid-career entrants to the company.

A number agreed that they could provide more career development support at mid-level which might improve retention.

Apart from maternity leave schemes, none had a formal returners’ scheme in place. Maternity returners’ schemes tended to be 1-2 months duration post return.

Benefits, challenges and barriers of returner programme

All respondents could see benefits in having a broader talent pool within the workforce, although there was a more immediate value for those with higher turnover, where innovation was a core part of the business and where the company is growing.

Barriers and challenges were around cultural change and business acceptance. Persuading managers to hire 'outside the box' and be innovative in flexible working approaches were also issues.

Some companies, particularly SME’s and those where the nature of their businesses require employees to “hit the ground running”, often hire only at the point when they obtain a project. In these cases shorter up front training programmes, or returners with personalities that are able to think laterally/entrepreneurially and/or with easily transferrable skills (such as project management) will be important..

Timescales for recruiting candidates, therefore, could be an issue when looking for returners. Where there is an immediate need for a particular project, the individual would need to be identified quickly and terms agreed within a few months of commencing the process. In cases where transferrable skills could be considered, time will need to be spent with the company involved to fully understand the role description and individual returner description that would be acceptable. Some companies would need guidance on the returner skills possibilities open to them.

Suitable candidates

The general comment from all companies was that the criteria for suitable candidates would be on a case-by-case basis and dependent on the role.

Most respondents would be flexible on the length of career break, type of career break and amount/type of experience before the break. There was even interest in the experiences obtained during career breaks where transferrable skills had been acquired. This could be, for example, voluntary work or roles dealing in international situations or even school governance. This highlights the need for the role criteria to lead the search for suitable candidates.

Technically, the main focus, across all sectors, is on electronic, telecommunications, electrical (HV particularly), control systems/electromechanical and software engineering. This is mostly due to the increased complexity and miniaturisation of electronic control systems within almost every product and industry. However there are still also shortages seen by some companies in mechanical, aerospace and nuclear skills.

There are also transferrable skills required in project management and general technical management. Most would prefer a good first degree and would also consider apprenticeship qualifications but few were interested in a PhD. Some also mentioned that any returners scheme should focus on candidates with a good first degree but most were just interested in individuals who could and would “do the job”.

As the roles and the candidates could vary so too could the salaries. Salaries ranged from £25k for a graduate with a few years of experience to an experienced senior engineering manager at £50+k.

Retraining requirements

Many respondents indicated that there might be a potential need for up-skilling particularly in software packages and industry developments. Although a number of the medium to large size companies stated they would be willing and had the capability to support most of these training requirements. A few more with links to regulated industries such as aircraft maintenance, nuclear and infrastructure highlighted an additional need for certification training to ensure compliance with current regulations. These training requirements and their currency were also seen as potential barriers to any scheme developed.

Common areas of retraining would be more in the non-technical arena and/or software skills/packages updating. Regulation training would be very industry/sector specific.

Value of a returners scheme

All respondents could see value in such a scheme if it could expand the talent pool available for recruitment and could also change the culture of industry (both within their own company and in the engineering industry more widely) to accept the value of diversity in all its forms, not just gender. It was believed that diversity in thoughts that could stimulate innovation and business performance. A key point here was that request for a sustainable and embedded change.

Many companies raised the need for a combined position encouraging a group of industries, companies and PEI's to work together to develop, enhance and engage on returner strategies, approaches and schemes. This combined position was seen as a way to ensure senior management engagement and support within companies for returner schemes. There was also a preference for any solution to be as homogenous and simple as possible.

Results and Analysis of Returners responses

Information was obtained from two sources. Firstly by analysing the feedback already obtained by the Daphne Jackson Trust. This included feedback from 15 past fellows. Secondly by sending out questionnaires to 20 additional people from which six responses were received.

Daphne Jackson Fellowship returner feedback

The final reports of 15 Daphne Jackson Trust Fellowships were examined. Nine former fellows held their Fellowships within an industrial environment, the other six were engineers within an academic environment. One was male, the remainder female.

The average career break was around five years. The average length of pre career break experience was 11 years. All respondents had had a career break due to child caring responsibilities, two with the additional responsibility of ill relatives. Ten respondents gave information on their career paths. Five had had pre-career break experience in industry, three of them eventually returned to industry. Three others who had experience in academia prior to their career break, successfully transitioned into industry after their Daphne Jackson Fellowship.

Feedback from additional returners' questionnaires

Twenty questionnaires were sent out to people who had heard about and expressed interest in this study. Six completed questionnaires were received, five from females and one from a male.

Career break

Most respondents had taken a career break to care for children. Two respondents could not resume their career after maternity leave, one was made redundant while pregnant and another moved 500 miles for their husband's job.

The average career break was approximately six years, with the longest break 14 years and the shortest 14 months. The average length of time spent in industry prior to a break was seven years with the longest being ten years and the shortest being six years.

Pre-career break

Pre-career experience and qualifications varied greatly from individual to individual, and each had worked in a different engineering profession, including automotive, electronics, consultancy and energy.

Returner Expectations

Three respondents resumed their existing career. Two returned to the company they had worked with prior to a career break. One individual who had a career break of 14 years returned to the same sector but within a different company.

Three respondents retrained in a similar or related field. The reasons for retraining were due to

- Their previous role was obsolete due to new testing methods
- Advances in software technology
- Retrained in a new area by studying an MBA.

Challenges to returning and flexibility requirements

There were a number of challenges for respondents in finding a role to which they could return, including their need for roles that permitted flexible working. Respondents were asked to specify problems they had encountered. Example issues were a lack of local jobs (one had successfully returned and one did not), lack of flexible working (respondent had not returned to workplace), another needed to update skills and retrain but had successfully undertaken this.

Most of the respondents reported that flexible working was the most important consideration. Two required part time working. The remainder considered flexible working patterns more important than contracted hours.

Only one of the respondents had not returned successfully to work. They felt that their lack of self-confidence was as a possible factor in being unable to secure employment. This made them unable to perform in presentations and interviews at a standard expected for the roles for which they were being considered.

Returner success

Most respondents had successfully returned to industry or academia, but via different routes. Three of the six respondents returned to a company they had previously worked for. One returned after 14 years into a data administration role and after nearly three years moved into an engineering role. One respondent had a year's contract and used this time to set up a related business. Another still works for the company they joined on returning.

Flexible working and other challenges

The main challenge for returners was flexible working but other issues such as cultural and re-integrating into the workforce were also highlighted. Two of the six respondents reported that their company does have a flexible working policy that they utilised.

Value of a returners scheme

From the returners questionnaires and previous Daphne Jackson Fellowship holders, it appears that most returners are proactive and realistic about their return to the workplace after a career break.

Flexible working was seen as an issue but there is more of a request for general understanding and adaptability from employers in employees fulfilling a full-time role rather than specifically part-time working. It could be classed as more a mobile and flexible working approach rather than a part-time and/or home based approach. Although advertised flexible working availability is an issue there were a number of other issues that should also be considered. Examples are;

- Retraining and up-skilling requirements which are individual to a returners previous skills and career objectives
- Managing two careers decreases relocation and location flexibility
- Self-confidence

An interpretation of some of the returner responses also indicates the value of an approach that offers coaching and mentoring on both sides, for employee and employer. This could improve how effectively returners re-integrate back into engineering roles and help retain those who may leave due to cultural reasons.

References

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Appendices

Appendix 1 – Companies and organisations contacted during study

Table 1

Companies interviewed	Company description
AECOM	Large(45000)/Global - architecture, design, engineering, and construction services
ARUP	Medium(12000)/Global - Design consultancy - An independent firm of designers, planners, engineers, consultants and technical specialists offering a broad range of professional services.
Atkins	Medium(18000)/Global- Design, engineering and project management consultancy
BAE Systems	Large(88200)/Global - Aerospace and defence security company
Bechtel	Large(53000)/Global - Engineering, procurement and construction company operating in the oil and gas sector
BG Group	Medium(5500)/Global - an international exploration and production and LNG company
BP plc	Large(80000)/Global - Energy company – Oil & Gas predominantly
British Airways	Large(44000 - inc 6000 engineering)/Global - Airline + technical aircraft services and authorised repairs
Intelligent Energy	SME(340)/Global - Energy company – develop hydrogen technology solutions for 3 main sectors – not volume manufacture; focus is around licencing technology to OEM's and manufacturers
Network Rail	Medium(~30000)/National - Main business is to maintain rail network for England, Wales and Scotland
Nifty Lift	SME(330)/Global – Original Equipment Manufacturer(OEM) of mobile lifting platforms
Northumbrian Water	Medium(3000)/National - Utility – water and wastewater company
Rolls Royce	Medium(25000)/Global - design and manufacture power systems for aircraft, ships and electrical generators
Selex ES	Medium(17700)/Global - Electronic and information systems solutions for defence, aerospace, space security, high-integrity surveillance, network management, info security and mission essential services
TRS(Talent Retention Solutions)	National - Recruitment organisation for STEM skills for industry

Table 2

Summary of all companies and organisations contacted via email and telephone during this study.

Company contacted	Contact source
Accenture	Royal Academy of Engineering (RAEng)
AECOM	Opportunity Now
Air Products	IChemE
Airbus	WISE
ALSTOM	WISE
Altran	RAEng
ARUP	Trust Team
Atkins	Trust Team
Babcock	WISE
BAE Systems	Opportunity Now
Bechtel	IChemE
BG Group	RAEng – DLG
BP plc	Trust Team
British Airways	RAEng
British Sugar	WISE
Caterpillar	RAEng
Cedar Radio	BIS
Cisco	RAEng/WISE/BIS
Construction Industry trade board (CITB)	Royal Academy of Engineering (RAEng) – Diversity Leadership group(DLG)
CSR	BIS
ERA Technology	Trust team
Environment Agency	IChemE
Fluor	WISE
GE (UK)	RAEng
GKN	RAEng
Halliburton	WISE
Hitachi	RAEng
IBM	RAEng
Intel	WISE
Intelligent Energy	Trust Team
JCB	RAEng
JLR (Jaguar Land Rover)	WISE
Johnson Matthey	IChemE
Kapsch Trafficom	RAEng - DLG
KBR	IChemE
Metalysis	BIS
Metaswitch	RAEng - DLG

Mitie	WISE
Mondelez	IChemE
Morgan Advanced Materials	RAEng
National Grid	Trust team
NATS	Trust team
Network Rail	Trust Team
NG Bailey	Trust team
Nifty Lift	Trust Team
NMI(Trade association for Electronics Systems, Microelectronics and Semiconductors in the UK)	BIS
Northumbrian Water	RAEng - DLG
OPITO (Oil & Petroleum industry organisation)	RAEng - DLG
Opportunity Now	Trust team
Plastic Logic	BIS
RAF	Trust Team
Ricardo	RAEng
Rolls Royce	RAEng - DLG
Royal Mail	WISE
Siemens	RAEng - DLG
Selex ES	RAEng - DLG
Thales	WISE
Talent Retention Solutions (TRS)	BIS
Unilever	IChemE
UTC Aerospace systems	WISE/BIS
Veolia	IChemE
WSP	IChemE

Appendix 2 – Industry questionnaire

Return, Retrain, Retain - maximising the UK's engineering talent potential - A feasibility study to identify best practice in returning qualified engineers to the workplace

Context for questionnaire

In November 2013, Professor John Perkins', the Chief Scientific Advisor to the Department of Business Innovation and Skills (BIS), published a Review of Engineering Skills which highlights the need for the UK – government, industry and academia – to support and improve the pipeline of skilled engineers joining and re-joining the workforce to ensure a sustainable supply of skills for the UK economy. The Daphne Jackson Trust, a charity, expert in returning engineers and scientists to the academic research community, is, with support from BIS, exploring ways to encourage trained engineers who have taken a career break, or moved into other careers, to return to professional engineering careers.

The Daphne Jackson Trust has until the end of April to report back to BIS on whether there is potential for a pilot scheme to be implemented during 2014/15, and if yes, what that pilot scheme will look like. We need your help with this feasibility study as well as an indication of whether you would like to be involved in a pilot scheme.

This questionnaire is an important component of our investigation into whether a programme needs to be implemented, and if so, how a “returnship” Programme could be structured, implemented and operated so that is useful to both the engineering employers and individuals wishing to return to engineering industries.

In the questionnaire, we are asking you for:

- General information about your organisation
- Your views on how a “returnship” might operate within your organisation (To assist with this, we have provided a table which includes a description of how the DJT Fellowship scheme currently operates);

By completing this questionnaire and collaborating with the Daphne Jackson Trust on this feasibility project you will be playing a valuable part in identifying whether or not we can find a way to help individuals like these return to engineering industries.

Questions:

1) Company description: (e.g. Areas of industry focus, types of operation)	
2) Main site locations: (National, EU, Global)	
3) Number of employees:	
4) What is the diversity profile of your company?	
5) Would your company like to see more diversity? Is there a business case to improve diversity?	
6) Do you have concerns around engineering staff acquisition and retention? If YES please highlight main areas of concern.	
7) What policies are currently in place for flexible working? What is the cultural perception/acceptance? Which aspects of the business is it most effective and where is it less effective?	
8) What does your organisation already have in place that could support engineering staff development? Please describe: e.g. training programmes, mentoring, processes, procedures, partnerships	
9) Do you think a "returnship" scheme could benefit your organisation by encouraging qualified engineers to return the profession? If so,	
a) What do you see as the potential advantages of this type of scheme for your organisation?	
b) What do you see as the potential challenges of/ barriers to this type of scheme in your organisation?	
10) Who might you consider a suitable candidate for the "returnship"?	
a) What type of experience should they have? Please describe.	
b) What is the maximum length of career break you would consider acceptable? For example; Less than five years; Less than ten years; any length of break?	
c) What level of experience, would you prefer a candidate to have had prior to their break? For example; Less than five years; Less than ten years; any level of experience?	
d) Do you have a minimum educational requirement e.g. graduate/ postgraduate degree?	
e) What areas of engineering are of most interest to your organisation?	

f) Further comments?
11) Can you identify any retraining requirements, both generic and specific to your particular engineering area?
12) Do you currently operate any “back to work” schemes? If YES please describe.
13) If you think a “returnship” scheme would benefit your organisation, how do you see the returner fitting into your organisation: For example; an existing post; Working on an existing or new project; any other approach?
14) Do you have any further comments or thoughts you'd like to share about the structure, implementation and operation of a “returnship” programme? For information we have included here a summary table of how the Daphne Jackson Fellowships for academia currently operate.

Further information –

We are looking to populate the right hand side of this table using your answers to the questionnaire alongside our discussions with you about a possible “returnship”. Please do feel free to fill in what you think may be appropriate for your organisation for a “returnship” if you have any definite views at this stage on what would work for you. When we have collated answers from a variety of potential stakeholders we will be back in touch to give you some more definite information on what a pilot “returnship” may look like.

Daphne Jackson Trust Fellowship approach	Proposed “Returnship” approach
Eligibility Criteria:	Eligibility Criteria:
A good first degree in a science, technology, engineering or mathematics (STEM) subject	A good first degree in a science, technology, engineering or mathematics (STEM) subject
At least 3 years in research prior to your career break and /or PhD qualification	
UK resident with the right to remain in the UK indefinitely	
A good command of English (spoken and written)	
Computer skills	
At least a 2 year career break	
Other considerations:	
Post-doctoral experience and publications	
Evaluated on:	
Personal background and experience	
Potential benefit that an award might have on their future career	
Likelihood of securing sponsorship	
Operation conditions:	Operation conditions:

Management and administration is by DJT – includes recruitment, specific training, financial administration and relationship management	Management and administration would be by DJT – includes recruitment, specific training, financial administration and relationship management
Fellowship sponsorship is 2 to 3 years part-time (normally 0.5 FTE)	
Placements are predominantly in academic research and universities	
Application process takes 6-9 months including peer review of research proposal and Awards Committee	
Programme costs:	Programme costs:
Fellowship costs are paid by sponsor at a relevant pay scale for postdoctoral researchers (includes salary and associated costs, management costs for the Trust and expenses amount for fellows to attend conferences etc.)	"Returnships" in the pilot scheme would be jointly sponsored by BIS and the company involved
Consumables, operational space & other costs are covered by host institution	If relevant these costs will be covered by the company involved
Trust Management costs covered by sponsor	Trust Management costs would be jointly covered by BIS and the company involved

Appendix 3 – Returners questionnaire

Return, Retrain, Retain - maximising the UK's engineering talent potential - A feasibility study to identify best practice in returning qualified engineers to the workplace

In November 2013, Professor John Perkins', the Chief Scientific Advisor to the Department of Business Innovation and Skills (BIS), published a Review of Engineering Skills which highlights the need for the UK – government, industry and academia – to support and improve the pipeline of skilled engineers joining and re-joining the workforce to ensure a sustainable supply of skills for the UK economy. The Daphne Jackson Trust, a charity, expert in returning engineers and scientists to the academic research community, is, with support from BIS, exploring ways to encourage trained engineers who have taken a career break, or moved into other careers, to return to professional engineering careers. The ensuing report will focus on the potential for a pilot scheme to be implemented during 2014/15. We need your help with this feasibility study to determine the needs of potential returners to engineering.

Questions:

1) Name and contact details. Please indicate if you prefer to remain anonymous.	
2) What was the reason for your career break?	
a) Caring for children	
b) Other caring responsibilities	
c) Health issues	
d) Other (please specify)	
e) Prefer not to say	
3) How long was your career break?	
4) How long did you spend in industry before your career break?	
5) What is your highest level of qualification eg A Level/NVQ, BA/ BSc/ postgraduate degree	
6) What was your background before your career break?	
a) Academia (please specify)	
b) Industry (please specify)	
c) Other (please specify)	

7) In resuming career after a career break did you or do you hope to:	
a) Resume existing career?	
b) Retrain in a similar or related area?	
c) Retrain in new area or industry?	
d) Other (please specify)	
8) What practical considerations did you or do you have in returning to your career?	
a) Flexible working patterns (please specify ie part time, regular hours, compressed hours)	
b) Training	
c) Other (please specify)	
9) Have you successfully managed a career return to industry?	
a) YES (please go to Q8)	
b) NO (please go to Q9)	
10) If you have successfully managed a career return to industry, please answer each question:	
a) Did you return to the same company/ industry?	
b) How long did it take you to find employment?	
c) Does your company have a flexible working policy?	
d) Did you encounter any problems in returning to your career? Please outline those relevant.	
11) What problems have you faced/ are facing in returning to a career in industry (please tick all that apply):	
a) Lack of jobs in the area	
b) Lack of flexible working policies	
c) Need to update skills	
d) Need retraining	
e) Other (please specify)	
12) Currently the Daphne Jackson Fellowship typically runs for two years part time. For a potential "Returnship" what are your thoughts on this model? What concerns would you have?	
13) Would you be happy for us to contact you for a follow up questionnaire when we have a draft pilot scheme prepared?	
a) Yes	
b) No	

Appendix 4 – Specialist recruiters and returner schemes

Talent Retention Solutions (TRS) - For Advanced Manufacturing & Engineering Careers <https://talentretention.biz/>

TRS has been set up by a group of senior industry leaders, the Skills and Jobs Retention Group, in response to a request made by Vince Cable, the Secretary of State for Business Innovation & Skills (BIS). Its purpose is to provide an industry led and sector focused programme through which to facilitate the deployment and retention of key AME skills across the UK. It is a significant resource for the AME supply chain, and supports large, medium and small company interests.

The Talent Retention Solution (TRS) puts skilled individuals looking for work and companies searching for new employees in direct contact with each other. The TRS is a UK wide scheme which aims to retain skills in the Advanced Manufacturing and Engineering Sector, including Aerospace, Automotive, Civil Engineering, Defence, Energy, Marine, Manufacturing, Nuclear, Power Generation and Renewable industries. TRS uses a web-based programme called 'CWeb' which has been developed to actively support redeployment and recruitment across these sectors.

Sagent Recruitment <http://www.sagentrecruitment.com/cm/home>

Sagent Recruitment is part of Sagent Solutions, a recruitment and consultancy organisation that focuses on improving the gender balance in engineering.

Greet Brosens set up Sagent Solutions with the view to promote women in engineering. With only 7% of female engineers, engineering is still the most male dominated industry in the UK. Whilst companies are sincere in their efforts to increase the numbers, Greet believes that more can be done to change the perception of female engineers, and to give them the right support networks to succeed. All recruiters are trained in unconscious bias awareness and understand the latest tools to ensure that they run bias free recruitment process.

Sagent is working in collaboration with the IET to offer a six-month series of facilitated peer coaching for women engineers. Using real-world examples in a confidential, inclusive environment, attendees can both give and gain insight into issues faced by women in the engineering industry, regardless of where they are in their working life. Registration is free and spaces are limited to 12 participants.

Knowledge Transfer Partnerships (KTP's)

Partnerships are formed between a company and an academic institution ('Knowledge Base' partner), which facilitates the transfer of knowledge, technology and skills to which the company partner currently has no access. Each partnership employs one or more recently qualified people (known as an Associate) to work in a company on a project of strategic importance to the business, whilst also being supervised by the Knowledge Base Partner.

Projects vary in length between 6 and 36 months. The Associates are either postgraduate researchers, university graduates, or individuals qualified to at least NVQ (Level 4) or equivalent.

Knowledge Transfer Partnerships is currently funded by fifteen Government organisations led by the Technology Strategy Board. Each Partnership is part-funded by Government with the balance of the costs coming from the company partner.

Women Returners <http://corp.womenreturners.com/>

Women Returners was established in 2012 by Julianne Miles & Katerina Gould to facilitate the return of women professionals to the workforce after an extended career break of 2+ years.

They are applying a US developed scheme that offers returning professional internships ('returnships'*) that are paid short-term employment contracts, typically lasting 8-12 weeks. The returner takes on commercially significant projects based on her skills, interests and prior experience. The employing organisation gains from focused attention on a business-critical issue and a low-risk opportunity to assess a potential employee's suitability.

In a best practice model, training and mentoring support is provided to the returner, both at the induction phase and during the programme. Returnships may be used by a returner to update skills and knowledge or to transition into a new area.

Although returnships are a new concept in the UK, they are a proven success in the US and India where they have been running since 2008. Goldman Sachs (US) has consistently hired half of the participants on its Returnship Programme into permanent positions.

Women Returners partner with a company, mainly in the financial sector, to design and deliver tailored programmes that attract returning professionals and support their re-integration into the workforce. These programmes can take the form of returning professional internships ('returnships') or targeted recruitment strategies. They can also help to facilitate the transition through one-to-one &/or group coaching and training.

Transitions <http://www.transitions-london.co.uk/>

Accessing the skills of refugee professionals, **Transitions** is a specialist not-for-profit Community Interest Company (C.I.C.). They provide inclusive workforce services including social enterprise graduate and experienced talent acquisition services, positive action internships, Corporate Responsibility staff volunteering, information and advice services to employers & professional bodies in London along with specialist career development services to candidates. Their aim is to contribute to an equitable skilled jobs market, with particular reference to highly skilled refugees.