

SCOTTISH LIFE SCIENCES EMPLOYER SKILLS SURVEY 2010

Animal Sciences *Biology* Biotechnology

Business Finance & Marketing

Chemistry *Life Sciences*

Embryology *Engineering* *Environmental*

Sciences Food Science *Health Sciences*

Software engineering *Market Research*

Maths and Statistics *Microbiology*

Molecular biology *Neuroscience* Pharmacy

Physical Sciences Physiology Psychology

Stem cell sciences *Toxicology* Immunology

Science Background Genetics

FOREWORD:

“The UK life sciences industry is a high-tech and innovative industry which is vital to the economic prosperity and growth of the UK. Life sciences businesses will help us to meet the big societal challenges of our age from addressing the needs of an ageing population through developing advanced diagnostics and medicines, to improving our sustainability and ability to feed a growing population”.

Uk Government: Business, Innovation and Skills and Department of Health, December 2010

Scotland continues to strive towards increasing its economic competitiveness and achieving sustainable economic growth. The Life Science sector has been identified by the Scottish Government as a key sector for growth

The Life Sciences Strategy has an aspiration to double the economic contribution of life sciences to the Scottish economy. It aims to create the best possible environment for life sciences businesses to succeed. Our ability to work collaboratively across Scotland is one of our biggest advantages.

Scotland already has an international competitive advantage in Life Sciences, particularly in the fields of medical R&D, technology and manufacturing capability. We can do even more to harness the sectors potential to achieve higher economic growth; more high value jobs and increased exports; building on the strengths that Scotland has in innovation.

But to move forward we need three things:

1. A detailed, common understanding of the current and likely future issues in the sector
2. In-depth engagement with employers in the Life Science sector to identify where the public and private sector can work together to tackle these issues
3. A means to take proposed solutions forward

This research was designed, developed and delivered by the Life Sciences Advisory Board (LiSAB), with the active support of key partners, particularly Skills Development Scotland, Scottish Enterprise and SEMTA. LiSAB is an industry-led body which brings together key stakeholders from across the public and private sectors to develop the overall strategy for the sector in Scotland. It has a crucial role in co-ordinating activities and in promoting collaboration among Scottish Life Science organisations.

The survey is part of a wider collaborative research effort which includes follow-up qualitative research and employer engagement in identifying solutions to the issues raised by the Life Sciences industry.

The results of the life sciences research will help us to better understand the scale of the opportunity that exists globally for the sector. They will also bring greater focus to our collective efforts and help us to address areas where we need to build capacity to respond to opportunities as they emerge. This research will provide the evidence base which underpins our activities in the future. It will also deepen our relationship with employers in the Life Science sector.



Dr Brian Bathgate
LiSAB People work stream Champion
Senior Vice President and President, European Preclinical Services
Charles River Laboratories

LIST OF CONTENTS

| | |
|--|----|
| 1. Executive Summary..... | 4 |
| 1.1 Introduction | 4 |
| 1.2 Business challenges: | 4 |
| 1.3 Key findings: | 4 |
| 1.4 Next steps: | 5 |
| 2. Introduction | 6 |
| 2.1 Background | 6 |
| 2.2 Structure and themes | 6 |
| 2.3 Survey design | 6 |
| 2.4 Respondents profile | 7 |
| 3. Business Challenges | 9 |
| 3.1 Main challenges facing businesses | 9 |
| 4. Recruitment | 10 |
| 4.1 Recruitment by sub-sector | 10 |
| 4.2 Job titles recruited for in the last 12 months | 10 |
| 4.3 Recruitment from outside Scotland | 11 |
| 4.4 Challenges faced in recruiting from outside Scotland | 11 |
| 4.5 Summary of key findings for recruitment Section | 12 |
| 5. Hard-to-fill Vacancies and Skill Shortages | 13 |
| 5.1 All vacancies | 13 |
| 5.2 Hard-to-fill vacancies | 13 |
| 5.3 Skill shortage vacancies | 13 |
| 5.4 Skill Areas in skills shortage vacancies | 14 |
| 5.5 Job titles for hard-to-fill vacancies | 15 |
| 5.6 Impact of hard-to-fill vacancies | 16 |
| 5.7 Summary of key findings for vacancies, hard-to-fill vacancies and skills shortages | 17 |
| 6. Skills Gaps in the Workforce | 18 |
| 6.1 Staff proficiency | 18 |
| 6.2 Future workforce skills | 18 |
| 6.3 Summary of key findings for skills gaps | 20 |
| 7. Future Skill Needs | 21 |
| 7.1 Skill Areas for future skill needs | 21 |
| 7.2 Job titles and number of posts required | 21 |
| 7.3 The top ten future job titles | 22 |
| 7.4 Estimated number of scientific/technical posts required in the next 2/3 years | 22 |
| 7.5 Estimated number of business/commercial posts required in the next 2/3 years | 23 |
| 7.6 The skills pipeline | 23 |
| 7.7 Summary of future skills needs | 24 |
| 8. Graduates | 25 |
| 8.1 Graduate recruitment | 25 |
| 8.2 Factors considered by employers when recruiting graduates | 25 |
| 8.3 Skills lacking in graduates | 25 |
| 8.4 Graduate qualifications and disciplines required | 26 |
| 8.5 Summary of findings for graduate qualifications and disciplines | 26 |
| 9. Training and Development | 28 |
| 9.1 Training activity | 28 |
| 9.2 Challenges in providing staff training | 28 |
| 9.3 Apprenticeships | 29 |
| 9.3 Summary of findings for staff training and development | 30 |

| | |
|--|----|
| 10. Effective Use of skills | 31 |
| 10.1 Summary of findings for effective use of skills..... | 32 |
| 11. Qualitative Research and Employer Engagement: The Next Steps | 33 |
| 11.1 Integrated qualitative research..... | 33 |
| 11.2 Arrangements for the qualitative research..... | 33 |
| 11.3 Current initiatives and best practice..... | 33 |
| 11.4 Qualitative research analysis and reporting..... | 34 |
| 12. APPENDIX ONE: Summary Table | 35 |
| 13. APPENDIX TWO: List of Hard-to-fill Vacancy Job Titles | 36 |
| 14. APPENDIX THREE: List of Academic Disciplines | 37 |

LIST of TABLES

| | |
|---|----|
| Table 1: Respondents Profile | 7 |
| Table 2: Percentage of organisations in sub-sector by employee size band | 8 |
| Table 3: Gender distribution life science Sub-sectors | 8 |
| Table 4: Key Challenges, Life Sciences ESS and SESS 2010 (top four challenges)..... | 9 |
| Table 5: Business challenges for companies with a hard to fill vacancy..... | 9 |
| Table 6: Numbers recruited in the last 12 months by sub-sector..... | 10 |
| Table 7: Science/technical job titles recruited in the last year..... | 10 |
| Table 8: Business/commercial job titles recruited in the last year..... | 11 |
| Table 9: Main factors that have led to recruiting from outside Scotland | 11 |
| Table 10: Candidates seen as lacking | 14 |
| Table 11: Summary of hard-to-fill vacancy job titles..... | 15 |
| Table 13: Skills required by employees in the next 2/3 Years | 19 |
| Table 14: Future skill needs and current skills shortage vacancies (top 4)..... | 21 |
| Table 15: Top ten job titles employers expect to recruit in the next 2/3 years | 22 |
| Table 16: Science/technical job titles and no of posts required in next 2/3 years..... | 22 |
| Table 17: Business/commercial job titles & no of posts required in next 2/3 years | 23 |
| Table 18: Most important factor in recruiting graduates | 25 |
| Table 19: Skills or abilities considered lacking in some graduates | 26 |
| Table 20 Disciplines preferred by life science companies..... | 26 |
| Table 21: How companies ensure effective use of skills..... | 31 |
| Table 22: Skills utilisation practices used by respondents | 31 |
| Table 23: Life Sciences research 2010 - comparison with other National Surveys | 35 |
| Table 23 Hard-to-fill vacancy job titles | 36 |
| Table 24 Disciplines preferred by life science companies..... | 37 |

1. EXECUTIVE SUMMARY

1.1 Introduction

This document presents a summary of results for the Scottish Life Sciences Employer Skills Survey, which was carried out by between May and June 2010 by TNS-BMRB on behalf of the Life Sciences Advisory Board (LiSAB) People Workstream.

The survey is part of a wider collaborative research effort which includes follow-up qualitative research and employer engagement in identifying solutions to the issues raised by the industry. The qualitative research is being conducted by SEMTA, the Sector Skills Council for Life Sciences with the support of LISAB partners and independent research consultants.

The detailed survey results are provided in the main report, 'Life Sciences Skills Research Report', TNS-BMRB, November, 2010. This document outlines the key findings and compares these with the results of other relevant research. Most notably, this report provides comparisons with the results of the Scottish Government's Scottish Employer Skills Survey 2010 (SESS 2010), which was published on the 16th March 2011. This report also highlights the key issues for LiSAB in taking forward the Scottish Life Sciences Skills Strategy.

1.2 Business challenges:

Respondents were asked which new or ongoing challenges their company was likely to face in the next 12 months to get a sense of where the skills issue sits in relation to other key drivers of economic growth.

According to SESS 2010, skills are considered to be a second order challenge by Scottish employers, behind cashflow, attracting and retaining customers and the downturn in the economic climate. The Life Science survey results reflect this trend, with around one quarter of respondents citing 'external funding' and 'diversifying or expanding their businesses as the top two challenges they are likely to face.

However, 'attracting appropriately skilled staff' is mentioned by 21 per cent of Life Science employers as a challenge. Therefore, it is a higher-order challenge for the Life Science sector than it is for Scottish employers generally.

1.3 Key findings:

The remaining questions in the survey research were organised around a number of key themes following the broad structure of the Scottish Employer Skill Survey. The headline data under these themes suggests the following:

- ♦ The Life Sciences Sector is part of a dynamic, global labour market. Nearly three quarters of respondents had recruited to their site in the 12 months prior to the survey with almost a third of these having recruited from outside Scotland
- ♦ Recruitment problems are evident in the Life Science sector. Hard-to-fill vacancies account for 23 per cent of all vacancies (compared to 35 per cent for SESS 2010). However, the vast majority of hard-to-fill vacancies in the Life Sciences sector (89 per cent) are skills shortages¹, compared to just over half (52 per cent) for Scottish employers on the whole.

¹ Skill shortages occur when employers find a vacancy hard-to-fill because applicants lack the necessary skills, qualifications and experience.

- ♦ In the Life Science sector, skill shortages are much more about applicants lacking the right skills and experience, as opposed to difficulties attracting people with appropriate qualifications. Only 17 per cent of employers reporting a skills shortage mentioned a lack of required qualifications compared to 85 per cent who cited lack of skills and 70 per cent who mentioned lack of experience.
- ♦ Skills gaps² are generally less problematic. Overall, 12 per cent of Life Science employers had at least one skills gap, compared to 15 per cent of Scottish employers overall (SESS 2010).
- ♦ There are a number of specific occupations in the Life Science sector where there are both skills shortages (difficulties recruiting) and skills gaps (some of the current workforce are not fully proficient). These generally related to specific science or technical occupations such as science managers and laboratory technicians, but also include occupations that require business related and core skills.
- ♦ Employers were asked which skill areas and job titles they expected to recruit for over the next 2/3 years to in order to meet their business objectives. Respondents also estimated the number of posts they were likely to require for each job title (including replacement demand and new jobs as a result of growth). Some 1,440 posts were recorded, including 1,136 science/technical posts and 304 business/commercial posts. The ten job titles which were likely to require the highest number of posts are listed below in order of priority:
 - ~ Clinical Research Associate
 - ~ Assistant Scientist
 - ~ Manufacturing Associate
 - ~ Animal Technician
 - ~ Production Operatives
 - ~ Sales Representative
 - ~ Process Operator
 - ~ Clinical Trials Staff
 - ~ Process Technicians
 - ~ Scientist

1.4 Next steps:

The next stage of the LiSAB research involves structured, face-to-face interviews with a sample of 30 respondents from the Life Sciences survey to explore the key issues emerging from the research in more depth and to help identify employer led-solutions to the key skills challenges.

This element of the research is being conducted by SEMTA, the Sector Skills Council for the Life Sciences sector with the support of LISAB partners and independent research consultants. The research consultants will provide a robust framework and external verification for the qualitative research, which will enable SEMTA to focus on its employer engagement role.

The findings from the qualitative research and employer engagement activities will be analysed by the Skills Development Scotland (SDS) Labour Market Information (LMI) team.

A report outlining the main findings will then be produced by SEMTA working in collaboration with Scottish Enterprise and Skills Development Scotland.

² Skill gaps occur when an employee is deemed not fully proficient by their employer.

2. INTRODUCTION

2.1 Background

This document presents a summary of results for the Scottish Life Sciences Employer Skills Survey, which was carried out by between May and June 2010 by TNS-BMRB³, on behalf of the Life Sciences Advisory Board (LiSAB).

LiSAB is an industry-led partnership with responsibility for promoting growth of the Life Science sector in Scotland. The overall aim of LiSAB in carrying out the survey is to provide robust up-to-date labour market information at sub-sector level to help inform the successful delivery of the Life Sciences Skills Strategy.

The survey is part of a wider collaborative research effort which pools the expertise and resources of key partners. SDS provided technical advice and has part funded and managed the overall project along with Scottish Enterprise, while SEMTA has a key role in delivering the qualitative research and employer engagement activities.

This document outlines the key findings from the survey and compares these with the results of other relevant research, such as the Scottish Employer Skills Survey 2010⁴.

2.2 Structure and themes

The questionnaire for the Life Science research was organised around a number of key themes, following the broad structure of SESS 2010. This enables comparisons to be drawn, whilst allowing LiSAB's innovative approach to linking research with action. This section outlines the key findings of the research under the same general themes, with international recruitment added as an area of particular relevance to the Life Sciences sector:

- ♦ Businesses Challenges
- ♦ Recruitment/International Recruitment
- ♦ Hard-to-fill Vacancies and Skills Shortages
- ♦ Skills Gaps in the Workforce
- ♦ Graduates/Qualifications/Disciplines
- ♦ Training and Workforce Development
- ♦ Making Effective Use of Skills

2.3 Survey design

The overall research model used by LiSAB involves combining a number of survey techniques in a tailored approach to gathering LMI for the sector. The different elements include:

- a) Secondary research to provide context,
- b) A large scale telephone survey to collect statistical data,
- c) Follow-up qualitative interviews with respondents to get behind the issues, and
- d) Employer engagement activities to involve the industry in defining priorities and solutions from the research.

The document summarises the findings from the telephone survey and secondary research.

³ www.tns-bmrb.co.uk

⁴ The Scottish Employer Skills Survey, "Skills in Scotland 2010", Scottish Government, March 2011.

The large scale survey is based on telephone interviews with a sample of 156 employers in Life Sciences who were interviewed by TNS-BMRB researchers between 19th May and 16th July 2010. The sampling frame used was a database of 248 Life Science companies drawn from the Life Sciences Scotland Source book (corresponding to a narrow definition of the sector). This gives a response rate of 63 per cent, which stands favourable comparison with other sectoral surveys.

In addition, the survey design uses a series of 'tried and tested' core questions to enable benchmarking of the results with other key research, including SESS 2010. This provides a context for interpreting the results for the Life Sciences sector in comparison with Scotland as a whole. When combined with a strong partnership approach through LiSAB, this will help to build a common view of priorities in the sector.

2.4 Respondents profile

In carrying out the survey, priority was given to interviewing larger organisations to help maximise the number of employees covered. Table 1 shows the breakdown of companies by size compared to the survey population profile and the grossed up employee numbers⁵.

| Table 1: Respondents Profile | | | | | | |
|------------------------------|----------------------|--------------------|------------------|----------------|----------------------|--------------------------|
| Size Band | Survey Sample | | | | Sample Database | |
| | No. of Organisations | % of Organisations | No. of Employees | % of Employees | No. of Organisations | No. of Employees Grossed |
| 0-5 | 48 | 30.8% | 145 | 1.7% | 74 | 223 |
| 6-24 | 53 | 34.0% | 700 | 8.0% | 87 | 1,149 |
| 25-100 | 41 | 26.3% | 2110 | 24.2% | 63 | 3,242 |
| 101-250 | 5 | 3.2% | 856 | 9.8% | 10 | 1,712 |
| 251-500 | 5 | 3.2% | 1806 | 20.7% | 8 | 2,890 |
| 501+ | 4 | 2.6% | 3119 | 35.7% | 6 | 4,679 |
| TOTAL | 156 | | 8,736 | | 248 | 13,895 |

Life Sciences Skills Research Report, TNS 2010: Base, all respondents (156)

As Table 1 illustrates, the majority of Scottish Life Science companies (65 per cent) are small (less than 25 employees). The largest companies (those with 250 employees) are only 6 per cent of all organisations in the sample, but are responsible for 57 per cent of employment. This reflects the pattern observed across Europe, where the small size of Life Sciences firms is one of the reasons given for Europe lagging behind the US on a range of indicators, including investment in R&D, venture capital and equity⁶.

The global Life Sciences market has tended to be dominated by large pharmaceutical companies. However, small companies are increasingly important across a range of knowledge intensive and highly specialised roles ranging from drug discovery through clinical trials and other research related services⁷. The importance of these small often leading edge companies is highlighted in Table 2.

⁵ The grossed –up employee number is the number of employees from the survey multiplied by a weighting factor based on the survey response rate, which provides an estimate of the total population of life science companies in Scotland. The total grossed-up employee number is broadly consistent with 2009 ONS BRES data for the life sciences sector, which puts the number of employees in the sector at 13,770.

⁶ Life Science New Ventures in Scotland: How International are they?, Centre for Internationalisation and Enterprise Research, University of Glasgow, 2008 http://www.gla.ac.uk/media/media_75719_en.pdf

⁷ ibid

Table 2: Percentage of organisations in sub-sector by employee size band

| | No employees | 1-4 employees | 5-24 employees | 25-49 employees | 50-249 employees | 250+ employees |
|---------------------------------|--------------|---------------|----------------|-----------------|------------------|----------------|
| Ag/Vet/Enviro | 0% | 23% | 38% | 19% | 19% | 0% |
| Clinical Research Orgn (CRO) | 5% | 14% | 45% | 18% | 5% | 14% |
| Human Therapeutics | 0% | 33% | 39% | 11% | 11% | 6% |
| Manufacturing | 0% | 9% | 45% | 14% | 27% | 5% |
| Medical Devices & Diagnostics | 2% | 34% | 30% | 15% | 11% | 9% |
| Specialist Services & Suppliers | 0% | 24% | 48% | 10% | 19% | 0% |
| All survey organisations | 1% | 24% | 39% | 15% | 15% | 6% |

Life Sciences Skills Research Report, TNS 2010: Base, all respondents (156)

The literature highlights the value of networking to overcome fragmentation and the need for co-operation and technology transfer amongst regions and identifies small and medium sized enterprises as key players in this process⁸.

Attracting more women into science, engineering and technology (SET) occupations is a key policy challenge. According to the survey, gender distribution across the Life Sciences sector is fairly well balanced. On average, 54 per cent of employees in the sector were male and 46 per cent were female. The distribution in terms of sub-sector is more variable, as shown in Table 3.

Table 3: Gender Distribution Life Science Sub-sectors

| | <i>Average per cent male staff</i> | <i>Average per cent female staff</i> |
|--------------------------------------|------------------------------------|--------------------------------------|
| Medical Devices and Diagnostics | 63 | 37 |
| Specialist Services and Suppliers | 60 | 40 |
| Human Therapeutics | 52 | 48 |
| Manufacturing | 52 | 48 |
| Ag/Vet/Enviro | 51 | 49 |
| Clinical Research Organisation (CRO) | 37 | 63 |

Life Sciences Skills Research Report, TNS 2010: Base, all respondents (156)

Medical Devices and Diagnostics and Specialist Services/Suppliers tended to have more male employees whilst Clinical Research Organisations (CRO's) had a greater proportion of female workers.

Occupation is an important dimension to consider in terms of gender balance. There was limited scope in the survey design to include additional questions on gender however the issues around occupational segregation are apparent from other recent research.

For example, a report on equality and diversity in the Scottish Government's key sectors⁹ estimated that 1 in 5 directors of Life Science businesses in Scotland were female. It also indicated that the number of women working in biological sciences falls significantly short of the number of women who study biological sciences at undergraduate or postgraduate level, suggesting that there is still scope for improvement in gender balance in the sector.

⁸ ibid

⁹ 'Equality and Diversity Baseline Information on Scotland's Key Economic Sectors', Scottish Enterprise and Highlands and Islands Enterprise, July 2010

3. BUSINESS CHALLENGES

3.1 Main challenges facing businesses

Respondents were asked what new or ongoing challenges their company was likely to face in the next 12 months to get a sense of how important the skills issue was compared to other drivers of economic growth.

According to SESS 2010, skills are considered to be a second order challenge in most organisations, falling behind cashflow, attracting & retaining customers and the downturn in the economic climate. In the Life Science survey around one quarter of respondents cite 'external funding' and 'diversifying or expanding their businesses as the top two challenges they are likely to face, whilst 'attracting appropriately skilled staff' was in third place.

Both the Life Sciences survey and the 2010 SESS report funding or cash flow as the main business challenge. However, recruiting appropriate staff is a higher order challenge for Life Science employers than for other Scottish employers. Only 7 per cent of companies in the wider economy saw this as a challenge compared to 21 per cent for Life Sciences. Table 4 shows the top four challenges for Life Sciences as compared to Scottish employers generally.

Table 4: Key Challenges, Life Sciences ESS and SESS 2010 (top four challenges)

| <i>Life Sciences (2010)</i> | <i>SESS (2010)</i> |
|--|---|
| Securing external funding (25 per cent) | Cash Flow (25 per cent) |
| Diversifying/expanding business activities (24 per cent) | Attracting new customers (19 per cent) |
| Attracting appropriately skilled staff (21 per cent) | Keeping existing customers/business (15 per cent) |
| Downturn in the economic climate (11 per cent) | Downturn in the economic climate (12 per cent) |

Life Sciences Skills Research Report, TNS 2010: Base, all respondents (156); Scottish Employers Skill Survey 2010

The order of priority that skills take in the list of business challenges for Life Sciences also depends on the degree of difficulty companies experience in getting the skilled workforce they need. This is illustrated in Table 5, which shows that 'attracting appropriately skilled staff' was the top priority for 39 per cent of organisations who had at least one hard-to-fill vacancy in the last 12 months.

Table 5: Business challenges for companies with a hard to fill vacancy

| | |
|--|-----|
| Attracting appropriately skilled staff | 39% |
| Diversifying/expanding business activities | 26% |
| Securing funding from external sources | 19% |
| Downturn in the economic climate | 15% |
| Costs/price e.g. interest rates, taxes, inflation etc. | 11% |
| Geographic location | 8% |
| Cash flow | 5% |
| Technical challenges | 5% |

Life Sciences Skills Research, TNS 2010: Base, all who gave a reason for hard-to-fill vacancies in the last year (62)

4. RECRUITMENT

Around three-quarters (70 per cent) of employers in the Life Science sector had recruited someone in the 12 months prior to the survey. The average recruitment figure was 9.2 per company. However, this reflects a very large number of recruits (330) taken on by just a few organisations. Excluding these larger recruiters the average number of people taken on was 6.2 per company. Around two-thirds of respondents (68 per cent) had recruited 5 people or less. Larger companies were more likely to have recruited - 93 per cent of those with 25 or more employees, compared to 37 per cent of those with 1-4 employees and 72 per cent of those with 5-24 employees.

4.1 Recruitment by sub-sector

The sector data was classified into 6 sub-sectors based on the organisation's main business activity. Table 6 shows the numbers recruited in the last 12 months across the sub-sectors.

| Table 6: Numbers recruited in the last 12 months by sub-sector | | | |
|---|------------------------------|--------------------------|-------------------------|
| | <i>Number of respondents</i> | <i>Numbers recruited</i> | <i>% of recruitment</i> |
| Manufacturing | 22 | 362 | 36% |
| Clinical Research Organisations | 22 | 285 | 28% |
| Medical Devices and Diagnostics | 47 | 173 | 17% |
| Ag/Vet/Enviro | 26 | 79 | 7% |
| Specialist Services and Suppliers | 21 | 52 | 5% |
| Human Therapeutics | 18 | 51 | 5% |
| Total | | 1,002 | 100% |

Life Sciences Skills Research Report, TNS 2010: Base, all respondents (156)

The manufacturing sub-sector had the highest recruitment, followed by Clinical Research Organisations (CRO's) and Medical Devices and Diagnostics. These three sub-sector groups were also the top three largest in terms of number of employees. Medical devices and diagnostics had the greatest share of total employment across the sub sectors (38 per cent) following by CROs (25 per cent) then Manufacturing (16 per cent).

4.2 Job titles recruited for in the last 12 months

Respondents were also asked for the job titles they had recruited to in the last 12 months. Over 240 job titles were mentioned. These were grouped into the most common responses in terms of scientific/technical and business/commercial occupations. Table 7 shows the range of specific scientific/technical job titles mentioned in order of priority (based on the number of times each job title was mentioned).

| Table 7: Science/Technical Job Titles Recruited in the last year |
|---|
| Science Managers / Directors |
| Technicians |
| Scientists |
| Quality Control / Compliance Staff |
| Engineers |
| Research / R & D Staff |
| Analyst |
| Biologists |

Life Sciences Skills Research Report, TNS 2010: Base, all respondents (156)

For science/technical skills the most common occupations recruited were science managers and directors, technicians and scientists. This is broadly similar to the profile for skills shortages and future skill needs. Table 8 shows the range of business/commercial job title mentioned in order of priority (based on the number of times each job title was mentioned).

Table 8: Business/Commercial Job Titles Recruited in the last year

| |
|---|
| Administrator / Receptionist / PA |
| Finance Staff |
| Sales & Marketing |
| Business Development Staff |
| HR / Learning & development Staff |
| Customer Service / Communications Staff |

Life Sciences Skills Research Report, TNS 2010: Base, all respondents (156)

The occupations most frequently mentioned by respondents when asked about previous recruitment for business/commercial skills were administrators/receptionists, finance staff and sales and marketing staff.

4.3 Recruitment from outside Scotland

Some 30 per cent of organisations responding to the survey had recruited from outside Scotland¹⁰ in the 12 months prior to the survey. There was a clear link to company size, with larger organisations more likely to have recruited from outside Scotland (60 per cent of those with 25 or more employees had done so, compared to 18 per cent of those with 5-25 employees and 8 per cent of those with 1-4 employees).

The main reason cited for recruiting from elsewhere was a lack of required skills amongst the local labour force, cited by 45 per cent of organisations (Table 9).

Table 9: Main factors that have led to recruiting from outside Scotland

| | |
|---|-----|
| Not enough candidates with the skills required in the local labour market | 45% |
| Candidates from abroad have greater soft skills, such as communication, team-working and problem solving skills than local candidates | 21% |
| Candidates from abroad are more highly skilled than local candidates | 19% |
| Candidates from abroad are better qualified than local candidates | 11% |
| Candidates from abroad are more enthusiastic than local candidates | 0% |

Life Sciences Skills Research, TNS 2010: Base, all who had recruited from outside Scotland (47)

4.4 Challenges faced in recruiting from outside Scotland

The majority of Life Science companies who had recruited from outside Scotland in the 12 months prior to the survey had done so without experiencing any difficulties. However, one in four (26 per cent) reported some problems. For those who had experienced difficulties the main issues were:

¹⁰ 'Outside Scotland' is defined as elsewhere in the UK (England, Wales, and Northern Ireland), continental Europe and non-European countries

- ♦ Visa/work permit issues,
- ♦ Difficulty in attracting candidates to Scotland,
- ♦ Finding a candidate with the relevant skills/experience, and
- ♦ Recruitment took longer than expected.

The reference to a lack of relevant skills/experience from candidates outside of Scotland suggests that some of the skills sought by Life Science organisations in Scotland were equally hard to find across the globe - and that there is likely to be stiff competition for such recruits.

Three particular skill areas emerge as being most sought after outside of Scotland, 'general business or commercial skills', 'general science or technical skills' and 'biological/medical science'. Each of these was mentioned by more than three in ten respondents. Biotechnology skills also emerged as an important area, mentioned by just over one in four (27 per cent).

Those Life Science companies who had recruited from outside Scotland did so in a variety of ways. The most popular method was via *company contacts, networking and word of mouth* (91 per cent). Many organisations had also recruited online, with 66 per cent using their *own website* to recruit from abroad and 56 per cent using *other job websites*. *Recruitment agencies* were used by just over half (52 per cent) while 45 per cent used *TalentScotland*.

4.5 Summary of key findings for recruitment section

- ♦ Around 70 per cent of employers in the Life Science sector had recruited in the 12 months prior to the survey. Clinical Research Organisations and Manufacturing were the sub-sectors with the highest proportion of employers who had recruited (86 per cent).
- ♦ Around two thirds of respondents (68 per cent) had recruited fewer than six people
- ♦ The job titles most frequently mentioned by respondents when asked about previous recruitment for science/technical skills were science managers and directors, technicians and scientists.
- ♦ For business/commercial skills the most common job titles recruited were administrators/receptionists, finance staff and sales and marketing staff
- ♦ Some 30 per cent of organisations responding to the survey had recruited from outside Scotland in the last 12 months
- ♦ The main reason cited for recruiting from outwith Scotland was a lack of required skills amongst the local labour force, cited by 45 per cent of organisations

5. HARD-TO-FILL VACANCIES AND SKILL SHORTAGES

5.1 All vacancies

Around two in every five Life Sciences organisations that responded to the survey had a vacancy – an overall total of 270 vacancies, equivalent to 3.1 per cent of employees. This compares to a vacancy rate for NESS 2009 of 1.2 per cent and a rate of 1.9 per cent for SESS 2010. This perhaps suggests more buoyant recruitment activity in the Life Sciences sector compared to the wider Scottish and UK economies. But it's also important to consider whether Life Science companies were finding these vacancies difficult to fill.

5.2 Hard-to-fill vacancies

In the Life Sciences survey 47 per cent of all companies with vacancies reported having at least one vacancy that was hard-to-fill. A total of 61 hard-to-fill vacancies were reported overall, representing 0.7 per cent of employees and 23 per cent of all vacancies. This compares to a hard-to-fill vacancy rate of 35 per cent for SESS 2010 and 22 per cent for NESS 2009.

Most organisations only had a single hard-to-fill vacancy, or two at most. A quarter of all scientific/technical vacancies were hard-to-fill compared to one in six of general/commercial vacancies. In terms of sub-sectors, Specialist Services & Suppliers, Manufacturing and Clinical Research Organisations had the highest hard-to-fill vacancy rates.

Hard-to-fill vacancy rates were much higher among the smallest companies. As a percentage of employees the rate for companies with up to 4 employees was 8.6 per cent and for companies with 5-24 employees it was 1.6 per cent. In terms of occupations, the greatest number of hard-to-fill vacancies were for laboratory technicians and laboratory scientists, followed by sales and marketing staff, process or product design engineers and research and development staff.

Given the size of the Life Science sector, care needs to be taken in interpreting the hard-to-fill vacancy results¹¹. Nevertheless, they are consistent with the recent CBI report, '*SET for growth*'¹², which highlights a shortage of intermediate technician level skills in the broader field of Science, Engineering and Technology (SET) industries. The qualitative research will allow further depth of analysis around Life Science issues.

5.3 Skill shortage vacancies

A skill shortage vacancy is a specific type of hard-to-fill vacancy that occurs when an employer can't find applicants with the skills, qualifications or experience required. Skill shortages occur when an employer is having difficulty recruiting new staff.

Vacancies can also be hard-to-fill because of a lack of applicants, or because the applicants are considered by employers to lack the appropriate motivation or attitude – these are not skill shortages.

Following SESS 2010, the Life Sciences survey uses a robust set of core questions to identify which hard-to-fill vacancies can be counted as skills shortages. The 2010 SESS report provides a diagram on page 13, the '[skill shortage vacancies route map](#)', which shows how these questions are applied to arrive at an accurate figure for skills shortages.

¹¹ The Life Sciences survey project team will look at these results in more depth during the follow up qualitative research

¹² Business priorities for science, engineering and technology, August 2010

In response to one of these questions, 30 per cent of Life Science companies cited the quality of candidates rather than the lack of applicants as the main reason for having hard-to-fill vacancies. For the vast majority of respondents who had difficulty filling posts due to the quality of applicants, the main problem was lack of skills and to a slightly lesser extent, lack of work experience (Table 10).

| Table 10: Candidates seen as lacking | % of Respondents |
|---|------------------|
| The skills you look for | 85% |
| The work experience that you require | 70% |
| Perception of poor attitudes and motivation etc | 30% |
| The qualifications you look for | 17% |

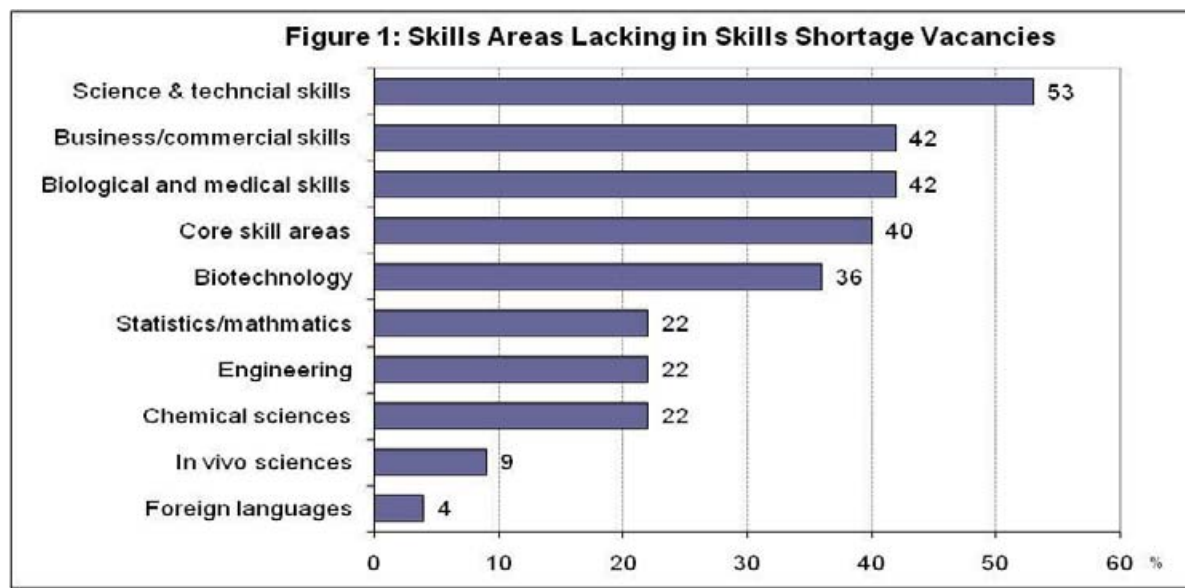
Life Sciences Skills Research Report, TNS 2010: Base, all who had issues with the quality of candidates (53)

Problems with applicants' qualifications were far less common than finding people with the right skills and experience. Candidates' soft skills¹³ and employers' perceptions of candidates' personal attributes such as attitude and motivation were also mentioned twice as often as lack of qualifications. Issues around qualifications are discussed later in this report, as part of the consideration of graduate qualifications and disciplines.

The proportion of Life Sciences vacancies that were skills shortages (20 per cent) was higher than the SESS 2010 rate (18 per cent) and higher than the rate for NESS (16 per cent). Life Sciences also has a much higher rate of skill shortage vacancies as a proportion of all hard-to-fill vacancies - 89 per cent for Life Sciences compared to 52 per cent for SESS 2010 and 74 per cent for NESS 2009¹⁴. This is consistent with the priority given by Life Science companies to 'attracting appropriately skilled staff'.

5.4 Skill areas in skills shortage vacancies

This section looks in more detail at the skill areas that employers find it hard to recruit skilled workers for. The main areas of skills shortage are highlighted in Figure 1 below. This shows the percentage of companies that cited each skill area as lacking in candidates for hard to fill vacancies.



Life Sciences Skills Research Report, TNS 2010: Base, all with skill shortage vacancies (54)

¹³ Softer core skills include problem-solving, team working, planning & organising and oral communication

¹⁴ Note that results from NESS on skills shortages are not strictly comparable

The main areas of skills shortage highlighted were:

- ♦ General science or technical skills, such as laboratory work and research and development (53 per cent)
- ♦ General business and commercial skills such as finance & marketing (42 per cent)
- ♦ Biological and medical skills (42 per cent)
- ♦ Core skill areas (40 per cent)

These figures reflect the technical nature of much of the work in the Life Science sector.

‘Core skill areas’ refers to transferable skills such as planning and organising, customer handling, problem solving, team working and communication skills. These are likely to be mostly associated with new graduates and entry level posts.

Core skills are a key theme for discussion and further analysis in the qualitative research and employer engagement activity.

The next section looks at the occupations that employers are currently finding hard-to-fill and these provide more detail on the types of jobs that respondents have difficulty recruiting for under the general science and business categories.

5.5 Job titles for hard-to-fill vacancies

Table 11 provides a summary of the job titles for hard-to-fill vacancies that employers were finding it difficult to recruit people for at the time of the survey. Most respondents mentioned only one job title but some had between two and six different job titles. Some 38 separate job titles were mentioned overall. These have been grouped into the most common occupations and summarised in Table 10 in order of priority based on the number of times each job title was mentioned. (A full list of job titles for current hard-to-fill vacancies is also included in Appendix 2).

| Table 11: Summary of Hard-to-fill Vacancy Job Titles |
|--|
| Senior Scientist/Managers |
| Technicians |
| Science Specialists |
| Quality Assurance & Regulatory Staff |
| Business Development Managers |
| Engineers |
| Finance and Admin Staff |
| Research Staff |

Life Sciences Skills Research Report, TNS 2010: Base, all with hard-to-fill vacancies

Senior scientists and technicians were mentioned more often than other hard-to-fill job titles and just over one fifth of all job titles mentioned were for business/commercial posts.

The findings are broadly consistent with the SEMTA/Cogent results for the Life Sciences sector across the UK, which found that hard-to-fill vacancies were more likely for professional, associate professional and technical occupations (41 per cent in each case).

Table 11 provides a simple snapshot of the hard-to-fill vacancies at the time of the survey. It is important to note that this is just an indicative list. More systematic vacancy information would be annualised to take account of recruitment peaks and troughs throughout the year and would factor in turnover and retention rates.

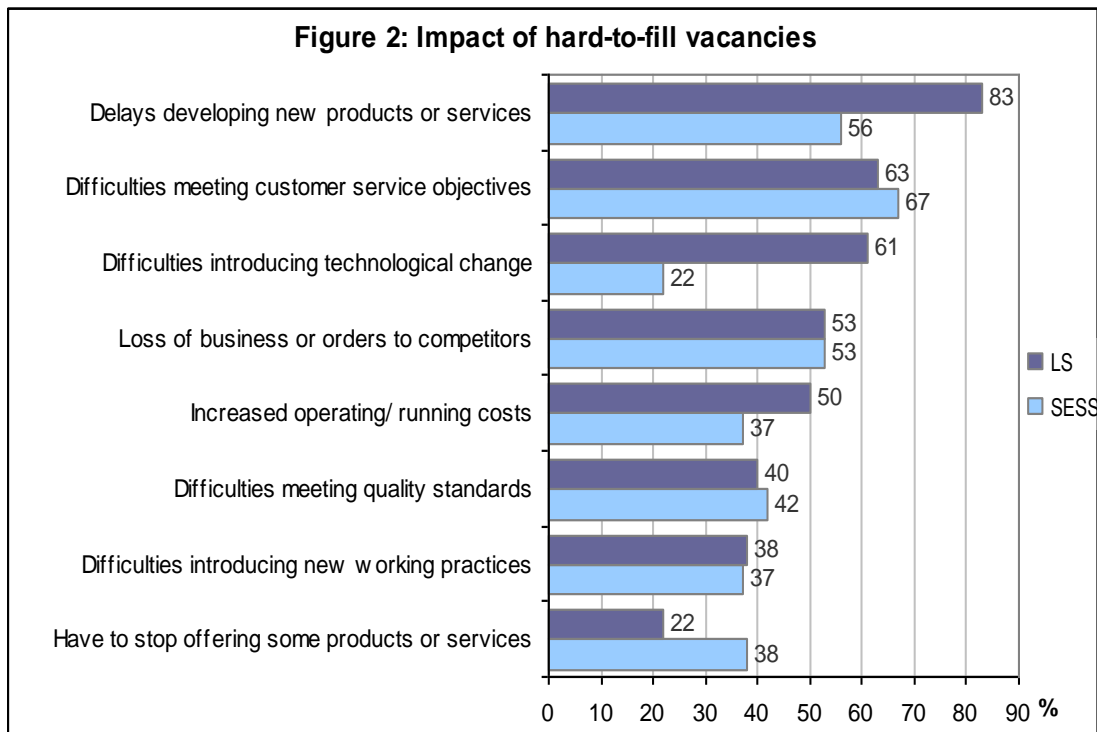
Employers in the Life Science sector were also asked to identify which job titles and occupations they expected to recruit in the next two to three years. It is important that employers' expectations in this area are captured. It is also important to recognise that such expectations are subject to revision in a competitive market environment.

5.6 Impact of hard-to-fill vacancies

Almost three quarters of respondents (74 per cent) stated that hard-to-fill vacancies had an impact on their organisation; for almost half of these (47 per cent) there was a major impact, with 26 per cent experiencing a minor impact.

In terms of sub-sectors, Clinical Research Organisations were more likely to report any impact (91 per cent) and also more likely to report a major impact (64 per cent). Larger organisations were more likely to cite a minor impact, but no more likely to report a major impact.

Respondents were also asked to say in what way hard-to-fill vacancies had made an impact on their organisation. Figure 2 below shows the percentage of companies that cited each impact and compares the results for Life Sciences with the SESS 2010 results.



Life Sciences Skills Research/SESS 2010: Base: All who said having hard-to-fill vacancies has an impact (115)

Hard-to-fill vacancies appear to have had a significant impact on the sector overall, holding back the development of new products and services, creating barriers to change and preventing many business from meeting their customer objectives.

The vast majority of Life Science organisations identified ‘delays in developing new products or services’ as an impact, 83 per cent compared to only 56 per cent for SESS 2010. A much greater proportion of Life Science organisations also cited ‘difficulties introducing technological change’ compared to SESS 2010, reflecting the critical role of advanced technology in Life Sciences.

However, the Life Science sector was much closer to SESS 2010 in relation to the impact on meeting customer service objectives which was the top impact for SESS 2010 and the second most important impact for Life Sciences.

5.7 Summary of key findings for vacancies, hard-to-fill vacancies and skills shortages

- ◆ Around two in every five Life Sciences organisations that responded to the survey had a vacancy – an overall total of 270 vacancies, equivalent to 3.1 per cent of employees.
- ◆ Less than a quarter (23 per cent) of life science vacancies were described as hard-to-fill, compared to a rate of 35 per cent for SESS 2010.
- ◆ Hard-to-fill vacancy rates were much higher among the smallest companies. As a percentage of employees the rate for companies with up to 4 employees was 8.6 per cent and for companies with 5-24 employees it was 1.6 per cent.
- ◆ In terms of occupations, the greatest number of hard-to-fill vacancies were for laboratory technicians and laboratory scientists, followed by sales and marketing staff, process or product design engineers and research and development staff.
- ◆ The Life Sciences sector has a much higher rate of skill shortage vacancies as a proportion of all hard-to-fill vacancies - 89 per cent for Life Sciences compared to 52 per cent for SESS.
- ◆ A significant proportion of Life Sciences employers (40 per cent) reported having softer core skills as lacking where skills shortages exist.
- ◆ Problems with qualifications were far less common for Life Sciences companies than finding people with the right skills and experience.
- ◆ Around three in every four respondents reported that hard-to-fill vacancies caused problems for their business including delays in developing new products or services, difficulties meeting customer service objectives and difficulties introducing technological change.

6. SKILLS GAPS IN THE WORKFORCE

In general, skills gaps are more common than skills shortages, but their impact on business performance is less severe. Many skill gaps are transitory – they are the result of employees being fairly new to the job. This can be through labour market churn – people changing jobs or as a natural part of the transition to employment, e.g. young people entering the labour market.

According to the SESS 2010 around two thirds of skill gaps (across the whole Scottish economy) are ‘transitory’ and likely to close as employees gain more experience or complete their training.

It is also worth pointing out that some skills gaps also occur as a result of developments that can be viewed as positive, e.g. when an employer wants to develop a new product or service, introduce a new technology or move into new markets. This emphasises that the demand for skills in the workplace is essentially a derived-demand based on company growth strategies for products and services.

6.1 Staff proficiency

Skills gaps are based on employers’ perceptions of staff proficiency – that is, the proportion of their staff that they consider not fully proficient. This is a very high standard and is linked to competence in the job.

On average, five in every six employees in the sector were considered by their employer to be fully proficient, with 37% of organisations stating that 100 per cent of their staff were fully proficient. The proportion of companies that considered their staff to be fully proficient is shown by sub sector in table 12¹⁵.

| | Ag/Vet/Enviro | CRO | Human Therapeutics | Manufacturing | Medical Devices & Diagnostics | Specialist Services & Suppliers | Total |
|----------------------|---------------|-----|--------------------|---------------|-------------------------------|---------------------------------|-------|
| Not Fully Proficient | 62% | 82% | 56% | 82% | 57% | 48% | 63% |
| Fully Proficient | 38% | 18% | 44% | 18% | 43% | 52% | 37% |

Life Science companies also had a high level of confidence in their workforce. Almost all Life Sciences companies (99 per cent) rated their employee skill levels as good – almost two-thirds (61 per cent) believed they were *very good*.

For Life Sciences companies who had a skills gap, 21 per cent said that these skill gaps had a *major impact* on their organisation, although for the majority (66 per cent) the impact was minor.

6.2 Future workforce skills

The largest skills area in which a gap was reported was general commercial or business skills with nearly three quarters indicating that their employees needed to develop skills in this area (Table 13). Almost a half said general science or technical skills (49 per cent) were needed whilst 40 per cent said there was a need for greater core skills among employees.

More specialised skills were also highlighted. Biological and medical science was mentioned by a third of organisations, biotechnology and engineering by more than a quarter and statistics/mathematics were mentioned by one fifth.

¹⁵ The measure for estimating skills gaps differed slightly from SESS 2010. Life Sciences asked for the percentage of staff who were fully proficient whereas SESS asks for the numbers.

Table 13: Skills Required by Employees in the next 2/3 Years

| | |
|---------------------------------------|-----|
| General business or commercial skills | 73% |
| General science or technical skills | 49% |
| Core skills areas | 40% |
| Biological and medical science | 33% |
| Biotechnology | 27% |
| Engineering | 27% |
| Statistics/mathematics | 20% |
| Chemical sciences | 13% |
| In vivo sciences | 8% |

Life Sciences Skills Research Report, TNS 2010: Base all respondents (156)

Over four-fifths of companies (84 per cent) mentioned at least one *specific* science/technical skill that their company would need to develop among its existing workforce in the next 2/3 years in order to achieve its business objectives.

Where skills gaps existed, core skills such as planning and organising, customer handling, problem solving and team working were mentioned by two-fifths of Life Science organisations.

The latest labour market report from SEMTA¹⁶, the Skills Sector Council for Science, Engineering and Manufacturing Technologies, highlights a similar set of skill gaps across the Life Sciences sector in the UK:

- ♦ Corporate managers (19 per cent)
- ♦ Scientific researchers (15 per cent)
- ♦ Sales representatives (7 per cent)
- ♦ Science and engineering technicians (6 per cent)
- ♦ Chemists (6 per cent)
- ♦ Customer care (6 per cent)
- ♦ Laboratory technicians (6 per cent)

¹⁶ Labour Market Survey 2009: Life sciences, Pharmaceuticals, Biotechnology and Medical Devices Prepared BMG Research for SEMTA and Cogent SSCs, March 2010

6.3 Summary of key findings for skills gaps

- ♦ Many skill gaps are transitory – they are the result of employees being fairly new to the job and are likely to close as employees gain more experience or complete their initial training or induction.
- ♦ For the Life Sciences sector, over one in three organisations (37 per cent) considered all their staff to be fully proficient. Overall, five in every six employees in the sector were considered fully proficient by their employer.
- ♦ The proportion of Life Science employees with a skills gap (12 per cent) was twice the rate for SESS 2010 which reported that skills gaps affected 6 per cent of employees in the wider economy.
- ♦ The largest skills area in which a gap was reported was general business or commercial skills (73 per cent) followed by general science and technical skills (49 per cent). Biological and medical science was also mentioned by a third of organisations, biotechnology and engineering by more than a quarter and statistics/mathematics were mentioned by one fifth.
- ♦ 84 per cent of Life Science companies mentioned at least one *specific* science/technical skill that their company would need to develop among its existing workforce in the next 2/3 years in order to achieve its business objectives.

7. FUTURE SKILL NEEDS

7.1 Skill areas for future skill needs

There was a broad correspondence between the skills areas highlighted in the vacancy section and the skill areas that employers said they would be looking to fill in the next 2/3 years. The main areas featured are general scientific/technical skills, general business/commercial skills and biological and medical science featuring prominently.

This is illustrated in Table 13 below. The top four areas of future skill needs are the same as the top four areas of skills shortage vacancies. However business and commercial skills were mentioned more often than science and technical skills in terms of the skill areas that employers think they will need to recruit for in the future.

| | Future Skill Needs | Current SSVs |
|---------------------------------------|--------------------|--------------|
| General business or commercial skills | 74% | 42% |
| General science or technical skills | 72% | 53% |
| Biological and medical science | 47% | 42% |
| Core skills areas | 43% | 40% |

Life Sciences Skills Research Report, TNS 2010: Base all respondents (156)

Other key skill areas mentioned in the full list of skill areas for future recruitment were engineering, statistics and mathematics, chemical sciences and *in vivo* sciences.

The following section looks in more detail at the specific job titles that employers think they will need to recruit in the next 2/3 years and at the potential scale of future skills demand.

7.2 Job titles and number of posts required

A key aim of the Life Science research was to get detailed information on the demand for specific occupations within the sector, therefore employers were asked what job titles they expected to recruit for over the next 2/3 years to in order to meet their business objectives. Respondents also estimated the number of posts they were likely to require for each job title (including replacement demand and new jobs as a result of growth).

A total of 1,440 posts were recorded, including 1,136 science/technical posts and 304 business/commercial posts.

The future job title questions were open rather than pre-coded and allowed employers to give their own job descriptions so care needs to be taken in interpreting this data because of the diversity of ways that job roles are described. The future job titles were coded using Atlas.ti (qualitative research software).

It is important that employers' expectations in this area are captured. It is also important to recognise that such expectations are subject to revision in a competitive market environment.

7.3 The top ten future job titles

Table 14 shows the top ten job titles that employers expect to recruit in the next few years. This provides a simply snapshot of the job titles that are likely to be most popular according to employers' perception of what they are likely to need.

| Job Title | Number of Posts |
|--|-----------------|
| Research Assistants/Associates | 237 |
| Manufacturing Production Operatives | 154 |
| Scientists and Science Assistants | 125 |
| Sales and Marketing Staff | 112 |
| Engineers | 87 |
| Science Specialist | 71 |
| Research Scientists | 64 |
| Sales and Marketing Managers | 61 |
| Science Managers and Senior Scientists | 49 |
| Production and Process Technicians | 48 |

Life Sciences Skills Research Report, TNS 2010: Base all respondents (156)

7.4 Estimated number of scientific/technical posts required in the next 2/3 years

The job titles that employers expect to recruit in the next 2/3 years includes 1,136 posts for science/technical job titles and 386 for business/commercial job titles. Table 16 shows the total number of jobs required for each job title category under general scientific/technical skills.

| Job Title | Number of Posts |
|--|-----------------|
| Research Assistants/Associates | 237 |
| Manufacturing Production Operatives | 154 |
| Scientists and Science Assistants | 125 |
| Engineers | 87 |
| Science Specialist | 71 |
| Research Scientists | 64 |
| Science Managers and Senior Scientists | 49 |
| Production and Process Technicians | 48 |
| Project Managers Science and Technical | 47 |
| Quality Control/Compliance | 43 |
| Lab Technicians | 41 |
| Chemist/Pharmacy | 35 |
| Animal Technicians | 35 |
| Analysts | 18 |
| Senior Technicians and Managers | 15 |
| Research Managers and Directors | 14 |
| Biology/Microbiology | 8 |
| Statisticians | 7 |

Life Sciences Skills Research Report, TNS 2010: Base all respondents (156)

Research assistants/associates stands out in the above list because this category includes 200 clinical research associates. There were also 38 other posts which included a variety of very specific roles, e.g. value stream leader, territory manager, nursing advisor, maintenance staff, investigation contract specialists.

Many of the job titles that employers expect to recruit for in the next few years are also mentioned in the hard-to-fill vacancies list of job title – e.g. senior scientists, technicians, engineers and a variety of specialist science roles.

In terms of the scale of posts required for future science/technical skill areas, research assistants, operatives and scientists/science assistants provide the greatest volume of requirements. The results suggest that there is also likely to be significant demand for engineers, science specialists and science managers/senior scientists in coming years.

7.5 Estimated number of business/commercial posts required in the next 2/3 years

Sales and marketing staff were the job titles most frequently mentioned in relation to business/commercial skills, followed by IT/communications staff and administrators (Table 17).

| Table 17: Business/commercial job titles & no of posts required in next 2/3 years | |
|--|------------|
| Sales & Marketing | 199 |
| IT/Communications Staff | 52 |
| Administrator/Receptionist/PA | 38 |
| Business Development Manager/Director | 27 |
| Business/Commercial Development Staff | 24 |
| Customer Service | 18 |
| Finance Staff | 15 |
| CEO/Board Members/General Managers | 13 |
| Total Business/Commercial | 386 |

Life Sciences Skills Research Report, TNS 2010: Base all respondents (156)

A requirement for business/commercial skills alongside science and technical skills has been a prominent feature of the results. Some posts, e.g. sales and marketing manager, are among the most critical hard-to-fill occupations.

The results for future job titles are also consistent with the CBI/EDI STEM report. More than half of all businesses in the CBI survey predicted these challenges will increase. Twice as many employers expect difficulties recruiting technicians and apprentices in the next three years than they do currently.

According to the CBI survey almost one third of businesses are anticipating difficulty recruiting STEM graduates and this is particularly acute for businesses in the science, high-tech and IT sectors.

7.6 The skills pipeline

The vast majority of the skills that will be required to meet future demand by the industry will come from people already employed in the Life Science Sector. There will also be a need to attract new people to the sector to meet the challenges of emerging new technologies and to cover replacement demand.

Estimating the demand for future skills requirements will need to take this flow into account. The Life Sciences Sector Skills Assessments provide information on intake and supply of scientists and graduates that can be used alongside the survey results to estimate future demand.

7.7 Summary of future skills needs

- ◆ Employers in the Life Science sector were also asked to identify which job titles and occupations they expected to recruit in the next two to three years. It is important that employers' expectations in this area are captured. It is also important to recognise that such expectations are subject to revision in a competitive market environment.
- ◆ General business/commercial skills, general scientific/technical skills and biological and medical science all featured strongly in the skills that employers said they would need over the next two to three years. Other specific science/technical skill areas mentioned were statistics and mathematics, chemical sciences, and in vivo sciences.
- ◆ Many of the job titles that employers expect to recruit for in the next few years are also mentioned in the hard-to-fill vacancies list of job title – e.g. senior scientists, lab technicians, engineers and a variety of specialist science roles.
- ◆ The top ten job titles that employers expect to recruit for in the next 2/3 years were:
 - ~ Research Assistants/Associates
 - ~ Manufacturing Production Operators
 - ~ Scientists and Science Assistants
 - ~ Sales and Marketing Staff
 - ~ Engineers
 - ~ Science Specialist
 - ~ Research Scientists
 - ~ Sales and Marketing Managers
 - ~ Science Managers and Senior Scientists
 - ~ Production and Process Technicians

8. GRADUATES

8.1 Graduate recruitment

The Life Sciences questionnaire included a dedicated section on graduates, given their importance to the sector and the current interest in graduate employment rates.

Over half of all Life Sciences organisations had recruited at least one graduate in the 12 months prior to the survey. The number of graduates recruited was, unsurprisingly, linked to company size. Amongst those organisations with 1-4 employees, the average number of graduates recruited in the past 12 months was 0.45. This increased significantly to 1.13 amongst those with 5-24 employees, to 3.18 amongst those with 25 or more.

Just over half (53 per cent) of companies recruited graduates via *universities or higher education bodies*, making this the most commonly used recruitment path. Some 43 per cent used *recruitment agencies*, whilst just over one third (36 per cent) used *TalentScotland*.

8.2 Factors considered by employers when recruiting graduates

The most important factors considered by respondents when recruiting graduates were focused on soft skills and experience (positive attitude, employability and relevant work experience). For over three quarters of Life Science companies the graduate candidate's degree result and degree subject was also important (Table 18).

| Table 18: Most important factor in recruiting graduates | % |
|---|----|
| Positive attitude | 94 |
| Employability skills (e.g. team-working, problem solving) | 92 |
| Relevant work experience/industrial placement | 82 |
| Degree result (e.g. 1st class, 2:1, 2:2 etc) | 79 |
| Degree subject | 79 |
| University attended | 25 |
| Foreign language capability | 16 |
| Don't recruit now/have never recruited graduates | 6 |
| Personality | 3 |

Life Sciences Skills Research Report, TNS 2010: Base all respondents (156)

A much smaller proportion of employers mentioned the specific university attended by graduate candidates and a significant minority mentioned foreign language capability in an unprompted response.

8.3 Skills lacking in graduates

Nearly two thirds of Life Science companies are content with the quality of graduates coming into the sector. Of those who had some concerns nearly a third said that graduates lacked the work experience they were looking for and a significant proportion felt they were lacking practical skills and business skills, as well as soft skills (Table 18).

| | |
|---|----|
| Relevant work experience | 31 |
| Positive attitude to work | 16 |
| Practical skills | 16 |
| Business and customer awareness | 12 |
| Teamworking skills | 9 |
| Knowledge about their chosen job/career | 8 |
| Graduates expectations are too high | 7 |
| Basic literacy and use of English | 6 |
| Self-management abilities | 3 |
| Basic numeracy skills | 3 |
| Communication skills | 2 |
| Problem solving skills | 1 |

Life Sciences Skills Research Report, TNS 2010: Base all respondents (156)

8.4 Graduate qualifications and disciplines required

When asked about the main qualifications they look for when recruiting graduates, almost 70 per cent of Life Science companies cited a relevant first degree/BSc. Other important qualifications include PhD and MSc highlighting the key role of graduates and post-graduates in the sector.

Respondents were also asked which degree disciplines they required when recruiting graduates. A wide variety of disciplines were mentioned. Table 19 shows those which were cited at least five times or more.

| | |
|--|-----|
| Chemistry | 46% |
| Biology/micro & molecular | 44% |
| Engineering | 28% |
| General Science/Life Sciences Background | 21% |
| Business/Marketing /Finance | 19% |
| Physical Sciences | 10% |
| IT/Software engineering | 8% |
| Health Sciences | 8% |
| Pharmacy | 8% |
| Maths and Statistics | 7% |
| Biotechnology | 6% |
| Immunology | 6% |
| Environmental Sciences | 4% |

Life Sciences Skills Research Report, TNS 2010: Base all respondents (156)

8.5 Summary of findings for graduate qualifications and disciplines

- ♦ Over half of all Life Sciences companies had recruited at least one graduate in the 12 months prior to the survey.
- ♦ The three most important factors considered by respondents when recruiting graduates were focused on soft skills and experience (positive attitude, employability and relevant work experience).
- ♦ Nearly a third of respondents said that graduates lacked the work experience they were looking for and a significant proportion felt they were lacking practical skills and business skills, as well as soft skills.
- ♦ When asked about the main qualifications they look for when recruiting graduates, almost 70 per cent of companies in the Life Sciences survey cited a *relevant first degree/BSc*.
- ♦ The top three disciplines that respondents said they required when recruiting graduates were: Chemistry; Biology (including micro & molecular) and Engineering.

9. TRAINING AND DEVELOPMENT

9.1 Training activity

The vast majority of Life Science organisations (85 per cent) had funded or arranged training for their employees in the past 12 months, including on and off the job training.

Life Sciences organisations had organised an average of 6.1 days off-the job training for each member of staff in the last 12 months, and 14.3 days on-the-job training. These average figures conceal a small number of organisations providing a large amount of training.

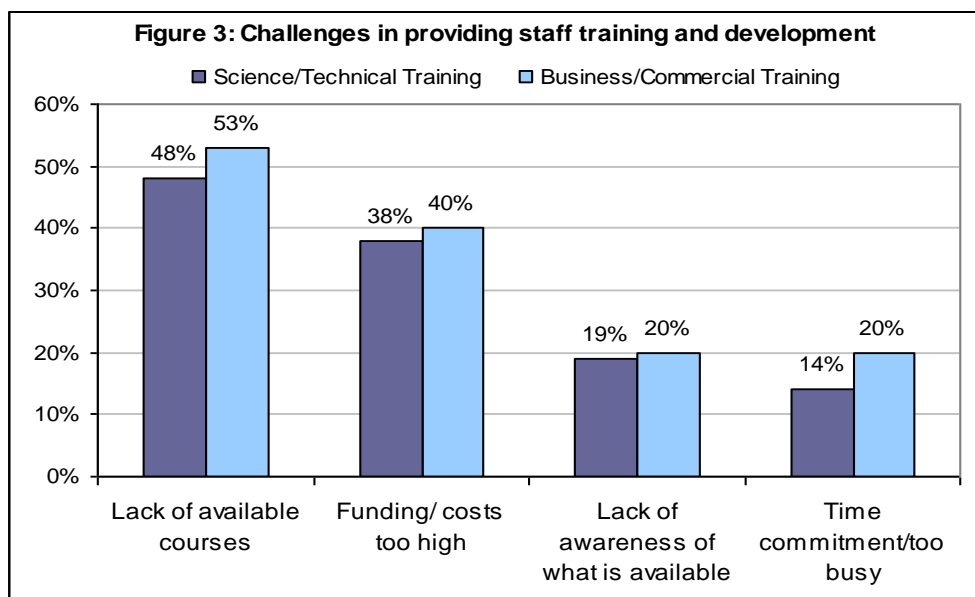
The provision of training was clearly linked to company size. Some 68 per cent of organisations with 1-4 employees had funded or arranged training in the past 12 months, rising to 84 per cent of companies with 5-24 employees and 98 per cent of those with 25 or more employees.

Companies in the Ag/Vet/Environ sector group and Clinical Research Organisations (CRO) companies arranged the greatest number of on-the-job training days whereas manufacturing companies organised the least. Human Therapeutics and Medical Devices and Diagnostics sub-sectors were slightly less likely to have funded or arranged training than other sub-sectors.

The main skill areas that Life Sciences companies had provided training in were broadly in line with earlier reported findings on skill gaps and shortages. For example, most organisations (80 per cent) had organised training on general business or commercial skills, with almost two thirds (64 per cent) having done so for general science or technical skills.

9.2 Challenges in providing staff training

Just over one fifth of respondents (22 per cent) said they had faced particular challenges in providing staff training and development. Figure 3 shows the percentage of companies that cited particular challenges for science and technical training and for business and commercial training. The top two challenges in both areas were lack of available courses and funding constraints. However, care needs to be taken in interpreting these figures because the bases are small.



Life Sciences Skills Research Report, TNS 2010: Base those who said it was difficult to source science/technical training (21) and those who said it was difficult to source business commercial training (15)

Respondents were also asked if they would have provided more training if they had been able to do so, which was a new question in the SESS2010 survey. Some 64 per cent of organisations in the life sciences survey said they would have provided more training if they had been able to do so, compared to 48 per cent of employers in the SESS 2010 survey.

The main barriers to provide more training in life sciences were also similar to SESS 2010 with 74 per cent of respondents saying that funding/costs were too high and 54 per cent citing time commitments/too busy.

More than three quarters of the training provided off the job was sourced from private sector providers or external consultants. Well over half (58 per cent) was provided by trade or industry associations.

The vast majority of organisations (72 per cent) indicated that they did not participate in any publicly funded programmes. *Modern Apprenticeships* was the scheme most likely to be used (by 12 per cent of respondents), with participation levels of less than 10 per cent recorded for *Skill Seekers*, *New Deal*, *Training For Work* and *Get Ready to Work*.

9.3 Apprenticeships

Life Science companies were asked what three factors would most encourage them to become more involved in providing apprenticeships. The top three factors mentioned were:

- ♦ Incentive payments and/or wage subsidies
- ♦ More suitably qualified young people
- ♦ Qualifications more relevant to business needs

The CBI education and skills report¹⁷ highlights the importance of ensuring that support for businesses that offer apprenticeships is effective and accessible, particularly for small and medium sized enterprises (SMEs) and for large organisations that are willing to train more apprentices than they need for the benefit of SMEs in their sector.

The Life Sciences survey also highlights the potential for collaborative solutions, with a small proportion of companies (26 per cent) saying they would be encouraged to get more involved in apprenticeships through the 'ability to share apprentices with other firms in same sector, supply-chain or location'.

The proportion of Life Science companies who said that they would be encouraged to get more involved in apprenticeships through the ability to share apprentices was higher in the 'Medical and Diagnostics' and 'Specialist Services and Suppliers' sub-sectors (around one third in each).

Larger organisations (those with 50 plus employees) were also more likely to be interested in collaborating with their peer organisations to provide apprenticeships - 38 per cent compared to an average of 24 per cent for those with less than 25 employees.

These results can help to illustrate how LiSAB aims to use the survey results pro-actively to help develop innovative employer-led solutions to the key challenges facing the sector. The interviews and discussions with companies will use the overall research results, alongside that company's specific response, to discuss potential collaborative solutions.

¹⁷ CBI Ready to Grow: Business Priorities for Education and Skills, Education and Skills Survey , May 2010

9.4 Summary of findings for staff training and development

- ♦ The vast majority of Life Science organisations (85 per cent) had funded or arranged training for their employees in the past 12 months.
- ♦ The provision of training was clearly linked to company size. Some 68 per cent of organisations with 1-4 employees had funded or arranged training in the past 12 months, rising to 84 per cent of companies with 5-24 employees and 98 per cent of those with 25 or more employees.
- ♦ Companies in the Ag/Vet/Environ sector group and CRO companies arranged the greatest number of on-the-job training days whereas manufacturing companies organised the least.
- ♦ Just over one fifth of respondents (22 per cent) said they had faced particular challenges in providing staff training and development.
- ♦ The top three challenges mentioned in accessing training were: lack of available courses; funding/costs too high; and lack of awareness of what was available.
- ♦ The top three factors that most encourage employers to become more involved in providing apprenticeships were: incentive payments and/or wage subsidies; more suitably qualified young people coming forward; and qualifications that were more relevant to business needs.
- ♦ Highlighting the potential for collaborative solutions, some 8 per cent of Life Science companies said they would be encouraged to get more involved in apprenticeships through the 'ability to share apprentices with other firms'.

10. EFFECTIVE USE OF SKILLS

Skills contribute to economic growth both through increased productivity and higher employment levels, when utilised effectively¹⁸.

Life Science companies use a range of practices to help ensure effective use of the skills, knowledge, and experience of their employees. The most common methods mentioned were training & development programmes (31 per cent) and performance management frameworks (24 per cent).

Table 21: How companies ensure effective use of skills

| | |
|--|-----|
| Training and development | 31% |
| Performance management framework : | 24% |
| Appraisals system | 10% |
| Line management support | 9% |
| Finding the right job to suit peoples skills/abilities | 8% |
| Others | 5% |
| Communication and team working | 4% |
| Mentoring | 3% |
| Incentive schemes : | 2% |

Life Sciences Skills Research Report, TNS 2010: Base all respondents (156)

The vast majority of Life Science companies have implemented some kind of formal skills utilisation practice. However, some key practices (such as incentive/performance pay, profit sharing, formal surveys and quality circles) were less widespread, especially among smaller Life Science organisations.

Table 22: Skills utilisation practices used by respondents

| | |
|---|-----|
| Arrangements for direct involvement of employees in decision making and problem solving | 90% |
| Flexibility for employees to decide how their work is organised | 88% |
| Formal staff performance review | 79% |
| Formal dispute resolution procedures | 78% |
| Explicit policy on equality/diversity in the workplace | 75% |
| Use of part-time staff | 71% |
| Use of temporary labour/contract staff | 59% |
| Incentive or performance related pay | 57% |
| Profit sharing/share options/gain sharing for employees | 49% |
| Formal survey of employees views or opinions | 47% |
| Quality circles | 38% |

Life Sciences Skills Research Report, TNS 2010: Base all respondents (156)

¹⁸ Skills for Growth: Analytic Paper, BIS 2009

The main benefits reported by Life Science companies as a result of skills utilisation practices were:

- ♦ Increased motivation/morale (39 per cent),
- ♦ Improved business performance (34 per cent),
- ♦ Increased productivity (24 per cent), and
- ♦ Increased employee commitment (23 per cent).

The main barriers that Life Science companies faced in seeking to ensure effective use of skills were:

- ♦ Time investment (20 per cent),
- ♦ Financial investment/cost (18 per cent),
- ♦ Lack of support/e.g. training, guidance on using (12 per cent), and
- ♦ Lack of suitable training (11 per cent).

10.1 Summary of findings for effective use of skills

- ♦ The most common methods used by respondents to ensure effective use of skills were training & development programmes (31 per cent) and performance management frameworks (24 per cent).
- ♦ The main benefits reported by Life Science companies as a result of skills utilisation practices were increased motivation/morale (39 per cent), improved business performance (34 per cent) increased productivity (24 per cent) and increased employee commitment (23 per cent).
- ♦ The main barriers that Life Science companies said they faced in seeking to ensure effective use of skills were: time investment (20 per cent); financial investment/cost (18 per cent); and lack of support/e.g. training and guidance on implementing skills utilisation practices (12 per cent).

11. QUALITATIVE RESEARCH AND EMPLOYER ENGAGEMENT: THE NEXT STEPS

11.1 Integrated qualitative research

The telephone survey reported on here is part of an innovative research model which integrates follow-up qualitative interviews with respondents to get behind the issues and employer engagement activity to involve the industry in defining priorities and solutions from the research.

The qualitative element of the Life Sciences Research will help to achieve the depth and quality of information required by LiSAB partners. It will drill down into the survey results to fully explore the key issues raised by respondents.

As well as looking at the issues from the survey in more depth, the qualitative element of the research will engage with respondents to explore their views on how these issues can best be addressed. It will look at examples of best practice and innovation in the sector and involve respondents in developing solutions to some of the key issues raised by the industry.

To balance this deep knowledge of the sector with an objective approach, external consultants have been commissioned to construct the sampling frame, prepare a topic guide and produce a template for collating the qualitative information.

11.2 Arrangements for the qualitative research

The qualitative research is being conducted by SEMTA with the support of LiSAB partners and independent research consultants. The research consultants will provide a robust framework and external verification for the qualitative research, which will enable SEMTA to focus on its employer engagement role.

The qualitative research includes the following main elements:

- ♦ Selection of a representative sample of 30 respondents from the telephone research based on size and sub-sector criteria,
- ♦ Production of a clear and robust topic guide, which picks up on key areas for further exploration from the telephone survey, and
- ♦ Development of a template for collating feedback from the qualitative research which will enable synthesis and analysis of the data in a systematic and measurable way.

11.3 Current initiatives and best practice

Many of the issues raised in the survey are already being addressed by LiSAB partners through initiatives such as the Science Technology Engineering and Mathematics (STEM) Ambassadors scheme, which provides science and engineering role models to work in schools supporting teachers and inspiring more young people to take up science as a career.

The industry itself is also active in addressing the key challenges facing the sector. For example, at a UK level, pharmaceutical companies invest over £1.75 million¹⁹ annually supporting outreach activities in local schools. Employees in pharmaceutical companies also contribute their time engaging with schools as STEM Ambassadors, Business Ambassadors and Industry mentors.

¹⁹ABPI Skills Needs for Biomedical Research 2008, p30





It is important to build on these examples of good practice. SEMTA has a wealth of experience and knowledge of the sector and will be in a position to discuss these types of initiatives in its dialogue with respondents.

11.4 Qualitative research analysis and reporting

The results of the qualitative research and employer engagement activity will be analysed by the SDS LMI team using the Atlas.ti qualitative analysis package. A report outlining the key findings will then be produced by SEMTA working in collaboration with Scottish Enterprise and Skills Development Scotland. This will be designed as a companion document to the quantitative research report.

A collaborative approach to gathering labour market intelligence ensures a common, robust view of sectoral issues in the Life Science sector. The innovative approach adopted also links gathering information on the issues to working with employers to find appropriate solutions.

12. APPENDIX ONE: SUMMARY TABLE

| Table 23: Life Sciences Research 2010 – Comparison with other National Surveys | | | | |
|--|---|--|---|---|
| |  SESS 2008 |  NESS 2009 |  SESS 2010 |  LSES 2010 |
| Vacancies | | | | |
| Number of vacancies | 69,800 | 385,675 | 43,900 | 270 |
| Vacancy Rate (per cent of employees) | 3.1% | 1.7% | 1.9% | 3.1% |
| per cent of workplaces with a vacancy | 18% | 12% | 13% | 38% |
| HtF Vacancies | | | | |
| Number of hard-to-fill vacancies | 34,700 | 85,425 | 15,400 | 61 |
| Hard-to-fill vacancy rate (per cent of employees) | 1.6% | 0.4% | 0.7% | 0.7% |
| Hard-to-fill vacancies as a per cent of all vacancies | 50% | 22% | 35% | 22.6% |
| Skills Shortages | | | | |
| Number of skill shortages | 16,400 | 63,100* | 8,000 | 54 |
| Skill shortage rate (per cent of employees) | <1% | <1%* | <1% | <1% |
| per cent of workplaces with a skill shortage | 5% | 3%* | 3% | 15.4% |
| Skill shortages (per cent of all vacancies) | 24% | 16%* | 18% | 20.0% |
| Skill shortages (per cent of all hard-to-fill vacancies) | 47% | 74%* | 52% | 88.5% |
| Main skills lacking - skill shortages exist | | | | |
| Softer core skills (composite) ²⁰ | 79% | 37%* | 81% | 40% |
| Business-commercial/strategic management skills | 32% | 32%* | 39% | 73% |
| Science-technical skills/technical and practical skills | 54% | 62%* | 60% | 49% |
| Biological and medical science | n/a | n/a | n/a | 33% |
| Skills Gaps | | | | |
| Number of skill gaps - NESS, staff with skill gaps | 178,900 | 1.7m | 139,000 | 54 |
| per cent of employees who are not fully proficient | n/a | 7% | 6% | 16% |
| per cent of workplaces with a skill gap | 20% | 19% | 15% | |
| Training | | | | |
| per cent of workplaces who train | 65% | 68% | 61% | 85% |
| Reasons for not training - staff fully proficient | 40% | * | 46% | 42% |
| Reasons for not training - seen as not necessary | 31% | * | 26% | 33% |
| Skills Utilisation | | | | |
| Barriers to effective use of the employees skills: | | | | |
| No support/guidance on how to implement | * | * | * | 34.6% |
| Lack of efficient training | * | * | * | 16.7% |
| Attitude of employees | * | * | * | 15.4% |

* Note: Some information is not directly comparable due to differences in definitions and questionnaire design. This is particularly the case for skills shortages, where the questions employers are asked in England are different to those in Scotland.

SESS is the Scottish Employer Skills Survey
 NESS is the National Employer Skills Survey, which covers England

²⁰ This covers all softer core skills such as customer handling, problem solving, planning & organising, oral communication and team working

13. APPENDIX TWO: LIST OF HARD-TO-FILL VACANCY JOB TITLES

| Table 23 Hard-to-fill Vacancy Job Titles |
|---|
| Academic Research Staff |
| Account Manager |
| Accounting Specialist/Finance Manager |
| Area Sales Manager |
| Assembly Technician |
| Business Development Director |
| Clinical Research Contract Analyst |
| Development Manager |
| Head of Quality Operations |
| Human Factors Engineer |
| Image Analysis/Rendering Scientist |
| International Business Development Manager |
| Investigator Contract Specialist |
| Senior Medical Technologist (Haematology) |
| Laboratory Technicians |
| Manufacturing technician |
| Manufacturing Assistant |
| Medical Director Oncology |
| Medical Director Pharmacology |
| Operational Manager |
| Process Development Chemist |
| Process Product Engineer |
| Production Engineer |
| Production Team Shift Leader |
| Project Manager |
| QC Analyst |
| Quality Assurance & Regulatory Manager |
| Receptionist Administrator |
| Regulatory Compliance Staff |
| Research and development staff |
| Science Manager |
| Animal technician |
| Senior Consultant |
| Senior Quality Assurance Auditor |
| Senior scientist |
| Statistician |
| Database Developer |
| Validation engineer |
| Validation Manager |

Life Sciences Skills Research Report, TNS 2010: Base, all with hard-to-fill vacancies

14. APPENDIX THREE: LIST OF ACADEMIC DISCIPLINES

| Table 24 Disciplines Preferred by Life Science Companies | |
|---|-----|
| Chemistry | 46% |
| Biology/micro & molecular | 44% |
| Engineering | 28% |
| General Science/Life Sciences Background | 21% |
| Business/Marketing /Finance | 19% |
| Physical Sciences | 10% |
| IT/Software engineering | 8% |
| Health Sciences | 8% |
| Pharmacy | 8% |
| Maths and Statistics | 7% |
| Biotechnology | 6% |
| Immunology | 6% |
| Environmental Sciences | 4% |
| Animal Sciences | 3% |
| Food Science | 3% |
| Genetics | 3% |
| Neuroscience | 1% |
| Toxicology | 1% |
| Embryology | 1% |
| Stem cell sciences | 1% |
| Other ²¹ | 15% |

²¹ Responses categorised as 'other' included mainly 'don't know' or references to a general requirement for science disciplines