How To Win The War For Talent?
Case Study In Biotech Related Industries of UK
如何在人才爭奪戰中獲勝？英國生技相關產業個案研究

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ABSTRACT

The recruitment and retention of highly talented scientists has become a significant concern for many companies, especially for those whose principal assets consist of talented employees and their knowledge, rather than the tangible assets of cash, buildings or materials. The competition for good professionals has become more intense as companies have become aware that other companies may be wooing their valuable scientists. This research stemmed from a problem with one of the interviewed firms, which highlighted that it was getting more difficult to attract and retain highly talented scientists with Ph.D. degrees and a few years of experience. Thus, this research considers the scientists’ labor market in the first instance and identifies whether there is a shortage of highly talented scientists in UK. Then secondly the recruitment and retention practices in companies are examined carefully. The author interviewed five companies in biotech related industry: Smith & Nephew, Nycomed - Amersham, Amgen, Murex Biotech, Alkermes Europe. It was found that there is no shortage in the numbers of scientists who are freshly graduated from higher education and with two or three years of working experience in the labor markets. However, as the better and more experienced scientists become fewer in numbers, firms find it difficult to fill senior positions. This phenomenon is partly due to the fact that all the interviewed firms wanted to recruit the ‘best’ postgraduate scientists, with the academic background and social skills to assist in the firms’ growth and to contribute to their success.

Keywords: War for talent, Human Resource Management, Biotech Industry, UK
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1. Introduction

In the research-intensive organizations, the future development and competitiveness mainly depend on the output of the companies’ professionals. This is especially true in the biotech related firms where successful product development determines the company’s survival in the market. Thus, every competitor is looking for the “best” scientist either from other companies or from the international scientist labor market. And many firms employed highly qualified scientists with at least Ph.D. degrees in science confirm such a condition and said that scientist with good working experiences are getting more and more difficult to recruit and retain. The research therefore, seeks to shed some light upon these issues of recruiting and retaining difficulties by analyzing not only the supply and demand for scientists in UK but also the attracting and retaining features at the company level.

The issue of “War for Talent” has been a long-existing problem starting in the 1980s when the government of UK was first aware of the shortage of scientific professionals in the labor market, and since then this topic has been broadly discussed in IT, management and other professions. Such debates are not confined to the UK, but also common elsewhere such as in the United States. Therefore, the first objective of this study is to review extensively the literature concerning the scientists’ labor market and the areas of its recruitment and retention, to identify whether there is a shortage in the number of scientists or whether there is a problem with their quality which is the main cause of the difficulty in recruiting and retaining them.

After gaining the full picture of the issue, the second objective is to look deeper into the recruitment and retention in the firms interviewed. This research has no pre-set hypothesis; instead it takes an investigative approach to develop an insight into why the interviewed firms are experiencing the two main problems of poor recruitment and retention of highly talented scientists.

Finally, the third objective is to set the empirical data against the body of literature and to examine a few interesting points which emerge from the interview
data. Hopefully, useful and innovative suggestions for recruiting and retaining scientists in research-intensive organizations will then concluded and presented in this research.

2. International Labor Markets for Scientists in UK

2.1 Scientists outflow and inflow of UK

About 1,000 new science graduates went overseas after graduation in 1998 of which 2.5% had first degrees, and between 6 and 10% according to the subjects, at postgraduate level. These proportions have changed little in recent years although the proportions are lower than in the early 1990s when job prospects were not as good in the UK. Their actual reasons for leaving and their destinations are not, however, known (FDS, Annual, 1999). More detail is available about the flows into the United States, and in the mid 1990s, less than 300 UK scientists, both newly-qualified and experienced, entered the United States to work each year; of these about two thirds were expected to stay in the US (Mauhoum, 1998).

Relatively less attention is paid to those coming to work in the UK, or UK nationals returning to the UK, where the UK is a beneficiary of international inflows. For example, a number of companies recruited newly-qualified scientists from continental Europe or beyond, as well as from the pool of foreign nationals who had been studying in the UK, or who were on exchange programmes such as ERASMUS, whose attraction for students is enhanced by their opportunity to refine their English language skills; the UK is seen as the most desirable destination in Europe with 35% of European students choosing, while most of the rest, 63% chose North America as their first choice (Inversum, 1998). There also direct applications by non-UK scientists especially from Europe, and the ‘old commonwealth’ countries.

In the mid, 1990s it was estimated that some 6% of professional staff in UK R&D establishments were non-nationals, the majority of whom were working in the sciences. This number was expected to increase as employers sought to raise their level of scientific expertise and strengthen their international culture (Court & Jagger, 1995). It has been estimated that there were about 4,000 foreign academician
employed in UK universities in the mid 1990s who had qualifications in the bio-sciences or chemistry, the main centers of their employment being Oxbridge and London (Mauhoum, 1998). In the United States which has a long tradition of attracting foreign students and immigrants, nearly half of the post doctoral workers in the sciences were non-nationals, up from one third in the early 1990s, and this dependency on non-US nationals is a cause of concern to policy makers (Pearson, Jagger, & Aston, 1999).

2.2 Opportunity for scientists in UK

There has been a continuing debate about the supposed lack of opportunities for scientists in the UK and whether or not there has been a ‘brain drain’ of scientific high flyers to other countries, particularly, the US (Pearson et al., 1999). Scientists, particularly those involved in research, are one of the few groups that there is a clear international labor market with key scientists known globally through publications, conferences, and collaborative work. The nature and cost of science is such that more of the core research is transcending traditional boundaries as collaboration spans corporate, sectoral, and national borders. As such there is now often a discontinuity between the providers and commercial beneficiaries of scientific research e.g. a US firm might benefit from the expertise of a UK scientist working in an international, publicly-funded consortium based in Switzerland. In the same way inward investment in R &D in the UK capitalises on, and draws off the UK skills base but the production and possibly the main profits may go back to the parent company in for example the US or Japan.

The relative strength of the UK science skills base is evidenced by the regular flow of inward and new investment such as the Welcome Trust’s recent proposed investment to create up to 1,000 new science and technology-based jobs in the Cambridge area. The brain drain is a much talked about topic in relation to science skills, especially at times of economic growth and apparent skill shortages such as the late 1980s, and again more recently. The ‘loss of key scientists’ is often quoted in debates about the funding of higher education and used to emphasise the need to boost investment in facilities and or salaries to retain the best scientists in the UK. There are often examples of individuals who have gone overseas but also many assertions as to
a likely future outflow, and most recently these have appeared again in the press in relation to medical researchers. There has, however, been no serious evidence supporting the notion of a brain drain from the UK or its impact on the UK skills base in the 1990s, while the research that was carried out in the 1980s showed that the then alleged problem was greatly overstated and that there was not a significant brain drain out of the UK.

2.3 Unbalanced labor market across sectors

A review of recruitment difficulties relating to science and technology across Europe showed that few were reported in science, with the main problems relating to IT which is outside the scope of this review. That research did, however, highlight the fact that the relative labor market competitiveness of employers in different sectors was affecting their ability to recruit, with higher education and the public sector in many countries experiencing difficulties because they were unable to offer attractive salaries and working conditions. In many countries higher education was also seen as unresponsive to the needs of industry and the labor market (Pearson & Jagger, 2000).

In the United States a similar picture emerged for much of the 1990s with relatively limited skill shortages in the sciences. There has, however, been strong concern as to the declining student interest in the sciences, the growing dependence on foreign nationals to fill many postgraduate and postdoctoral positions in the universities, and paradoxically the declining employment prospects in academia and pay levels for those who do qualify at postgraduate level in biological sciences and in Mathematics. The continuance of the economic boom in the US means that science is likely to be experiencing more problems, along with most other occupations and sectors. There is, however, concern that complaints about skill shortages there are being overstated (Kuh, 1999). This was also the case in the 1980s.

There is no substantive body of evidence, to support the notion that there is a widespread problem in terms of an inadequate, supply of science skills sought by employers. There are problems for certain employers, especially those who do not offer competitive packages, which in the case of the sciences includes the use of up-to-date equipment may have difficulties recruiting required or needed skills.
Internationally, there is little evidence that the US or other European countries have significant shortages of scientists.

The most frequently quoted problems encountered, however, is the personal qualities of potential recruits. Most firms would prefer their recruits to have better ‘personal’ skills and competencies in areas such as business awareness, project management, team works, and communication skills. Similar concerns were also raised about recruiting non-scientific graduates. There is, however, evidence that some science graduates, especially biologists, have difficulty moving into jobs and careers where they can use their scientific skills and, that they have experienced problems of under-employment and lower relative earnings, with many moving into technician level roles, or areas unrelated to science. This is not a recent trend, but is expected to increase in future years. This is a phenomenon had been highlighted in the past (Pearson, 1995). Such problems are also to be found in other European countries and to some extent in the United States.

3. Interviews in Companies

This section summarizes the results of interviews in five different biotech related firms, Nycomed-Amersham, Amgen, Murex Biotech, Alkerme Europe, and Smith & Nephew. To begin with, the basic information of the five companies is presented and compared to generate a general picture of these companies. Then, detailed interview results are described according to different recruitment and retention methods adopted in each firm. The same headings are used to describe each firm for the convenience of organizing the findings. In the end, comparative conclusions are presented.

3.1 General Information of Companies

Brief nature and characteristics of firms are listed below:

- **Smith & Nephew (S&N)** is a global company that develops and markets advanced and complex medical devices, in orthopedics, endoscopies, and advanced wound management and rehabilitation.
- **Nycomed-Amersham** is a multi-national company in medical diagnostics and in life sciences.
- **Amgen** is the world’s largest independent biotechnology company researching
and manufacturing proteins and molecules as human therapeutics.

- **Murex Biotech** develops, manufactures, and markets in-vitro diagnostic products and was bought into Abbott Diagnostics Division in 1998.
- **Alkermes Europe** is part of Alkermes, which has established itself as one of the world's premier drug delivery companies.

There was at least one interview undertaken in each of the companies, an additional two more interviews were arranged with senior scientists in Smith & Nephew. In total, seven interviews were carried out ranging from one hour to one and half hours in length. The purpose of these interviews was to extend the understanding from the pool of data gathered at S&N and a range of other biotech related firms. Interviews were mostly held with HR managers who had previous experience of recruiting and retaining scientists and highly talented scientists (HTS) in their companies. All the interviews were conducted either at research centers and factories or offices of the branch, mainly located in the southeastern and northeastern parts of England. This meant that much information about the practices and issues were focused on these regions.

All of the firms interviewed are international and global based; and have headquarters either in England or the United States. All the interviews were conducted either in one of their R&D centers or offices in England. The size of these firms varies enormously from the smallest having only one office in England with 15 staff, to global companies with the largest having 70,000 employees internationally. Thus the number of highly talented scientists being recruited annually also ranged variously from one or two, to ten. The basic company information is summarized in the Table 1.

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**Table 1** Summary of basic information in interviewed companies

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<table>
<thead>
<tr>
<th></th>
<th>S&amp;N</th>
<th>Nycomed-Amersham</th>
<th>Amgen</th>
<th>Murex Biotech</th>
<th>Alkermes Europe</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Location</strong></td>
<td>York</td>
<td>Cardiff</td>
<td>Cambridge</td>
<td>Dartford</td>
<td>Cambridge</td>
</tr>
<tr>
<td><strong>Number of employees internationally</strong></td>
<td>7000 (Based in US)</td>
<td>8900 (Based in UK)</td>
<td>6000 (Based in US)</td>
<td>70000 (Part of Abbott Lab in US)</td>
<td>415 (Based in US)</td>
</tr>
<tr>
<td><strong>Size of site interviewed</strong></td>
<td>180</td>
<td>520</td>
<td>300</td>
<td>350</td>
<td>15</td>
</tr>
<tr>
<td><strong>Type of structure at interviewed site</strong></td>
<td>Research Center</td>
<td>Research Center with labs and factories</td>
<td>Purely office</td>
<td>Research Center with labs and factories</td>
<td>Purely office</td>
</tr>
<tr>
<td><em><em>Number of highly-talented scientist (HTS)</em> per year</em>*</td>
<td>6 at the most</td>
<td>Around 5-10</td>
<td>5 at the most</td>
<td>Less than 6</td>
<td>1 or 2</td>
</tr>
</tbody>
</table>

* The definition of “Highly Talented Scientist (HTS)” is someone with Ph.D. degrees and at least 10 years of working experience in the specialised field and usually he is the head of department or project leaders.

4. Methodology

4.1 In-depth interview

The objective was to generate qualitative data by conducting in-depth personal interviews, which permitted the researcher to obtain the necessary information for a key issue in the research. The individual in-depth interview is referred to as a one-on-one interview that probes and elicits detailed answers to questions, often using non-directive techniques to uncover hidden motivations (McDaniel and Gates, 1996).

There are many advantages, and therefore reasons for using in-depth interviews. The most important ones are the appropriateness for the opportunity to provide confidentiality, the depth and richness of the data obtained, and the enhancement of the understanding of decision-making patterns (Tull and Hawkins, 1990; Baker, 1994). In-depth interviews provide the opportunity to probe answers where the researcher wants the interviewees to explain, or build on their responses. They may also lead the discussion into areas that the researcher had not previously considered but which are significant.

Essentially, where it is necessary to understand the reasons for the decisions that research participants have taken, it will be necessary to conduct in-depth interviews. They are considered to be an appropriate methodology for producing clear insights into real behaviour and attitudes (Turnbull and Demades, 1995), particularly when the
interviews are with professional people or with people on the subject of their jobs (Tull and Hawkins, 1993)

4.2 Open-ended questionnaire

Open-ended questionnaire may vary from being fully structured to having a totally unstructured format, depending on the specific goals set for conducting the research. The researcher decided to use a semi-structured format of questionnaire, where a list of the issues to be covered must be determined in advance, but not necessarily having to be followed in order of appearance.

The main reason for justifying the need for an open-ended questionnaire is that it constitutes an effort to present biases from affecting the data before the data collection, rather than afterwards (Jankowicz, 1991). According to this requirement, the questions are prepared prior to the interview and they guide the conversation, making sure at the same time that the main topics of interest are covered. Furthermore, the necessary preparation of the questions takes place before the interviews. This way, familiarity is obtained with the questions as well as the structure of the interview schedule, which helps for a smoother flow of the interview (Mitchell, 1994).

The researcher chose to adopt in-depth interviews in a small sample of biotech related companies instead of distributing postal questionnaires. There were several reasons for the decision. Firstly, postal questionnaires, which are completed by the respondent, often, generate a very low response rate, and as little as 30% would be regarded as reasonable (Hunt, 1999).

Also, the previous research showed that professionals and managers tend to accept interview opportunities if the topic is interesting and closely related to their work. With the help from S&N, the researcher was able to form a small list of participating firms, some of which them were facing the same recruiting and retaining difficulties. Secondly, the nature of the topic required the researcher to gain a deeper understanding of how different firms operating in the biotech related industries deal with the problem of recruiting and retaining scientists. The in-depth interviews would be most suitable to satisfy this need while questionnaires could only gather a
systematic pattern of results.

4.3 Interviews at S&N

Since the researcher started the study of this research, S&N has already faced the difficulty of recruiting and retaining highly talented scientists. Three semi-structured interviews were first carried out at S&N with HR managers and two other senior scientists to obtain the whole picture of the problem up to the point of interviews.

These preliminary interviews were intended to secure background information from S&N. Various issues were raised during the interviews. Basic information about S&N was obtained and the importance of the research project was discussed. Other issues were: How serious had the problem gone so far? What was the effect of this difficulty in recruiting and retaining scientists on the organization as the whole? What were the company’s definitions and qualifications for highly talented scientists? Additionally the recruitment and selection processes were discussed, especially about salary details and reward system. Issues like the turnover rates and retention tools were touched. Furthermore, in the interviews with scientists at S&N, their personal experiences of recruitment and retention were thoroughly examined. Factors influencing scientists’ intentions to apply and stay at S&N were discussed. Finally, company reputation and culture were rated and commented upon.

4.4 Following Interviews at Other Firms

The information gathered from the interviews and subsequent literature reviews, together with the interview results from S&N, led to further interviews in other small number of companies operating in the biotech related industries. The criteria for sample selection were based on the following considerations. First, in order to gather useful information about the recruitment and retention practices, the companies must either be research-intensive or at least significantly rely on product or service innovation for their future development. Therefore, the companies had to emphasise the quality of human intellectual in research centers and highlight the effort to recruit and retain best-qualified scientists as their principal assets. These kinds of companies could range widely over industry sectors, such as electronics, computers, telecommunications, aerospace, pharmaceuticals, business, and professional services.
Furthermore, there is also a diverse range of scientific professions, which may display different patterns of characteristics and motivation factors. To name an example, IT professionals emphasise skill and career development within the company, while scientists look mostly for challenging work and autonomy within the working environment. Therefore, since S&N, which develops and markets medical devices, raised the research topic initially, this study would only focus on the healthcare-related industries, including pharmaceutical and biotechnology firms, which recruit scientists from physics, biotechnology, material science, medicine fields and so on.

In the end, four other biotechnological companies agreed to assist the researcher by providing their experience on this issue. In the interviews, companies were asked to describe the situations they faced regarding the problem of recruitment and retention for scientists within the companies, alongside questions about the companies’ systems for scientists’ recruitment and retention. They were asked how the problem had evolved and changed. What were the drivers behind the change, and the possible reasons for causing the difficulty, what inflow and outflow of scientists from the UK and other countries had occurred, what their perception was about the labor market for general scientists and highly talented scientists. Those questions were particularly added to gain more understanding about this problem. Also their feelings toward the attitude of government and universities on this issue were sought.

All the interviews were recorded using a tape recorder in order to ensure none of the information given was lost or missed. The tapes were then transcribed; it was necessary to extract data from the interviews. The tape recorder enabled the researcher to focus on the answers given and the interviewer taking notes would not distract the interviewees. This technique also helped the researcher to come up with more follow up questions.

4.5 Methodological Limitations
Firstly, those companies and personnel interviewed were not chosen at random. They were chosen due to their similar biotech related background, and their willingness to co-operate in the research. This could mean that they may have already had certain biases or pre-conceptions on the research topic. Furthermore, the use of semi-structured interviews can also mean that there was a chance that the data obtained was influenced by the interviewer’s biases, either intentionally or unintentionally.

Secondly, interpretation of data can be a problem. It is often difficult to provide a definite account of someone’s views or perceptions about an organization, or on different issues. This is however, an inherent factor of data collection in such research projects and it is difficult to be purely objective. An even more difficult aspect lies in the comparability of the interview results since there is a lack of general model or standardized form for comparing criteria on recruiting and retaining scientists.

Thirdly, the small sample of data also poses the problem of over generalization toward this issue. Due to the time frame limitation and the need for companies to be willing to participate, the data were only gathered from five interviewed companies in a similar industrial field. The researcher recognized the fact that the results of the study could be biased and difficult to apply to the general issue of recruiting and retaining scientists.

5. Cases Comparison

Due to different nature and characteristics of these five companies, they show similar recruitment and retention patterns, but each has some distinct features, which distinguish one from the others. Here are the results:

5.1 Difficulty of recruiting highly talented scientists

Among all the companies interviewed, three companies claim that they have difficulties in recruiting highly talented scientists with Ph.D. degrees plus two to ten years of working experiences, and even some fresh Ph.D.s. Only two firms, the biggest and the smallest of the companies, Nycomed-Amersham and Alkermes Europe reported that they do not have this problem but that the time taken to fill
positions in highly specialized scientific areas has become longer. In giving the reasons contributing to successful recruitment, the answer varies with different firms. They range from high and competitive salary, good company reputation, advertisements either in professional journals, company web sites, and the Internet, strong links with universities, and promotion within the company. Other factors, which may attract scientists to apply for the jobs, are location, being near famous universities, or having many other large biotech companies around the area, and interests in the nature of work itself. It is worth noting that using headhunting companies is only limited to the recruitment of highly talented scientists. Most scientists are still recruited from conventional advertisements.

5.2 Recruitment methods

All the companies employ a variety of recruiting methods, from traditional like advertisement in journals, to headhunting agencies. However, the most effective routes to recruit general scientists with good degrees and work experiences are reportedly to be through advertisements on professional web sites and in publications. And special agencies are aimed to help provide the target candidates and supply CVs. As for the specific area of talented scientists, who may have well-established reputations in the field and capabilities to direct research teams, the most common way to recruit is through special agencies, which spot who and where these kinds of talents are. However, once qualified candidates are located, the decisive factors, for successful recruitment, are pay level, reputation of company, and future potential of the work.

It is interesting to point out that Nycomed-Amersham does not have a probation period, which is not the case in the other four interviewed companies. The HR manager explains that once a candidate makes the big decision to join the company, Nycomed-Amersham would fully trust this person, thus instead place more emphasis on effective recruitment and selection process. This philosophy of trust and respect in employees could be one of the main elements for the successful recruitment and retention of highly talented scientists and good reputation among employees.

5.3 Turnover rate and retention
Generally speaking, scientists do not make career changes lightly. They tend to stay in one company, and develop and progress their career parallel with the company. The reward and appraisal systems in the five companies, which according to the interview, are all well established and sound. Therefore, at this moment, these five companies, turnover rates at only around 0-7%. Last year at Alkermes Europe, no one left the company, while Nycomed-Amersham has had a turnover rate of 1.5% for the past years. A possible reason for Alkermes Europe to keep such an excellent record may have to do with the small number of staff, employed by the company. On the other hand, Nycomed-Amersham reported that the above-average benefit and salary are the main reasons for the retention of good employees. Other companies generally pay around the middle of the market.

Besides tangible financial rewards, other elements considered in contributing to employee retention are the organizational culture, location, and interest of work. Most companies, Alkermes Europe, Amgen, and Murex Biotech, agree that good communication within the organization helps to create a happy and family-like working environment and a unique company culture, which helps retain employees.

5.4 Appraisal system

The most common appraisal system is measured by merit or employee performance, and it is generally carried out annually. Some companies like Nycomed-Amersham, Amgen have informal appraisal process, consisting of talks with line managers without writing the results down, every three or six months. All the companies refer to the external salary survey in the pharmaceutical and biotech industries to determine their own pay rates. The salary increase, personal performance, and promotion opportunities are all taken into careful consideration to fairly reward the employees. Nycomed-Amersham particularly separates the performance review and salary review by a three-month period to gain the advantages of free and open discussion about employee’s performance.

Murex Biotech is distinct from the others in that it employs a competency based pay system designed to encourage a learning organization. So learning new skills and gaining new knowledge while performance is paid as one of the bonuses measure
scientists in Murex Biotech.

6. Discussion of Results and Reflection on Literature

Both the labor market of the scientists and the recruitment and retention practices within the company have been examined in detail to create the big picture of the difficulty of recruiting scientists in the UK. Interviews were conducted in five biotech related firms, among whom three were reported to have faced the problem to a significant degree. Therefore, this section mainly discusses the results drawn from consolidating the literature review with the interview results.

To begin with, the firms’ perceptions on the shortage of scientists are examined and measured up to the data drawn from statistics. Secondly, the concept of quality is discussed and concluded that it is more important than quantity. Thirdly, the idea of ‘best’ or ‘most suitable’ scientific position is argued based on both the firms’ point of view and the literature review. Fourthly, the effectiveness of the recruitment methods is examined. Then the attracting features of an organization for scientists are discussed. Finally, this section is concluded with the discussion of the effective ways to retain talented scientists.

6.1 The Notion of a Shortage in Scientists

The notion of the shortage in scientists should be examined at two levels, junior and senior. The first level comprises of junior scientists who just freshly graduated from higher education with a couple of years of experience. The second level is the senior, or so-called highly talented, scientist who holds Ph.D. degrees, plus at least five years of working experience in the laboratory and is eminent in the professional area. Those two classes of scientists are greatly different in numbers. Thus, it is reasonable to discuss them in separate arguments.

6.1.1 Junior scientists

According to the literature, there is no significant shortage in the number of graduate or postgraduate scientists being produced each year. Rather, the last decade has seen a dramatic expansion in the numbers graduating in Chemistry, Mathematics and Biology at undergraduate level (Pearson et al., 1999). In the
postgraduate field, the numbers of students awarded Master or Ph.D. degree have grown even more rapidly than first degrees. It seems reasonable to conclude that there is no shortage in supply of the scientists across all levels.

However, this fact is not well recognized by most recruiters in the industries. The interviewed results show quite contradicting views about “What are the drivers behind the problem of recruiting scientists?” which could also imply a shortage of supply of scientists. Among the five firms interviewed, two companies expressed the viewpoint that demographically, there were fewer young people in the workforce than before and fewer students are going into science disciplines. But only one firm, which was not experiencing the difficulty of recruiting junior level scientists, un-mistakenly stated that “now more people come to universities and science is an area where there is no great shortage”.

Therefore, it is safe to conclude that some companies (two out of five interviewed firms), contributed to information of the difficulty of attracting enough numbers of applicants to fewer numbers of scientists in the labor market. But actually looking at the literature review, it seems not to be true.

6.1.2 Senior-scientists

Unfortunately at this stage there is no complete and reliable evidence to show how many senior scientists are actually in the labor market and ready to be recruited. Therefore, this study could only build on the data indirectly related to the number of senior scientists in UK and then make an estimation based on the existing data.

As concluded from the literature review on the scientists’ labor market, the research shows that since 1984, the output of postgraduates in science has grown rapidly, particularly in the number of Ph.D.s, which increased by around one third between 1984-1994 (Connor, Court, Seccombe, & Jagger, 1994). This implies that if these scientists were still employed as scientists in the research laboratories and enhancing their professional knowledge in the work, by now there would be more Ph. D.s, who have at least five to ten years of work experience and who are very
specialized in their specific field, than before. According to this estimation, the numbers of Ph.D.s, with Biology, Chemistry, and Physics degrees, are nearly 2,730 scientists. Of course, the exact number of senior scientists would probably be fewer than this figure. But, the idea is that there is actually a growth in the number of experienced senior scientists in the labor market.

Nevertheless, this increased numbers of highly talented scientists are not reflected in the recruitment situation in all the firms interviewed. Out of five interviewed firms, three reported when recruiting senior scientific positions, they experienced certain difficulties. Even the two, which reported that they did not have this problem, still claimed that the time to fill the positions became longer and longer. S&N clearly stated the issue by saying “We don't have many choices [in senior posts] because there are not any people around…the lower level of scientist you go, the easier it [the recruitment] becomes”.

Possible explanation to the cause of this condition could be categorized into two main points. Firstly even though the numbers of senior scientists is increasing, these professionals may well be found outside of the biotech related industries. As Nycomed-Amersham, the biggest in all the interviewed firms, stated. “The real difficulty is to find out where these people reside… and whether they are in the pharmaceutical market or not.”

Secondly all the firms interviewed place huge emphasis on recruiting and retaining the most ‘suitable’ and ‘capable’ scientists into their research teams. These highly talented scientists are their main intellectual capital and therefore, the issues of reliability, quality and capability are always at the forefront. Postgraduate scientists, particularly the Ph.D.s, are regarded as a good source of professional talents and thus all the firms want the ‘best’. Competitions to recruit outstanding scientists between the firms are very fierce. They all seek to gain competitive advantage over each other.

The results are in line with Barney’s claim that human capital advantage is “developed through recruiting and retaining outstanding people through capturing a stock of exceptional talent” (Boxall, 1996). All the interviewed firms placed a lot
of emphasis on recruiting senior scientists especially since research in the laboratory has become increasingly demanding and competitive. They all emphasized the importance of recruiting postgraduate scientists with not only strong academic backgrounds but also with good so-called soft skills such as “interpersonal skills”. This result supports recent literature that organizations expect to recruit postgraduates with more than just strong academic orientations.

6.2 Quality Is More Important Than Quantity

Another commonly mentioned concern of those involved in recruiting scientists is about the quality and ability of the scientists who apply for the jobs. One interviewed firm specifically stated, “People [scientists] at the bachelor level can’t demonstrate the ability to work well to fit in their teams or work well with other people.” This concern raises two issues. One is related to whether the overall quality of scientists is falling or not. The other one is linked to what kinds of abilities are lacking in scientists.

6.2.1 Quality is falling

One interviewed firm described this trend “when we advertise for jobs whether it is new scientists or local people, we have lots of applicants now but the quality is not as good as it used to be. So that is the problem we are experiencing. The quality means the academic side in terms of good degree.” This phenomenon experienced by the firm is actually in line with the results of the literature review. It is suggested that the quality and ability of academic knowledge is dropping although the number of postgraduate scientists is enlarging.

One interviewed firm, S&N, also expressed the concern about the quality of scientists it recruits. “We do tend to fill in positions. One of the arguments is whether or not we compromise on the requirements. So we start measuring quality of recruitment we do.”

6.2.2 Academic knowledge vs. inter-personal skills

In accordance with Pfeffer (1998) who states that “organizations serious about
obtaining profits through people will expend the effort needed to recruit the right people in the first place”, in particular, the research and development firms are becoming more specialized in the scientific field. Recent literature refers to findings that employers are having problems in attracting postgraduate scientists with the right caliber. For instance, Krehoneiecka (1999) reported that 64% of recruiters found it increasingly difficult to recruit graduates, which they regarded as being of the ‘right’ caliber. However, only two firms, out of the five firms interviewed, commented there was a problem of low caliber graduate scientists applying. The firms illustrated this by saying that generally it takes at least two years to find the right candidates of the right caliber. The other firms had similar figures but did not regard this low caliber of applicants as a problem. Harvey, Moon, Geall, & Bower (1996) found that it was increasingly common for graduates to be unable to fulfill the organizations’ increasing requirements, and the results did substantiate this. Furthermore, almost all the firms interviewed reported that a lack of interpersonal skills is the main problematic area.

6.2.3 ‘Best’ or ‘Most Suitable’

While all the firms aim for postgraduate scientists who have the capability to perform the job well, it must be questioned whether they need the best ones to fill all their positions. Highfliers may be more likely to have ambitions elsewhere. To quote one firm “The idea is that new graduates will come in and learn quickly but the down side is that after two or three years, they move to something else. As for the school leavers, they pick up slowly and take longer to train up. But they would stay longer.” Therefore, this firm would recruit less qualified employees into laboratories, which are related to the product development, thus suggesting that the finding of IRS Employment Review (1998a) may be correct…

“Reflection on their actual needs and what they can offer by way of jobs and careers can make for a more effective requirement process and satisfactory outcome, with a more realistic match between recruits and jobs, and better long term performance and retention.”

On the other hand, this may be viewed in a different light. Highfliers clearly make a valuable contribution to every firm and this just highlights the fact that
employers need to devise ways to retain them. Obviously this is easier for larger firms as they have more opportunities to offer.

6.3 Recruitment Methods—How Effective?

In line with the literature, all the interviewed firms claimed that they adopted a combination of recruitment methods to attract as many applicants as possible. However, interview results indicate that due to the requirement of different levels of the scientists, junior or senior, firms would use diverse ways to effectively recruit those professionals.

The literature review shows that to recruit scientific professionals, posting recruitment advertisements in the trade journals or the professional journals, like New Scientist, would attract the most favorable applicants (Still, 1985). All the interviewed firms reported that they have used this route to recruit scientific professionals. Furthermore, firms, such as S&N and Amgen, proclaimed that it is the main source for taking in general scientists who may have less working experience in the industries.

Again, one area where the interviewed results are in line with the literature is the use of the Internet. IRS Employment Review (1998b) found that 92% of firms regarded the Internet as their most effective tool for recruitment. All five interviewed firms reported using the Internet as a main vehicle for advertising posts, both in the company web site, if the interviewed firms have them, or on special professional web sites which suit the requirements of recruiting positions.

The five interviews present an identical view that they do employ head hunting companies to locate particular jobs and types of organizations to target favorable candidates. In fact, four out of five firms interviewed actually used head hunting companies to recruit senior scientists with at least five to ten years of work experience in the laboratory. Furthermore, those companies claimed that head hunting companies were the main sources for locating and recruiting highly talented scientists. On the other hand, only one firm, Nycomed-Amersham, reported that they did not “need it for R&D positions in the last years. The people who come from other big companies
would either look at the press or by word of mouth.” This statement may suggest that Nycomed-Amersham has a good reputation and company image. They act as a major attraction to scientific professionals. Therefore, the company did not use head hunting companies to recruit suitable candidates.

One route, recruitment from academia, which is not much mentioned in the literature review, is actually quite important practically and is used by two out of five firms. S&N reported that they get more benefits from academic supports by funding students. However, the firms, which recruit scientists through this route, also pay particular attention to the balance between those people who have practical pharmaceutical working experience and those who only have a pure research background in academia. One interview with a senior scientist at S&N demonstrated this point with the words like “hunts less from universities and more from industries because there a big danger of getting people who are very narrow experts but who can’t communicate or don’t know how to do business cases or no interest in business”.

6.4 The Attracting Features of an Organization

The literature review specifies that scientists possess several unique characteristics that are critical to their career selection including the desire for autonomy, the need for achievement, and professional identification (Rosenbaum, 1991a, 1991b; Badawy, 1988; McMeekin and Coombs, 1999; Brown, 2001). All of these characteristics center on the idea of the interest of work. Scientists require meaningful and challenging work to apply them self fully and use their skills and knowledge. Thus, when these professionals look for jobs, the first consideration is whether the content of work is related to their professional knowledge and skills and is challenging or interesting enough. One of the senior scientists agreed with this point and stated, “I prefer the working environment, the sense of progressive and dynamic organization and the interesting and challenging work… So I think it is really the nature of the work.” The interviews with five firms also expressed the interest of work as one of the most important features, which attract scientists to apply for the R&D positions. The other feature, the salary, also appeared in the interviewed results as the second main concern for applying a job. This issue may in part be related to problems of retention. However, it will be discussed in the later section.
The literature suggests that a firm’s image and reputation act as a major component of early job choice decisions. Out of the five interviewed firms, two firms, Nycomed-Amersham and Amgen, pointed out specifically that reputation is a very strong factor in attracting applicants to apply for R&D positions. Nycomed-Amersham is one of the two firms, which identify reputation as important. It stated “By the time they get to Ph.D., they would know Nycomed-Amersham is one of the companies to go…What features attract candidates to seek positions in Nycome-Amersham are reputation and pay”.

Turban and Greening (1997), among others, go on to suggest that there is a link between socially responsible actions and positive images that leads to competitive advantage through the attraction of high quality staff. The interviews with two senior scientists back up the results by saying “It [S&N] has a good image in working on devices that help people get better rather working on nuclear warheads…. It is the industry, in fact it is the medical healthcare industry, seems worthy to do. As a physicist the alternative would be one of the defense contractors.”

The Great Expectations survey (Purcell and Pitcher, 1996) found eight main desirable characteristics, which attract graduates to choose the companies. The first three characteristics are interesting and challenging work, competitive salary and continual skills development, which are all in line with the two interviews with senior scientists. “Salary is definitively one of important factors…The interesting and challenging work is another most important, than salary, factor”. “I am looking for the interesting and challenging work, salary and lab equipments”.

6.5 Effective Ways of Retaining Highly Talented Scientists

As discussed in the literature review, many companies face the difficulty in measuring the cost of turnover because the information is hard to get. One of the interviewed firms, S&N, reported that the actual cost of a turnover at the Ph.D. level would be very high and involved many expenses, like overhead cost in the HR departments, agency fee for searching right candidates, and other miscellaneous expenditures, which make it more complicate to calculate the correct figure. In the
end, the company stated that generally a turnover would cost the first year of salary of the position, which is in line with the literature review.

All the five interviewed firms claimed that last year their turnover rates were quite low, ranging from 0%-7%. Yet, the research carried out by Kochanski and Ledford (2001) shows that on average, R&D organizations do maintain a lower turnover rate, at around 3.6%, than other industries such as retail and service. Taking this figure as an indicator, only two firms could be fittingly qualified as enjoying a low turnover rate. These two firms are Nycomed-Amersham and Alkermes Europe which are the biggest and smallest firms among all those interviewed. What is more interesting is that these two firms also claimed to encounter no difficulties in recruiting and retaining highly talented scientist in their companies.

Nycomed-Amersham, the biggest one among all interviewed firms, pointed out in the interview that the interest of work and the above-average salary are the main reasons why scientists are retained within companies. While Alkermes Europe, the smallest one, reported that being a small company gives employees the opportunities to communicate and form the family-like working environment. Also the interests of work and the salary are all part of the factors contributing to the successful retention of scientists. However, from the reasons given by these two companies, it is quite difficult to generate a conclusion about the ‘best’ practices for retaining scientists.

Reportedly all the firms commented that the turnover rate for highly talented scientists is quite low at the moment but they saw the trend was going up. Part of the reason is due to other opportunities in the industry since they can easily get jobs with a better salary and benefits elsewhere. However, as numerous studies have shown employees rarely leave a firm purely for monetary gain. Studies investigating retention have cited a number of factors that contribute to a low turnover of staff. These include being clear about company strategy and the economic situation of the company (creates confidence in the company). Employees also need to gain adequate recognition and receive training and development; and to have good relations with management and other employees as this plays a key role in creating a good working climate.
All the firms were questioned about all the above factors and they all claimed to fulfill all of the above, each gave details of their appraisal systems that were often updated and monitored. The information provided to the employees in the varying firms differed in format but all thought that their employees were gaining enough information. However, it is hard to know if these views are more idealistic than realistic. Yet, if the views are accepted as realistic, the results do not add to the body of information on causes of retention problems.

As the turnover rate of scientists is regarded as a problem by the interviewed firms, all are proposing new retention tools to try to improve the situation, namely concentrating on the flexible working-hours, training programs and career development, and not just focusing on the monetary incentives. Despite the variation in these techniques that all the firms proposed, it backs up what Buhler (1998) believes…

“Committing to the retention of employees means offering training and development, developing career advancement programs, enriching jobs, empowering employees and becoming creative in offering non-financial rewards”.

7. Conclusions

Positions in Biotech firms offer enormous opportunities for improving the quality of life and the possibility of creating major wealth. Yet more and more biotechnology-related firms around the UK report facing difficulties either in finding scientists with the right caliber or in the prolonged time taken to fill scientific positions. These issues were then raised by one of the interviewed firms, S&N, and they proposed this project in order to explore the nature of these issues and generate some innovative suggestions.

Subsequently, this study mainly concentrated on examining the labor market of scientists, particularly focusing on disciplines in Biology, Chemistry and Physics, and the proper recruitment and retention practices in the companies. It attempted to offer an understanding of the theoretical background to the issues. For this reason, the researcher examined the existing literature and discussed the findings in the previous
sections. The discussions tried to answer the question “Is there a real shortage in scientists in UK?” and considered the best practices in recruiting and retaining scientists into companies.

Due to the exploratory nature of the issue and time constraints, this study adopted a qualitative research method by conducting in-depth personal interviews, instead of distributing questionnaires. The deciding criteria for choosing the interviewed firms were determined by two factors. Firstly, the companies had to be research-intensive and put great emphasis on the quality of the human intellect. Therefore, to recruit and retain best-qualified scientists directly relates to the future development of the companies. Secondly, in order to generate sensible and usable conclusions, all the interviewed firms had to be in the industries where they recruit scientists such as biologists or chemists. With the help from the HR manager at S&N, five interviews were carried out in the biotech related industries. Afterwards this set of empirical data was compared to the results drawn from the literature review to form the main discussion.

The question “whether there is a shortage in supply of scientists in UK?” has to be answered at two levels. Even though three out of five firms interviewed reported that there was a difficulty in recruiting junior level scientists, statistically there seems to be no shortage in the number of graduate or postgraduate scientists. Rather, the more problematic area lay in recruiting senior level scientists who have at least Ph.D. degrees and five years of relevant working experiences. All the firms claimed the time to fill in those positions was getting longer and longer.

Therefore, the next question turned to why the interviewed firms faced the difficulty in recruiting highly talented scientists. There are two possible reasons to explain this. Firstly, these professionals may reside outside of the biotech related industries. Secondly, all the firms place great resources on searching for the ‘best’ and most ‘capable’ scientists regardless of whether the nature of the positions really require the ‘best’ scientists or not. As a result, the competition gets fiercer.

While interviewed firms commented that they found it difficult to attract greater numbers of applicants for scientific positions, they also experienced the trend that the
quality of applicants was often getting below the standards they expect. Again there are factors contributing to this phenomenon. The research shows that although the numbers of students graduating in science at Master or Ph.D. level are rising, the overall quality related to the professional knowledge actually does not increase with the quantity. Furthermore, nowadays companies emphasize not only the academic skills but also the interpersonal skills and team-working skills. As a consequence, it is more difficult for scientists to meet those demands.

In terms of recruitment methods, all the interviewed firms employed a combination of techniques, ranging from advertisements to word of mouth, to attract as many applicants as possible. However, the research shows that due to the different levels of scientists, firms chose diverse ways to effectively recruit those professionals. For junior level scientists, posting advertisements in professional journals, web sites, and trade magazines would be the main sources of recruitment. Nevertheless the most effective way of recruiting would be to hire head hunting companies to help locate these highly talented scientists.

When discussing the attracting features of an organization, the literature review and the interviewed firms expressed different views on this topic. They include a wide range of features, ranging from the interest of work, salary, culture, working environment, reputation and company image, to location and so on. The interview results show that scientists appeal to the interest of work most and then the salary. Out of five interviewed firms, only two firms, Nycomed-Amersham and Alkermes Europe, reported no difficulty in recruiting scientists. The biggest one, among the five, Nycomed-Amersham identified its attracting features as reputation and above-average salary. While the smallest one, Alkermes Europe, claimed the broad experiences that scientists would get, is the attracting feature for them.

During the interviews, all the firms stated that they enjoyed quite low turnover rates, ranging between 0-7%. Yet, the existing research shows that on average R&D organizations do maintain a lower turnover rate than other industries such as retail and service, which is around 3.6%. Taking this figure as an indicator, again only Nycomed-Amersham and Alkermes Europe could be rightly qualified for low turnover rate. Both firms once more gave different reasons for their successful
retaining practices. Nycomed-Amersham stated that the interest of work and the above-average salary were the main reasons for retaining scientists within companies. Alkermes Europe, on the other hand believed that being a small company gives employees the chance to communicate and the family-like working environment as the key factors.

In sum, the research clearly shows that even though overall there is no shortage of scientists in the UK, the numbers of highly talented scientists who are very specialized and well known in the professional field are getting fewer. Thus, the answers to solve the difficulty in recruiting and retaining scientists then rests on the diverse characteristics of the companies, such as the reputation and company image, the interest of work, salary and so on.

Among the five interviewed firms, there are two firms, which appear to succeed in recruiting and retaining scientists. However, due to the difference in size and characteristics of the companies, they both have their unique features of attracting and retaining scientists make it difficult to generate a general conclusion on the ‘best’ practice on recruitment and retention. Therefore, hopefully this research has provided useful insight and can be used as a foundation for further research.

Reference


## Appendix

### Companies’ Web sites


### INTERVIEW QUESTIONS

#### Difficulty of Recruiting and Retaining High Talent Scientists

- Have you experienced this problem in your company?
- Has the problem been changed?
- Why has the problem been changed?
- If it is changed, does it become less or more easy to recruit and retain scientist?
- What are the drivers behind this change?
- What about the inflow and outflow from UK and other countries?
- Does international recruitment from American and European business increase the difficulty of recruitment in your company?
- What about the training given by the university?
- Does it fit with business need or does it need to change?
- Do you think the government policy has tried to solve the problem?
- How the government policy influences the recruitment and retention of scientist?
- Does the government help to recruit scientists from other countries?

#### Organisational Background

- Organisational structure- brief outline
✓ Number of departments at laboratory site
✓ Number of employees in total

**High Talent Scientists Recruitment and Selection**
✓ Number of applicants per year
✓ Number of High Talent Scientists employ annually
✓ Qualifications
✓ Skills and academic background
✓ Work experiences
✓ Salary and reward system
✓ Recruitment methods-- advertisement, headhunting companies, Internet, links with other careers services, links with university departments
✓ Which one is the most effective in recruiting the right candidate?
✓ Selection process-- interviews, psychometric tests
✓ Brief overview of stages
✓ What features attract candidates to seek positions in your company?
✓ Have you experienced any problems in recruiting high talent scientists?
✓ Any areas in particular you find difficulty in filling the vacancies?

**High Talent Scientists Turnover and Retention**
✓ Why high talent scientists leave the company? Other opportunities in other firms, industries, as well as abroad.
✓ Wages, benefits and working hours
✓ Compensation package
✓ Training systems
✓ Appraisal system
✓ Retention tools-- bonus, stocks…