

Enterprise and Learning Committee

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Purpose

The purpose of this memorandum is to provide the perspective of a research intensive SME on the subject of "the engagement of HEI's with small businesses in Wales and beyond". This document conveys summary information from an SME perspective on the perceived current strengths and weaknesses of SME-HEI interactions and the impact that these interactions have on local and regional economies. The committee is being asked to take the interests of research intensive SMEs into account and reflect on opportunities that exist for realising sustainable research employment when reviewing the effects of SME-HEI collaborations.

Background

Park Place Research Ltd represents an independent research intensive SME, based in Wales with a rapidly growing global customer base which includes customers in the US, Denmark, France, Germany and India. The company employs PhD and graduate qualified process research and development chemists with extensive industrial experience in global pharmaceutical, biotechnology, agrochemical and fine chemical organisations. The company staff comprises 7 PhD and two graduates with PhD equivalent experience. The company conducts leading edge contract research for many of the world's leading innovative pharmaceutical, biotechnology, and agrochemical companies.

For complex issues associated with confidentiality and ownership of intellectual property, Park Place Research has to conduct research independently from HEIs. The company does maintain close interactions with academics at Cardiff and Aberystwyth Universities and has recently recruited PhD graduates from Cardiff University.

From the perspective of an SME in Wales, such as Park Place Research, the link between HEIs and SMEs should consider graduate and postgraduate employment opportunities for HEI students and researchers. We are not able to provide statistical data, however our experience of the relevant industry sectors and our growing list of high calibre applicants for research positions strongly support the widely held view that high calibre scientists need to leave Wales in search of developing their careers in industrial research and development centres outside of Wales. This suggests that graduates from HEIs in Wales are very important for the wider UK and EU economies, but if these graduates leave the locality then the return to the local and regional economy will be indirect.

Summary / Recommendations

HEIs provide an important element in assisting innovative research and development within the SME sector in Wales. The principle benefits from our experiences with Cardiff University School of Chemistry is the provision of very high calibre PhD graduates and this could represent a very important potential resource to our company as we expand.

There are currently very limited opportunities for employment of postgraduate chemists in research roles within companies in Wales. Furthermore, companies which have leading edge research groups are deemed very attractive places to work, particularly for high calibre scientists and Park Place Research has a growing list of highly qualified and industrially experienced applicants from outside Wales. The company has not experienced any form of skills gap or availability of suitable recruits. From the perspective of prospective employees, the gap which exists in Wales is the provision of suitable employment opportunities. This gap can only be addressed by the growth in the number of companies with appropriate "in-house" research capabilities.

There are several mechanisms which exist to assist manufacturing companies to fund university research, such as Knowledge Exploitation Fund grants and this is an important source of revenue generation for universities. For small SMEs and research intensive start ups, the enormous cost of becoming established makes it very difficult to invest the time and expertise needed to navigate these fields. To develop collaborations with universities and access the funding to do this requires a significant investment of time in both meetings with consultants, legal fees in relation to contractual issues and the associated time devoted to developing the information required to support the application.

Many SMEs in Wales, particularly product manufacturers, may find subsidised access to university expertise of significant importance to assist in the development of their services and products. In this respect universities are acting as subsidised contract research organisations and there is currently no means of oversight to ensure that universities do not inadvertently and unfairly compete with independent contract research organisations.

Subsidised competition from universities could ultimately stifle the growth of independent contract research activities outside of universities. This is important to the sustainable generation of employment opportunities for graduates and postgraduates, since universities are less able to provide long term sources of employment for such researchers. The growth of university spin-outs may address this employment issue in part, but there are key differences between research conducted in academic and industrial environments and the synergy between the two needs to be encouraged. There are currently few if any mechanisms for not-for-profit collaboration between universities and industrial research organisations and this would be a very useful means of sharing knowledge and expertise.

Companies which have "in-house" research and development capabilities will add significant long term value to the local and regional economies. Additionally companies with "in-house" research and development expertise will offer a sustainable source of long term employment for high calibre graduate and postgraduate scientists.

The key barriers to development of SMEs with such expertise and capabilities are exceptional capital expenditure costs, very high salary costs, the need for continual investments in industrial training and the costs associated with the promotion of the company's activities at global trade events.

Collaboration with universities to address the high capital expenditure costs associated with specific high value items of equipment may provide a useful mechanism for providing centralised low cost, not-for-profit services for SMEs. The SME sector could benefit greatly from access to such equipment and services, provided that this is not deemed as a means of income generation for the university. There are currently no cost-effective incubator facilities available for SME or start-ups to conduct laboratory chemistry research in Wales and this is a major hurdle that new enterprises have to overcome.

The longer term benefits for the HEI sector will include a sustainable source of employment for graduates and postgraduates. There are no short term financial incentives for universities to operate in a way that helps to support the development of a sustainable SME resource and a long term view has to be taken. The realisation of a sustainable commercial research and development community in Wales will necessitate a long term collaborative commitment on the part of HEIs and the SME sector

In terms of developing a research intensive, innovative SME sector the application of entrepreneurial education programmes and encouragement of graduate start-ups appear to be very worthy and there have been several notable successes, but in many of the market sectors in which our company operates it is difficult to envisage how these activities will achieve the extensive success that is desired. It is our belief that it is important to have a correct mix of companies operating commercial research activities, with a mechanism for close interaction with HEIs and graduate start-ups or spin-outs.

There are very clear differences between research conducted within HEIs and research conducted within a commercial business environment. Scientific knowledge, expertise and professionalism increase significantly during the early years of employment of a graduate and postgraduate. Industrially experienced scientists acquire significant exposure to regulatory issues, environmental issues, production and market considerations working within multidisciplinary project teams and a commercial environment. As an example the research and development of a pharmaceutical requires intimate knowledge of the drug development process, competitive pressures and the relevant regulatory environment. It is difficult to envisage how a graduate start-up in this area will gain a full appreciation of these issues in a short timescale and the use of paid industrial consultants on a long term basis is unlikely to represent a feasible solution.

Many graduate start-ups, unless they happen upon truly revolutionary, groundbreaking new technologies could eventually flounder, not through lack of technical business management capabilities or funding issues, but through a misunderstanding of the market and the needs of customers. Meaningful, market data for many new scientific and technology areas is generally not available through typical avenues and obtaining this information can require intimate first-hand knowledge of the markets and access to customers. Industrially trained scientists and research managers could make a significant difference to these endeavours. The potential lack of industrial research experience involves a significant risk that start-ups will inadvertently spend a considerable amount of time and effort in reinventing the wheel or develop their plans based on false misconceptions of the markets.

It is also important to recognise that companies, such as Park Place Research, which move beyond the incubator stage and have demonstrated a track record can realise even more acute difficulties in terms of expansion of operations. The reality that there are no chemical laboratory facilities available to lease and the capital expenditure costs associated with investments in laboratories and equipment represent the most important key decision making area for companies looking to expand. The availability of laboratory facilities represents one of the greatest barriers to growth. The costs are such that many companies may choose to move beyond this stage before they are able to effectively consider collaborations with HEIs.

From the perspective of delivering a sustainable research intensive, independent SME sector, which has the ability to work with the HEI sector, the key barrier from the SME perspective, is the lack of available funds to fulfil a participative role. To conduct scientific research, requires a very large investment in facilities and infrastructure at company inception and this continues as the company expands. In the formative years of a new company, this impacts on the funds available for collaborations. In theory, this could be addressed by access to greater investment funds for the business, however new companies typically need to establish a track record before this can become a genuine reality.

If facilities and equipment resources were accessible that could satisfy issues of commercial confidentiality many small business would be able to productively utilise revenues for the long term sustainability of the business such as business development, training and recruiting more graduates. As an SME, with significant industrial experience we would like the opportunity to be able to provide training opportunities in house, teaching master classes and being involved in joint research projects with HEIs, without the costs and time associated with the need to resolve IP ownership issues. Ultimately the uniqueness of research and development both in HEIs and within SMEs creates it own special circumstances and a thriving research intensive SME sector will provide a mechanism for a significant source of long term talent to come to Wales. If this is supported and made a reality then this will make a sustainable contribution to the welsh economy. It is essential to establish an SME community based on reputation for scientific excellence in industry, which is not clouded by irresponsible hyperboles and exaggerated notions of success. A thriving research intensive SME community must exist alongside HEIs in order to enable effective collaborations to be realised and both parties in collaboration will be able to enhance the diversity of training, education and employment into the future.