

Enterprise and Learning Committee

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Purpose

This company has been asked to comment on the engagement of HEIs with businesses in Wales.

Background

The company

GTW Developments is a very small company, based in Pontypool. We manufacture pneumatic yarn splicers - tools which join yarns together without using traditional knots. Splices are smoother and neater than knots, and improve fabric quality and production efficiency.

We have a strong historical link with earlier companies, Pentwyn Splicers and Pentwyn Precision, who were first to bring the product to market in 1976. Historically, our principal market was the UK textile industry, which remained healthy until the 1990s. The UK market declined, sales suffered, and in 1996 Pentwyn - then owned by a large holding company - was sold to its present management. Shortly after, GTW Developments was formed as a research and development company, to develop new forms of splicer for Pentwyn.

Eventually, all the old products became impossibly uneconomic to produce in the new and hostile market, and Pentwyn and its product range died. All splicers now in production are those which have been designed by GTW Developments Ltd. Our new products are characterized by their design simplicity, their effectiveness in their relevant market sectors, and their reliability in service. These features are particularly valuable in export markets; customers have little need to hold large spare parts inventory, and are able to conduct effective on-site maintenance without the need to contact the manufacturer.

The actual manufacture of splicers needs only simple engineering skills. Simple engineering is rarely associated with innovation and advances in technology, and is not highly-rated in the industrial pecking order. However, the technology which underlies the design of splicers is far from simple, involving quite complex aerodynamic processes. Since the principles are not easy to understand, and the market is relatively small, there are few manufacturers of splicers in the world; we are the only such firm Britain. Not quite the simple engineering company we seem to be, we invest heavily in innovation - currently more than 35 per cent of all our man-hours are devoted to research and development. We are conducting a far-reaching programme of genuinely fundamental research into the splicing process, which is already yielding new forms of pneumatic splicer. Because we are small, this research effort is insignificant in absolute terms, but for us it represents a huge commitment in an uncertain world.

Since the buyout in 1996, GTW and Pentwyn have won a number of innovation and design awards, including:

ISI/InterForum: E Commerce awards 1999

Cardiff University UK: Innovation Award 1999

British Design Council: Millennium Product Award, Model 111, 1999

British Design Council: Millennium Product Award, Model 103, 2000

Cardiff University UK: Sir Brian Smith Innovation Prize 2001

Five Counties Innovation award 1995

Awards and accolades notwithstanding, the company's existence is permanently at risk, because the traditional industry in the UK has essentially ceased to exist, and we have not yet secured enough export business to be comfortable.

We seek to survive, not simply by exporting, but also by entering new market sectors. A number of opportunities have been identified outside our core business, in markets such as aerospace. Drawing on our research effort, the first new-technology product was introduced to the technical textiles market in 2007; this product has already been sold into two major U.S. companies, which are both involved in the aerospace supply chain.

Our staffing level has fallen sharply; always small, staff strength has been reduced from over 20 to 6 over the past ten years. However, because the products are simpler than before, and the production process is much more efficient, this small team could easily produce more output than its predecessors.

The technical competence of our staff is essential to any future expansion; the establishment is so small that each staff member must function efficiently, and at the highest level of technical competence. Using standard descriptive terms, the educational profile of our staff is unusual:

Level 5	2
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Level 3	3
Level 2	1

The two senior staff have advanced technical qualifications; mine are in physics and systems analysis, and my junior's are in engineering. I am ready for retirement, and the engineer is newly qualified - about to receive his PhD. The engineer is, however, not wet behind the ears; as part of an ESPRC scheme, he has done his research on our premises, and worked under my direction on the fundamentals of our technology. In the process, he has become one of a very few people world-wide to understand the technology. In addition, he has been taught basic business skills, and has seen at first hand the trials of the small firm in a taxing environment.

The level 3 staff are all of middle years, having been through traditional apprenticeships. They are capable of functioning completely unsupervised, and have been educated in the ways of the business to a degree that they are fully aware of the risks and opportunities which exist in our commercial environment.

We have a major concern, when considering the survival and the expansion of the company. All staff are extremely highly trained, and each, in his own way, is important to the functioning of the company. Should they leave, they will be difficult to replace. At the very least, potential successors should be able to match their technical skill levels. Education and training of future staff is therefore an issue which figures very highly in our plans for the expansion of the company.

What do SMEs need? And what do they get?

SMEs need a good supply of literate and numerate recruits, at Levels 1, 2, and 3, with potential for further training.

At the lower levels, this need may or may not be met by the latest strategies outlined by Ed Balls; the success or otherwise of his policies remains to be seen. The signs are not good; there is no question that, despite the brave words of our leaders, the literacy and numeracy standards of recruits at levels 1 and 2 leave much to be desired, and the responsibility for bringing staff up to an acceptable standard now rests with employers, post-recruitment.

Recruits at level 4, for Research, Development, IT and other senior positions. Again, these recruits must be literate and numerate.

Technical graduates require literacy skills, just as much as do classicists. It is a prime requirement for technical staff that they are able to construct tightly-reasoned and semantically correct reports, in which English is used with appropriate precision. In general, with present-day graduates, this is not the case. Though politically correct and culturally desirable, Welsh-medium teaching does not help in this respect.

Recruits at all levels should already have been imbued with the concepts of standards, quality, and self-assessment. In this respect, the present-day employer is confronted with a dichotomy. Modern society tends to discourage exposure of young people of school age to an overtly judgemental and competitive environment; however, pupils emerge as young adults into a world in which their employers are urged - by the same policymakers - to be fiercely competitive on a global stage. It falls to the employer to impose the standards, and the frames of reference, which society is now signally failing to provide.

Our present relationships with HEIs

We have always sought to establish and maintain links with HEIs. Short of technical resources, we need to enhance our capabilities by picking the brains of relevant academic staff, and by providing opportunities for student placements. We have very strong links with two local universities - Cardiff and Glamorgan.

For some years, we have been active members of the Cardiff University Innovation Network (CUIN).

I sit on the Industry Advisory Group, which is a steering committee for CUIN.

We have a continuing relationship with Cardiff University's School of Business, and for the past two years have provided study projects for students at MSc level.

Until the demise of eCIC, Cardiff's e-commerce team, we had a long-standing relationship with Cardiff's electronic commerce experts, using their teachings to improve company efficiency, and, in return, providing material projects for junior academic staff.

On a contract basis, we use the facilities of Cardiff University's MEC department.

Under an ESPRC scheme, we have employed and supported a Glamorgan University postgraduate student for over three years, as he has worked towards his PhD, on one of our research projects.

On balance, we feel that we get very good value from our local universities at present. Having looked at the Leitch report, and having read some of the warnings issued by institutions as eminent as the Royal Society, we feel rather less comfortable about the future.

Indeed, I fear for the future of universities themselves.

Our future relationships with HEIs

The Leitch report is a wide-ranging and passionate document. However, the document does seem profoundly flawed. As a lay person, I am aware that my opinion will count for little, but it seems to me that Leitch proposes contradictory targets. He wants a 'demand-led' system of HE, in which employers should influence what universities offer. His principles of shared funding will reduce government support in future, with more money from employers, who will be the people expected to finance the further expansion of higher education. (The cynic may see this as a simple ruse to increase the feeling of well-being in the country, without requiring a commensurate increase in central taxation).

Yet Leitch seems specifically to eschew the notion of strategic planning for the study of subjects which might be relevant to the future society. A word search of his document reveals little or no reference to the disciplines of Physics, Chemistry, Engineering as being important to this nation's future. This while the Chinese, for example, are pouring out thousands of engineers per year.

It seems that the simple notion of a future expansion of higher education is seen by Leitch as a good thing in itself - motherhood and apple pie - with the assertion being made that higher qualifications per se will yield a better future. Leitch seems to be the epitome of laissez-faire.

Long ago, at a time of great crisis, the old DSIR was formed, one of its priorities being to identify and promote key areas of study which were critical to the future of the country. From the outset, it was charged with putting an end to the laissez-faire attitude towards the choices of academic study. I was once privileged to sit at a table, as a young undergraduate, in the presence of no less than three Nobel Prize winners, all of whom were on the staff of that one college; I doubt whether British academia will ever attain such eminence under the proposed structures. The DSIR had its faults, but it is clear to anyone with an interest in the history of science and technology that there was something very special about this nation's academic attainments in the first half of the last century.

Academic tenure may have been past its sell-by-date in the 1980s, but at least it allowed academics to concern themselves with the content of their work, rather than the political and financial environment in which it was conducted. Already, HEIs seem to be in thrall to commercial funding, and to short-term contracts; academic staff are constantly looking over their shoulders, concerned about the source of the next tranche of funding. The resulting short-termism contributes little to academic rigour and strategic research goals.

The eCIC team assembled by Tony Davies in Cardiff was an enormous help to small businesses in Wales, but as soon as funding was withdrawn by BT, the whole initiative came to a complete halt.

The Cardiff group led by Prof. Pham has a very high profile, and Pham himself has been honoured by the academic fraternity; but if support from companies such as Mitutoyo were to be withdrawn, it is probable that his team would be disbanded in a very short time. Now Leitch - and apparently the powers-that-be in Westminster - want more of the same.

This particular lay person fears for the future, but much more eminent commentators are of the same mind:

A-Levels

A 2005 report from Birmingham University recorded that A-level entries for physics halved between 1982 and 2005. Co-author Prof Smithers said the downturn was impacting on higher education, with numbers at universities down by 28%. Professor Smithers said that physics may be in the grip of a long-term downward spiral.

Chemistry graduates

The Royal Society of Chemistry has observed that chemistry is becoming more interdisciplinary and chemists are increasingly being sought after by other areas of industry. The demand for chemists at both graduate and PhD level will increase in the next 10 years. However, the number of chemical science graduates is falling. The RSC has concerns about university funding, and the supply of chemistry graduates for future industry needs. Graduates and doctorates must be able to sustain UK industry in the future, but if demand for chemistry graduates is not met by UK universities, students may look elsewhere.

Postgraduates

The Royal Society is concerned that the UK's position as a leader in higher education could be jeopardised by students turning their backs on postgraduate science courses, with doctoral degrees in science declining markedly compared with doctoral degrees overall. The society has warned that the UK will become uncompetitive in the global economy.

Conclusion

Even if industry-funding were to prove successful, and not a Faustian tax-saving contract, it would be of limited significance. Even the most prodigal captains of industry would not need, and would not be prepared to finance, 40 per cent of the population in higher education.

The consequence of the latest proposals could be that there will an industry-funded elite, studying the subjects which really matter. Then there would be more and more graduates, studying subjects of doubtful relevance, taught by academics with less and less command of their material; tens of thousands of "graduates" whose studies prove to be of little relevance.

We may be facing a period of "homeopathic education", where, in the pursuit of a political egalitarian goal, the concept of graduate study is spread too thin, diluted too far.