

Call for Evidence: Analysis on Demand for STEM Skills (A DIUS Consultation)

The BCS View of Demand for STEM Skills – August 2008

Introduction

The BCS is the Professional Body & Learned Society for IT, with around 65,000 members. These members are drawn from a wide range of educational backgrounds, many with a STEM qualification. The IT sector as a whole is one of the largest sources of employment for STEM graduates, with demand continuing to rise, particularly for higher level skills. In turn, the sector supports economic growth in other areas, as well as infrastructure for and transformation of public services.

The BCS of itself does not conduct a great deal of statistical research on the IT labour market, but is well-placed to comment on general trends within the sector. However, BCS recently contributed to a detailed analysis of the supply and demand for computing graduates along with the Council for Professors and Heads of Computing (CPHC). The report may be found here:

<http://www.cphc.ac.uk/docs/reports/cphc-itlabourmarket.pdf>

In addition, we would like to make the following observations on the statistics and trends in this sector.

A Rapidly Changing Industry

The complexity, breadth and rapidity of change within the IT sector to some extent defies analysis. The number and type of companies, job roles and courses defined as either inside or outside the sector varies wildly based on small changes in criteria. Focusing on software engineering, IT service organisations or roles inside an IT department may give easily defined results, but as each of these examples evolve, they become more embedded inside the sectors they service.

In terms of supply and demand of skills, study over suitable timescales introduces even further uncertainty. During just the last 20 years the IT sector has grown dramatically, and now nearly 1 in 20 people employed in the UK work in IT¹. The Internet has become a part of critical infrastructure and has changed working practices substantially. This level of growth has pulled people into the sector to fill jobs from all kinds of educational backgrounds. There has never been a 'steady state' pipeline from education into the IT profession, and past routes into it may bear no resemblance to future routes.

The UK is increasingly dependent on the earnings from the 'knowledge economy' and GVA per job in the IT and Telecoms industry is £81,400 or 2.5 times the industry average.² Information Technology is now also an essential part of the UK infrastructure

¹ e-skills uk 2008- IT & Telecom Insights 2008 www.e-skills.com/Research-and-policy/Insights-2008/2205

² e-skills uk

which is key to successful service delivery across all sectors of the economy – including the public sector.

The cornerstone in skills terms of this contribution to society is the largest and growing gap between supply and demand. The highest level technical design skills matched with professional skills command a huge premium.

Any Degree, a STEM degree, a Computing Degree

It is estimated that 141,300 new entrants are needed *each year* to meet the demand for IT workers. Of those new entrants, 28,600 are expected to be direct from Higher Education (far more than computing courses supply), 70,900 from non-ICT roles and 43,600 from other sources re-entering the work force e.g. returners after a career break, early retirement, spell of unemployment. The IT industry is accustomed to hiring highly-skilled employees who can quickly contribute to the business. Over 57% of IT professionals hold a level 4 or higher qualification (twice the UK average³ in the general workforce).

Recruiters for large IT services companies indicate a strong preference for computing graduates, but necessity dictates that they must broaden their requirements in order to recruit in sufficient numbers. Preference for particular subjects varies depending on the type of role. For example, a software engineering organisation may prefer someone with a Masters in software engineering, but would also look at physics, mathematics and electronic engineering graduates; an IT services organisation looking to hire an analyst may prefer a computing graduate but would also be content with a history or psychology graduate. If a generalisation can be made, it is that the preference is for computing, then wider STEM, then any degree.

The end result is that any given job role can draw from a wide range of educational backgrounds. In the IT industry, professional or vendor qualifications and experience are more likely to be an essential requirement for a role than, for example a particular degree subject (although there are exceptions). Anecdotally, employers have become accustomed to 'making do' in the face of chronic shortages. Therefore, hard demand for high-level skills as evidenced by the statistics may be the tip of a larger latent appetite for those skills. For many roles, employers are not looking for high level technical and business skills simply because they cannot afford them. Consequently, increasing supply far beyond the current measurable skills gap may simply create new levels of demand.

The implication is that the IT sector could potentially make use of any realistically achievable increase in supply of STEM skills over the medium term. This is set against a backdrop of a severe decline at several stages of the education pipeline into the IT sector.

³ e-skills UK

Higher Education Computing

Despite the increased demand for highly skilled employees in IT – particularly at HE level – the number of graduates graduating from the single subject computing is declining (down to just over 31,000 or 16.5% from 2003-04 to 2006-07) as opposed to a 2.8% increase across all subjects. Although a substantial number of graduates (over 40%)⁴ leave the UK after graduation, at least new computing graduates appear to be more likely to stay in the UK than other graduates. Even so, since the intake of new graduates to computing courses is also falling, the supply of graduates will remain low over at least the next three years increasing the skills shortages in the IT industry.

School Computing

The trend for young people taking computing A-level is also in decline (down nearly 50% since 2003)⁵. Although a pass at A-level computing is not mandatory for enrolment on the majority of computing degree courses, it indicates a worrying lack of interest in the subject amongst the workers of the future.

Poor take-up of computing at A/AS level at school and beyond in to HE has been partly attributed to young people's poor experience of GCSE ICT which concentrates on IT user skills which, although useful in themselves, are not relevant to study of computing at HE or for a career in IT. BCS believes that this disconnect between what is taught in schools and computing at HE and in the workplace needs to be addressed and is currently consulting members about whether Computing – rather than ICT – should be reintroduced at GCSE level.

There is a glimmer of hope for STEM in school, with the recent news of an increase in people taking maths A-level (7.5%)⁶ compared with the previous year; mathematics is a pre-requisite to a number of university computing degree courses, and highly desirable on almost any computing course. Of course, this needs to be a sustained year-on-year increase to make a substantial difference to the potential supply of labour with the skills UK needs.

Women in IT

The IT skill shortage has not encouraged more women in to the IT industry – in fact the proportion of female IT & Telecoms professionals has dropped to 18%. Lack of knowledge about the diversity of careers available in IT may be one reason. However, the UK cannot afford to miss out on this labour source.

Conclusion

In terms of demand for STEM skills, the IT sector has hard, easily-identifiable and acute demands for more. There is also a softer-edged demand where STEM skills are not a requirement, but highly desirable. They are an important part of the mix in almost all

⁴ CPHC www.cphc.ac.uk/docs/reports/cphc-itlabourmarket.pdf

⁵ CPHC

⁶ Department of Children, Schools & Families www.dcsf.gov.uk/pns/DisplayPN.cgi?pn_id=2008_0174



areas. Given the enormous size of the IT sector and its growth potential, this demand, will continue to be a key driver behind demand for STEM skills and a potential sink for increased output.

BCS is extremely concerned at the impact of current and future skills gaps on the IT industry and, as such, the UK economy and along with other organizations is working to raise awareness of this.

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