UK ICT Industry Skills and Jobs Crisis

The purpose of this Briefing Note is to highlight significant concerns being voiced by the UK Higher Education Information and Communication Technologies (ICT)* sector over falling levels of home student recruitment and the impact on UK industry and economy, especially in terms of the "knowledge economy" that is so central to future growth predictions. The tabloid-style headlines presented below reflect existing and worsening outcomes if no immediate intervention takes place. They are backed up by research carried out by industry, academia and government agencies. Arguments and statistics from that research are used to support the headlines and recommendations for interventions are also provided.
[* N.B. Within the Briefing Note the terms ICT and IT are used interchangeably, as they are elsewhere, but for CPHC these refer to courses classified by HESA under the general term "Computer Science"]

UK plc loses competitive edge through inadequate IT support!

- Rising vacancy levels for ICT jobs in industry, only 27% of staff are degree qualified and only two thirds of them have ICT degrees [1]
- Approx. 42% of ICT graduates enter industry (represents 61% of ICT graduates in work [11]) [2]
- Leitch identifies future need for 40% of workforce to be degree-level qualified [8]

Recommendation:

- Financial incentive schemes for lifelong learning programmes for ICT, to encourage workforce to reskill and upskill through funded, part-time and full-time degree level study in ICT.

UK loses ground in world IT research and development!

- Specialist and advanced qualification levels are needed for high-quality, added-value, knowledge economy jobs – home students are not taking up postgraduate places [3].
- Minimum of 50% of ICT postgraduate students in the UK are from overseas – we're training our competitors [3].

Recommendation:

- Incentive schemes and financial support to encourage home postgraduate students, industry-based research study and specialist facility development. Especially important to encourage students from other disciplines to take postgraduate qualifications to move into the field.

UK imports more graduates but bleeds IT jobs to outsourcing!

- 42% drop in UCAS acceptances for ICT first degrees 2001-2006, so not enough home students to fill vacancies, need foreign students to work in UK. [4]
- "Indian companies are likely to be responsible for around 20% of the UK IT services market by revenues in 2020. Up to 40% of the UK IT services sector by revenue, and maybe as much as 60% by staff numbers, could be delivered offshore by 2020." [5]

Recommendation:

- Offer easy route to work permit/permanent residence for overseas students such as the Scottish Fresh Talent initiative, to plug UK skills gap in interim [6].
- National government and industry sponsored publicity campaign, offering financial incentives, sponsored studentships, industry internships and other mechanisms to encourage long term growth of home ICT student numbers.

UK pupils not motivated to study for new technology degrees!

- Shortage of computing qualified, high quality school teachers
- Lack of coordination between school and University curriculum, and industry needs. [2]
- Drop in pupils studying ICT / Computing at GCSE / A level [7].

Recommendation:

- Further development of teacher training incentive schemes, possibly industry scholarships, to encourage good graduates and experienced industry professionals to move into the teaching profession.
- Development and funding of high-quality CPD courses for computing teachers, with appropriate time release to ensure their knowledge and skills stay current.
- Review "irrelevant and unattractive" ICT School curriculum [2].

UK industry won't pay, so no funds for lifelong learning!

- Leitch Review proposes industry funded HE programmes and institutions, along USA model, but UK CBI states "education is the province of the State" [8]
- Vast majority of non-first degree HE study in the UK is self-funded by students, very limited industrial support. However, training and continuing professional development courses attract £23 billion, predominantly from industry, of which only 1% is spent on collaboration with UK HE [9]

Recommendation:

- There is a need to engage UK industry directly in the supply of graduates. A system of tax breaks and incentives for industry sponsorship for courses and students, and for direct financial gifts to institutions, should be considered.

The argument

Fundamental to the argument that UK plc is in decline in ICT and therefore losing competitive edge, is the decline in the numbers of students undertaking ICT degree level qualifications and postgraduate qualifications. The evidence for the decline is based on the reduction in student acceptances for ICT undergraduate degrees through UCAS (represents the bulk of undergraduate students in the UK). Between 2001 and 2006, this dropped by 42%. Note that 76% of applicants take 3 years, and 24% of applicants take 4 years, to graduate. This decline has therefore already affected the pool of graduates available from 2004 to 2010. In parallel to this, the e-skills UK report [1] shows new job vacancies in this sector are increasing (up to 72% of job vacancies in 2006 from 60% in 2005), and the e-skills UK / Gartner publication [10] and Leitch Review [8] show a significant growing requirement for graduate level skills in ICT in the UK job market over the next 10 years.

Making the optimistic assumption that 25% of overseas students studying in the UK do not return home and all EU/Home students remain in the UK job market, this means that there were 22,310 first degree and higher degree holders available for employment in 2006. Note that figures are not available for the ICT percentage of overseas students studying higher degrees so the calculation has been based on the figure for all subjects, which shows 48% of those studying for a postgraduate degree in the UK are from overseas (as opposed to 8% for undergraduate). We would argue, based on feedback from CPHC members, that this is very optimistic for ICT. However, a report by Microsoft [2] states that at best only 42% of those students qualifying with an ICT degree are taking jobs in the industry (backed up by our own research [11] for 2003 which showed a similar percentage working in the industry, representing 61% of all ICT graduates in work). This means that in practice, there are

only **12,940 graduates available for the industry in 2006**. This figure declines by a further 21% for **2008 giving a graduate population of 10,800**.

The figures from the e-Skills UK survey [1] on ICT vacancies in 2006 covering quarters 1-3 demonstrate a quarter by quarter vacancy factor of 122,000. Making the assumption that 25% of these vacancies are recurring, we can identify a vacancy level of 366,000 jobs in the ICT sector in 2006. Of these, 260,000 are identified by e-Skills UK as being new positions, an increase to 72% of ICT vacancies against 60% in 2005. Overall, the ICT sector has shown a steady growth since it reached the bottom of a period of decline in the third quarter of 2003, but the problem is that this has to be set against a declining ICT graduate population as identified above.

The e-skills figures indicate that only 17% of the ICT community have a relevant degree which means there are at least **62,200 new vacancies in 2006 for personnel who are ICT qualified** (assuming the percentage of degree qualified personnel reflects need rather than availability). Figures are not available for those leaving the sector each year; however it is nevertheless clear that the new graduate population being produced by the UK HE sector is inadequate to meet such a demand. In order for UK industry to be competitive across the board, there is a need to ensure that new technologies, especially in the ICT field, are adequately supported to provide industry with the competitive edge that it needs. It can clearly be argued that in 2006 this was not the position.

Final thoughts

If the existing shortfall is to be made up by a combination of graduate qualified immigration and job outsourcing then thousands more graduate qualified immigrants are needed each year, as outsourcing permanently removes jobs from the UK market. Also, outsourcing is regularly reported as offering financial benefits to UK industry, which is true in the short term, but in the long term it reduces the indigenous workforce, and capacity, and increases the likelihood of corporate relocation, significantly damaging the UK economy, especially in terms of the growing requirements for the “knowledge economy”. It should be noted that this approach “treats the symptom not the illness” [2], so we need to find solutions that enhance UK capability. It also does not address the need for high quality postgraduates to support UK IT innovation and development. The current best-case scenario is that half the postgraduate ICT student population are home students, which means we are already training our competitors in the high level skills which are believed to represent the future market for UK industry [2] [10]. Without a significant home student population undertaking such qualifications there is no likelihood of the UK remaining globally competitive in this area.

Despite the belief stated in the Leitch review that there is an appetite in UK industry for involvement in the provision of degree-level qualification, statements made by CBI that education is the “province of the state” would suggest that there is a need to provide incentives for a dialogue between industry and academia to be enabled. The argument propounded by Leitch that the UK requires 40% of the working population to be qualified to level 4 or above by 2020 proposes a significant task for the UK HE sector, especially in ICT, which is seen as one of the major growth industries for the UK over the next 15 years [8] [10]. Without significant and immediate intervention it is not just that the goals presented by Leitch will be unachievable, but the UK will be unable to maintain its present position of competitiveness within world markets and its capability to support its own indigenous industry and will become heavily

dependent on imported expertise and externally purchased ICT services. India and China combined produce about 500,000 engineering and computer science graduates every year [2]. Currently, the long-term implications for the UK balance of payments, job market, and competitive future are bleak.

References

[1] e-Skills UK ICT Inquiry issue 9 - Q4 2006
http://www.e-skills.com/cgi-bin/orad.pl/426/ICTinquiry_Q4_06_final.pdf
[2] Microsoft "Developing the Future" report June 2007..
http://download.microsoft.com/documents/UK/developingthefuture/Developing%20_The_Future_07.pdf
[3] HESA Statistics 2006. http://www.hesa.ac.uk/
[4] UCAS Statistics 2001-2006. http://www.ucas.com/figures/index.html
[5] LogicaCMG report on Outsourcing 2005.
http://www.logicacmg.com/pSecured/admin/countries/_app/assets/outsourcing_for_corporate_value--uk_corp--uk--logicacmg__final_-6282005.pdf
[6] Scottish Executive's Fresh Talent Initiative
http://www.scotland.gov.uk/Topics/Government/Promoting-Scotland/18738
[7] CPHC report: Investigation into the decline in BSc Computing/IT Applications to British Universities - July 2006. http://www.cphc.ac.uk/docs/cphc-admissions-trends-report.pdf
[8] Leitch Review of Skills
http://www.hm-treasury.gov.uk/media/6/4/leitch_finalreport051206.pdf
[9] Lambert Review of Business-University Collaboration. http://www.hm-treasury.gov.uk/consultations_and_legislation/lambert/consult_lambert_index.cfm.
[10] e-skills UK / Gartner publication 'IT Insights - Trends and UK Skills Implications'. November 2004.
http://www.e-skills.com/cgi-in/go.pl/research/publications_library/article.html?uid=632
[11] CPHC report: First Destinations of UK Computing Graduates. Anna Round, Gillian Lovegrove. June 2005. http://www.cphc.ac.uk/docs/cphc-ict-graduates-2005.pdf