



Skills

a critical issue

A Critical Issue

Recent headlines have highlighted growing skills issues¹ throughout the Information and Communication Technology (ICT) industries. Set against strong jobs growth² these issues are now critical.

They impact :

- The growth prospects of the Scottish ICT industry
- Leading edge industries
- Inward investment strategy
- General business productivity
- Universities & Research Institutes

Research³ carried out by industry, academia and government agencies indicate that this is considerably more than a short term problem, with a significant underlying upward trend.

A healthy ICT sector is integral to a successful knowledge economy. It is therefore vitally important that action is taken now to tackle these skills issues. As the trade body for the ICT industries in Scotland, ScotlandIS in partnership with Sector Skills Council e-skills UK, is working with a range of stakeholders to develop and deliver a practical programme to address these issues.

Skills shortages

Authoritative forecasts at a UK level suggest impending increases in skills requirements, at entry, general and senior levels within the ICT industries. Available evidence suggests particular pressure in the following areas:

- Entry level – mainly undergraduate⁴. There has been a 49% reduction in ICT first degree entrants in the period 2001-2006⁵.
- Senior level technical skills – eg technical architects, business analysts, project managers, senior sales people
- Underlying vacancies at a UK level on a quarter by quarter basis of 156,000 jobs as at end 2006.

These trends are highlighted by the higher education institutes (HEI's) who have raised concerns about :

- Falling numbers of school leavers choosing computing science courses
- A higher than average drop out rate after first year, in undergraduate computing science courses
- Less than one in three post graduate research students are of UK origin

1. These are defined as Gaps in existing workforce skills and Shortages of skills for recruitment

2. Source : Scottish Technology Industry Survey

3. See Appendix A : References

4. There is anecdotal evidence that the undergraduate issue is more marked in Scotland than in England.

5. e-skills UK analysis of UCAS data, forthcoming

6. Source e-skills UK, ICT Inquiry

The “Industry”

The IT and telecoms industry employs more than 60,000 people⁷ in Scotland. A high percentage of employees are graduates (48% have a degree or equivalent / higher education qualification), and average earnings are second only to the oil & gas sector.

The industry can be subdivided into four sectors – three ‘expert’ and one general :

Expert sectors

1. Information and communication technologies are the core of the software, telecommunications and IT services industries (the “supply industry”).

2. They are also a vital component of all other industries, in particular “knowledge industries” such as financial services and biotechnology.

Most large companies have an expert IT department requiring similar skills to the supply industry.

3. A third user of expert ICT skills is the ‘research base’, the Universities and research institutes which are an essential part of the Scottish economy

General

4. Finally there is ‘all other businesses’ – many larger companies have in house IT staff who tend to have a broad range of skills and bring in/manage external expertise.

The Evidence

Recent reports (see Appendix A : References) provide evidence of the increasing problem. Although there is little doubt as to current shortages, more detailed work needs to be undertaken to accurately forecast future requirements. e-skills UK will shortly publish the revised data from interviews with more than 251 employers in Scotland providing more detailed evidence on the nature of skills shortages and gaps.

The ‘expert sectors’ tend to demand computing science/software engineering/electronics engineering skills, together with an increasing focus on business-oriented skills within technology roles. Whilst the falling numbers of young people choosing computer science⁸ as a career is a clear indicator of reducing supply at entry level, the shortages of more experienced staff need further investigation.

The e-skills UK survey on ICT vacancies in 2006 covering quarters 1-3 demonstrate a quarter by quarter UK vacancy factor of 156,000, however, new data about to be published will provide additional evidence to inform strategic planning and policy. (STET) (I’m reluctant to lose this – I think we need to demonstrate that ours is not a knee jerk response (PP)

7. Source : Labour Marketforce Survey data 1Q 2007

8. Between 2001 and 2006, applicants to ICT first degrees dropped by 49% at a UK level and e-skills UK analysis of HESA destination data suggests there is a falling percentage of graduates of IT-related degrees who report entering IT professional jobs. As of 2004, 28% of such graduates are reported as being in IT professional occupations within six months of graduation, a drop from 47% in 2000.

Two further factors that must be included in future demand forecasts are :

1. Inward investment effort in Scotland is currently concentrating on attracting high level back office financial services jobs. Many of these are in software development, therefore adding to the demand for expert skills.

2. Many of the major employers of IT professionals, particularly IT consulting firms, are looking for a more complex mix of technical, business and interpersonal skills, rather than just pure computing science skills.

e-skills UK, the sector skills council for the industry, is about to update the initial research undertaken in 2004/5, providing an opportunity to establish more detailed evidence.

The Impact

The ICT skills gap is now widely recognised as impacting UK competitiveness. At a Scottish level the move to a knowledge economy is threatened as expert ICT⁹ skills are an essential element of knowledge based industries.

It will also impact general business productivity significantly – there is a clear fit between improved productivity and ICT . Without the relevant skills Scotland will fall further behind in the productivity stakes.

The research base is already experiencing recruitment problems, with two out of three post graduate research students coming from abroad. To quote the UK Universities Heads of Computing “we are training the competition”.

Underlying factors

Schools

- ICT has a poor image in Schools; equates to spreadsheets and word processing; lack of understanding of the potential of computer science
- Teachers are often less IT literate than pupils (this is the iPod generation)
- Under-informed careers advice

HEI's

- Falling undergraduate numbers, (particularly women)
 - Concern about future supply of researchers
- ### **Employers**
- Insufficient appropriately skilled graduate entrants
 - Serious skills shortages emerging
 - Need to provide flexible accredited life long training

Media and Headlines

- Tend to concentrate on demise of Electronics sector and don't promote opportunities in other parts of the ICT industry
- High profile of outsourcing has fuelled the perception that there are many fewer jobs here

Productivity

- Need to improve the exploitation of productivity gains enabled by ICT
- The general workforce and senior management throughout industry need greater ICT knowledge and skills, to enable productivity improvements .

9. The contribution of ICT to innovation and productivity growth is just as important – or possibly more important – than that of traditionally-defined R&D. For example, the US Bureau of Labor Statistics estimates R&D contributes 0.1 to 0.2 percentage points to annual US productivity growth, while OECD (2004) estimates that ICT capital growth contributed 0.8 percentage points to annual US GDP growth in the period 1995-2001.

Interested parties

There are a number of organisations with an interest in ensuring the continuing supply of suitably skilled people, including:

- ScotlandIS – representing industry
- BCS/IET – professional bodies
- e-skills UK – the sector skills council for ICT
- Careers Scotland
- HEI/FEI sector
- Schools
- Scottish Executive
- Scottish Enterprise

A number of initiatives already exist, aimed at addressing some of the elements leading to the current skills shortage ; however they tend to be small and disjointed. ScotlandIS has undertaken a review of these initiatives, to understand current activity.

The Plan

ScotlandIS and e-skills UK will work in partnership to develop and deliver a programme to address these issues, using a partnership approach with the bodies mentioned above.

We have identified four key areas for action ;

1. A concerted campaign to provide careers advice (a) at the schools level : pupils, parents, teachers, careers advisors, and (b) to more mature entrants.
 2. An industry led internship scheme to link undergraduates to employers prior to employment, creating stepping stones to job opportunities at an early stage.
 3. Deployment of the modern apprenticeship scheme, linking with initiatives such as the Industry Alliance for Jobs, to augment more traditional routes into the industry.
 4. The development of a coherent, shared life-long learning framework for those already in the workforce, using the industry-defined IT Professional Competency framework (PROCOM).
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In preparing this paper, we have had discussions with:

- BCS,
- DTI
- Scottish Universities Heads of Computing,
- Scottish Funding Council,
- Further Education sector
- David Hume Institute
- Scottish Executive
- Many software and ICT companies across our membership.

Appendix 1 - References

Relevant Reports

A The Leitch Review : Prosperity for all in the global economy - world class skills

B Information Age Partnership Reports

1. Ensuring the Right Conditions for an Innovative, Inclusive and Competitive UK Knowledge Economy

2. Raising UK Productivity - not yet on the web but a DTI/IAP report published mid June

C Developing the Future 2007 – Microsoft, BCS, City of London University

D Scottish Technology Industry Survey 2007 – ScotlandIS

E The Institution of Engineering and Technology Skills Survey 2007

F ICT Inquiry issue 9 - Q4 2006 – e-skills UK

G Skills Gap Report – an analysis of current initiatives - ScotlandIS July 2007

H HESA Statistics 2006. <http://www.hesa.ac.uk/>

I UCAS Statistics 2001-2006. <http://www.ucas.com/figures/index.html>

J LogicaCMG report on Outsourcing 2005. http://www.logicacmg.com/pSecured/admin/countries/_app/assets/outourcing_for_corporate_value--uk_corp--uk--logicacmg__final_-6282005.pdf

K 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>