Your details

Name

david moloney

Relevant Skills:

What do you consider to be the relevant skills for development in the period to 2025?

There is a major need for parallel software development skills in this timeframe given that Moore’s law will have disappeared as an economic driver. The implications of this are very far reaching for essentially all of the growth in the world economy, which is largely predicated on productivity enhancements, delivered largely by software which depends in turn on semiconductor process technology. ITRS predicts 40%/yr increase # cores 5x performance increase in five years, 25x in ten years as cores and parallelism replace faster transistors as a means of achieving higher performance.

Implications of multicore are that while we can make multicore chips we’re poor at programming them and we can’t rely on compiler technology which compiler only doubles CPU perf. every 18 years (Proebsting’s Law Microsoft) and Wirth’s (Reiser’s) Law

Which states that SW is slowing faster than HW is accelerating aka “Groves giveth, and Gates taketh away”

John Hennessy (Stanford) put it very succinctly when he said “… parallelism and ease of use of truly parallel computers are as hard a problem as computer science has faced … I would be panicked if I were in industry”

The Swedish software organisation Swedsoft did a similar exercise to what you’re doing from 2008 reported here http://swedsoft.se/wp-content/uploads/sites/7/2015/05/Swedsoft_SRA_2010.pdf but in contrast identified the impact of the lack of these skills and most importantly identified concrete measures to address future needs.

The report identified 50% of Sweden’s total exports critically dependent on SW! However in Sweden only 1% of SW developers proficient in parallel programming and parallel SW development is 2-3x more expensive

Swedsoft concluded that “[Sweden] must become at least 10x more efficient [in software] to remain globally competitive. The stakes are huge.” - Swedsoft, Jan 2010

The concrete measure implemented by the Swedes was the Swedish Multicore Initiative (SMI) with a Vision to make multicore easy as single-core for Swedish industry

The Forfas ICT report from November 2013 http://www.skillsireland.ie/media/04112013-Addressing_ICT_Skills-Publication.pdf contains exactly 2 references to parallel and 1 to multicore software but contains zero concrete measures to address the requirements.

Our lack of planning for this is worrying when ICT is Ireland’s biggest export at 6B and our competition in Europe take SW technology more seriously that we do

• SW revenue (OECD stats 2008)
  – Sweden $7B
  – Ireland $21B
• ICT employment (EU 2009 Report)
  – Sweden 7%
  – Ireland 9%
• ICT BERD Reinvestment (EU 2009 Report)
  – Sweden 8.5%
  – Ireland 2.0%

Do we have the right mix of initiatives to deliver the future needs of enterprise, the economy and society?

We are totally failing to address software and ICT in general as a transversal skill base and resource that can be used to achieve systemic productivity enhancements and generate new enterprises across the whole economy. The SFI RSPG reflects this where despite my protests that SW was not addressed as a discipline all silos identified by SFI mentioned ICT as being the key technology. According to the latest report on NRPE progress parallel software is still not a priority or even recognised as such https://www.djei.ie/en/Publications/Publication-files/For%27s%273%27A1s/National-Research-Prioritisation-Exercise-First-Progress-Report.pdf
In terms of specific skills requirements deep-learning using convolutional neural networks and computer vision are skills that underpin major new business opportunities in robots, virtual reality and autonomous systems generally and do not appear to be addressed in any of our national plans. Furthermore given the immense computational power required to deliver these applications massive gains must be made across the board from embedded devices to the cloud in order to make such services ubiquitous.

These skills are in short supply worldwide with Google and Facebook acquiring deep-learning companies like DeepMind in the UK and Facebook setting up an AI lab in Paris in 2015.

The good news is this scarcity is an opportunity for Ireland and with a vision to be in the top 3 worldwide and investment to back it up Ireland could play and win at a worldwide level much in the same way as the Israelis are #2 in drones worldwide

Investment in these key areas should be backed by a comprehensive educational program from primary school onwards where students are taught to use computers as tools for information gathering and analysis as part of every subject. In order to achieve this the next generation of teachers must be prepared and equipped to deliver this approach to learning.

This pioneering work reported in Wired magazine in 2013 [http://www.wired.com/2013/10/free-thinkers/] shows a group of disadvantaged Mexican schoolkids living on a refuse dump were able to achieve the best Maths scores in the entire country through the use of computers as integrated learning tools in the classroom as well as a self-directed problem-solving approach to learning rather than rote learning.

How can employers and education and training providers work more effectively to identify and address skills needs and ensure the “work readiness” of learners?

In my own experience work placements are the best way of preparing students for the world of work. It shows the student how an organisation and teams work and how they can integrate into the workplace interacting, learning and contributing to the team in a way that no classroom can fully do although the Mexican experience reported in Wired can go a long way to bridging the gap. Building in work placements, team based classroom learning and critical thinking would help to prepare students and should be implemented on a sliding scale starting from the first year of secondary school education. Generally critical thinking is only currently handled in English language classes and only regards works of literature and poetry. These skills have broad applicability for people to process information in their personal lives, interpreting mass and social media in a critical way, but equally as a key tool in scientific and business endeavour. This change alone would make our society a healthier and more productive place with very little in the way of extra investment in terms of training teachers although a change in teachers mind-set to one in which they encourage and shape debate as facilitators would be required.

Measurement & targets:

What indicators should be used to measure progress in the new Skills Strategy (e.g. NFQ levels, Employer surveys, other)?

International competitiveness indicators and GDP per-capital are probably the best indicators of the effectiveness of such a strategy but take time to filter through when starting from the ground up. Obviously both academic publications and patents are also means of gauging progress but again are medium term. In terms of short term measures annual of bi-annual surveys as well as workshops and conferences on a regional and national level involving industry and academia in thematic areas would be the best way of getting rapid feedback into the academic community and legislators.

Life Long Learning:

How can we motivate more people to participate in life-long learning? What are the attitudinal and structural barriers to learning that need to be overcome?

With online platforms like Coursera and most of the Universities offering online courses the barriers to accessing high-quality educational materials have never been so low, What is missing is accreditation and acceptance of such qualifications. On the side of the student he/she must be prepared from a very early stage to use online media to expand their horizons beyond rote learning of what is in book. Critical analysis will be key here in terms of cross-checking of facts.

What actions can be taken by employers to support and encourage increased participation in lifelong learning?

Clear explanations of current and future business needs in terms of skills and approved courses people can do to address these needs would be of great help to employees. Where courses were on an approved
What actions can be taken by education & training providers to support and encourage increased participation in lifelong learning?

A change in focus from rote learning to problem-solving in teams backed up by self-directed learning would allow students to flexibly access teaching material from the best presenters in a time and place of their choosing, if they're not morning people and/or are working during the day etc. This requires a huge change in mindset from the academic community separating the performer who delivers the lecture from the problem-solving tutors who help students to apply what they have learned.

What actions can be taken by the State to support and encourage increased participation in lifelong learning?

The state should prioritise key skills and provide tax-reliefs for these skills. A good example of this is the 16% personal tax-break for engineers/programmers in export-oriented ICT in Romania which has had a massive impact on the Romanian ICT industry.


How can we give recognition to prior learning including skills acquired in work, home or community settings?

Providing academic accreditation for Coursera or Kahn Academy type self-learning by exam or other means would be helpful here.

What barriers need to be addressed in order to stimulate investment in training by Irish enterprises?

None. High quality courses are available for free today on platforms like Coursera. At secondary and primary level there should be a mandatory requirement for free school e-books and tablets for all students in order to level access with current providers free to adapt and provide value-added services rather than maintaining a few established academic publishers in Ireland in a privileged position to exploit the citizen economically.

What barriers need to be addressed to encourage disabled people to engage with education and training?

Again in ICT there are relatively few barriers other than the physical ones and generally accessible workplaces and more support for remote working would be of help to disabled workers.

Real world experiences for learners:

How can the range of work place experiences be expanded, particularly in SMEs, to increase opportunities for learners to gain practical experience as part of their education and training programme?

National programmes and online resources aimed at acquainting SMEs with training resources would be very helpful here.

Skills infrastructure:

Is the structure and architecture for the education and training system fit for purpose?

No. We need more team-working and problem solving in the workplace for high-skilled jobs as well as critical thinking and communications skills. Unfortunately our teachers are ill-equipped and resistant to change.

Is there a need for greater collaboration, particularly in the post-secondary sector to support learners to access learning opportunities and to meet the skills needs of employers?

Absolutely and as previously stated an active work-placement scheme for both students and teachers throughout the education cycle would be of immense value in making sure we have a common understanding of work-practices and challenges.

How can we encourage the provision of a range of programme offerings by education and training providers that are relevant to learners and enterprise needs?

Provide basic access to online and e-books and materials and low-cost tablets for free with providers encouraged to provide value-added services on top rather than making minimal incremental changes to paper books every year and gouging the consumer.
What can institutions do to ensure their policies and practices are inclusive and open to people with disabilities and other under-represented groups?

Accessibility both physical to buildings and to materials is key as are flexible work practices that allow people to work and study remotely for at least some part of the working week.

There are divergent views on the issue of over-education and the scale of skills mismatches in the economy. It is clear that enterprise requires skills at all levels of the NFQ. We would welcome views on this issue and the implications that it has for the skills system and in particular the balance of provision between further education and training and higher education.

The government needs to manage grants, tax-relief and other means at its disposal to sluice talent towards where it will produce the maximum return for Ireland Inc. This requires a continuous feedback system between academics, industry, legislators and students. A survey is not sufficient to do this and workshops, conferences and seminars in thematic areas are required to ensure there is a real understanding of the issues, not just soundbites.

How can education and training providers and employers work together more effectively to respond to the results of the Employer Survey to achieve greater satisfaction amongst employers in future with the skills of graduates?

A survey is not sufficient to do this and workshops, conferences and seminars in thematic areas are required on an ongoing basis (quarterly) to ensure there is a real understanding of the issues, not just soundbites from educators, industry, legislators and students.

What changes can be made to the approach to training and skills development to improve the employment prospects of people who are long-term unemployed?

I don't have any expertise in this area.

How can the education and training system better engage with unemployed people with low levels of educational attainment?

Problem-solving in teams is a way to get the best from people where they may not be high individual achievers.

How can we encourage people with disabilities and other under-represented groups to return to education or to retrain for employment?

I don't have any expertise in this area.

What measures can be taken to improve the progression of young people from education and training – as well as those not in education or training, including early school leavers – to employment?

I don't have any expertise in this area.

What can we do to facilitate and support the return of skilled Irish migrants in the coming years?

The tax burden and housing supply are key in attracting migrants to return and must be addressed for our national competitiveness.

How can we encourage older people to reskill & retrain and continue to participate in the labour market? What skills will they require?

I don't have any expertise in this area.

How best can this reskilling and retraining be facilitated?

I don't have any expertise in this area.

What changes could be made to ensure that future skills needs of the economy can be anticipated and communicated most effectively to education and training providers, employers, students and those already in employment?

Online resources, workshops, conferences and seminars at regional/national level on an ongoing quarterly basis rather than the Mastermind approach "I've started so I'll finish".

How can all stakeholders work more effectively to increase awareness of skills requirements and career opportunities among both school leavers and those already in the labour market?

Work placements during education from yr 1 of secondary school for teachers and students alike and in the work place Online resources, workshops, conferences and seminars at regional/national level on an ongoing quarterly basis rather than the Mastermind approach "I've started so I'll finish".
How can the new network of Regional Skills Fora best contribute to the development of the skills base in each region?

I don’t know anything about Regional Skills Fora but I already stated that online resources, workshops, conferences and seminars at regional/national level on an ongoing quarterly basis rather than the Mastermind approach "I've started so I'll finish"

How can we ensure a better understanding of the skills that are available, for instance in creating a common understanding of language proficiency?

If you want to understand something you have to measure it. This goes for any area including language proficiency. Other areas of importance would be critical thinking and debate as well as teamwork

How can we promote a more effective use of skills at work? In particular, how can managers be supported to identify effective work and organisational practices that make the best use of skills available to them?

Managers need to be trained and measured on their progress - you get the behaviour you incentivise for

How can this best be promoted among SMEs?

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How can workplace learning be used more effectively to link training provision more closely to employer needs?

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What additional measures are required to support entrepreneurial education and entrepreneurship skills in Ireland?

Entrepreneurial skills should be part of the curriculum all through second and third level. People like Jerry Kinnelly are already doing this locally in Kerry and their program could be rolled out country-wide. The big issue is resistance to change among heachers

How can SMEs be better supported and encouraged to engage with training?

Show them how it affects their bottom-line using case-studies in seminars/workshops/conferences and provide economic supports for them to share their own experiences as well as to learn best practice from others

Thank you for consulting Movidius, however I think it is at very short notice for a matter which has fundamental implications for pretty much the entire Irish economic output in the coming decade.

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