Skills for a Knowledge Economy

Eoin O'Driscoll
Forfas
eod@aderra.ie

Growth
In 1988 a cover story on the front of ***The Economist*** magazine referred to Ireland within the EU as the 'poorest of the rich'. Less than a decade later, in 1997, Ireland again featured on ***The Economist's*** cover as 'Europe's shining light'.

Today, Ireland is still enjoying the benefits of a period of sustained and unprecedented growth that started in the early nineties. This growth, which was driven by industry and export led, resulted in a reduction in unemployment levels to less than 5%; doubled the number of people in employment to over two million; boosted exports and increased GDP/Capita from 89% to 128% of the EU15 Avg.

The drivers of this growth included our active participation in the EU, an effective taxation regime regime, social stability, pro enterprise government policies and favourable demographics. Perhaps the greatest driver of Ireland's growth over the past two decades was the strong focus on education since the 1970s.

In particular the education system was aligned with the needs of our economy. The ***IMD World competitiveness Yearbook 2006*** rates the Irish workforce very highly on 'flexibility and adaptability when faced with new challenges' and ranks the education system ranks highly in meeting the needs of a competitive economy.

These factors made Ireland an attractive location for foreign direct investment. Investment by ICT, pharmaceutical, medical device and internationally traded service companies established Ireland as a base for leading multinational corporations. These corporations fuelled our export growth and this in turn stimulated the domestic economy

New Challenges
However we now face new challenges. These challenges result from globalisation and the increasing role of services as the engine of growth in most developed economies.

The process of globalisation has increased in intensity and quickened in pace over the past 5 years. The entry of China into the World Trade Organisation (WTO) created a new dynamic. This historical event in 2001 brought a country with one quarter of the world's population into the multilateral trading system for the first time.

In addition, companies can now to divide up their value chains into smaller and smaller slices, move these slices around the globe to optimise value and tie it all together again with advanced telecommunications technology.

The world is indeed flat and new markets and competitors are now emerging. In the past, we defined global commerce around the old industrialised world; a world of 580 million producers and consumers in the USA, Europe and Japan.

Commenting on soccer, Jean Paul Sartre, the French philosopher, wrote that *'In football everything is complicated by the presence of the other team'*. In global terms this other team now has 6.3bn players. Global power is shifting. It is forecast that by 2050, the Chinese economy will exceed that of the US, India will have a higher GDP than Europe and Brazil's economic output will rival that of Japan.

Competing in the Knowledge Economy
As a consequence of recent success and increased expectation Ireland is now a high cost location. A key question for policy makers is: ***'In the new competitive global landscape, how do we keep ourselves in the style to which we have become accustomed?'***

Companies competing, from a high cost base, in this new environment will need to dramatically increase value added and productivity To sustain our high standards we must compete on knowledge This will require a continued focus on people..…people who have the ability to generate and exploit the commercial potential of ideas.

In our efforts to stay ahead of the curve and compete in the global economy we must recognise that: - **'*Knowledge creation and diffusion are at the core of economic activity. Knowledge is embodied in people, and it is the quality of the human resource that will determine the success or otherwise of firms and economies in the years ahead. It is people who create knowledge, and it is people who disseminate, adapt and use data, insights, intuition and experience to create distinctive value*"** (ESG 2004)

The focus on science, technology and innovation through the Programme for Research in Third Level Institutions (PRTLI), Science Foundation Ireland (SFI) and the Strategy for Science Technology and Innovation 2006-2013, has transformed the research landscape in Ireland.

There is now significant research activity of world class taking place here. Gross Expenditure on research exceeded €2.3bn in 2006. Third level expenditure on Research and Development exceeds €600m for first time and Ireland's higher education R&D spend of 0.4% of GNP is comparable to the OECD average and exceeds that of the EU27.

One of the very significant recent developments is the creation of the Centres for Science Engineering and Technology (CSET). These CSETs help link scientists and engineers in partnerships across academia and industry. They address crucial research questions. They foster the development of new and existing Irish-based technology companies and they attract foreign industry that could make an important contribution to Ireland and its economy.

People
Achieving success in the knowledge economy will ultimately depend on the quality of the human capital we produce. We are making excellent progress at the 4th level. We are seeing dramatic increases in the population of higher education researchers with the

number of full time equivalents now approaching 5000. This puts us in the same league as the EU27 but with still some way to go to catch the leading players.

However the greatest concern is the supply of graduates to industry and to 4th level. We are not getting an adequate supply of people with an interest in science and technology into third level. Science and engineering are the bedrock of Ireland's knowledge economy, but we have failed to excite our students to study these subjects.
Only 18.32% of the 54,100 students that sat the Leaving Certificate examination in Ireland in 2006 attempted the honours paper in maths. Consequently only a relatively small cohort of students is eligible for higher-level degree courses in science, technology and related areas, where a Grade C in higher-level maths is a minimum requirement.

The ***National Competitiveness Council*** highlighted the problem in 2006 when it stated: 'The supply of people with high levels of maths, science and ICT skills is crucial to the success of Ireland's strategy to facilitate the development of knowledge-intensive sectors and to enable Irish people to live and work in a knowledge society…….Improved teaching strategies and learning outcomes in maths, chemistry, physics and biology should be a priority."

Maths is one of the basic building blocks for many of the opportunities in the knowledge economy. We urgently need to look at how we might improve teaching strategies and learning outcomes in maths. These teaching methods should focus on helping students to think creatively and to understand how maths in employed in the real world. We must move from the binary approach of right and wrong and develop the approach of supporting an answer versus remembering formulae. To achieve this will require a culture change that removes the fear and the sense of failure that result from many of the existing of the current teaching strategies. Many parents and teachers add to the difficulty of developing mathematical competencies by reinforcing the myth that success or failure at maths is genetic.

Success in a knowledge economy will require a focus on skills at all levels. We must ensure that those entering the workforce are able to operate at the levels of productivity and innovation required to sustain our success. To achieve this we must boost leaving certificate (or leaving certificate equivalent) completion rates to greater than 90% and ensure that the quality of our graduates and post graduates rank in the top decile of OECD countries.

Perhaps our greatest challenge is to upskill those in employment, ensuring that they have the skills to continue to be productive in the economy as the nature of employment changes in response to the forces of globalisation. We must develop a focus and a detailed approach to providing adults with the required mathematical competencies and numeracy skills comparable to that provided on literacy.

Ireland became Europe 'shining light' by developing people through education. In a rapidly globalising world increasing our focus and investment on education will allow us to build on our past success.

Paper Presentations