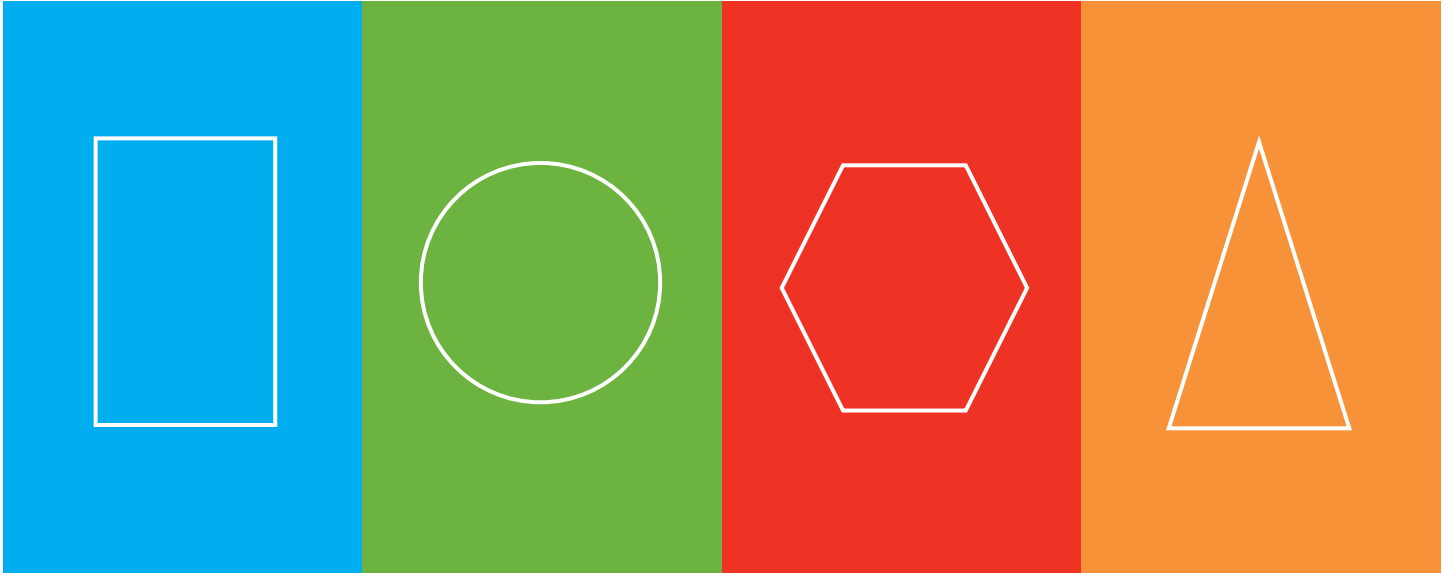


Tomorrow's Skills Towards a National Skills Strategy

5th Report
Expert Group on Future Skills Needs
2007



Tomorrow's Skills Towards a National Skills Strategy

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Foreword

by Anne Heraty, Chairperson of the Expert Group on Future Skills Needs

On behalf of the Expert Group on Future Skills Needs, I am pleased to introduce this report titled *Tomorrow's Skills* based on research undertaken at the request of Micheál Martin T.D., Minister for Enterprise, Trade and Employment to underpin the development of a National Skills Strategy.

To date, education and training policy has served Ireland well. It is one of the building blocks upon which Ireland's economic success has been developed. Our ability to meet the skills needs of enterprise has been one of the cornerstones of our economic success to date. There is, however, no room for complacency. If we are to maintain our international competitiveness and ensure a continued high standard of living, then we must continue to develop the skills required to compete and prosper in the ever-changing modern economy.

In a rapidly changing environment, the changing skills needs of the economy and society are difficult to predict with a high degree of certainty, however, it is possible to identify trends which will assist us in making informed policy decisions. Those trends point to increasing demand for those with high level skills and a relative decline in demand for those with low level skills. They show a continuing shift towards the services and high value added manufacturing sectors. They point to increasing employment in managerial, professional, associate professional, personal and service and sales related occupational groups and an increasing emphasis on generic skills including basic skills such as literacy, numeracy and using technology.

In simple numerical terms, the Irish economy is likely to need 950,000 extra new workers between 2006 and 2020. This demand will be met through the young school leaving cohort, through increased participation and continuing to attract inward migration.

In absolute terms, the demand for skills at National Framework of Qualification levels 6-10 will continue to grow strongly. However, in the absence of policy change, a significant proportion of Ireland's workforce will remain low-skilled in 2020, with their highest level of educational attainment below upper secondary level. The result will be an under-supply of skills at the higher levels, and an over-supply of those at the lower levels. The skills requirement of the economy will be met only by re-skilling and upskilling the resident workforce and by attracting highly skilled migrants.

The Expert Group on Future Skills Needs proposes a vision of Ireland in 2020 in which a well-educated and highly skilled population contributes to a competitive, innovation-driven, knowledge-based, participative and inclusive economy.

In order to achieve this vision the Expert Group has identified a set of objectives which will assist Government in developing a National Skills Strategy. These objectives include achieving a significantly improved educational profile for the labour force, upskilling 500,000 people in employment, increasing the participation rate in upper secondary education to 90% and ensuring the progression rate to third level increases to 72%. Meeting these objectives represents a significant challenge and will require an integrated all-of-government approach led by Department of Enterprise, Trade & Employment and the Department of Education & Science.





A number of approaches are required to achieve these objectives. Firstly, we need to ensure that young people receive the maximum benefit from our formal education system. Secondly, we need to ensure that those within the workforce have opportunities to engage in learning. If met, these objectives will ensure Ireland's continued competitive advantage in the areas of skills, education and training.

I would like to thank all those that contributed to the production of this report. Firstly, I would like to thank the Ministers for Enterprise, Trade & Employment and Education & Science and their officials for their cooperation, assistance and advice during the course of this study. I would like to express my gratitude to the members of the Expert Group on Future Skills Needs and the members of the sub-group who steered this study to conclusion. I would like to thank the team at Forfás and FÁS that provides secretariat and research support to the Expert Group on Future Skills Needs. Finally, I would like to thank Martin Shanahan, Forfás for leading this project to a successful conclusion.

Anne Heraty

Chairperson, Expert Group on Future Skills Needs



Preface

In July 2005, the Minister for Enterprise, Trade & Employment asked the Expert Group on Future Skills Needs (EGFSN) to identify the skills required for Ireland to become a competitive, innovation-driven, knowledge-based, participative and inclusive economy by 2020.

In response, the EGFSN carried out a detailed programme of research, the results of which are presented in this document. The conclusions and recommendations in this document are based on this research, and should underpin the development of a National Skills Strategy.

The document has five chapters:

Chapter 1 Introduction

Investment in education and training, through increased participation, improving the productivity of workers, and encouraging innovation, boosts economic growth and living standards. Ireland's recent economic success was based to a significant extent on growth in labour productivity and increased participation in the labour market. World class skills, education and training have been identified in the Enterprise Strategy Group Report as an area in which Ireland can continue to develop competitive advantage in building sustainable enterprise.

Over the coming years, education and training will continue to play a significant role in ensuring the country's economic prosperity. From a societal perspective, sustained improvement in our national educational attainment levels can also yield much broader benefits, through contributing to greater social cohesion, better public health, reduced levels of poverty and social welfare dependency and a reduction in crime rates.

Chapter 2 Changing Skills Needs

The skills requirements of the economy are not static. As the economy increases its dependence on services and high technology manufacturing, and traditional sectors decline in importance, there will be a corresponding change in the particular skills and the balance of skills needed in the economy.

An analysis of skills requirements needs to take account of:

- Changes in the balance of the different economic sectors;
- Changes in the demand for specific occupations within each sector;
- Changes in the specific skills required in each occupation; and
- An increasing emphasis on basic and generic skills.

As employment in sectors such as agriculture and the manufacture of machinery continues to decline, it is areas such as ICT, medical devices, pharmaceuticals/biotechnology, food and drink, and high-value engineering that hold the potential for future growth. Services, such as finance, business and marketing, will continue to grow strongly. Managerial and professional occupations will account for more and more of our workforce in the years to 2020, while unskilled manual labour, agricultural occupations and similar occupations will account for significantly less. Clerical and craft related occupations will grow in absolute terms but their relative share of employment will decline.

Generic, transferable skills, such as literacy, numeracy, IT and people skills, will be increasingly valued; employees will be required to demonstrate flexibility and an ability to continually acquire new knowledge and skills. Employees will be required to have a greater breadth of knowledge, and the demand for higher qualifications will increase.

The shift to services also demands investment in education and training: in this sector, it is more difficult to drive productivity by investment in capital or technology; productivity increases depend largely on creativity, innovative ability and the application of knowledge.

As is expected in a rapidly developing economy, there is a tight labour market and skills shortages currently exist in several sectors of the economy, for example construction, finance, health care, engineering and IT related occupations. While multinational companies in Ireland in general appear to be satisfied with the skill level available, the availability of labour remains an issue.

In the recent past, large-scale immigration has added significantly to the supply of skilled labour. The immigrant population is characterised by high levels of educational attainment, but immigrants are often employed at levels for which they are overqualified; their potential productivity is thus not fully realised.

Among the existing labour force (and particularly in older age cohorts), a significant proportion is educated only to lower secondary level or below. Without intervention, this is self-perpetuating: low educational attainment levels are linked to low literacy levels, and low literacy levels inhibit participation in education and training.

Seen against the requirement to reskill and upskill the existing workforce, Ireland's relatively low participation rate in continuous learning is cause for concern – at 7 percent, it lags significantly behind the EU's Lisbon target and the best performers in Europe.

Gender imbalances are apparent across all strata of education and employment, with males underperforming relative to their female peers in second-level education. Despite this, the female participation rate in the labour force, at 52.5 percent in 2006, lags appreciably behind the male rate of 72.8 percent. Gender streaming is also evident, with more females in caring professions and teaching, and more males in engineering and construction.

Chapter 3 Investment in Education and Training

There are proven positive returns to the State, to enterprise and individuals from investment in education and training. Better trained individuals can command higher salaries, and enjoy better security of employment and job satisfaction. Their employers in general experience increased productivity that more than compensates for the higher wages.

The reluctance of many individuals to participate in education and training may be due to their lack of awareness of the benefits, or to financial constraints. The barriers are more pronounced for those with lower level skills. The State, therefore, is justified in intervening in the market for education and training at certain levels, notably at primary and post primary level and also has a role to play in encouraging participation, and in particular in supporting the low-skilled who would otherwise be unlikely to participate in education or training.



Chapter 4 Supply and Demand for Skills to 2020

In simple numerical terms, the Irish economy is likely to need 950,000 extra new workers between 2006 and 2020. This demand will be met through the young school leaving cohort (640,000) and through increased participation and continuing to attract inward migration (310,000).

In absolute terms, the demand for skills at levels 6-10 will continue to grow strongly. However, in the absence of policy change, a significant proportion of Ireland's workforce will remain low-skilled in 2020, with their highest level of educational attainment below upper secondary level. The result will be an under-supply of skills at the higher levels, and an over-supply of those at the lower levels. This will be apparent by 2010, and will worsen considerably by 2020. The requirement will be met only by reskilling and upskilling the resident workforce and by attracting highly skilled migrants (and employing them in occupations for which they are qualified).

Chapter 5 Conclusions and Recommendations

The Expert Group proposes a vision of Ireland in 2020 in which a well-educated and highly skilled population contributes optimally to a competitive, innovation-driven, knowledge-based, participative and inclusive economy.

Specifically, the Expert Group concludes that if Ireland is to realise this vision of a new knowledge economy which can compete effectively in the global market place, it requires enhancing the skills of the resident population, increasing participation in the workforce, and continuing to attract highly skilled migrants. Specifically, the Expert Group proposes that, by 2020:

- 48 percent of the labour force should have qualifications at NFQ Levels 6 to 10;
- 45 percent should have qualifications at NFQ levels 4 and 5; and
- The remaining 7 percent will have qualifications at NFQ levels 1 to 3.

In order to achieve these objectives, action is required at a number of levels:

- An additional 500,000 individuals within the workforce will need to progress by at least an NFQ level.
 - Specifically, upskill 70,000 from NFQ levels 1 & 2 to level 3; 260,000 up to levels 4 & 5; and 170,000 to levels 6 to 10.
 - The cost of the proposed upskilling to NFQ levels 3, 4 and 5 is estimated over a thirteen year period at €153 million per annum.
 - The cost of the additional upskilling to the higher NFQ levels (6-10) is estimated over a thirteen year period at €304 million per annum. These costs reflect tuition costs which should be apportioned between the State, employers and individuals.
- The proportion of the population aged 20-24 with NFQ level 4 or 5 awards should be increased to 94 percent, either through completion of the Leaving Certificate or through equivalent, more vocationally oriented programmes. The retention rate at Leaving Certificate should reach 90 percent by 2020.
- The progression rate to third level education will have to increase from 55 percent to 72 percent.

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Executive Summary

Context

The objectives of this study are to:

- Identify the skills required for Ireland to make the transition to a competitive, innovation-driven, knowledge-based, participative and inclusive economy by 2020;
- Provide projections of the labour force's skills profile required to make the transition to such an economy and compare that profile to that which current projected output will yield; and
- Provide training and education objectives where gaps and deficiencies are evident between the desirable situation and the likely supply.

Skills and human capital development have played a very significant role in productivity increases, economic growth and improvements in living standards in Ireland. Human capital development will continue to play a key role in economic growth into the future, therefore sustained and enhanced investment in the educational and training infrastructure is essential to our economic and social development over the medium term.

Changing Skills Needs

- The trends in the changing profile of sectors that we have seen in recent years, in common with most developed countries, will continue for the foreseeable future. By 2020, the services and high value added manufacturing sectors will have increased in relative importance, while traditional manufacturing and agriculture will continue to decline. This shift to services will pose a significant productivity challenge for policymakers and for enterprise alike.
- At occupational level, the greatest increases in employment are expected to occur in the 'professional', 'associate professional' and 'personal & service' occupational groupings.
- Employees in all jobs will be increasingly required to acquire a range of generic and transferable skills including people-related and conceptual/thinking skills. Work will be less routine, with a requirement for flexibility, continuous learning, and individual initiative and judgement.
- The Enterprise Strategy Group emphasised the importance of R&D, innovation and marketing skills. All occupations will become more knowledge-intensive, resulting in many cases in a rise in the requirement for qualifications and technical knowledge.
- Science, Engineering, ICT and R&D skills are an integral part of a knowledge-based economy and their promotion remains important.



Investment in Education and Training

- Participation in education and training has an unambiguously positive impact on earnings for employees, firms and the economy in general.
- However, due to a lack of recognition of this positive impact, or due to other obstacles, employees and firms do not always participate in education and training to their full potential. This failure justifies state intervention in the market for education and training.
- This intervention is particularly justified in primary and post-primary education and in education and training of certain target groups, such as the low-skilled and marginalised, who without this intervention would not receive education or training.

Supply and Demand for Skills to 2020

The labour force is projected to grow to about 2.4 million by 2020. Approximately 1.4 million of the current workforce will still be in the labour force in 2020. An additional 640,000 young people will come into the labour force from the formal education system. The remaining additional 310,000 will be made up of immigration and increased participation by the existing population.

Table A.1 below (Column 1) shows the 2005 skills (educational attainment is used as a proxy for skills) profile for Ireland. OECD comparisons of this profile with that of other OECD countries are unfavourable. In 2004, only 6 out of 27 OECD countries had a worse performance than Ireland in terms of the percentage of the labour force who had only attained up to lower secondary qualification.

If we simply extrapolate current provision and demographic trends to 2020 and do not add to training and education output, the educational attainment of the labour force will have improved. This baseline 'no policy change' scenario is set out in Column 2, Table A.1. However, it is important to remember that our main trading competitors will also have improved their educational profiles and that if Ireland is to compete effectively, it will need to build competitive advantage in the area of skills.

Comparing these baseline 'no policy change' educational attainment projections (Column 2) with projected demand in 2020 (Column 3), leads to the conclusion that by 2020 there will be:

- A slight shortage at National Framework of Qualifications (NFQ) levels 8 to 10*;
- A significant shortage at NFQ levels 6 & 7; and
- Surpluses at NFQ levels 1-5 with the possibility that a large number of low-skilled individuals will be unable to find suitable employment.

In addition, Ireland's ambition should not be to simply meet projected skills demand based on an extrapolation of current observed trends. If Ireland is to develop competitive advantage in world class skills, education and training, and transition to a knowledge economy in which skills drive innovation, productivity, and entrepreneurial activity, it requires a skills profile which substantially changes the equilibrium – skewed towards higher levels of skills attainment. Such a profile is set out in Column 5, table A.1. The challenge for Ireland is to move from the baseline 'no policy change' scenario set out in Column 2 to the vision of a skills profile for the new knowledge economy set out in Column 5.

* The National Framework of Qualifications is explained in Section 4.0 and is illustrated in Appendix J.

Table A.1 Skills Profile of Ireland's Labour Force – Absolute and Relative Share Grouped by NFQ level

NFQ Level	Column 1	Column 2	Column 3	Column 4	Column 5
	Current Skills Profile (2005)	Baseline Skills Profile in 2020 based on 'no policy change' to Supply	Baseline Projected Demand for Skills in 2020	Unmet Skills Needs (Column 3 less Column 2)	Vision of Skills Profile for 'New Knowledge Economy' in 2020
Levels 8-10	20% 393,000	28% 667,000	29% 681,000	14,000	32% 776,000
Levels 6-7	12% 223,100	10% 233,000	16% 372,000	139,000	16% 385,000
Levels 4-5	40% 773,600	44% 1,051,000	38% 894,000	(157,000)	45% 1,090,000
Levels 1-3	28% 539,500	18% 450,000	17% 390,000	(60,000)	7% 180,000
Total	100% 1,929,200	100% 2,401,000	100% 2,337,000	–	100% (2,431,000)

This requirement to enhance the skill level of the working population presents a substantial challenge as Ireland's participation rate in continuous learning (non-formal learning) is relatively poor. Only 14 percent of 25-64 year olds in Ireland engaged in non-formal learning in 2002, compared with 16.5 percent in the EU25 and 34.5 percent in the UK.

Ireland also ranks poorly in terms of adult literacy but evidence suggests that literacy among young people has improved in recent years.

Significant gender imbalances are apparent across all strata of Irish education, training and employment and addressing these imbalances could contribute considerably to the alleviation of the projected skills shortages.

Vision

The Expert Group proposes a vision of Ireland in 2020 in which a well-educated and highly skilled population contributes optimally to a competitive, innovation-driven, knowledge-based, participative and inclusive economy.

Specific Objectives

Specifically, the Expert Group concludes that if Ireland is to realise this vision of a new knowledge economy which can compete effectively in the global market place, it requires enhancing the skills of the resident population, increasing participation in the workforce, and continuing to attract highly skilled migrants. Specifically, the Expert Group proposes that, by 2020:

- 48 percent of the labour force should have qualifications at NFQ Levels 6 to 10;
- 45 percent should have qualifications at NFQ levels 4 and 5; and
- The remaining 7 percent will have qualifications at NFQ levels 1 to 3 but should aspire to achieve skills at higher levels.



Achieving the Proposed Objectives

In order to achieve these objectives, action is required at a number of levels:

- An additional 500,000 individuals within the workforce will need to progress by at least an NFQ level.
 - Specifically, there is a need to upskill 70,000 persons from NFQ levels 1 & 2 to level 3, 260,000 up to levels 4 & 5 and 170,000 to levels 6 to 10. The cost of the proposed upskilling to levels 3, 4 and 5 is estimated over a thirteen year period at €153 million per annum.
 - The cost of the additional upskilling to the higher levels (6-10) is estimated over a thirteen year period at €304 million per annum. These costs reflect tuition costs which should be apportioned between the State, employers and individuals.
- The proportion of the population aged 20-24 with NFQ level 4 or 5 awards should be increased to 94 percent, either through completion of the Leaving Certificate or through equivalent, more vocationally oriented programmes. The retention rate at Leaving Certificate should reach 90 percent by 2020.
- The progression rate to third level education will have to increase from 55 percent to 72 percent.

Issues to be Addressed

The upskilling of 500,000 persons already in the labour force is a significant challenge. This is particularly true of those at the lower skill levels i.e. those with below level 5 qualifications, who find it difficult to access training and education opportunities, in some instances receive little support from their employers and many of whom have low levels of literacy. Employees, also may experience practical barriers in attending courses or may lack the confidence or knowledge to seek appropriate training. Equally, employers and employees sometimes do not recognise the value of training. Additionally, employers may find it difficult to release employees to attend training.

The existing arrangement of programmes, schemes and grant aid is not sufficient to deliver the target skills profile set out above. If it is to be achieved, a number of new innovative initiatives need to be taken which will foster a culture of continuous life-long learning. The Expert Group has not been prescriptive in relation to the type of exact provision required, however it has provided some overarching guidance.

Develop Skills for Economic Growth

Government, in particular through the Department of Enterprise, Trade & Employment (DETE), and the Department of Education & Science (DES) should, through their commitment to a National Skills Strategy, develop and implement a comprehensive set of policies and actions to provide the skills required for economic and social development.

Implement a One-Step-Up Approach

A major effort will be required to increase the number of employed persons benefitting from the *One-Step-Up* programme. An implementation mechanism under the auspices of DETE and DES should be put in place to coordinate the activities of all stakeholders. A *One-Step-Up* approach needs to involve a wide range of providers including universities, institutes of technology, vocational education committees, Skillsnet, FÁS and other development agencies and education providers.

The initiative should be communicated clearly to all key stakeholders, and should incorporate the following key elements:

- Systematic identification of the needs of individuals and enterprises;
- Flexible and responsive training provision;
- A high profile National Media Awareness Campaign;
- An accreditation/quality assurance system; and
- Adequate funding.

Target the Low Skilled and Educationally Disadvantaged

As a general principle, individuals who do not currently hold a qualification equivalent to NFQ Level 4 or 5 (Leaving Certificate equivalent) should be assisted to achieve such an award, through either full- or part-time study, without incurring tuition costs and with a level of subsistence, provided by the State, for full-time study where appropriate.

The State should continue to support and, where necessary, increase funding initiatives targeted at addressing educational disadvantage, the second-level retention rate and low literacy levels.

Integrate Migrant Workers

The system for recognition of international awards should be reviewed to ensure that it is meeting its objectives and that the facility is widely communicated to employers and international employees. Procedures to identify those migrants who most need English-language training are also required. The provision of this training needs to be extended, with a distinction being maintained between adult literacy and migrant English-language proficiency. Finally, a strategy is required to ensure that migrants integrate into the formal education and training system at all levels, and that specifically, migrant children are successfully integrated into the Irish education system at primary and secondary level.

Basic Skills

Basic skills such as literacy, numeracy and the use of technology should be prioritised and embedded into all publicly funded education and training provision in so far as possible. Literacy is a basic foundation skill and the Expert Group notes the recommendations of the report *Adult Literacy in Ireland (2006)*. Mathematics is fundamentally important to the educational and economic well-being of the country. For this reason the review process at second level needs to be expedited and prioritised, and once completed should be accorded immediate consideration by all relevant stakeholders. Furthermore, the success of the revised primary mathematics curriculum needs to be evaluated and any positive lessons built upon at second level ensuring continuity for the learner. Given the importance of mathematics, a strategic approach to its development needs to be adopted.

Issues to be Examined

There are a number of issues which remain to be addressed and will require further investigation in order to:

- Increase employer commitment to education and training; and
- Increase and incentivise employee commitment to education and training.



These include:

- How best to assist employers, especially in the SME sector, in identifying training needs for their staff which will benefit their firms: The level of demand for training and education is not commensurate with the perceived need for it. One of the reasons is that individuals and businesses are not aware of their skills shortcomings. In order to engage with individuals and firms and meet their needs, individuals and enterprise need to be able to assess their strengths and weaknesses from a skills perspective. Enterprise agencies (FÁS and Enterprise Ireland) and representative organisations and Skillnets should continue to assist companies in identifying the training needs of their employees. Brokerage systems to help companies identify their needs and source training are being used elsewhere. The opportunities presented by such systems should be further investigated.
- How best to ensure that publicly-funded education and training is appropriate for enterprise development: There is a need to develop ways of capturing data on skills needs at a regional and sectoral level and feeding it back to education and training providers. This would give employers and the enterprise sector greater ownership of their own training programmes. The role of skills advisory bodies in facilitating this process should be further investigated.
- How to achieve flexible and responsive provision: The provision of education and training courses should reflect the needs of individuals and enterprise. This would foster improved linkages between the education system and enterprise, as already recommended by the Enterprise Strategy Group. The accelerating pace of change at all levels within the economy, and particularly in relation to skills, necessitates flexible and responsive provision. There must, therefore, be genuine dialogue between publicly funded education and training providers and those seeking learning. The provision of workplace based training which is fitted around working hours needs to be actively promoted.
- How to structure schemes aimed at incentivising employer and employee involvement in education and training: The Expert Group have not undertaken a detailed analysis of the funding mechanisms that are required to stimulate participation by employers and employees in life long learning and that would best fit the requirements of the Irish context. The Expert Group has formed a tentative view that the most effective way to ensure flexible and responsive provision of training may be to empower individuals and enterprises through funding, rather than through direct support for providers. Such mechanisms require further research and analysis. An immediate examination of mechanisms adopted elsewhere to encourage participation in continual learning, such as Individual Learning Accounts (ILAs), paid learning leave and co-financing, should be conducted and the results then used to guide policy.
- The Expert Group have previously recommended the provision of strong career guidance support for those in the workplace including the use of better on-line skills assessment tools. Approaches are outlined in *Careers and Labour Market Information in Ireland Report 2006*.

Integrated Government Policy

In order to meet the skills needs of the Irish economy as set out in this report, it will require coherent policy spanning several government departments. In particular it will continue to require an integrated policy approach between the DES and the DETE and an implementation mechanism which coordinates the activities of all relevant stakeholders.

Policy initiatives should be 'learner' and 'enterprise' centric rather than being developed from the perspective of education or training providers. This approach would be demonstrated by adopting agreed national objectives, increased co-operation between both departments and their agencies, and co-funding of initiatives. In relation to *One-Step-Up*, an integrated policy approach would also be enhanced if an implementation mechanism under the auspices of DETE and DES was put in place to coordinate the activities of all stakeholders.

Implementation

DETE and DES should agree a mechanism to monitor and report on the implementation of the National Skills Strategy. Consideration should be given to publishing a report on an annual basis detailing progress.

Challenges and Opportunities

The Expert Group's vision of Ireland in 2020 in which a well educated and highly skilled population contributes optimally to a competitive, innovation-driven, knowledge-based, participative and inclusive economy requires that significant challenges are met by Government, enterprise and individuals. The rewards for meeting these challenges are great. The costs of not meeting these challenges are equally high.

Ireland now possesses an opportunity to determine the shape of its economy going forward. A highly skilled, well educated population will drive productivity, innovation and entrepreneurship and increase living standards for all. The consequences of inaction will be a labour force that does not meet the needs of future industry much less act as a driving force in shaping that industry.

The objectives that the Expert Group has outlined to achieve its vision are ambitious. Significant upskilling of those in employment, increasing the leaving certificate retention rate and increasing progression to third and fourth level will require a sustained and coherent effort by all stakeholders. Ireland can learn from best international practice in relation to skills development while at the same time developing its own innovative policies which reflect the nuance of Ireland's particular stage of development.

World class skills, education and training can provide Ireland with a unique competitive advantage which will allow us to remain ahead of the curve economically, while improving living standards in a participative and truly inclusive society.



Chapter 1: Introduction

Human capital development is inextricably linked with productivity growth and improvements in living standards. Productivity can be influenced through investment in education and training;

Employers, employees and the economy as a whole benefit from investments in education and training.

In the years immediately ahead, labour productivity will be the key determinant of economic growth in Ireland, and increasing productivity will depend to a large extent on education and training. A workforce that is better educated and trained can produce higher value goods and services, and is more likely to be innovative.

Improved education and training also yield a social dividend: they result in better social cohesion and public health, and mitigate against poverty, crime and social welfare dependency.

Finally, globalisation requires a flexible workforce. Ireland, as a small open economy, must be able to respond rapidly to changes in the world economic and technological environment; only a well-educated population is able to respond in this way.

Sustained and enhanced investment in the educational and training infrastructure is thus necessary and desirable for the foreseeable future.

1.0 Background

In September 2005, the Department of Enterprise Trade & Employment (DETE) requested the Expert Group on Future Skills Needs (EGFSN) to undertake research to underpin the development of a National Skills Strategy. The Group established a sub-group to oversee the development of the Terms of Reference for the project and to steer the subsequent research study¹. The sub-group reported its findings to the Expert Group in September 2006. The key findings of this study are set out in this report.

1.1 Terms of Reference

The Terms of Reference for the study set out that:

The objectives of this study are to:

- Identify the skills required for Ireland to make the transition to a competitive, innovation-driven, knowledge-based, participative and inclusive economy by 2020;
- Provide projections of the labour force's skills profile required to make the transition to such an economy and compare that profile to the profile which the current projected output will yield;
- Provide training and education objectives where gaps and deficiencies are evident between the desirable situation and the likely supply; and
- Examine the underpinning arguments for investment in skills development in Ireland to achieve the stated objectives of enterprise policy, as defined by the report of the Enterprise Strategy Group (ESG)².

¹ Membership of the sub-group is set out in Appendix B

² Enterprise Strategy Group, (2004), *Ahead of the Curve: Ireland's Place in the Global Economy*

Based on the Terms of Reference, six research strands have been identified as being required to underpin the development of a National Skills Strategy. These are:

- To establish the impact of skill levels on productivity growth in an Irish context;
- To set out current supply and project future supply of skills and qualifications to 2020;
- To identify the skills profile and needs of the economy to 2020;
- To identify key objectives for education and training based on likely supply and demand;
- To identify the roles of various stakeholders in supporting education and training; and
- To identify the features of a skills development system which will provide the required skills.

1.2 Rationale and Context for the Study

After 15 years of successful economic development, based on the premise that large inflows of foreign direct investment would stimulate the economy and, hence, employment growth, Ireland has reached a turning point. Economic policy is no longer concerned solely with the creation of job growth – successive governments/administrations and a multiplicity of actors have combined to eliminate Ireland’s long-standing unemployment crisis. Ireland is now a country which enjoys practically full employment, a situation virtually unimaginable in the 1980s and early 1990s when unemployment peaked at over 16 percent in 1988, and the economy was adversely affected by the mass emigration of skilled people.

Full employment, combined with a substantially expanded labour force (through a combination of rising participation rates and favourable demographics, the Irish labour force has increased from just 1.64 million in 1997 to over 2 million in the first quarter of 2006) and a much improved macroeconomic environment have led to policymakers and society generally targeting more ambitious goals for the Irish economy and its people in general³. Job growth is no longer an end in itself. Rather than focusing on the *quantity* of jobs created, policymakers, the development agencies and firms alike are now also concentrating on the *quality* of employment.

One of the cornerstones of economic and social policy is the design and implementation of policies that improve living standards. Specifically, living standards can be improved by enhancing GDP per capita, over time, and it is widely recognised that productivity growth is the main driver of living standards in the long term. Increases in GDP per capita can be generated (i) by increasing real output per employed worker (through better technologies, better education and training, better public infrastructures, more and higher-quality machinery and equipment, better social relations), (ii) through more hours worked per employee and (iii) by putting a larger fraction of the adult population at work. Option (i) represents increasing average real productivity (the value of goods and services produced per person or per hour, for example), while option (iii) requires increased employment growth. The growth rate of real GDP per person employed is simply the sum of the increase in productivity and the increase in the employment rate.

At the same time, our changing economic circumstances have seen Ireland not only become one of the wealthiest societies in the OECD but also one of the most expensive in which to live and work⁴. A decade of above average consumer price inflation means that we can no longer sell ourselves solely on the basis of our cost competitiveness to multinational companies looking for a location to base large scale manufacturing operations. Instead, if Ireland is to continue to grow and succeed in international markets we must offer

³ CSO, *Database Direct*

⁴ According to the IMD’s *World Competitiveness Yearbook 2006*, Ireland’s GDP per capita (PPP) in 2005 was US\$39,597 equating to a rank of 4th out of 61 economies, behind only Luxembourg, Ile-de-France and the US. Over the past number of years, analysis conducted by the National Competitiveness Council (NCC) has consistently found Ireland to be amongst the most expensive countries in the Eurozone in terms of consumer prices.



potential investors (and potential new indigenous entrepreneurs) something which differentiates us from our competitors. That 'something' is likely to take the form of higher quality human capital, resulting in improved productivity and, hence, lower unit costs.

In developing our stock of human capital, Ireland can put in place the foundations of a knowledge economy, as set out by the report of the Enterprise Strategy Group:

"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)

Specifically, the ESG envisages an Ireland where internationally traded services will play an increasingly important role, albeit in combination with a continued focus on high value-added manufacturing and R&D. The authors of the ESG report also acknowledged the scale of the challenge ahead if Ireland is to evolve from a more traditional investment driven economy into a knowledge driven economy:

"Companies increasingly face global competition and seek to find new ways of competing effectively. Unable to compete on the basis of low costs, companies in more developed economies strive to identify and build new sources of competitive advantage based on knowledge and expertise. Despite a widely held belief that the Irish educational system is world-class, considerable improvements are required if we are to sustain enterprise development in the coming decade." (ESG 2004)

Our success to date has been based on above average output from the education and training system overall, despite expenditure levels which tend to lag average OECD levels. Although Ireland performs well in terms of many skills based indicators, notably in terms of international surveys of employers and statistics such as the number of graduates emerging annually from the third level system in the key disciplines of science and engineering, there are some significant indicators which need to be improved on if we are to maintain and enhance our current economic success⁵. This report, following a combination of primary research, literature reviews and widespread consultations identifies the changing skills needs of the Irish economy and proposes actions designed to meet those needs.

1.3 Vision for the Irish Economy and Society

At a broad level, policymakers, industrialists, trade unions and employees alike are in agreement that Ireland needs to evolve into a knowledge economy if Irish based firms (both indigenous and multinationals) and employment are to remain competitive on the international stage. Yet there does not appear to be a common understanding of what constitutes a 'knowledge economy'. Such an understanding is important if we are to identify correctly the policy measures needed to underpin it.

⁵ For example, according to the IMD's World Competitiveness Yearbook 2006, Ireland is ranked 13th out of 61 in terms of the availability of skilled labour, 5th out of 61 in terms of the availability of financial skills and 7th out of 61 in terms of the availability of competent senior managers.

The definition summarised below offers a neat composite of the various descriptions put forward by multiple sources⁶. The defining characteristics of the knowledge economy are:

- New industries and organisational structures which are heavily dependent on knowledge;
- Changing occupations and skill structures which privilege particular kinds of knowledge production (i.e. knowledge workers);
- Highly intensive workplaces, requiring new types of knowledge and generic skills and competencies; and
- An increased importance for innovation in order to sustain the competitive advantage of individuals, firms, regions and economies.

This encapsulates only the economic side of the vision. A vision, however, must extend beyond the economic sphere. The National Economic and Social Council (NESC) argue that the foundations of a successful society are⁷:

- A dynamic economy;
- A participatory society incorporating a commitment to social justice;
- Economic development that is socially and environmentally sustainable; and
- Development which responds to the constantly evolving requirements of international competitiveness, understood as the necessary condition of continuing economic and social success.

The Social Partners subscribed to this vision in the 2006 Social Partnership Agreement *Towards 2016*. The Expert Group have used the principles underpinning this vision, in conjunction with the output from the ESG for guidance in undertaking its research and developing its analysis. In keeping with the Group's mandate and focus, the balance of its comment in this study is in relation to skills for economic development with specific focus on the enterprise sector and the report examines the returns to education and training primarily in economic terms. It also takes account, however, of the wider societal issues, and the Expert Group supports the NESC view that it is critical to integrate our thinking about the economy and society.

1.4 The Economic Scenario over the Next Decade

The facts of the 'Celtic Tiger' era are well known: rapid economic growth averaging approximately eight percent per annum between 1993 and 2001, before more moderate growth of around five percent per annum in the intervening period; a massive expansion in employment, particularly in the years since 1997, and a significant rise in living standards. As pointed out earlier, despite this success, threats and challenges remain. The future of the Irish economy remains to be determined and will be shaped by a myriad of factors. These are too numerous to mention in their entirety, let alone predict their effects with certainty, but those most directly impacting on skills are covered in this report.

Nevertheless, it is possible to forecast the most likely economic scenario which will confront Irish policymakers in the years ahead. The *Medium Term Review 2005-2012* of the Economic and Social Research Institute (ESRI) outlines a number of paths which the Irish economy might follow in the years ahead. These forecasts provide the basis for the demand analysis featured in *Chapter 4* of this report. This analysis paints a picture of the shape of the economy in macroeconomic terms in 2012 and to a lesser extent, 2020, as well as informing us about the types of skills likely to be required by future employers.

⁶ See Cairney (2000)

⁷ National Economic and Social Council 2005



The ESRI produced both a high and low growth scenario for Ireland out to 2012. The difference between the two forecasts centred on the timing and extent to which the US economy is forced to adjust downwards as a result of the large and unsustainable US current account deficit; any downward adjustment in the US economy would inevitably have a negative impact on the Irish economy given Ireland's open economic regime. For the purposes of this report, the Expert Group take the view that the most realistic scenario is that Ireland will follow the high growth scenario up until 2010. Thereafter, a slowdown in the US economy, combined with the result of a steady shift to lower productivity services output, a very tight labour market, increasing wage demands and large immigration flows, fuelling congestion costs, is likely to see Ireland shift to a lower growth path.

The ESRI high growth forecast shows the Irish economy enjoying robust economic growth out to the end of the current decade; GDP is forecast to grow at an annual average rate of 5.7 percent between 2005 and 2010, while GNP is forecast to grow at an average annual rate of 4.9 percent over the same period. Per capita incomes are also expected to rise by an average of 3.4 percent per annum between 2005 and 2010. Perhaps more importantly, growth in output per worker is expected to improve with growth in GNP per worker expected to average 2.5 percent per annum. Unemployment over the entire period is expected to remain moderate, and indeed will decline from just over four percent currently to approximately 3.6 percent by 2010.

Post 2010, economic performance is expected to weaken: GNP growth is likely to average 3.1 percent between 2010 and 2015, and 3.3 percent between 2015 and 2020. Likewise, per capita income growth will be slower post 2010 than previously, averaging 1.8 percent per annum from 2010-2015, and 2.2 percent thereafter until 2020. The general economic slowdown will also be evidenced by a slowdown in productivity growth; growth in GNP per worker is forecast to average 1.8 percent per annum until 2015. Thereafter, a slight improvement in performance will see annual growth improve slightly to 1.9 percent per annum. Finally, the ESRI predict that unemployment can be expected to rise to over six percent from 2010, before declining again to around the four percent mark post 2015.

1.4.1 Sectoral and Structural Changes

Sectoral forecasts are also based on the assumption that Ireland will follow a high growth scenario until 2010 and a low growth scenario thereafter. Growth in agriculture is expected to remain weak to the end of the decade, averaging just over one percent per annum. This trend is likely to continue post 2010. At the same time, it is expected that growth in manufacturing will accelerate to around seven percent per annum until 2010, driven by the high technology sector. Between 2010 and 2020, however, growth in manufacturing is actually forecast to contract.

Traditional manufacturing is expected to experience lower growth rates of approximately 2.7 percent per annum, compared with average annual growth of 7.8 percent per annum in the high technology sector up until 2010. Thereafter, the manufacturing sector is likely to contract. The growth in construction is also expected to remain robust at 4.3 percent per annum up until 2010, driven by a strong housing and commercial property market as well as continued state investment in infrastructure. Between 2010 and 2020 growth is expected to contract.

In relation to market services, output growth in distribution is forecast to stabilise at 4.8 percent per annum to 2010. Beyond 2010 growth is forecast to decline to an average of 3.5 percent per annum. Likewise, growth in non-market services is expected to slow from over 4 percent per annum between 2005 and 2010 to 1.6 percent per annum post 2010.

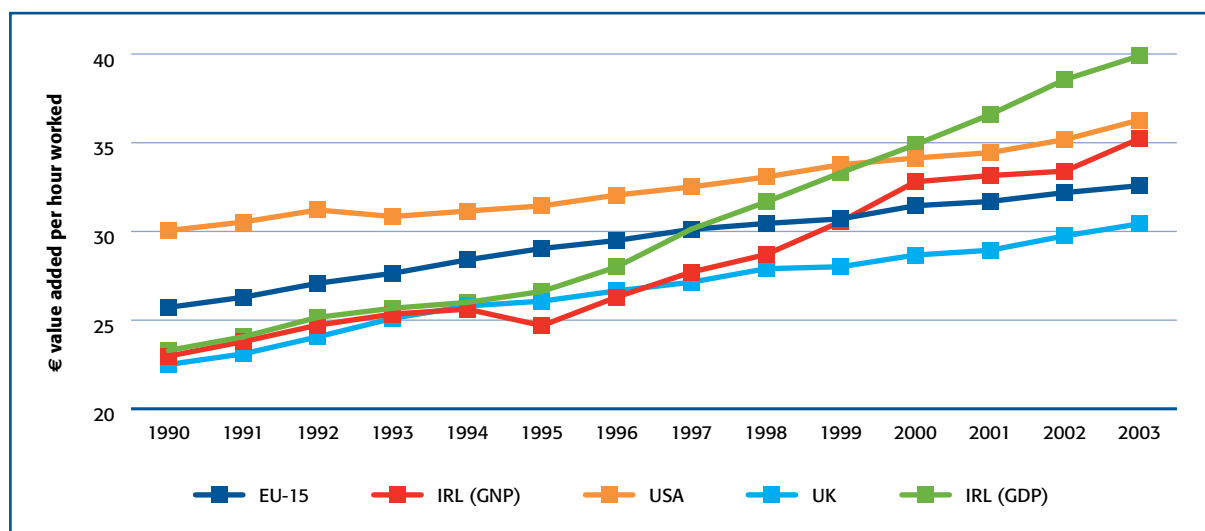
Employment forecasts for all sectors are provided in *Chapter Two*.

1.4.2 Ireland's Productivity Performance to Date

An examination of Ireland's recent productivity performance provides some useful insights. While many sectors are rightly lauded for exceptional productivity growth during the era of the 'Celtic Tiger', the fact remains that in many cases the leading performers were significant outliers, and average performance across the economy as a whole was substantially weaker.

Analysis carried out by the National Competitiveness Council (NCC) highlights the fact that, although Ireland has made substantial improvements in productivity over recent decades, Irish productivity growth slowed to 1.4 percent per annum in 2004/2005 at a time when US productivity growth is accelerating⁸. *Figure 1* below illustrates productivity performance for several selected economies, based on per-hour productivity rates. While data for all countries is based on GDP, figures for Ireland are also calculated using Gross National Product (GNP), thus factoring out the impact of the large presence of multinational companies located here, and the associated net factor income outflows.

Figure 1: Output per Hour Worked in Selected Economies, 1990-2003 (€)



Source: Forfás calculations based on Groningen Total Economy database, August 2006

It is clear from the graph that Ireland has performed extremely well in terms of productivity since 1990; using GDP as the base for calculations, Ireland's average productivity increased from just two-thirds of the US output per hour in 1990 to exceed US performance in the late 1990s. Even using more conservative GNP measure of per-hour output, Ireland's performance remains impressive per hour, although average productivity per hour marginally lags US performance.

Figure 2 below separates the contribution of the quantity of labour employed and the hours worked (labour utilisation) from the productivity per hour of the labour force (GDP per hour worked) to more accurately identify the drivers of productivity across a range of countries.

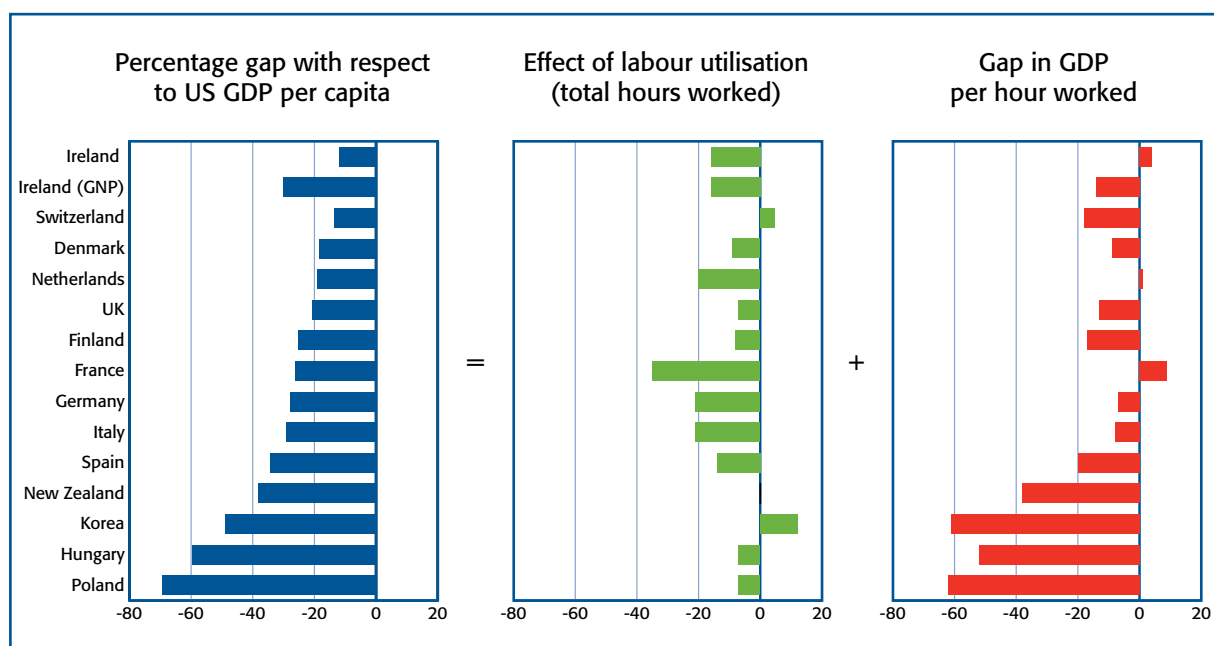
Once again, there is a marked difference in the Irish productivity per hour performance when GNP is used instead of GDP. The left hand panel of the graph shows the overall per capita productivity performance across a range of countries vis-à-vis the US. Ireland continues to be a strong performer, although per capita productivity continues to lag US performance, particularly when GNP is examined, thus highlighting the impact of the large multinational sector on Irish productivity figures.



Part of this difference is accounted for by lower levels of labour utilisation illustrated in the centre panel (i.e. lower levels of participation and shorter working weeks in Ireland). However, a significant proportion of the productivity differential between Ireland and the US is accounted for by the lower levels of productivity per hour worked, illustrated in the panel on the right hand side of the graph.

While there are limits to what can be achieved in terms of improved labour utilisation (due primarily to societal preferences), there remains significant potential to further increase output per hour.

Figure 2: Decomposition of GDP per Capita, 2003
Percentage point differences in PPP-based GDP per capita with respect to the US



Source: NCC

1.4.3 Human Capital and Productivity⁹

Productivity growth is the principal driver of economic growth and improvements in living standards. It has been shown that economic and productivity growth increasingly depend on the synergies between new knowledge and human capital¹⁰, which is why large increases in education and training have accompanied major advances in technological knowledge in all countries that have achieved significant growth over the past decade¹¹.

Growth theory concludes that the macroeconomic effect of investment in education and training, through improving the productivity of workers, and/or encouraging innovation, boosts economic growth and living standards. The externalities associated with human capital investment are captured.

⁹ The analysis of human capital theory in this section is based on a background paper produced on behalf of the EGFSN by University College Cork and available at www.skillsstrategy.ie.

¹⁰ Bowlus et al (2005) argue that technological improvements in human capital production could be the major source of standard of living growth in the last few decades.

¹¹ South Korea, Spain, Taiwan and India are examples of countries that have invested significantly in human capital in recent times. See Bergheim (2005) for a discussion in particular, of the success stories of Spain and South Korea.

At a microeconomic level, human capital theory suggests that a person's earnings in the labour market are influenced by the level of human capital they possess and that education and training play an important role in attaining that level of human capital.

There is no consensus among academics about which theory most accurately describes the process of *economic growth*¹². However, there is consensus that improvements in human capital provide a boost to growth by making workers more productive and/or more flexible. The following is some of the evidence available from both an Irish and international perspective.

Overall Returns to Investment in Human Capital

- In the Irish context, estimates of increases in labour quality (that mirror higher levels of educational attainment in the 1980s and 1990s) have been estimated to contribute almost one-fifth of the total growth in output during the boom¹³;
- It has been estimated that 'labour quality' in Ireland increased by 13.2 percent between 1994 and 2003¹⁴. Improvements in the educational mix (or attainment) of those in employment was found to account for 12.2 percent of this improvement, or a 1.4 percent improvement per annum;
- The same study calculated that improvements in labour quality contributed 1.0 percent per annum to average annual GNP growth (6.4 percent per annum) and annual average GNP growth per adult (4.7 percent per annum) over the same period;
- In addition, improvements in labour quality also had a positive impact on the employment rate; it is estimated that a maximum of two thirds of the increase in employment over the period 1994 to 2003 reflects the increase in educational attainment. The consequential increase in aggregate hours worked, combined with improved labour quality suggests that increased educational attainment contributed up to 2.1 percent per annum to GNP growth per adult;
- The changing education of the labour force during the last 50 years has accounted for a significant proportion (around one-third) of overall productivity growth in the US¹⁵;
- Evidence from the UK covering the period 1971-92 suggests that a one-percentage-point increase in the proportion of workers with higher qualifications raises annual output by between 0.42 and 0.63 percent¹⁶. These results, however, are extremely sensitive to the measure of educational quality that is used;
- There is compelling international evidence indicating that investment in education increases growth and boosts national prosperity; for example, a one year increase in average education has been found to raise the output per capita by between 3 and 6 percent¹⁷;
- Increasing either primary or secondary school enrolment rates by one percentage point leads to an increase in per capita GDP growth of between 1 and 3 percentage points¹⁸;

12 *Blundel et al. (1999)*

13 *See Durkan et al. (1999)*

14 *See Hamilton (2005). 'Labour quality' reflects the characteristics of an individual employee and their job; it takes account of age, educational attainment and gender.*

15 *See Grilliches (1997).*

16 *See Jenkins (1995).*

17 *This is based on a review of several cross-country studies conducted by, amongst others, Barro (1991), Levine & Renelt (1992), Mankiw, Romer & Weil (1992), Barro (1997), Judson (1998), De la Fuente & Domenech (2000), and Bassanini & Scarpetta (2001). Further details can be found in the background paper produced on behalf of the Expert Group by UCC.*

18 *Ibid.*



- The impact of increases at different levels of education appears to depend on the level of a country's development. In particular, while primary and secondary skills appear to be related to growth in the poorest, and in intermediate developing countries respectively, it is tertiary skills that are important for growth in OECD countries;
- Both the initial level and the subsequent growth of tertiary education are found to be positively and significantly related to per capita income growth in OECD countries. It has been found that a one percentage point increase in the annual growth of human capital increases growth by 5.9 percentage points¹⁹;
- There is clear evidence that human capital plays a key role in fostering technological change and diffusion, although the extent of this is not always captured in empirical studies²⁰;
- There is evidence that the rate of technology transfer is enhanced by human capital²¹;
- Pre-primary development is a key determinant of performance at all levels of education²². According to some research, early interventions can make returns of up to 700 percent²³ and it has been shown that investment at this stage is comparatively more successful at addressing educational disadvantage than later interventions in the primary or secondary level cycles;
- In addition to the monetary and economic benefits accruing from education and training outlined in the previous section, there are externalities which positively impact on society as a result of improved educational attainment. These positive externalities offer further validation for sustained and enhanced investment in education and training;
- For example, greater educational attainment is linked to superior health status, lower risks of unemployment and poverty, and increases in some aspects of social cohesion such as reduced crime potential and greater political participation²⁴. Research has also found positive associations between higher levels of education and lower smoking participation, a lower incidence of excessive alcohol consumption and increased level of exercise; and
- It must, however, be borne in mind that improvements in education and training will not necessarily yield dramatic results if pursued in isolation. Rather, a cohesive, all encompassing approach to social policy is likely to be required to deliver real change.

The Expert Group has not attempted to estimate the future return on investment from upskilling workers with various skill levels. In the UK the Leitch report estimated that through upskilling an additional 3.5 million adults from the lower end of the skills spectrum an average annual net benefit of 0.3 percent of GDP, primarily through increases in employment could be delivered²⁵. It was also estimated that improvements in intermediate and higher end skills would deliver average annual net benefits of 0.4 percent and 0.45 percent of GDP respectively, primarily due to enhanced levels of productivity. In terms of value for money, Leitch suggests that each scenario offers similar returns.

19 See Gemmell (1996)

20 See Moretti (2005)

21 See Benhabib & Spiegel (1994) and Griffith, Redding and van Reenen (2000)

22 See Harmon & Walker (2002)

23 See Carneiro & Heckman (2003)

24 Further discussion on this issue can also be found in Schultz (1963 and 1981), Becker (1993), Blundell (1999) and Johnson (2004).

25 Leitch Review of Skills (2005), *Skills in the UK: The Long-term Challenge (Interim Report)*.

1.5 Scope and Focus of the Report

1.5.1 A Dynamic Skills Framework

In order to contextualise the study, it is necessary to set out the Expert Group's understanding of the dynamic nature of skills supply and demand. The framework in *Figure 3* shows a diagrammatical representation of this in terms of the relationship between skills supply and demand, skills stock and the factors which are driving change.

For the purposes of this research, the Expert Group defines 'skills' as being proximate to 'human capital'. Furthermore, it is the belief of the Expert Group that any holistic definition of skills must give explicit reference to outputs and focus less on inputs. Incorporating these tenets, the Expert Group understands skills as emanating from and developing through:

- Innate ability and socialisation;
- Formal, informal and non-formal education and training²⁶; and
- Experience, both from the workplace and other voluntary activities.

In the wider literature, the term 'human capital' has attracted some opposition from those who feel it objectifies human beings as mere factors of production. The term as used here is in no sense pejorative; on the contrary it denotes the high value placed on a person's skill levels which are relevant for their participation in both the economy and society. While greater attention is placed on the former in this study, in line with its terms of reference, the latter is also addressed and the study demonstrates that there is a strong link between the two.

The processes by which individuals develop skills are various, thus making them difficult to measure at either an individual level or at the level of the population. The Expert Group has alluded to these difficulties in previous reports (for example, EGFSN, 2005²⁷). Educational attainment as measured by qualifications is the most commonly used proxy for 'skill level'. However, this proxy does not take account of an individual's experience or their on-the-job training²⁸. A person's occupational level, for example, socioeconomic classification, may be used as a proxy. This has the advantage of telling us some more about which skills individuals are likely to employ as well as which skills they are likely to have.

A person's salary or remuneration can also be used as a proxy for skills, the theory being that workers are rewarded for more skills at higher levels. The advantage of this method is that it doesn't necessarily distinguish how skills were acquired i.e. through education, training, experience or knowledge. Implicit in using salary as a proxy means that it is the labour market which assigns value to skills; it should be noted, however, that salary levels frequently include 'economic rents' not associated with either productivity or skills. The first two proxies, therefore, are primarily used throughout this study, with due recognition of the inevitable limitations this involves.

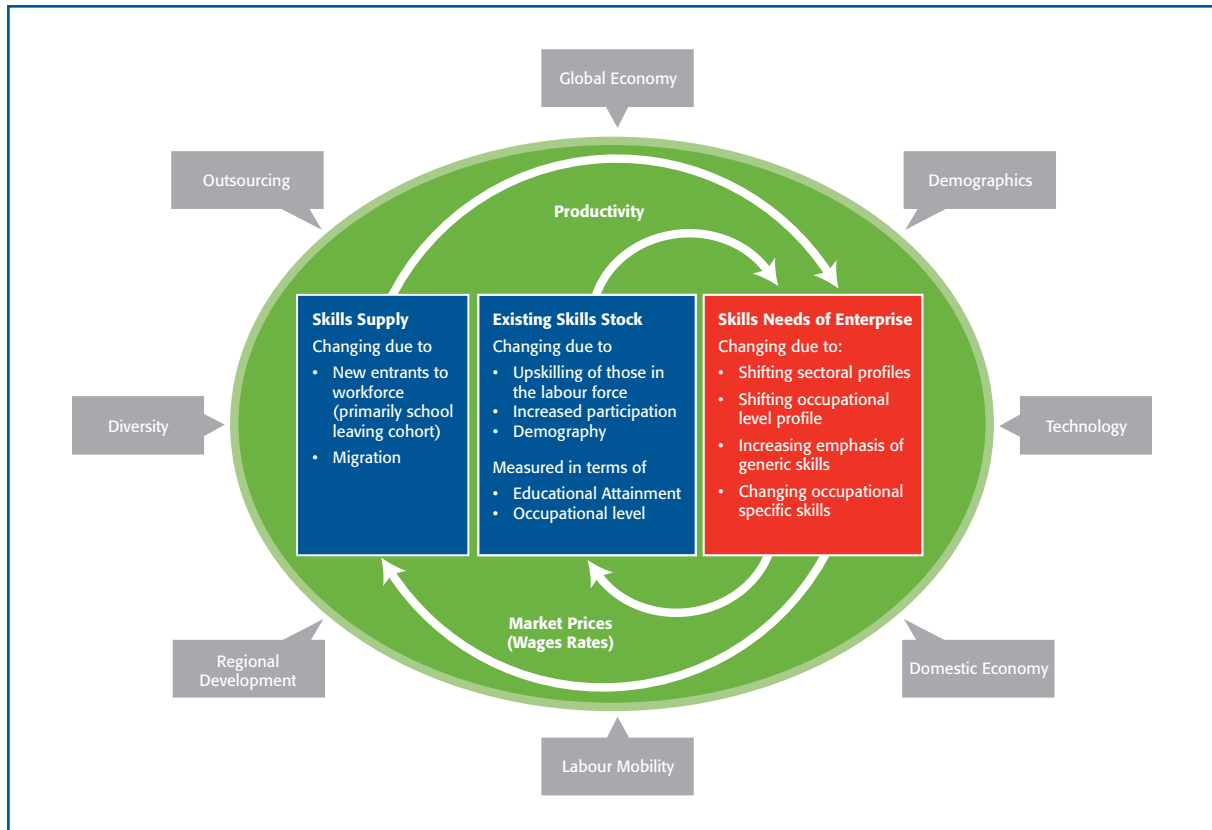
26 Formal education corresponds to education and training in the regular system of schools, universities and colleges; non-formal education and training includes all types of taught learning activities, which are not part of a formal education programme; and informal learning corresponds to self-learning which is not part of either formal or non-formal education and training, using methods such as books, computers, learning centres or educational broadcasting.

27 EGFSN 2005, *Skills Needs of the Irish Economy: The Role of Migration*, Forfás, Dublin.

28 'Recognition of prior learning' is being introduced as a component of the NQAI's award recognition system.



Figure 3: A Dynamic Skills Framework of the Irish Labour Force



Source: Forfás, EGFSN

The diagram in Figure 3 illustrates that the skills needs of enterprise and skills supply are not independent variables. There are a number of important concepts involved:

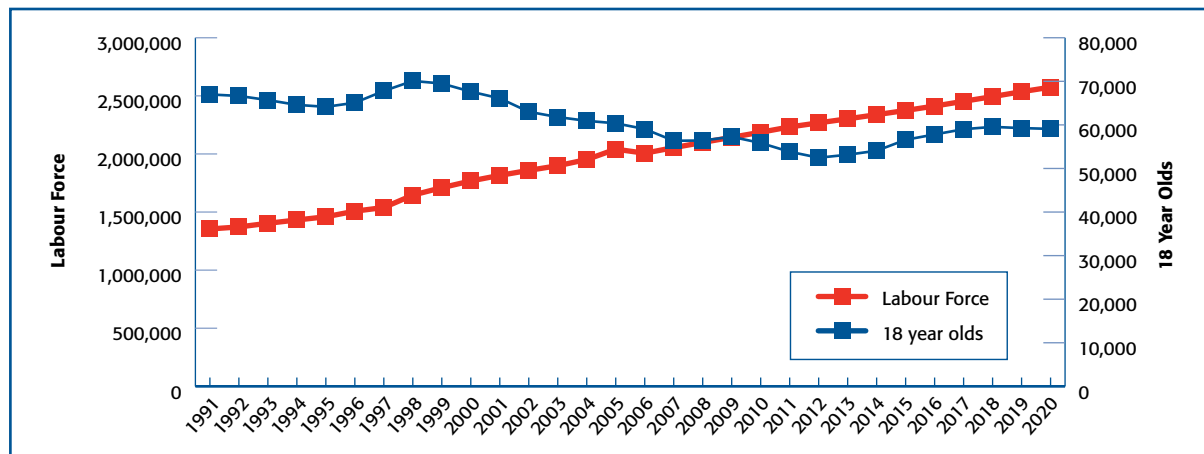
Skills Supply

The left hand side of the diagram illustrates the skills supply (or flow) into the economy. The two principal sources of inflows are through new entrants into the workforce directly from the education system, or through the immigration of foreign labour into the economy.

New Entrants

New entrants refers to individuals entering the labour force for the first time upon completion of their formal education. Individuals make this transition at different ages due to personal characteristics including the level of education that they attain and the age at which they commence their education. Currently, the proportion of new entrants to the labour market relative to the total labour force is levelling off due to demographic factors. *Figure 4* uses the 18-year-old age cohort as a proxy for the school leaving population²⁹. It is clear that Ireland is currently experiencing a slight decline in the number of 18 year olds relative to the total labour force. This trend is forecast to continue until approximately 2012 when the absolute numbers of 18 year olds is expected to rise (primarily as a result of the impact of immigration).

²⁹ The 18-year-old cohort does not reflect the numbers completing upper secondary education or the numbers actually entering the labour force. Rather it is intended to provide an indicative indication of demographic trends.

Figure 4: Total Labour Force and 18-Year-Old Cohort in Ireland 1991-2020

Source: CSO

Immigration

Ireland is now part of a single EU labour market encompassing approximately 210 million people, all of whom are entitled to live and work here without restriction. This is of major importance to an economy currently experiencing skills and labour shortages in a number of key sectors. There are an estimated 283,000 non-Irish nationals aged 15 and over currently in Ireland, over 73 percent of whom are from within the EU³⁰. In the 12 months prior to Q2 2006 it is believed that almost 87,000 new migrants arrived in Ireland, filling 54 percent of all new jobs created. Going forward, the ESRI has forecast net inward migration of 70,000 in 2006 and 55,000 in 2007. This represents a massive inflow of labour, which in fact exceeds the annual flow of new entrants discussed above.

Currently, the skills profile of non-Irish nationals living in Ireland is skewed towards the upper end of the education spectrum: 54 percent of migrants in Ireland have a third level qualification. Other countries with a longer history of immigration than Ireland, such as the UK or the US, attract large number of immigrants at the lower end of the education spectrum. Analysis conducted previously by the Expert Group concluded that, while the current EU labour market was likely to meet virtually all of Ireland's labour requirements in the medium term, there would continue to be a deficit of high skilled workers³¹. Evidence exists, however, which suggests that currently highly qualified immigrants are not being employed at a level that reflects their educational status. This is referred to as the *occupation gap*. This untapped reservoir of high skilled workers offers a potentially significant boon to efforts to enhance productivity. The occupation gap does, however, appear to decrease over time³². Whereas, a recent study found no occupational gap amongst immigrants who arrived between 1995 and 1999 and who are still employed in Ireland today, an occupational gap of 13.4 percent exists for more recent arrivals, suggesting that the gap declines in line with the amount of time an immigrant has been resident in Ireland. Three explanations have been proposed to explain the decreasing gap. The first is that immigrants integrate over time by developing fluency in English or through acquiring other skills. Secondly, those that arrived between 1995 and 1999 with low education levels may have left the country since and, thirdly, the nature of the inflow may have changed over time in terms of performance levels. It is worth noting that the ESRI have found that the earnings differential between migrants and the resident population is more pronounced for migrants from non-English speaking countries (32 percent) than from English speaking countries (3 percent).

³⁰ CSO, *Quarterly National Household Survey, Quarter 2 2006*

³¹ EGFSN, (2005), *Skills Needs in the Irish Economy: The Role of Migration*

³² ESRI (2006) *Quarterly Economic Commentary, Autumn 2006*



Existing Skills Stock

In the centre of the diagram in Figure 3, the existing stock of skills is illustrated. This represents the largest proportion of the supply of skills available in the Irish economy and dwarfs the annual inflow of new skills in terms of volume. For example in 2005, the number of 18 year olds in Ireland (representing the 'new entrants') equated to just 3 percent of the existing labour force. The stock of workers can change through the labour force participation rate (i.e. the proportion of people of working age who are actively engaged in the labour market and are either in employment or are unemployed). At present Ireland has a participation rate of 62.6 percent; while the male participation rate (72.8 percent) is approximate to the EU average, the female participation rate (52.5 percent) continues to lag the performance of other EU states. Labour force participation is linked to educational qualification. As educational attainment increases, so does the likelihood of participation in the labour force.

Skills Need of Enterprise

The right hand side illustrates the changing nature of the demand for skills arising from the evolution of the economy and driven by various exogenous factors largely outside the control of domestic policymakers.

At the simplest level, the demand for skills is impacted by the evolving sectoral and occupational make-up of the Irish economy, as well as changes in the generic skills demanded by employers. Furthermore, even within existing occupations, the required skill sets are undergoing a constant process of flux. This is dealt with in more detail in *Chapter Two*.

There are numerous exogenous factors which impact on the overall operating environment for enterprise. These include, but are not limited to:

- **Demographics:** Ireland is forecast to continue to reap the benefits of population growth for the next decade or so; the population is forecast to exceed 5.3 million in 2020. The labour force is also expected to grow rapidly at an average rate of 2.2 percent per annum up to 2015, and at a slightly slower rate thereafter. The continued expansion of the labour force and of the population can be expected to drive economic growth and provide a steady supply of human capital. At the same time, policymakers need to consider the implications that an ageing population will have on participation rates, taxation and social welfare policy etc;
- **The Global Economy:** At the broadest, macroeconomic level, the demand for skills will be driven by global economic trends. The strength (or otherwise) of the global economy will directly impact on demand for goods and services, and as a consequence, will affect employment growth and demand for labour;
- **Offshoring and Outsourcing:** The emergence of China and India as major players on the world economic stage is having a major impact on the global economy. As well as impacting on aggregate levels of supply and demand, the emergence of low-cost Asian economies has resulted in the outsourcing of certain activities, as companies strive to maximise cost-savings. This trend seems set to continue over the next decade and is likely to be primarily concentrated in low to medium skilled sectors, thus reducing employment opportunities for members of the Irish labour force with poor levels of education and training. While the increased efficiency generated by outsourcing can be expected to result in the creation of new, higher skilled jobs in the sending country, unless policies are put in place to address the skills deficits of unskilled workers, it is possible that these new jobs will be unobtainable for workers made redundant by outsourcing. Offshoring may also create requirements for new forms of management skills, with increases in demand for middle managers and logistics managers to oversee the outsourcing process;
- **Increased Mobility of Human Capital:** Increased globalisation is likely to increase labour mobility, thus making it more feasible to recruit skilled workers from anywhere in the globe, should labour market conditions so require. Similarly, students have become significantly more mobile. Irish educational institutions are also ideally placed to exploit the trend of internationalisation of education. Policies are

currently being developed to encourage non-national students to remain in Ireland post-graduation, thus enhancing the size, breadth and quality of the labour market;

- **The Rapid Spread of Emerging Technologies:** Globalisation is facilitating the rapid spread of emerging skills and technologies, requiring an adaptive, flexible workforce which can meet the changing needs of industry. This will require flexibility from both education and training providers and from employers (who will need to facilitate training for their staff) as well as from individuals. The impact that technological development will have on the labour force will, in part, depend on the extent to which Ireland's enterprise policy promotes science/technology driven sectors, relative to business services (financial, corporate etc). In certain sectors most suitable for increased levels of automation or computerisation, technological development might result in a decline in the proportion of roles requiring low or middle-level skills. However, virtually all occupations now require a greater breadth of knowledge than previously. In general, there has also been a decline in the share of routine work in most occupations, and rising qualification and technical skill requirements;
- **The Domestic Economy:** Issues such as the rapid increase in house prices and the inadequate stock of transport infrastructure are indirectly having a detrimental impact on the Irish labour market. For instance, high house prices impinge adversely on both labour supply (as high prices discourage inward migration) and labour mobility (as prices force people to live further away from centres of employment). Long commute times, made necessary by high house prices in centres of employment, also reduce the incentive for the inactive population to enter the labour market, thus constraining labour force participation rates;
- **Regional Development:** One of the State's key goals is to ensure balanced regional development, thus ensuring that income distribution is relatively equal throughout the country. An important element of this, therefore, should be the balanced distribution of skills and qualifications; this involves ensuring that the public are granted equal access to education and training, regardless of their geographic location. A recent report by the EGFSN entitled *Skills at a Regional Level in Ireland: a Study of Skills Demand at a Regional Level for Specified Enterprise Sectors* highlighted the disparity in educational attainment between the Dublin region and the rest of the country. For example, whereas 37 percent of the workforce in Dublin had a third level qualification, just 25 percent of the BMW (Border, Midlands, West) region workforce and 27 percent of the workforce in the rest of the State had a third level qualification³³. It is important to note the cross border element of regional development. Increasingly, the Irish labour market is viewed as an all-island market, with free movement of labour possible in both directions. While at present just six percent of undergraduates and 13 percent of postgraduates from Northern Ireland take up employment in the Republic³⁴, this pool of well-qualified labour represents a significant human capital resource for Irish employers, particularly in the border-midland-western (BMW) region; and
- **Diversity:** At both a global and national level, diversity is increasing exponentially, through the increasing mobility of persons and of work, facilitated by ICT, and through the opening up of access to diverse cultural experiences, via low-cost travel and multimedia availability. Within the workplace, diversity is not simply a matter of differing nationalities and ethnic groups working together. Other factors, such as changing age profile, educational attainment levels and work patterns, as well as greater female participation, will all impinge on the cultural ethos of organisations of the future. Cultural diversity will create demand for 'new' skills in the Irish context, at management level, throughout the workforce and within the spheres of education and training. Training to respond to diversity in the workplace and in conflict resolution potentially arising from that diversity are important skills agenda issues for the future.

³³ EGFSN, *Skills at a Regional Level in Ireland: A Study of Skills Demand at a Regional Level for Specified Enterprise Sectors* (2006).

³⁴ DELNI, (2006), *Northern Ireland Compendium on Higher Education Statistics Revisions*



1.5.2 Fundamental Assumptions of a Dynamic Skills Framework

- The skills needs of the economy in the future are not predetermined. In addition to meeting the current needs of enterprise, skills supply can drive and shape the future profile of enterprise (through productivity, innovation and entrepreneurship) and the associated future skills needs of enterprise: the supply of certain types of skills is likely to partly determine the types of enterprises which locate here;
- Skills supply is dictated in part by the individual returns to investing in those skills and by the general level of awareness of those potential returns. Economic theory, however, is predicated on the assumption that individuals will always make rational decisions. In reality, an individual's decision to undertake investment in education or training is often influenced by non-economic considerations including personal and family circumstances, gender, and class background³⁵;
- The future skills stock of the economy can be adjusted through both new supply and upskilling of those in the labour force;
- The future skills needs of the economy are not entirely within our control. There are exogenous drivers of change which will impact on the future skills needs of enterprise. Changing skills needs result from changing needs within occupations and as a result of the changing occupational and sectoral profile of the economy;
- The supply of skills is also impacted by the prevailing labour market conditions; strong demand for low skilled jobs is currently contributing to educational under-achievement by encouraging individuals into employment rather than continuing in education; and
- An increased supply of skills will impact on the prevailing wage rate. The relationship between supply and demand of labour and the prevailing wage rate for particular occupations is complex and embodies many feedback mechanisms. While, in theory, *ceteris paribus*, an increase in the supply of skills should result in a fall in wages, in reality all things are never equal. An increase in the supply of skills does not automatically lead to a decrease in wages. On the contrary, an increase in the supply of skills drives economic expansion with an emphasis on higher value-added activities. This can actually lead to a situation where the wage premium for high skills can be maintained, albeit perhaps at a more modest rate of growth, as is borne out by findings outlined later in this report. This therefore will in all likelihood create a favourable labour market for high skilled individuals in terms of real wage levels. The extent to which Irish wages can rise, however, is tempered by the fact that Ireland is part of a single European labour market with free movement of labour and as such, we are price takers.

There are significant difficulties and challenges posed by the dynamic nature of the skills framework in forecasting future supply and demand. This does not make such forecasts any less valuable as signposts in strategic planning. The more explicit we can be on what we think the likely impact of endogenous and exogenous factors will be on skills supply and demand, the more effectively we can plan and prepare. That planning needs to have flexibility built into it so that as variables change, the education and training system can react accordingly.

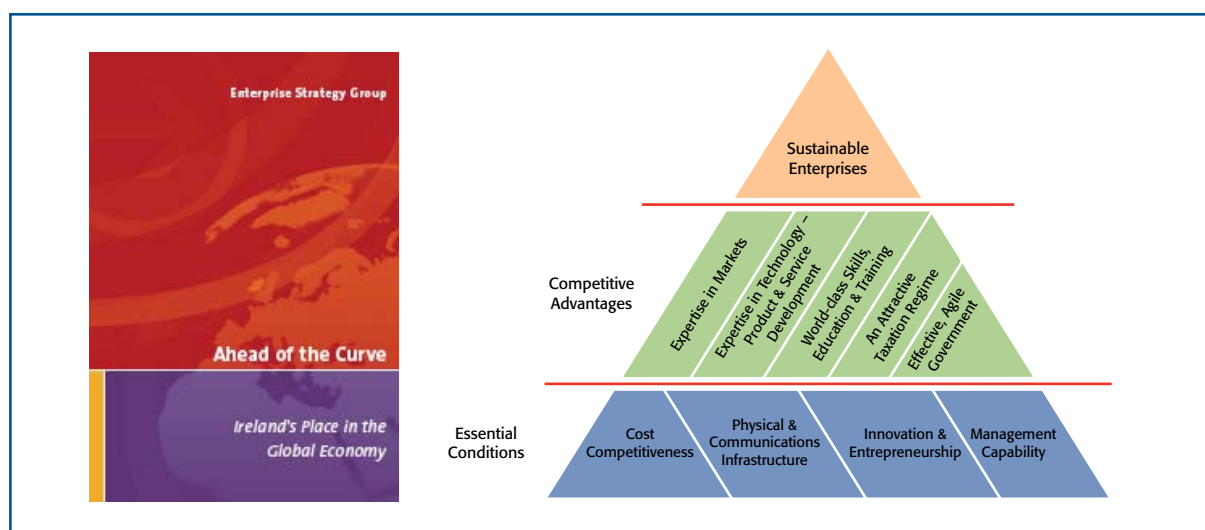
Finally, it is important to note that, rather than viewing skills as a binary situation where individuals or sectors are characterised by either high skilled or low skilled, it is preferable to consider a skills continuum, encompassing a range of skill levels. Individuals can move within the continuum through additional experience, education and training, while the range of skills captured by such a continuum is constantly changing to meet demand. The development of the NFQ is helpful in furthering this different perspective on the means of acquiring skills.

35 In economic terms this is termed information asymmetry.

1.6 Enterprise Strategy Group and Policy Context

The Enterprise Strategy Group set forth a vision for enterprise development in Ireland. Central to that vision were a number of essential conditions which provide the building blocks upon which sustainable enterprise can be built. These include cost competitiveness, infrastructure, management capability and innovation and entrepreneurship. The Enterprise Strategy Group also identified a number of areas in which competitive advantage could be achieved. These include expertise in markets, expertise in product and service development, an attractive taxation regime and flexible and agile government. These are demonstrated diagrammatically in Figure 5. These specific areas require a high degree of human resource input. In addition the ESG also specifically identified world-class skills, education and training as an area in which Ireland can foster competitive advantage. The research for this report should help to further elaborate what is required in this area of potential competitive advantage.

Figure 5: Enterprise Strategy Group



This report takes due account of the fact that in recent years reports and policy documents such as the *White Paper on Adult Education (2000)*, the report of the *Task Force on Lifelong Learning (2002)*, the report of the *Task Force on the Physical Sciences*, the *National Workplace Strategy* and the Expert Group's own reports have, among other sources, provided recommendations in regard to education and training policy generally which remain valid. Many of the recommendations that have been implemented to date, including the introduction of the National Framework of Qualifications, the development of adult literacy services, and the expansion of some part-time options such as VTOS, have gone some way to help improve the opportunities for many individuals. However, there is still much to be done, not alone in areas where no action has occurred but also in those areas where some progress has already been made. It is within this context that the conclusions and recommendations of this report have been formed.

We do not aim to revisit all of the recommendations of previous reports but rather to try to provide an overarching view of where Ireland needs to progress to from a skills and learning perspective. This report also points to specific issues which it believes are of significant importance for enterprise development, and highlights new issues that have not been dealt with in previous reports.



The Group also notes that the commitments entered into under *Towards 2016* are consistent with achieving the overarching objectives set out in this report.

Additionally, the Expert Group would like to draw attention to the work of the National Economic and Social Forum (NESF) and specifically the work which they have undertaken to address both social inclusion and early childhood education. The NESF reports *Creating a More Inclusive Labour Market* and *Early Childhood Care and Education* should provide a valuable input into the *National Skills Strategy*.

Chapter 2: Changing Skills Needs

The sectoral profile that we have seen in recent years (in common with most developed countries) will continue to change for the foreseeable future: the services sector will increase in relative importance, while 'traditional' manufacturing and agriculture will continue to decline. This shift to services poses a productivity challenge for policymakers and for enterprise.

At occupational level, the greatest increases in employment are expected to occur in the 'professional', 'associate professional' and 'personal & service' groupings.

All occupations are becoming more knowledge-intensive, with a corresponding rise in the requirement for qualifications and technical skills. Employees will be required to acquire a range of generic and transferable skills and attitudes. In most cases, work is becoming less routine, with a requirement for flexibility, continuous learning, and individual initiative and judgement.

The Expert Group concludes that the following should be included in a generic skills portfolio:

- Basic/fundamental skills – such as literacy, numeracy, IT literacy;
- People-related skills – such as communication, interpersonal, team-working and customer-service skills; and
- Conceptual/thinking skills – such as collecting and organising information, problem-solving, planning and organising, learning-to-learn skills, innovation and creativity skills, systematic thinking.

2.0 Skills for Enterprise Development

The Enterprise Strategy Group (ESG) envisaged a *knowledge* economy for Ireland's future, focused on high value-added products and internationally traded services, and which relied on innovation as the primary engine of growth. In order to realise this vision, Irish enterprise needs to focus on developing two key capabilities:

- Expertise in international markets to drive sales; and
- R&D to support innovation in high value-added products and services.

These capabilities are inextricably linked, as innovation in products and services will only result in market success if they meet customers' genuine needs. Sophisticated sales and marketing skills will thus be at a premium, not only to develop market intelligence, but also to communicate this knowledge effectively to the R&D function of the business.

The ESG also identified management capability as an essential ingredient for sustainable enterprises. It called on development agencies and enterprise firms to actively promote management development. Forfás and the Expert Group subsequently carried out more in-depth studies to understand the skills needs in these areas, each of which is summarised below.

2.0.1 Management Development

The Management Development study by the Expert Group focused on management development in the small-to-medium enterprise (SME) sector. It concluded that management development was a critical policy



issue for Ireland, in particular in the non-internationally-traded sector for Ireland's future development. The direct benefit of management development in the impetus it provides for the training of other employees has much wider consequential upskilling implications.

A central recommendation of this report was the establishment of an SME management development co-ordination committee or forum to maintain an on-going focus on the issue of management development in SMEs and to ensure coherence and coordination of all activity in the area³⁶. This recommendation was subsequently endorsed by the Report of the Small Business Forum³⁷.

2.0.2 Innovation, Marketing and Sales

Another report by the Expert Group highlighted the collective importance of innovation, marketing and sales capabilities for the future success of Irish exporting SMEs³⁸. In particular, it stressed the importance of the interrelationship between these three business functions. Successful innovation will hinge on the ability of firms to utilise customer and market knowledge in the development of products and services which meet genuine customer needs.

The report identified an acute problem in relation to sales staff in SMEs recruited from technical backgrounds, who have inadequate, if any, formal training in sales. The report advocated greater provision of tailored (sector-specific and highly targeted) programmes by the training providers. The need for Higher Education Institutes to align their marketing and sales curricula closely to the needs of SMEs was also highlighted.

2.0.3 Languages for Enterprise

The Expert Group has also reported on the link between foreign language skills and enterprise development, and has highlighted the importance of foreign language skills for exporting indigenous firms and foreign-owned firms engaged in international service activities³⁹.

International business relationships will be crucial to indigenous enterprise in the future. Success in marketing and selling Irish goods and services will be contingent on the ability of the indigenous sector to establish and maintain close relationships with customers in global markets. An exporter that can interact with potential customers in their native tongue will automatically have a competitive edge over one that cannot. This is crucial given that 75 percent of the world's population do not speak any English and 94 percent do not speak it as their mother tongue.

Service transactions generally involve a high level of human interaction and therefore require sophisticated communication skills. The availability of an internal supply of foreign language skills will enhance the attractiveness of Ireland for foreign multi-nationals wishing to establish such activities here.

In its report the EGFSN also highlights the fact that the current profile of languages being studied in the public education system, which is dominated by French at post-primary level, has arisen in an ad hoc manner and owes more to historical factors than any analysis of the needs of learners and the State.

A key recommendation of the report was that a National Languages Policy should be formulated by the Department of Education & Science, in collaboration with the National Council for Curriculum and Assessment (NCCA), to provide an integrated and coherent approach to language education.

³⁶ Which would operate under the auspices of DETE and to include other relevant government departments and State agencies, representatives of SMEs and major providers of management development in Ireland.

³⁷ Report of the Small Business Forum, Small Business is Big Business, May 2006

³⁸ EGFSN, Innovate Market Sell, 2004

³⁹ EGFSN, Languages and Enterprise, 2005

The report also suggested that future policy on languages should take account of patterns of migration into Ireland. The pool of foreign language capability created by immigration should be recognised and utilised as a resource.

2.0.4 Building Research and Development Capability

In 2004, the Expert Group set out its findings in relation to the human capital requirements to support R&D in Ireland⁴⁰. The projections in that report were considered as part of the development of the *Strategy for Science, Technology and Innovation (2006)* launched by the Government in June 2006⁴¹. The Expert Group notes the key actions set out in the Strategy to build the human capital required to underpin world class research. These actions include:

- The enhancement of post graduate skills through a graduate schools mechanism;
- The development of sustainable career paths for researchers;
- The enhancement of mobility of researchers; and
- The doubling of PhD graduate output by 2013.

2.1 Changing Skills Needs

In order to understand how skills needs might change at a macro level, the Expert Group chose four variables across which to analyse these changes: shifting sectoral profiles, shifting occupational profiles, the changing nature of, and level of demand for, generic skills and changing skills within occupations.

The Expert Group commissioned the ESRI to produce labour market demand projections by educational level. Using its *Medium Term Review* as a base, the ESRI produced sectoral and occupational employment forecasts and estimates of the likely replacement demand in 2010 and 2020. They also estimated the likely educational distribution of employment in 2010 and 2020. The 2010 estimates are based on the high growth scenario from the *Medium Term Review*. Thereafter, the forecasts switch to the ESRI's low growth scenario.

These forecasts provide the basis for the current study and, in particular, determine the predicted level of employment for 2010 and 2020 and its distribution across broad sectors of the economy. In fact, changes in the sectoral structure of employment have a significant impact on the forecast outcomes in terms of occupations. For example, employment in services (especially business services) is expected to continue to show significant growth, and it follows, therefore, that occupations associated with these sectors will be shown to assume greater importance.

Research was also carried out into the changing nature of generic skills requirements based on a review of international literature and changing skills requirements within occupations using four representative occupations⁴².

2.2 Sectoral Shift: The Evolution of an Economy and the Shift towards Services

The manufacturing sector continues to be of significant importance to Ireland, however, like most western economies, in employment terms it has seen a decline in its share of employment relative to the services sector over recent years. The share of employment in the service sector of the economy has increased

40 A Model to Predict the Supply and Demand for Researchers and Research Personnel in Line with Ireland's Strategy for Contributing to the European Research Area 3% Initiative (September 2004)

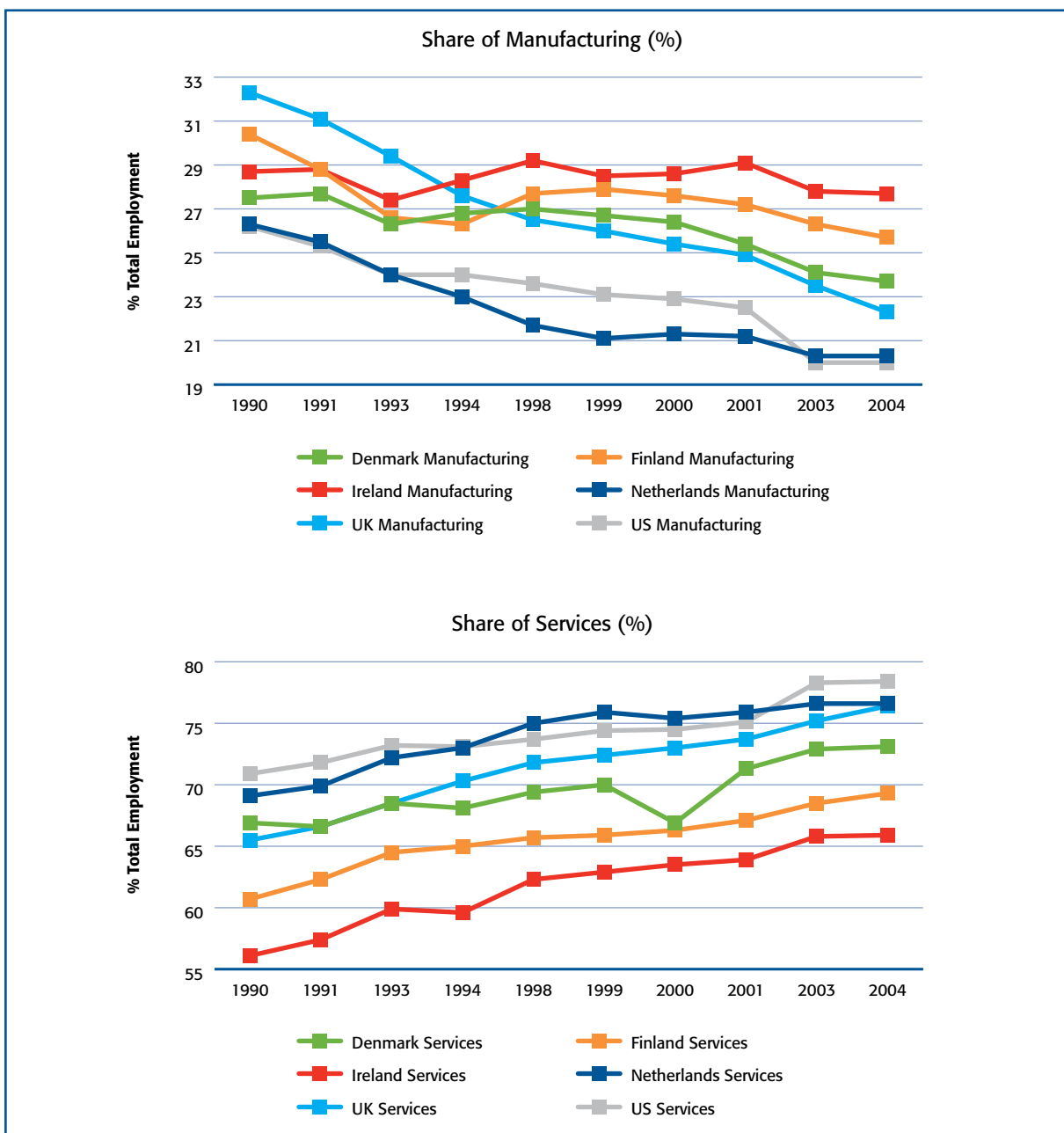
41 Strategy for Science, Technology and Innovation 2006-2013

42 Copies of these background studies are available at www.skillsstrategy.ie



dramatically (Figure 6). It should however be noted that the distinction between the service and manufacturing sectors has blurred over recent years⁴³. In particular, an increasing share of workers in the manufacturing sector is actually engaged in 'service-related' activities; according to a recent Forfás report over 30 percent of workers in the manufacturing sector are already engaged in services-related activities⁴⁴. These activities include scientific professionals, managers and administrative staff.

Figure 6: Changing Shares of Employment Internationally 1990-2004 (%)



Source: OECD in Figures

⁴³ Pilat & Wöfl (2005)

⁴⁴ Forfás, (2006), The Changing Nature of Manufacturing and Services: Irish Trends and International Context, Pg 22

The general decline in manufacturing worldwide has not been spread equally across all sectors. Instead, job losses have been concentrated in 'traditional' sectors such as textile production and metal products. Ireland has been fortunate in that we retain a comparative advantage in many of our core manufacturing activities, particularly in the pharmaceutical and medical devices industries. This is in-line with the findings of the ESG report which identified high value-added manufacturing as an area of continued strategic importance for Ireland going forward. Nevertheless, Irish manufacturing remains vulnerable to outside shocks, particularly currency shocks, as a consequence of our dependence on non-eurozone trade, particularly with the US and UK; between 2000-2006, over 31,000 jobs have been lost in manufacturing in Ireland, with sectors such as the office machinery and equipment sector, the pulp, paper and recorded media sector, the radio, television and communication equipment sector and the textile sector all experiencing significant job losses.

The rapid growth in service sector employment has been primarily rooted in the strong performance of a number of key sectors, including telecommunications, transport, wholesale and retail trade, and financial services. Combined, these sectors accounted for 60 percent of all employment growth in the OECD. It is notable that growth in many of these sectors was fuelled through increased technological deployment in the form of ICT.

2.2.1 Skills Profile by Sector

Agriculture and Fisheries

Employment in agriculture is characterised by low educational attainment when compared with other sectors. This holds for all European countries. 9 percent of those employed in agriculture in Ireland are educated to third level, which is the European average. However, with 59 percent of employees attaining no more than lower secondary education, Ireland only ranks above the Mediterranean countries in overall attainment level terms. Teagasc is the State agency responsible for training and development within the agri sector.

Bord Iascaigh Mhara deliver training related to the seafood industry through the National Fisheries College (NFC), the Regional Fisheries Centre (RFC), and through BIM's two mobile Coastal Training Units (CTUs) as well as at Head Office in Dún Laoghaire. According to BIM, experienced seafood industry personnel are gravitating towards the construction sector or other shore-based employments as a result of ongoing structural transition in the fisheries industry, and the reduced quota opportunities resulting in temporary tie-ups of fishing vessels. Some of these experienced personnel may chose not to return to the seafood industry, hence the increasing dependence on new member state crew and shore-based personnel will continue.

Data Analysis of In-Employment Education and Training in Ireland looked at participation in education and training by economic sector of all persons in work in 2003⁴⁵. 1.5 percent of those in the agriculture, forestry and fishing sector participated in formal education or training, 9.1 percent in non-formal and 28.8 percent in informal training.

Manufacturing

The distribution of employment by education in the Irish manufacturing sector is bell shaped, with just over 40 percent at upper secondary/post secondary level and the remainder equally distributed between low and high educational attainment. In terms of the share of employment with less than upper secondary education, Ireland stands at the European average. However, Ireland has the highest share of employment at third level in manufacturing when compared with other European countries. This could be due to a significant concentration of Irish manufacturing in higher value added activities.



In terms of skills shortages in this sector, the Skills and Labour Market Research Unit (SLMRU) have identified shortages in the following areas: metal working production and maintenance fitters, sheet metal workers and welders⁴⁶. In relation to education and training, 5.3 percent of the manufacturing sector participated in formal education or training in 2003, 15 percent in non-formal and 41.1 percent in informal training.

Construction

At 38 percent, Ireland has a higher share of employment at primary/lower secondary level in this sector than the European average of 31 percent. On the other hand, Ireland has a slightly higher share of employment at tertiary level than the European average. The SLMRU have identified the following shortages in the construction industry: civil engineers, architects and quantity surveyors; and at technician level: architectural and planning technicians, and building and civil engineering technicians. There are also shortages of management skills in the construction sector. In terms of trades, there are shortages of bricklayers, plasterers, carpenters, scaffolders and floorers/tilers. It is expected that shortages will subside in the construction sector to a certain degree in the future due to the slowdown in this area and an increase in training and education.

By 2020, off-site construction processes will have changed the way in which people work in construction. There will be ever higher safety and environmental standards. Company management, project management and information technology skills will be in greater demand as the office-based side of construction activity assumes greater importance. In an increasingly competitive economy, skills in project costing, financing, estimating and planning will be in greater demand.

In relation to education and training in this sector, 9.7 percent participated in formal education or training in 2003, 14.3 percent in non-formal and 32.2 percent in informal training.

Wholesale and Retail

In this sector, Ireland's employment distribution by education differs to most other European countries in that it is skewed toward lower education, with 32 percent of employment at levels lower than upper secondary education and just over a half at upper secondary level. By contrast, most European countries have a bell shaped employment distribution with a significant majority of employment (>60 percent) at upper secondary level and relatively small shares (<20 percent) at lower than upper secondary and tertiary education levels.

Many companies in Ireland are experiencing difficulties recruiting high calibre sales personnel with international experience and sales representatives with technical, product and sectoral knowledge. The evidence also indicates a shortage of marketing skills, especially at managerial level.

In 2003, 4.7 percent of those in the wholesale and retail sector participated in formal education or training, while 12.7 percent participated in non-formal education or training and 41.6 percent in informal training.

Hotels and Restaurants

Ireland has a higher educational profile of employment in the hotel and restaurant sector than the European average. In particular, at 22 percent, it has a significantly higher share of employment at tertiary level than the European average of 11 percent, the only country with a higher share of employment at this level is Estonia. High educational attainment in this sector is partly due to the large share of non-national workers (20 percent of the total employment of the sector) of whom just over one third have tertiary education and just over a half have upper secondary or post secondary education. Although shortages have abated to a certain extent since 1994 in the catering industry, there is still evidence of a shortage of chefs and waiters/waitresses.

In 2003, 5.2 percent of those in the hotel and restaurants sector participated in formal education or training, 11.6 percent participated in non-formal education or training and 38.2 percent participated in informal education or training.

Transport

As with almost all sectors, employment distribution by education in the transport sector indicates that Ireland has higher shares of employment than the European average at both ends of the curve: those holding higher education qualifications and those with lower than upper secondary qualifications. There is evidence of a shortage of transport managers, particularly those with relevant skills to manage integrated supply chains, specifically in the indigenous sector. There is also evidence of a shortage of persons with specialised computer related skills in both the clerical and warehousing functions of this sector, as well as a shortage of heavy goods vehicles drivers.

In terms of education and training, 3.5 percent of those in the transport, storage and communication sector participated in formal education or training in 2003, 14.2 percent in non-formal and 41.2 in informal training.

Finance and Business

In most European countries, employment in the financial sector and other business activities sector is characterised by high educational attainment. Almost all European countries have at least one third of employment with higher education qualifications. Similarly, most European countries have less than 10 percent of employment with lower secondary or less education in the financial sector. For the other business activities sector this share is less than 20 percent for most European countries. In terms of education levels, Ireland's standing in both sectors is high. In both sectors, Ireland's share of holders of tertiary qualifications is greater than 50 percent, while the share of those not completing upper secondary education is below the European average. Skills shortages identified in the financial area include: accountants and tax experts, actuaries, financial analysts (primarily investment and risk analysts) and underwriters.

In 2003, 7.9 percent of those in the financial intermediation sector participated in formal education or training, 25.8 percent in non-formal and 52.7 percent in informal training.

Public Administration, Education and Health

Employment distributions by education in the public administration, education and health sectors generally indicate high educational attainment across Europe, with on average less than 15 percent of employment with lower secondary education or less and well above a third with higher education. Understandably, tertiary education in the education sector is predominant in all countries (50 percent or more, with the exception of Italy where the share stands at 46 percent). With 75 percent of employment having higher education in the education sector, Ireland is above the European average. In the public administration sector Ireland is very close to the European average. In the health sector, Ireland has a different distribution than the European average, whereby its share is higher at both ends. The higher share of tertiary level than the European average is partly due to the differences in healthcare systems, whereby in Ireland nurses have third level education, while in many countries they are qualified after completing vocational secondary education.

Skills shortages in the healthcare system include medical practitioners, dentists, various types of therapists (including dieticians) and medical radiographers, as well as nurses and pharmacists. There is little evidence of skills shortages in the education sector.



In terms of participation in education and training, 7.5 percent of those in the public administration, defence and social security sector participated in formal education or training in 2003, 27 percent in non-formal and 53.4 percent in informal training. In the education sector, 9.7 percent participated in formal, 33.3 percent in non-formal and 64.5 percent in informal training. In the health sector, 9.5 percent participated in formal, 26.7 percent in non-formal and 54 percent in informal training.

Engineering

The SLMRU have identified shortages in the following engineering occupations: electrical and electronic engineers, planning and quality control engineers, design and development engineers, chemical engineers and engineering technicians. These shortages are expected to continue in the medium term as a consequence of declining student enrolments and the expected strong performance of the IT, pharmaceutical and medical devices over the coming years.

Information Technology

The *National Skills Bulletin 2006* points to the following areas of skills shortages in the IT sector: software engineers, computer analysts/programmers and computer systems managers. This is underpinned by the declining uptake of computer courses, with the level of enrolment in computing courses in both 2004 and 2005 less than half the level in 2000.

Mining and Quarrying

Of those in the mining and quarrying sector, 0.7 percent participated in formal education or training in 2003, 12.3 percent in non-formal and 25.9 percent in informal training. In terms of those working in the electricity, gas and water supply sector, 8.9 percent participated in formal education or training in 2003, 26 percent in non-formal and 45.9 percent in informal training, while 8.2 percent of employees in real estate, renting and business activities participated in formal education or training, 21 percent in non-formal and 57.3 percent in informal training.

Summary

Ireland's share of employment with higher education qualifications is above the European average in almost all sectors. However, its share of employment with lower secondary or less education is, with the exception of the financial sector, either close to or above the European average. In particular, in agriculture, construction, retail and transport sectors, Ireland's share at the lower end significantly exceeds the European average (7 percentage points or more). This finding illustrates the scope for improving the education profile by upskilling those at the lower education levels.

2.2.2 Change in Employment Profile by Sector in Ireland in 2020

Demand forecasts suggest that current sectoral shifts will continue. Overall, employment in Ireland is forecast to increase from 1.9 million in 2005 to over 2.4 million in 2020. The broad trends are illustrated below. *Figure 7* below illustrates the forecast employment changes by sector in terms of absolute numbers and average annual percentage change.

Figure 7: Employment by Sector 2000-2020

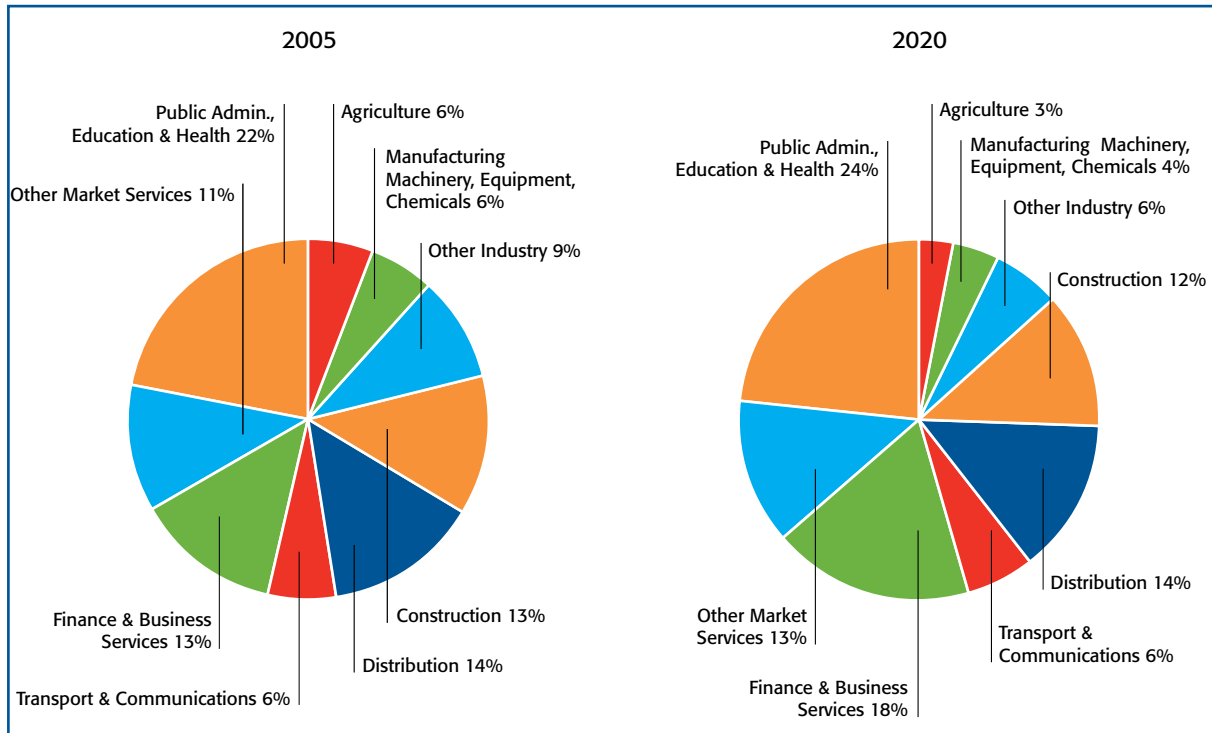


Source: ESRI



Figure 8 shows the proportion of employment accounted for by each sector in 2005 and 2020.

Figure 8: Employment in Ireland by Sector 2005-2020



Source: ESRI

- It is forecast that employment in agriculture will continue to fall in absolute terms, from over 113,000 in 2005 to just 73,000 in 2020;
- Other large declines are also forecast in the 'other industry' sector (-36,000 jobs)⁴⁷;
- Employment in manufacturing is also expected to continue to decline by almost 17,000 jobs from approximately 116,500 in 2005 to less than 100,000 in 2020. This drop will be most pronounced in the traditional manufacturing sectors⁴⁸;
- Services based employment is expected to increase significantly over the period, with the largest absolute increases forecast to occur in the 'financial and business services' sector (+170,000 jobs), 'public administration' sector (+125,000 jobs), and 'other market services' (+80,000 jobs)⁴⁹;
- In relative terms (i.e. the proportion of total jobs accounted for by each occupational group in 2020, relative to its proportion in 2005), the 'financial and business services' sector is likely to enjoy the highest growth, increasing its relative share of total employment by 37.9 percent;
- Both the 'other market services' sector (+12.6 percent) and the 'public administration' sector (+7.1 percent) are also expected to increase their relative share of employment;

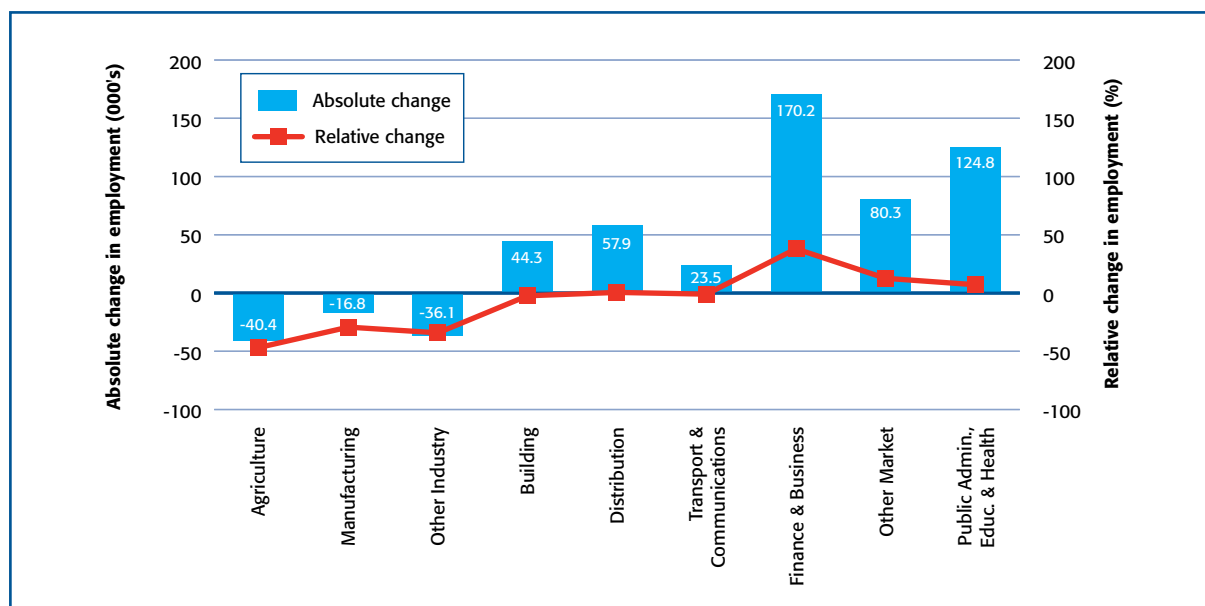
⁴⁷ 'Other industry' includes employment in the manufacture of basic metals and fabricated metal products, manufacture of food products and beverages, tobacco products and textiles.

⁴⁸ Manufacturing refers to, for example, the manufacture of office machinery and equipment, manufacture of electrical machinery, manufacture of medical, precision and optical instruments, watches and clocks etc.

⁴⁹ 'Other market services' includes hotels, restaurants, bars, canteens and catering, recreational, cultural and sporting activities.

- The largest relative falls in employment are expected in the 'agriculture' sector (-46.8 percent), the 'other industry' sector (-34.2 percent) and the 'manufacturing' sector (-29.3 percent);
- These trends are further illustrated in *Figure 9* (below).

Figure 9: Change in Absolute and Relative Employment 2005-2020



Source: ESRI

2.2.3 Implications of the Shift to Services

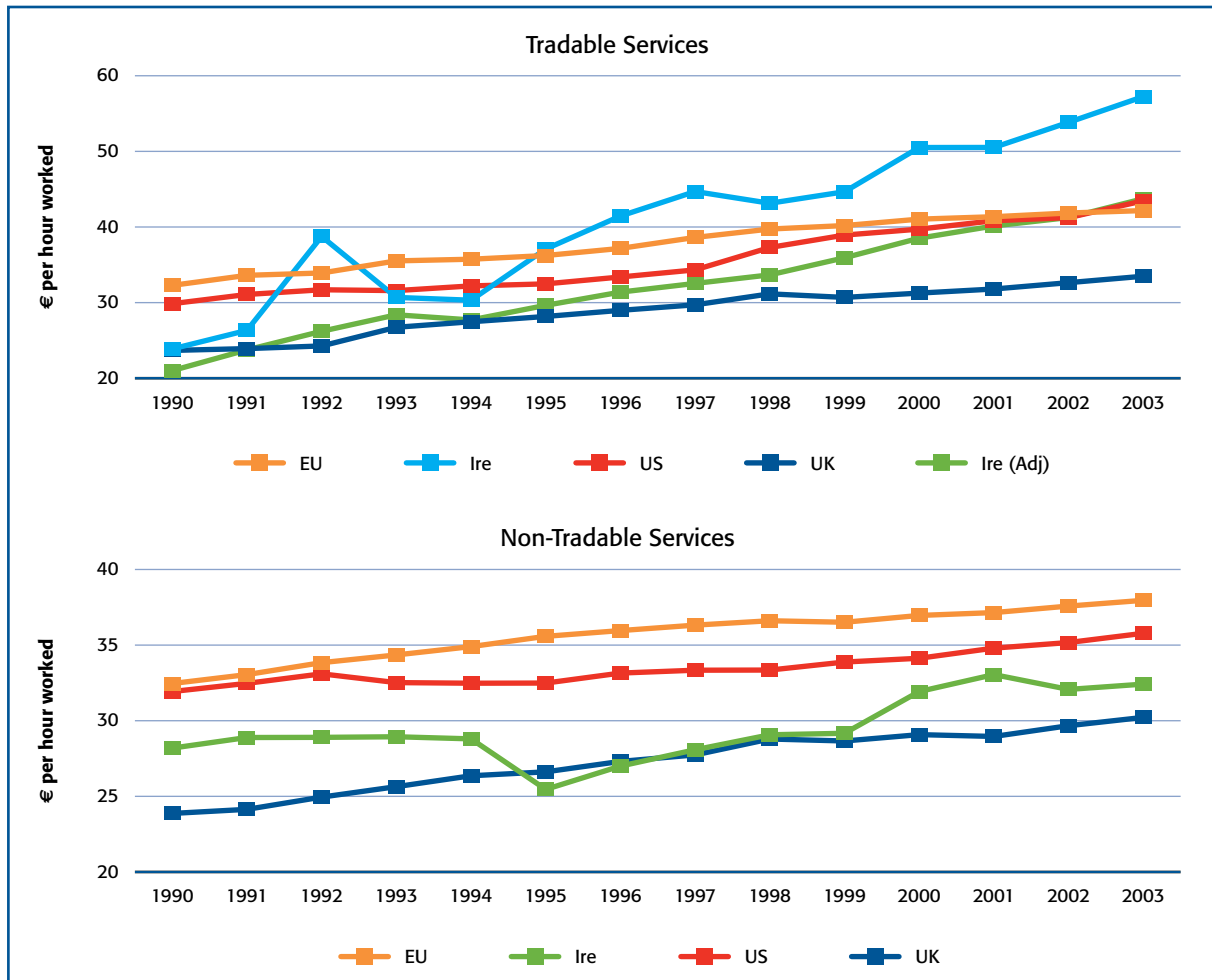
The shift towards services poses a distinct productivity challenge for the Irish enterprise sector. Traditionally, growth in manufacturing productivity has outstripped growth in service sector productivity. Indeed, the majority of the Irish economic 'miracle' was based on the performance of foreign-owned manufacturing firms. According to McKinsey, the foreign owned sector accounted for 70 percent of Irish economic growth in Ireland between 1995 and 2003, despite employing only 15 percent of the country's workforce.

Within the services sector, there are sectoral disparities in terms of productivity performance: specifically, the productivity performance of the Irish tradable and non-tradable service sectors differs significantly (*Figure 10*)⁵⁰. The tradable services category, which includes communications, tourism, finance, computers and R&D is amongst the most productive sectors in the economy, according to value added, and Ireland's performance exceeds the average EU and US performance in the unadjusted series. Ireland's performance in terms of GNP is somewhat diminished, although it remains relatively strong. However the non-tradable services sector (which comprises wholesale and retail trade, transport, utilities, real estate, public services and other services) performs below both EU and US levels in terms of value added.

50 The tradable services graph includes two data sets for Ireland; one using GDP and one adjusted for GNP.



Figure 10: Output per Hour Worked in Services 1990-2003 (€2003)



Source: Forfás calculations based on Groningen Growth & Development Centre, 60 Industry Database, October 2005

Whereas labour productivity in manufacturing has been driven by enhanced automation, effective rollout of ICT and investment in human capital, services often tend to be customer-facing and thus, less amenable to automation or other labour-saving innovations. The challenge for firms now, is to maintain Ireland's recent strong productivity performance in an environment increasingly dominated by service industries.

2.3 Occupational Shift: The Emergence of Knowledge Work

'New Economy' theory suggests that advanced countries are witnessing a striking growth in 'knowledge jobs', and that standardised manual labour is being increasingly displaced by knowledge-rich employment. Internationally, there is some evidence of growth at the top and bottom of the skill continuum. Background research for this report shows that the skill and qualification requirements for jobs at all levels are rising and that there is an increasing emphasis on generic skills.

In Ireland, analysis of CSO data suggests that between 1997 and 2004, job growth at the high and low ends of the skills continuum exceeded growth in middle level occupations, with much of the job growth at the high skill level in managerial and administrative functions⁵¹. On the other hand, an evaluation of Ireland's occupational profile, using years of education as a proxy for skill levels, has found that 'high skilled' employment increased between 1991 and 2001 while 'low skilled' employment declined.

Figure 11 illustrates the forecast change in employment according to occupation, in terms of absolute numbers and average annual percentage change.

Figure 11: Employment by Occupation 2000-2020

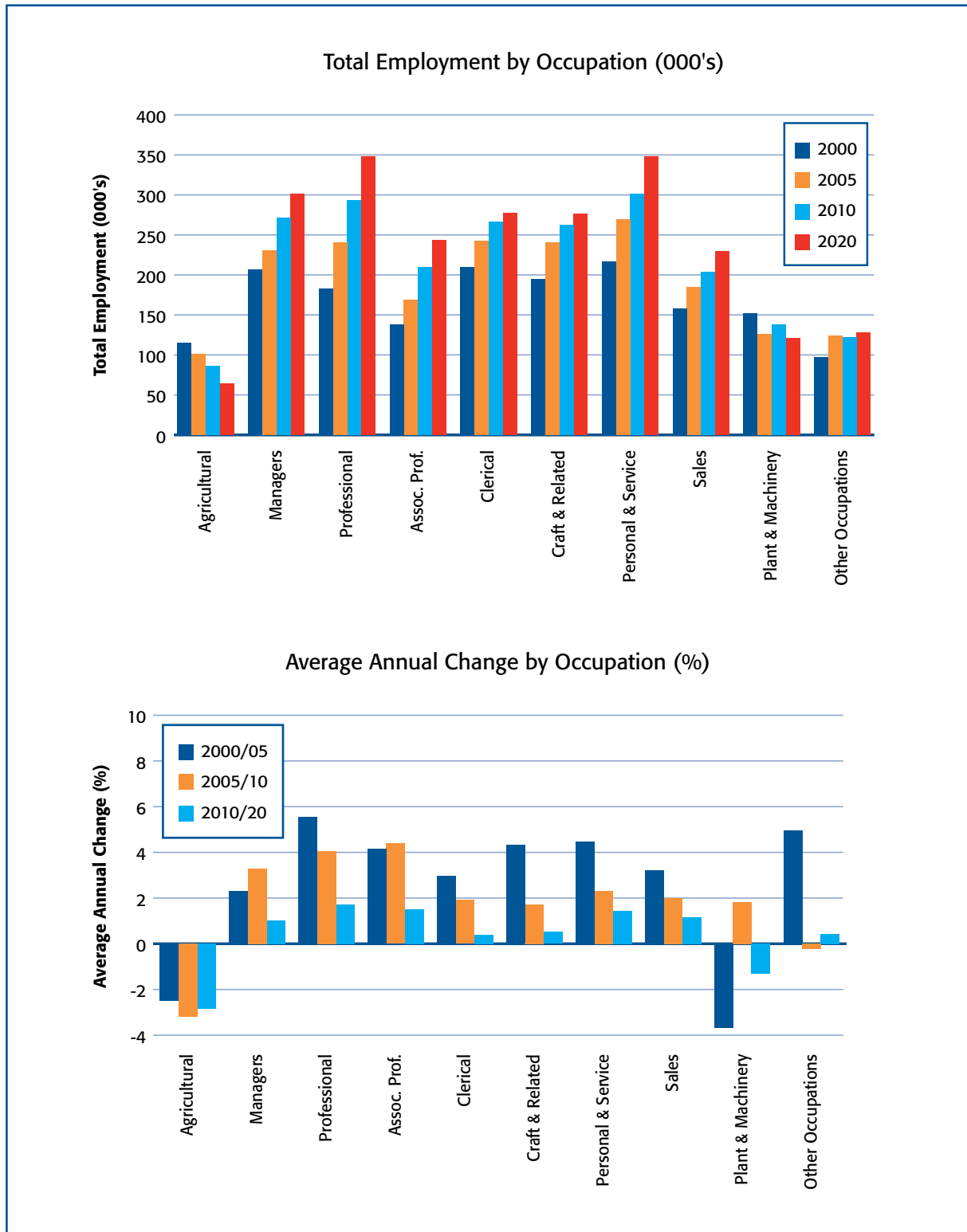
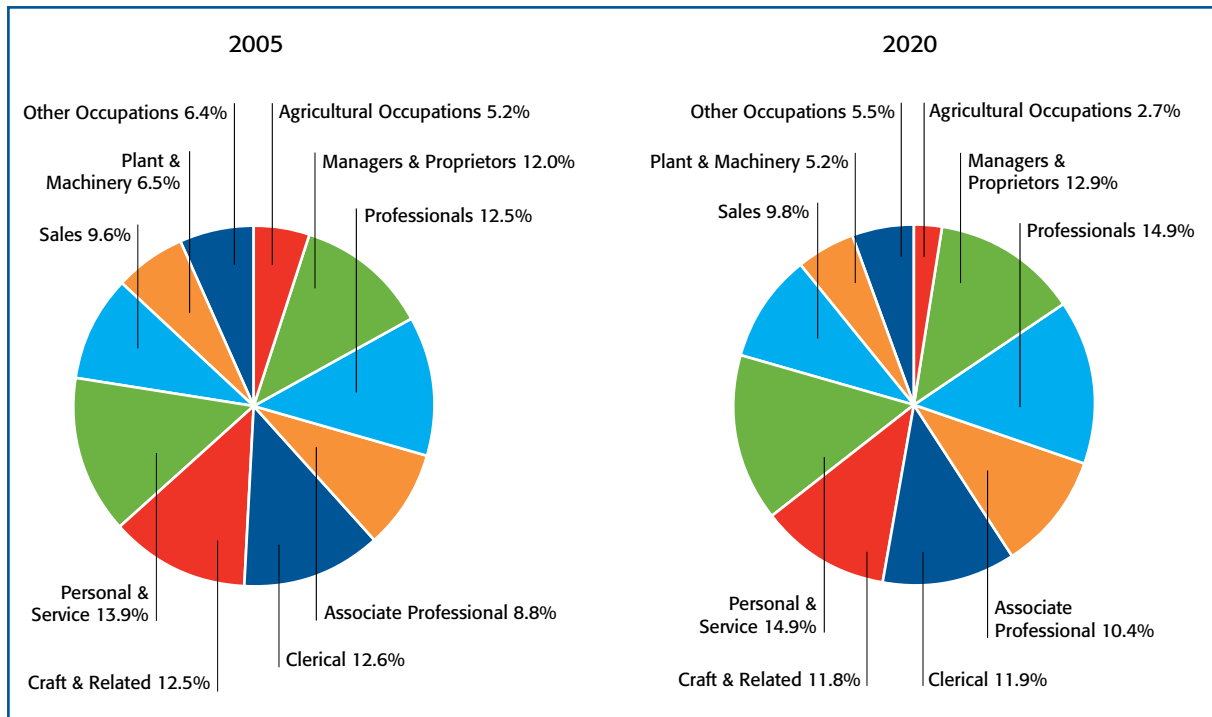




Figure 12 illustrates the expected change in Ireland's occupational profile between 2005 and 2020.

Figure 12: Employment in Ireland by Occupational Level 2005-2020



Source: ESRI

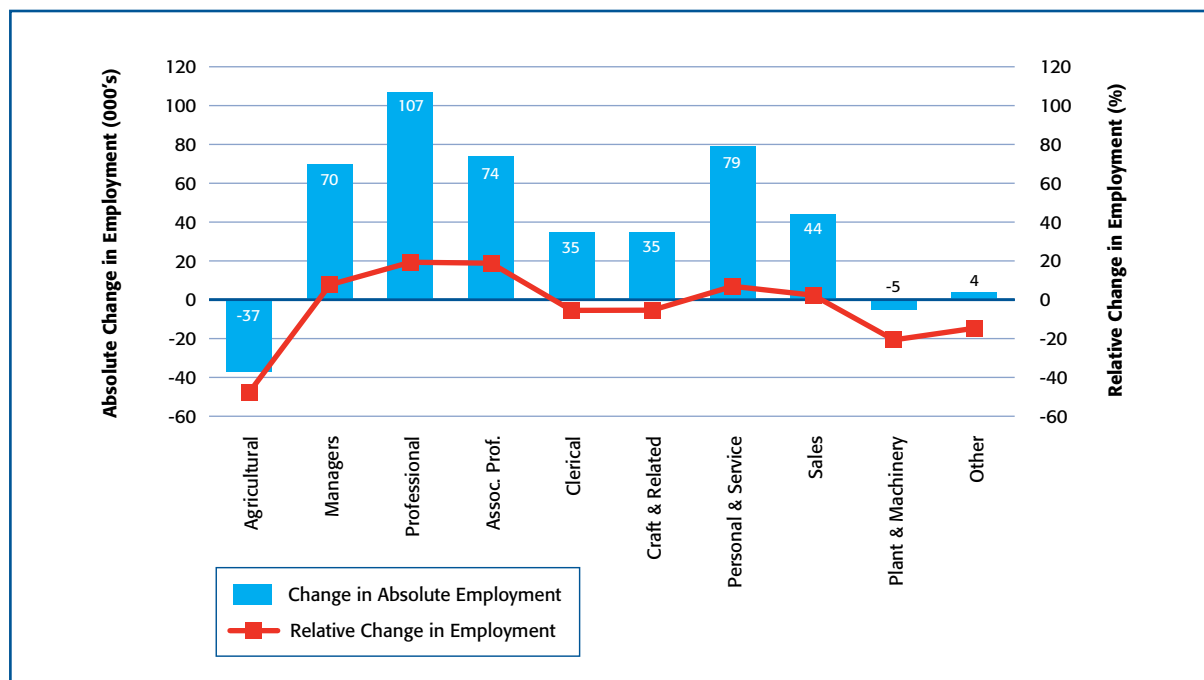
The main findings emerging from these forecasts indicate that by 2020:

- In absolute terms, the largest increase in employment is likely to be recorded in 'professional' occupations, with 107,000 positions created;
- 'Personal & service' occupations (79,000 positions) and 'associated professional' occupations (74,000 positions) are also forecast to record strong employment growth⁵²;
- The 'agricultural' and 'plant & machinery' occupations are expected to lose 37,000 and 5,000 positions respectively⁵³;
- In relative terms (i.e. the proportion of total jobs accounted for by each occupational group in 2020, relative to its proportion in 2005), the largest growth is forecast to occur in the 'professional' (+19.3 percent), 'associated professional' (+18.8 percent), 'managerial' (+7.7 percent) and 'personal & service' (+6.9 percent) occupations;
- 'Agriculture' (-47.6 percent), 'plant & machinery' (-20.7 percent), 'other' (-14.7 percent), 'clerical' (-5.5 percent), and 'craft & related' (-5.4 percent) are all expected to decline in relative terms⁵⁴;
- These trends are illustrated in Figure 13.

⁵² 'Personal & service' occupations include catering staff, travel attendants, hairdressers, care assistants. 'Associate professionals' includes occupations such as scientific technicians, quantity surveyors, nurses, underwriters.

⁵³ 'Plant & machinery operatives' includes occupations such as general operatives and assembly line workers.

⁵⁴ 'Clerical' includes occupations such as administrative and clerical officers, records clerks, secretaries; 'Craft & Related' refers mainly to construction trades, electrical trades, metal forming and welding trades.

Figure 13: Change in Absolute and Relative Employment 2005-2020

Source: ESRI

The expected decline in some occupations (which generally appear to be in manual, relatively low skilled jobs) and the rise in importance of professional and associated professional occupations will almost certainly impact on the types of skills which will be required by enterprise. The data also emphasises that while the importance of high skilled occupations is growing, there will continue to be demand for workers at all levels of the economy.

The last two sections have focused on the changes occurring within sectors and occupations. These trends, however, do not necessarily take account of the changing skills requirements within particular occupations and the increasing levels of job complexity. The next two sections address this issue.

2.4 The Changing Nature of Generic Skills

It would appear that virtually all sectors of industry are becoming more knowledge-intensive, in the very broad sense of the term. This involves a change in the types of skills required, with a rise in the importance of generic skills, including the ability of individuals to work more autonomously; be self-managing, work as part of flexible teams, adapt to change, solve complex problems, think creatively and engage with innovation as a continuous process.

Regardless of how the 'knowledge economy' develops, there is a widely shared assumption that there will continue to be demand for relatively low skilled workers⁵⁵, the main difference being that now they will increasingly be employed in services that require a relatively greater emphasis on generic-type skills. Combined with evidence suggesting that the kinds of higher-level jobs more generally associated with a knowledge economy are also requiring proportionately more skills of a generic nature, the overall message for the centrality of generic skills demand and supply is clear. There is substantial evidence to indicate that generic skills are regarded as of at least, if not more, importance for employers as technical or job-specific skills for the 21st century workplace.

55 This belief is shared for example, by Leitch (2005) and Keep (2003).



There is no widely agreed and adopted taxonomy for generic skills, although several plausible variants exist. 'Generic', 'horizontal', 'basic', 'soft', 'key', 'transferable', 'employability' are among the more common classifications used when broadly referring to combinations of skills and personal attributes which are deemed essential to be effective in the workplace of the 21st century.

What is encompassed within individual generic skills has also been expanding in scope. Thus, what was seen as the 'specialist' skill of IT just 10-15 years ago is now regarded as a 'basic' skill, essential for a great proportion of jobs and occupations, although the level and complexity of actual skill utilised will vary substantially across and even within occupations.

Based on the national and international academic evidence available, the Expert Group has identified the key and most widely shared elements that should be included in a generic skills portfolio as⁵⁶:

- **Basic/fundamental skills** – such as literacy, using numbers, using technology;
- **People-related skills** – such as communication, interpersonal, team-working, customer-service skills; and
- **Conceptual/thinking skills** – such as collecting and organising information, problem-solving, planning and organising, learning-to-learn skills, innovation and creative skills.

The variety of levels and intensity with which any of these skills might be required will vary, depending on the job⁵⁷. Furthermore, other skills such as scientific literacy, enterprise skills and possibly broader citizenship skills might also be included in any essential generic skills set. There are initiatives already underway which will assist in developing generic skill competency. These initiatives comprise the inclusion of generic skills as a measured output at various levels in the NFQ and through the development of new curricula within which generic skills are embedded by the National Council for Curriculum and Assessment (NCCA).

2.5 Changes within Occupations

The Expert Group assessed the extent to which (i) the skills sets within four representative occupations have changed since 1990 and (ii) they are likely to further change over the period to 2020. The sample of occupations chosen for detailed study were selected on the basis that they were strategically important to the future of the Irish economy or were in significant employment sectors, and were representative of different occupational levels⁵⁸. The four occupations selected were:

- Food Processing Operatives (SOC 809) working in the food and beverages sector (NACE 15);
- Software Engineers (SOC 214) working in the computer and related services sector (NACE 72);
- Laboratory Technicians (SOC 346) working in the health and social work sector (NACE 85); and
- Cashier and Counter Clerks (SOC 411) working in the financial intermediation sector (NACE 65).

The main findings of the analysis of these four occupations are outlined below.

- **Increasing Breadth of Knowledge:** Across all four occupations studied, most of those employed need an increasing breadth of knowledge. For example, software engineers now need more than

⁵⁶ *The Changing Nature of Generic Skills, Forfás. The full report is available at www.skillsstrategy.ie*

⁵⁷ *In an unpublished paper for the Expert Group, Two Perspectives for assessing skills: what can they contribute to policy? (Sept.2003), Statz makes the point that, for instance, communication skills requirements vary widely across jobs with respect to the mode, style, purpose and audience for the communication.*

⁵⁸ *Forfás/EGFSN commissioned Publica Consulting Ltd to undertake this study. The full report is available online at www.skillsstrategy.ie.*

just programming skills, they also need an understanding of the business domain that their research is intended to target;

- **Increased Share of Knowledge Work/Reduced Share of Routine Work:** Across all four occupations, automation and other factors have sharply reduced the amount of the most routine, intellectually undemanding work that needs to be done. The other side of the picture is that, to varying extents, more advanced knowledge work has increased within occupations, driving consequential changes in the skills required, and is continuing to increase. For example reduced cash transactions have eliminated much of the routine work for cashiers and counter clerks, while the share of work devoted to customer service and sales has increased steeply;
- **Rising Qualification and Technical Skill Requirements:** Another significant, but less universal, trend visible is a rise in the level of technical skills required in occupations, and a consequential rise in qualifications requirements. The changing entry requirements for laboratory science provide an example of this phenomenon: previously, a two year certificate was required to enter laboratory science – currently, an honours bachelor degree is required;
- **Importance of Continuing Learning:** Reflecting ongoing change, continuing learning is important in all four occupations, and is more important than it was in 1990. It is on track to be significantly more important by 2020;
- **Significance of Regulation:** Public regulations have had, or seem likely in future to have, a major skills impact. Examples include health and safety regulations, tax compliance, quality assurance etc.;
- **Skills for Dealing with Others:** Interacting with other people has become a bigger part of all four occupations over time, with a growth in team working and in the extent to which people interact with others outside their department or team. For example, cashiers and counter clerks in team-intensive automated areas increasingly have collaborative contact with specialist staff in other areas, such as sales;
- **Upskilling/Deskilling:** In the main, across the four occupations, while automation has simplified the job in some respects, it has also caused greater demands in terms of the role's skill and knowledge content, more than compensating for the loss of skills that has occurred; and
- **Dependability:** All four occupations increasingly require highly dependable and responsible people.

2.6 Skills for Emerging Technologies

One of the important facets of the industrial landscape in 2020 will be the prevalence of new technologies currently emerging which will dominate markets and in an open economy such as Ireland these changes will be greater than others. It is important that the skill base of tomorrow take cognisance of this and ensure that those in both the workplace and society as a whole will have the skills to take advantage of the changes which these new technological advances will bring. One of these key technologies is nanotechnology. As an example of the human capital requirements of a new emerging technology, the emergence of nanotechnology will increase the demand for the following skills both within the workforce and society: science literacy in the broad base of citizens to ensure the early adoption of nanotechnology developments; a scientific skill base to support the exploitation of nanotechnology based opportunities; a multidisciplinary skills base with high level competence in basic sciences intertwined with engineering and information sciences. These requirements are not unique to nanotechnology and are illustrative of the actions which need to be taken in the skills area to ensure that the economic benefits of convergent technologies are reaped by the Irish economy and wider society.



Chapter 3: Investment in Education and Training

Participation in education has an unambiguously positive impact on earnings.

Due to a market failure, individuals do not invest in the optimum level of education and training.

The State, therefore, is justified in intervening in the market for education and training at certain levels, notably at primary and secondary level, and for certain target groups (for example, individuals who left formal education without completing a leaving certificate or equivalent).

In the years ahead, labour productivity will be the key determinant of economic growth in Ireland, and increasing productivity will depend to a large extent on education and training. A workforce that is better educated and trained can produce higher value goods and services, and is more likely to innovate.

Improved education and training also yield a social dividend: they result in better social cohesion and public health, and mitigate against poverty, crime and social welfare dependency.

Finally, globalisation requires a flexible workforce. Ireland, as a small open economy, must be able to respond rapidly to changes in the world economic and technological environment; only a well-educated population is able to respond in this way.

Sustained and enhanced investment in the educational and training infrastructure is thus necessary and desirable for the foreseeable future.

3.0 Introduction

The chapter highlights the returns from investment in education and training to individuals and enterprises. It looks at the distribution and rates of return where data is available. It examines the economic case for investment by the State in education and training where there is market failure.

3.1 Stakeholder Investment in Education and Training

3.1.1 Individual Returns to Investment in Education

According to Human Capital Theory, when deciding to invest in education and training, an individual will perform a cost-benefit analysis, considering the benefits of education and training, net of costs. Various other factors will also influence the individual's decision: investment is more likely when the person is young, when the expected earnings are higher, and when the initial investment costs are lower. The following summarises the key findings from the empirical literature of the rates of return to an individual from investment in education:

- Education and earnings are positively linked. In all countries, including Ireland, graduates of tertiary level education earn substantially more than upper secondary and post-secondary non-tertiary graduates⁵⁹;

- Analysis using years of schooling as a measure of human capital throws up rates of return to the individual of an additional year of education in the range 5-15 percent⁶⁰;
- The most recent international evidence suggests a return to a year of schooling to be in the range of 7-9 percent for males and about 8-10 percent for females.
- It is higher for Ireland: between 9-11 percent for males and about 14 percent for females. These returns for Ireland are significant and represent a high return on investment, relative to any other form of investment. These returns are central to any assessment of the impact of Exchequer investment on education⁶¹;
- Evidence suggests that the returns to investment in education and training are higher for those in the top decile of the income distribution compared to those at the bottom decile⁶²;
- Individuals have different levels of ability and when estimates of the rate of return to schooling are adjusted for this, they are somewhat lower. Similarly, those who invest most in education are likely to be those who will earn the most from it⁶³;
- According to Harmon et al. (2003) there is an 'unambiguous positive effect on the earnings of an individual from participation in education'; and
- Some tentative evidence suggests the return to education may not be linear; there may be a bonus for higher levels of educational attainment such as a degree⁶⁴ – this may also be true for Ireland.

3.1.2 Individual Returns to Investment in In-Employment Training

Individuals benefit from investment in training as well as education. Most training takes place post formal education in the form of in-employment training. The research base in relation to the returns from training is not as developed as it is for returns from investment in education. The following summarises the key findings from the literature on the economic returns to training:

- People with higher ability and with higher educational attainment are more likely to participate in training, suggesting a strong complementarity between the three main components of human capital; early ability, qualifications and knowledge (acquired from formal education) and skills and competencies (acquired from training on the job)⁶⁵;
- International evidence indicates there are significant returns to investment in formal training for the individual: higher earnings in the range of 5-10 percent have been observed⁶⁶;
- There is very limited evidence on the returns to training in Ireland but the studies that do exist indicate that it is positive⁶⁷;
- Individuals benefit in other ways from training, in addition to increased earnings. Training is associated with the likelihood of promotion, reduced probability of unemployment, and reduced likelihood of quitting⁶⁸.

60 The methodology used to calculate the rate of return does not differentiate between levels of education. Many studies, including UK studies, suggest there are decreasing returns to successive investments in human capital; the rate of return to education declines with the level of schooling (e.g. Dearden (1998) and Blundell et al (1997) for the UK, Hanoch (1967) and Vaillancourt (1993) for the US and Canada). This finding indicates that successive investments in education are still profitable and worthwhile, but the rate of increase in the return is declining. It is not clear that this is the case for Ireland.

61 See Harmon et al. (2003). Callan & Harmon (1999) and Callan & Wren (1992) also support the higher than average rates of return to schooling for Ireland.

62 See Buchinsky (1994).

63 See Card (1999, 2001).

64 See Heckman et al. (2003), Hungerford & Solon (1997) and Park (1996, 1999).

65 This reflects the findings of the NCPP as published in NCPP/ESRI, *The Changing Workplace: A Survey of Employees' Views and Experiences, Forum on the Workplace of the Future, Research Series No.2, ESRI/NCPP, 2004.*

66 See Blundell et al. (1999).

67 See Denny & Harmon (2000).

68 See Blundell et al. (1999), Greenlagh & Stewart (1987) and Bishop (1990).



3.1.3 Firm Level Returns to Investment in Human Capital

Recent developments in the field of human capital studies have focused attention on the impact of human capital at the firm level. To date, research on Ireland is limited by the absence of appropriate datasets. The sections below outline the main findings of international research and where possible draw parallels with the Irish situation. Some key findings from the literature are as follows:

- The international literature indicates that training has a positive impact on firm-level productivity, although the magnitude of the impact varies;
- Recent evidence from the UK found that an increase in the proportion of employees trained in a production sector industry (from 10 percent of employees to 15 percent) was associated with a 3 percent increase in value added per worker⁶⁹;
- The same study also found that the productivity effect of training exceeded the wage effect, suggesting that a portion of the productivity gains accrue to the firm;
- In some studies, the productivity increase was over twice the size of the wage effect⁷⁰;
- In an Irish context, training projects piloted by Skillnets produced positive measurable returns: Diageo, for example were able to measure a 121 percent return on investment on a cross-skilling training programme, while Lionbridge Technologies measured a 32 percent return on a management and supervisory skills training programme, and Laepple recorded a 150 percent return on a safety training initiative⁷¹. Skillnets have also piloted training programmes in small and medium sized enterprises and recorded positive returns on investment;
- There is some evidence that training also benefits the firm; in the UK a one-percentage point increase in training is associated with an increase in the value-added per hour of about 0.6 percent⁷². However, evidence from the US and New Zealand, although positive, is more limited⁷³;
- More highly skilled workers are more likely to adapt to change and to be a direct source of innovation;
- The most productive firms appear more likely to use advanced technology/ICT than the less productive;
- Computer use, university education and computer skills development are associated with higher productivity, however, computer use is correlated with productivity benefits irrespective of whether workers have university degrees⁷⁴; and
- Productivity improvements from employing a greater share of university graduates and using computers are larger for smaller firms (less than 20 employees)⁷⁵.

69 See Deardon et al (2000)

70 See Barron et al (1989) and Blakemore & Hoffman (1998)

71 Skillnets, (2006), Building Skills and Competitiveness: Training Networks Programme Report 2002-2005

72 See Deardon et al. (2005).

73 See Lynch & Black (1995) for US data.

74 See Turcotte & Whewell (2004).

75 Ibid

3.2 The Market for Education

3.2.1 The Theory of Educational Markets

The previous sections outline the case for private investment in human capital based on the significant rates of return from investment in education and training. There is, however, an economic justification for state intervention in the provision of education and training. The theoretical justification for intervention is outlined below and specific comment is made in relation to the preferred role of the Irish State.

In a hypothetical situation of perfect markets, there would be little or no need for state intervention in the provision of education and training. This is based on the assumption that individuals make economically rational decisions and that the demand for education is a function of the current and future benefits it provides to individuals (i.e. through higher returns in the form of wages, reduced likelihood of unemployment etc. as outlined earlier in this chapter 3.1.2). By extension, the optimal level of education and training for society as a whole would be determined by the aggregate, rational decisions of individuals regarding the quantity and quality of education and training which they would demand.

Such a scenario, however, is built on a number of notable and unrealistic assumptions (outlined in *Section 3.2.2*) that do not withstand close scrutiny. This results in a *market failure*, which requires a level of correction only feasible through state intervention. Thus, the role of the State in the provision of education and training can be justified since the societal returns significantly exceed the private gain to the individual. The nature and degree of this intervention remains, however, an issue of debate.

3.2.2 Market Failure in Education

In order to appreciate the role of the State in the education and training sphere, it is necessary to first understand the nature of the market failures inherent in the market for education and training.

In most instances, decisions regarding a child's education are taken, not by the child themselves, but by their parents or similarly responsible adults. As we have seen above, the evidence suggests that the decision to invest in education and training is a rational one, at all levels⁷⁶; the returns to education and training are unambiguously positive. However, the opportunity for individuals to invest in their human capital can be constrained by their ability to access the necessary finance. While in many situations investment decisions can be postponed, human capital is not particularly suited to deferred consumption, nor have capital markets developed sufficiently to offer widespread finance for education and training in return for such intangible collateral as the future earnings which are likely to accrue from the education⁷⁷.

Likewise, the assumption of perfect information undermines the hypothesis of an efficiently functioning market for education. For a start, individuals may not fully appreciate the true value of acquiring an education, due to either lack of awareness, risk aversion (i.e. there are not definitive guarantees that the returns to the individual will be as significant as presumed) or to the uncertainties about the future state of the labour market. Although it would appear rational to invest in education in order to reap the rewards in the future, the long-term nature of returns to education ('delayed gratification') can result in under-investment. This problem is more likely to be prevalent in those sections of society already suffering from relatively poor levels of educational attainment, as the willingness or ability to weigh up the short-term costs versus long-term benefits requires role models to provide positive encouragement and financial resources. These role models are often only available to wealthier and better-educated cohorts. Similarly, in terms of training, both individuals and firms may be unaware of the returns to investment in training, particularly since these returns are difficult to quantify, resulting in below optimal take-up.

⁷⁶ Notwithstanding the rationality of investment in education, individuals in developed countries are generally required by the state to participate in formal education up to a minimum standard or age.

⁷⁷ There are exceptions to this rule, notably at third level where several funding mechanisms are on offer, including student loans etc.



Additionally, the fact that the benefits flowing from increased educational attainment extend beyond the individual and accrue to society as a whole may actually militate against individuals investing in education at the optimal level. In other words, they may be reluctant to make investments for which do not receive the totality of the benefits. Equally, the fact that parents make the most significant investment decisions regarding education, but do not receive the majority of the returns from this investment, may also dissuade them from making the most desirable level of investment in education.

To negate the impact of these market failures, the modern state has stepped into the breach. Faced with the option of either providing education directly as a public good or creating a framework whereby private suppliers provide the service in a market situation, traditionally the State has opted for the former option.

3.2.3 Balancing Political and Market Control of Education

While the arguments outlined above justify some state intervention in the field of education and training, the extent or the manner in which this intervention should be pursued requires consideration. A study by West⁷⁸ into the need to balance political and market influences on the education system concluded that

"...the optimal balance between political and market control of education is an empirical, rather than ideological issue, with a unique resolution for each particular time-period, nation, and level of education."

Education and training provision is exposed to the same threats to productivity as any other state-provided good or service. In the past, state intervention in education has resulted in sub-optimal results, when compared with idealised market-based outcomes (i.e. state provision has on occasion resulted in inefficient delivery mechanisms/deadweight loss, poor motivation amongst staff, and low levels of flexibility in curricula design). Furthermore, evidence from the US suggests that instances of inefficient resource allocation occur due to uncertainty over which inputs improve the quality of education the most, although it should be noted, that this uncertainty is not limited to state intervention: all providers face similar problems⁷⁹.

Nevertheless, these problems need to be considered when determining future government policy. What is clear, however, is that the nature of the returns to investment in education and training, particularly the positive externalities which are associated with enhancements in average attainment levels, are likely to necessitate continued state intervention in areas identified as specifically suffering from market failures. In particular, it seems appropriate that the State should fund targeted, specific cohorts of the population, primarily low-skilled individuals, who would otherwise be unlikely to partake in either education or training.

3.3 Public and Private Investment in Education and Training

3.3.1 Formal Education System

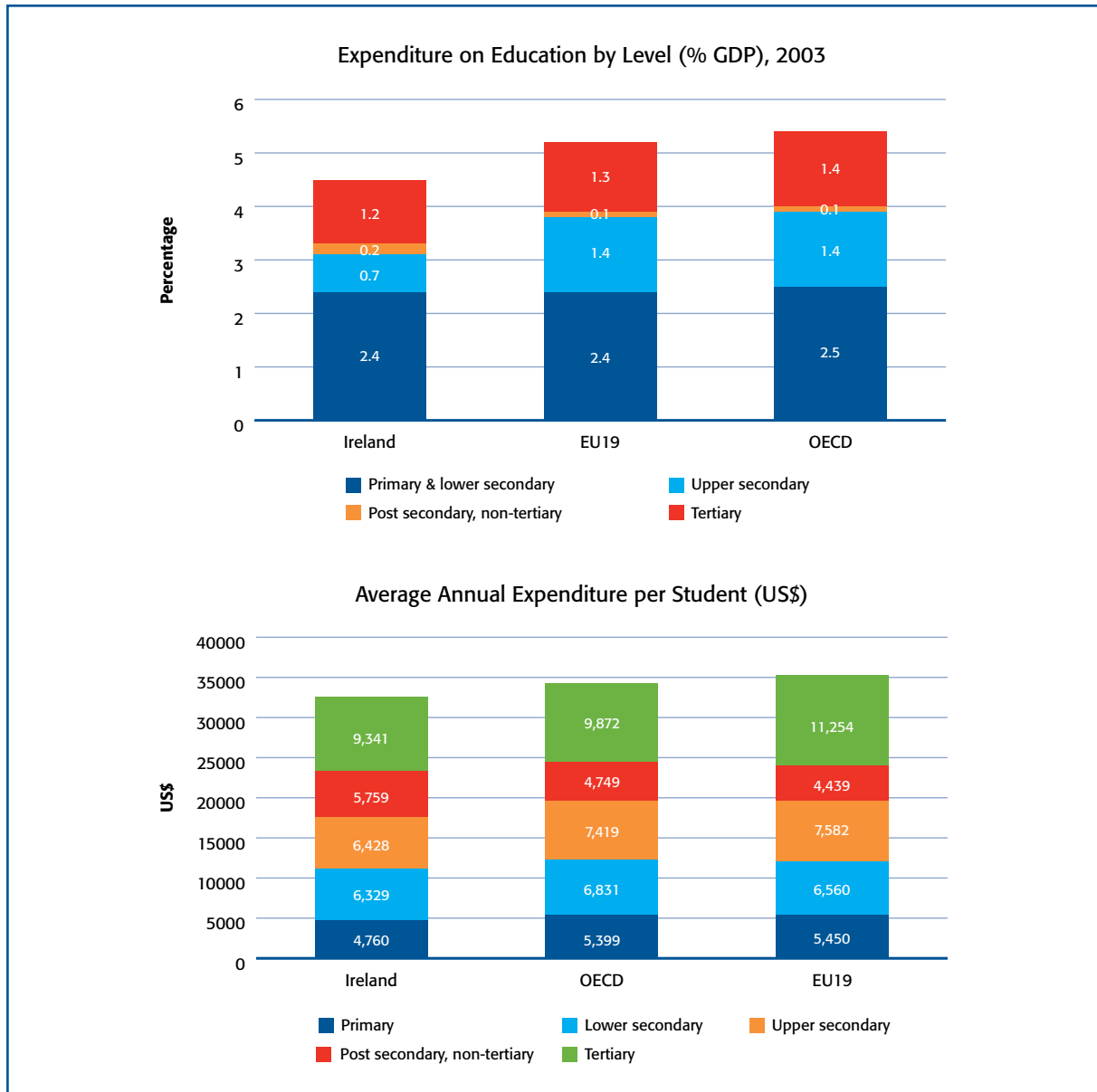
The Irish government, like all modern states, devotes a significant proportion of its budget to the funding of education and training. According to the OECD, in 2003 Ireland spent 4.5 percent of GDP on educational institutions⁸⁰. This was less than both the OECD average (5.4 percent) and the EU-19 average (5.2 percent)⁸¹. *Figure 14* below illustrates educational expenditure in Ireland vis-à-vis the OECD and EU-19 in greater detail. It should be noted that Ireland's performance would improve (though would continue to lag the OECD average) if GNP was used rather than GDP.

78 West, M., (2000), State Intervention in English Education 1833-1891: A public Goods and Agency Approach, *Discussion Papers in Economic and Social History*, Number 37, October 2000, University of Oxford

79 Kuo, R. (2000), The Human Capital Market Failure: Using Vouchers to Increase Educational Quality and Productive Efficiency

80 OECD, Education at a Glance 2006

81 The EU-19 average is calculated as the unweighted mean of the data values of the 19 OECD countries that are members of the European Union for which data are available or can be estimated. These 19 countries are Austria, Belgium, the Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Italy, Ireland, Luxembourg, the Netherlands, Poland, Portugal, the Slovak Republic, Spain, Sweden and the United Kingdom.

Figure 14: Expenditure on Education

Source: OECD

The Expert Group acknowledges the increased resources which have been dedicated to education over the last decade. Nevertheless, these graphs reveal that Irish expenditure on education continues to lag behind average EU and OECD performance. The expenditure shortfalls are greatest at primary and upper secondary levels (for example, \$4,760 per primary school pupil compared to \$5,400 in the US).

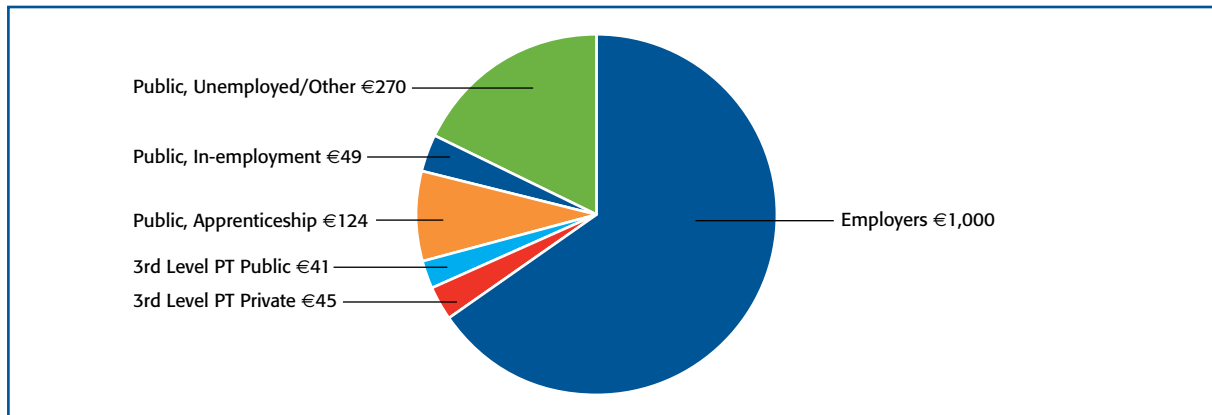
The relatively low proportion of private funding for education in Ireland is also worth noting. According to the OECD, private sources accounted for just 7 percent of total educational expenditure in Ireland in 2003. This compares with 27.7 percent in the US and an OECD average of 12 percent. The shortfall in private funding sources of education in Ireland is evident at all levels of the education system, but is perhaps most notable at third level where the returns to investment are most easily captured; just 16.2 percent of third level funding is privately sourced in Ireland, compared with 57.2 percent in the US and an OECD average of 23.6 percent.



3.3.2 Continuing Vocational Education System

In terms of training, *Figure 15* illustrates the total expenditure on vocational education and training in Ireland in 2003.

Figure 15: Total Expenditure on Continuing Vocational Education and Training, 2003 (€million)



Source: Expert Group

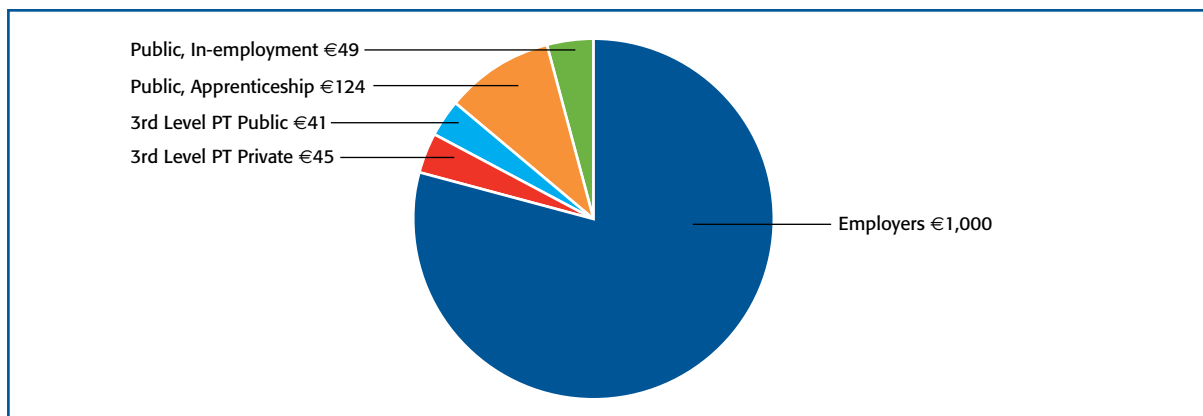
It is clear from this data that employers account for the vast majority of the total expenditure on education and training of people in work. By comparison, public expenditure on education and training for those in employment is on a very modest scale. Indeed, the majority of public expenditure on continuing vocational education and training in 2003 was related to the training of the unemployed rather than on those in employment.

In 2005, FÁS received a very substantial increase in its budget for training of the employed in 2005 to €35 million from €8 million in 2004. This level of budget has been maintained in 2006. FÁS currently gives effect to *One-Step-Up* through its Competency Development Programme (CDP). Under this programme financial supports are provided which reduce the cost of training of employed persons. Priority areas of training have been identified by FÁS following consultation with sectoral and regional stakeholders and other development bodies.

There was a national call for proposals/tenders in 2005 from FÁS which resulted in a series of agreements with major stakeholders including the Chambers of Commerce Ireland, ISME, SAF, ICTU and the National College of Ireland to deliver training programmes in priority areas. A further call for proposals in the area of low-skill employees will take place in 2007.

Figure 16 below excludes expenditure on the unemployed and so provides a clearer breakdown of the expenditure on various types of vocational education and training.

Figure 16: Total Expenditure on Continuing Vocational Education and Training, In Employment Training Only 2003 (€million)



Source: Expert Group

Firms are generally slow to invest in training that equips workers with transferable skills (i.e. general training), because such training would make an employee attractive to other firms: any firm that invests in such general training would be likely to recoup the cost by paying a wage which is below marginal productivity. In a competitive labour market, these trained workers would leave to earn their full marginal product with another employer who does not invest in general training and can thus afford to pay the higher wage rate. According to economic theory, therefore, firms are more likely to invest in specific training, so that they can reap some of the benefits when the worker becomes more productive as a result of training.

The concept of employee poaching by non-training firms illustrates the nature of the market failure for education and training and gives rise to a demand for state intervention to correct this failure. In reality, however, the evidence is not entirely supportive of the theory. In Ireland, almost 80 percent of employers indicated that the training which they sponsored was general in nature and could be of use to another employer. Similar findings have been reported in the UK, US and Sweden for instance, suggesting that employers may not be overly concerned about the difficulties of capturing the returns from investment in education and training as has been assumed. This would weaken the case for state intervention.

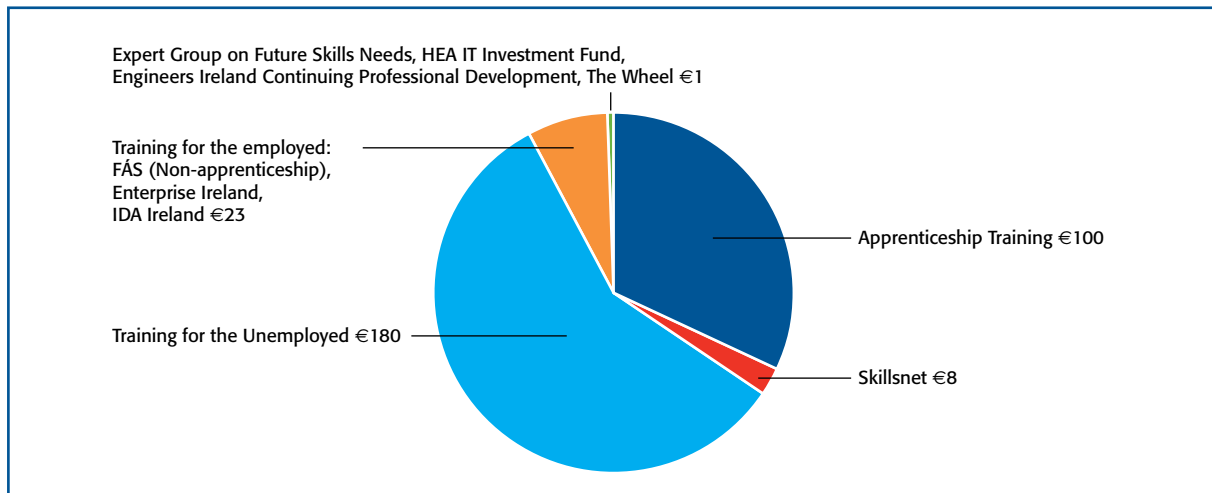
3.3.3 The National Training Fund

The National Training Fund (NTF) was established under the National Training Fund Act 2000 as a dedicated fund to finance a range of schemes aimed at (i) raising the skills of those in employment (ii) providing training to those who wish to acquire skills for the purposes of taking up employment and (iii) providing information in relation to existing, or likely future, skills requirements in the economy. The NTF is resourced by a levy on employers of 0.7 percent of reckonable earning in respect of employees in Class A and Class H employments; this represents approximately 75 percent of all insured employees.

Total NTF expenditure amounted to €312 million in 2005, and thus accounted for a substantial proportion of public expenditure on VET, as outlined in Figure 17. The NTF contributed about €100 million to the training of Apprentices (IVET), another approximately €23 million to training of those in employment (CVET), including FÁS courses and sectoral training grants by the development agencies, and €8 million on the Skillnets programme. The NTF contribution to the training of the unemployed amounted to almost €180 million in 2005. The NTF also contributed €1 million to the information infrastructure on training, through its support of the Expert Group on Future Skills Needs, the Information Technology Investment Fund at the HEA and the Engineers Ireland Continuing Professional Development Programme.



Figure 17: NTF Expenditure (€ millions), 2005



3.4 Maximising Returns from Investment: The Role of Objective Setting

The Irish State and public education and training providers are subject to a number of nationally and internationally agreed objectives. These emanate at international level primarily from the European Union and domestically from targets driven by government policy.

International objectives include those emanating from the European Employment Strategy 1997 and the Lisbon Strategy which include both employment objectives and education and training objectives⁸².

At a domestic level there are a number of relevant areas in which objectives have been set. The current strategy for the DES sets out 5 high-level goals and 29 associated objectives⁸³. For each objective it sets out a number of strategies for achieving that objective; for each strategy a number of performance indicators are then identified.

For indicators relating to framework conditions such as the enactment of legislation or the establishment of new bodies or services an objective date is specified. However, for the majority of the indicators no quantified objectives are specified and therefore there is no obvious mechanism for gauging the degree of success of the individual strategies. The exceptions are indicators which reiterate objectives set in other policy documents such as the Programme for Government, Sustaining Progress, National Development Plan, National Employment Action Plan and the National Anti-Poverty Strategy.

There are legislatively driven targets such as the Education (Welfare) Act 2000 which requires that all students must be in school, or some equivalent education and training, until they reach the age of sixteen, or completion of junior cycle, or equivalent.

There are objectives set out in other reports such as the *Commission on the Points System*⁸⁴, the *National Anti-Poverty Strategy*⁸⁵; the *National Action Plan on R&D*; social partnership agreements such as *Sustaining Progress and Towards 2016*. The *Employment and Human Resources Development Operational Programme* of the National Development Plan 2000-2006 sets several relevant objectives. However, typically, these objectives are directed at inputs i.e. they specify the number of places to be provided in various programmes.

⁸² Lisbon European Council, 2000

⁸³ Department of Education & Science, Statement of Strategy 2005-2007

⁸⁴ Commission on the Points System, Final Report and Recommendations, GPO, 1999

⁸⁵ Department of Social and Family Affairs, National Action Plan against Poverty and Social Exclusion 2003-2005, 2003.

3.4.1 The Importance of Objective Setting

In general, there is a recognised reluctance to commit to transparent, quantitative objectives in relation to public policy initiatives. There are at least some understandable reasons why this may be so, not least the difficulties presented by over-simplification in the interpretation of data and the absence of well designed performance indicators. In the sphere of education and training for instance, some qualitative indicators will always be required as well as quantitative ones.

At present the determination of the success of many policy initiatives resides with the implementing body concerned. The Expert Group believes that objective setting must be an integral part of a National Skills Strategy if it is to be effective. It also believes that effective monitoring and evaluation is an integral part of policy development.

Specifically, objectives contribute to sound policy making and implementation through a number of channels:

- They facilitate accountability by indicating success or failure at the completion of a plan;
- Moreover, they can also play a constructive role in delivering policy goals: they can be used to provide quantitative feedback on progress during the execution of a plan *i.e.* they provide an impartial means of gauging progress on an on-going basis; and
- They are measurable and, therefore, can be used to encourage staff motivation thus enhancing employee productivity.

3.4.2 Best Practice in Setting Objectives

The Expert Group has set out below a series of guidelines which should be considered by policymakers when implementing a *National Skills Strategy*.

- Objectives are a means to an end and, consequently, must be chosen judiciously to ensure that they are causally linked to the desired, over-arching goal; otherwise the objectives may assume primacy over the goal with unintended consequences;
- Objectives should be both realistic and ambitious;
- Objectives should also be clear and unambiguous and be integrated across all levels of education and training;
- The ultimate objectives should be supplemented with intermediate ones, to facilitate monitoring progress over the life of the strategy;
- Responsibility for achieving objectives must be clearly assigned to an executive entity;
- Objectives should not undermine the free market that should operate for labour;
- Objectives should not be overly prescriptive; in certain circumstances the market is better left to determine outcomes, such as discipline mix etc. The role of the state should be to facilitate the efficient operation of the market through the timely dissemination of available information;
- Nor should actions to achieve objectives compromise individual freedom of choice to pursue particular avenues of education or training;
- Objectives should, where appropriate be outcomes-based rather than input-based. Input objectives are relatively easy to meet and easy to measure but provide little information on the overall effectiveness of a policy or programme;



- Attainment objectives are most appropriate for the horizontal or generic skills that will be a prerequisite for success in a wide range of employment and participation in the knowledge society;
- Objectives should be used to bring national performance (for example, PISA rankings, completion rates) up to or above that of international norms (for example, either EU/OECD average or top decile);
- Objectives should not focus exclusively on mean (average) performance levels but should also encompass the deviation from the mean; particularly variations in performance by gender and socioeconomic background. Significant polarisation is already evident in educational performance and, if left unchecked, could deteriorate further;
- Aspirations should not be used as substitutes for objectives; and
- Likewise, indicators which are used to assess progress in relation to specific policy objectives should not be confused with quantitative objectives which refer to actual outcomes rather than measurements of progress.

Chapter 4: Supply and Demand for Skills to 2020

Current Situation

The requirement to enhance the skill level of the working population presents a substantial challenge: Ireland's participation rate in continuing learning is relatively poor. Only 14 percent of 25-64 year-olds in Ireland were engaged in non-formal education and training in 2002, compared with 16.5 percent in the EU25 and 34.5 percent in the UK.

Ireland also ranks poorly in terms of adult literacy, but evidence suggests that literacy among young people has improved in recent years.

Significant gender imbalances are apparent across all strata of Irish education, training and employment.

No Policy Change Scenario

Based on EGFSN forecasts, and assuming no change in policy, the demand for labour will outstrip supply by more than 310,000 between now and 2020.

In relation to the supply of skills, the EGFSN estimates that, without policy change, in 2020 there will be:

- A continuing shortage at third-level degree and above;
- A significant deficit (approximately 139,000) at third-level certificate/ordinary degree; and
- Surpluses at lower educational levels, with a large number of low-skilled individuals unemployed or inactive.

Vision

The Expert Group proposes a vision of Ireland in 2020 in which a well-educated and highly skilled population contributes optimally to a competitive, innovation-driven, knowledge-based, participative and inclusive economy.

Specific Objectives

Realising this vision requires maximising the skills of the resident population through upskilling, increasing participation in the workforce, and continuing to attract highly skilled migrants. Specifically, the Expert Group proposes that, by 2020:

- 48 percent of the labour force should have qualifications at NFQ Levels 6 to 10;
- 45 percent should have qualifications at NFQ levels 4 and 5; and
- The remaining 7 percent will have qualifications at NFQ levels 1 to 3 but should aspire to achieve skills at higher levels.



4.0 Introduction

This chapter outlines the current stock of skills within the economy, makes projections in relation to future skills supply and compares these skills supply projections with skills demand projections set out in Chapter Two.

The data in this chapter is classified using the CSO classification of educational attainment. The CSO data differs in format from the classifications used by the National Qualifications Authority of Ireland (NQAI) in the National Framework of Qualifications (NFQ)⁸⁶. Due to methodological differences in data classification, it was not possible to map CSO data in terms of the 10-level NFQ. However, the forward looking recommendations of this report are stated in terms of NFQ level. The NFQ is illustrated in *Appendix J*. The Expert Group believes that the NFQ is a vital tool in progressing the development of skills for a knowledge economy in Ireland and that the availability of data based on the NFQ is of the utmost importance.

4.1 Analysis of Current Skills Stock⁸⁷

This section provides a profile of the current Irish labour force and sets these findings in an international context. As well as looking at the total labour force (those persons in the labour market aged 25-64), specific attention is also accorded to the cohort aged 25-34⁸⁸. The purpose of this exercise is to determine whether the profile of the most recent cohort to complete their full-time education differs in any way from the general population, thus possibly reflecting recent policy or social innovations.

The labour force is usually defined as the total number of people who are in employment or seeking employment, and who are aged 15-64. The Irish labour force has expanded rapidly over the past decade or so, from 1.64 million in 1997 to almost 2.1 million in 2006⁸⁹, due to a combination of rising participation rates and significant population growth and migrants. Following recognised international trends, Ireland has also witnessed a substantial improvement in educational attainment levels across the population over recent decades. For the purposes of this section, however, the labour force only refers to those aged 25-64, since a significant proportion of the population aged 15-24 are engaged in full time education. Using this age cohort, the labour force has increased from just under 1.27 million in 1997 to 1.77 million in 2006.

At the top level of the education system, the number of persons with tertiary education has increased continuously since the 1960s, with the greatest increase during the 1990s. This trend continued into this decade. *Figure 18* shows the change in the education structure of the Irish labour force aged 25-64 between 2000 and 2005.

In 2005, one third of the labour force (aged 25-64) had completed some form of higher education. This compares to one quarter in 2000 and an estimated 4 percent⁹⁰ in the early 1970s. In addition, there has been a decrease in persons holding up to lower secondary qualifications from just over one third of the labour force in 2000 to 28 percent in 2005. The shift at the lower end of the education distribution is even more remarkable when a longer time period is observed: there has been a decline in persons with primary education or less from an estimated 60 percent in the early 1970s⁹¹ to 11 percent in 2005.

86 *NFQ Framework: The NFQ comprises ten levels of qualifications, with each level based on nationally agreed standards, skills and competence. These standards define the learning outcomes to be achieved by learners seeking qualifications at each level. The ten levels include qualifications gained in settings from schools, to places of work, the community, training centres and to colleges and universities, from the most basic to the most advanced levels of learning. The framework includes many existing qualifications and values those made in the past. Awarding bodies will also develop new qualifications within the NFQ. These new qualifications will be made on the basis of 'learning outcomes' defined in terms of standards of knowledge, skill and competence. The outcomes-based nature of qualifications in the framework is a significant change from the input-based (e.g. time served) nature of many existing qualifications.*

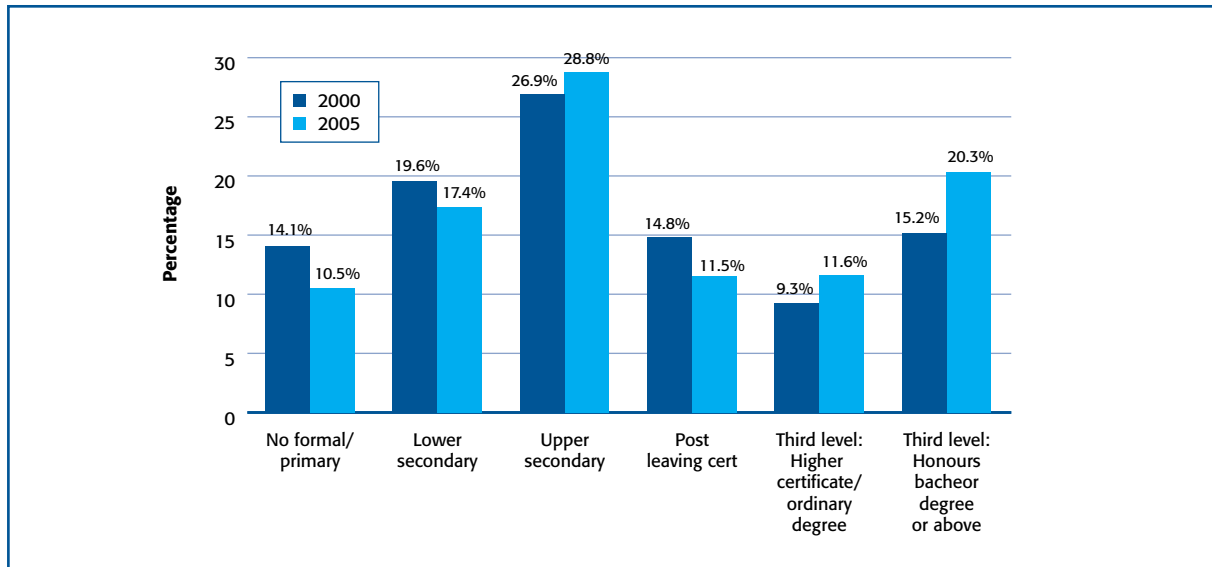
87 *The Skills and Labour Market Research Unit (SLMRU) in FÁS has carried out this analysis and projected the supply of qualifications for the labour force for 2010 and 2020 on behalf of the Expert Group. The full analysis is contained in EGFSN (2006) The Current and Likely Future Supply of Skills and Qualifications: An Input by the FÁS Skills and Labour Market Research Unit to the National Skills Strategy. This document is available at www.skillsstrategy.ie*

88 *The labour force includes all of the economically active population i.e. those in employment and those unemployed. It does not include the economically inactive population.*

89 *CSO, Database Direct*

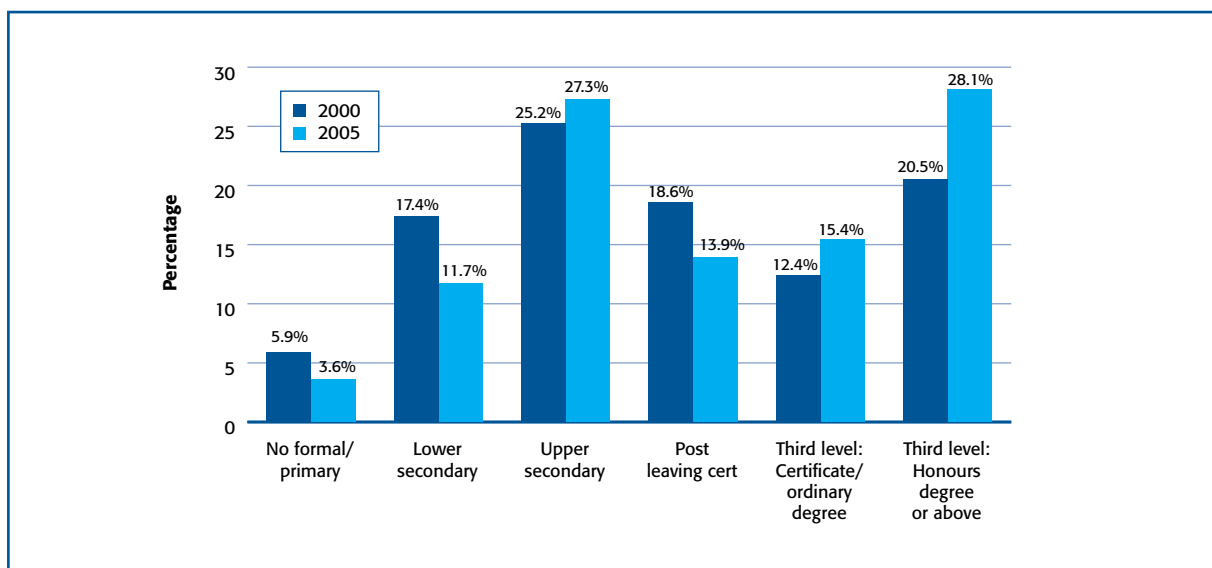
90 *CSO data from the Census of the Population 1971 shows that 64%, 18%, 9%, 5% and 4% of the labour force at the time was at primary, secondary, vocational, secondary and vocational and university (including technical) level of education respectively. Given that Census definitions and questions changed over the years, only rough comparisons between education levels over time can be made. In addition, for Census 1971 data, we approximate the labour force by persons classified as gainfully or not gainfully occupied. Finally, in 1971, the working age population included persons under 15, whereas, currently, it is bound to persons over 15.*

91 *CSO Census (1971)*

Figure 18: Labour Force (25-64) by Highest Education Level Attained, 2000 and 2005 (%)

Source: CSO, QNHS

This trend is even more pronounced for the labour force in the younger age cohort (*Figure 19*). In 2005, the share of persons with higher education in the labour force aged 25-34 was 44 percent, compared to one third in the total labour force. Additionally, the share of younger persons with 'lower secondary or less' education was 15 percent in 2005, compared to 28 percent for the total labour force. The data shows that the shift towards higher education between 2000 and 2005 is happening faster in the 25-34 age cohort than in the overall labour force: this is not unexpected, reflecting as it does trends over the last few decades.

Figure 19: Labour Force Aged 25-34 by Highest Level of Education Attained, 2000 and 2005 (%)

Source: CSO, QNHS



While these figures illustrate the positive trends in attainment levels in the Irish labour force, they need to be looked at in an international context in order to determine Ireland's progress vis-à-vis other developed economies. *Table 1* compares the Irish performance against other OECD countries. The Irish performance lags that of the leading performers: Ireland was ranked 14th out of 27 selected OECD countries in 2004 in terms of the proportion of the labour force with tertiary education. Even more worryingly, perhaps, is the poor performance at the lower end of the attainment spectrum: 37 percent of the Irish labour force had not completed upper secondary education and this represents a far larger proportion than the leading performers. These statistics, combined, leave Ireland with significant room for improvement and certainly do not allow grounds for any complacency.

Table 1: Labour Force (25-64) by Highest Level of Education Attained, 2004⁹²

Country	Pre-primary/Primary/ Lower secondary	Upper secondary & Post secondary non-tertiary	Tertiary
Australia	36%	34%	31%
Austria	20%	62%	18%
Belgium	35%	34%	30%
Canada	16%	39%	44%
Denmark	17%	51%	32%
Finland	23%	43%	34%
France	35%	41%	24%
Germany	16%	58%	25%
Greece	42%	37%	20%
Hungary	25%	59%	16%
Ireland	37%	34%	27%
Italy	51%	37%	11%
Japan	16%	47%	38%
Korea	26%	44%	30%
Mexico	78%	6%	16%
Netherlands	29%	42%	28%
New Zealand	22%	53%	26%
Norway	11%	56%	32%
OECD Average	30%	42%	25%
Poland	16%	69%	16%
Portugal	75%	13%	13%
Slovak Republic	16%	72%	13%
Spain	55%	18%	26%
Sweden	17%	48%	34%
Switzerland	15%	56%	28%
Turkey	74%	17%	9%
United Kingdom	15%	56%	29%
United States	13%	49%	38%

Source: OECD, *Education at a Glance 2006*

⁹² The international data should be interpreted cautiously given the difference in education classifications across countries. For instance, in the case of the UK, Austria, Poland and some other countries, no labour force is classified at pre-primary and primary education levels (ISCED 0/1). Similarly, for a number of countries there appears to be nobody at post-secondary education level. These patterns are explained by the differences in mapping of national education classifications against ISCED. Despite the difference in classifications, the OECD data is still of use in assessing Ireland's relative standing vis-à-vis other countries, particularly when levels are grouped.

The story for the younger 25-34 year-old cohort is more positive: the data in *Table 2* shows that Ireland has a higher share of the labour force with tertiary education than most OECD countries, and consequently is ranked 6th out of 25 countries, with 40 percent of 25-34 year-olds having completed tertiary education. Nevertheless, with 21 percent of this cohort not having completed upper secondary education, problems remain, suggesting that deficiencies in Irish educational attainment cannot be entirely written off as a legacy of prior policies, nor will these deficiencies be eliminated by simple demographic trends.

Table 2: Labour Force (25-34) by Highest Level of Education Attained, 2003

Country	Pre-primary/Primary / Lower secondary	Upper secondary & Post secondary non-tertiary	Tertiary
Australia	23%	41%	36%
Austria	13%	67%	20%
Belgium	20%	39%	41%
Canada	9%	38%	53%
Finland	11%	51%	38%
France	20%	42%	38%
Germany	15%	62%	23%
Greece	27%	48%	25%
Hungary	16%	65%	19%
Ireland	21%	39%	40%
Italy	36%	49%	15%
Japan	6%	42%	52%
Korea	3%	48%	49%
Mexico	75%	6%	19%
New Zealand	15%	57%	28%
Norway	4%	57%	39%
OECD Average	23%	46%	31%
Poland	40%	37%	23%
Portugal	60%	21%	19%
Slovak Republic	6%	80%	14%
Spain	39%	23%	38%
Sweden	9%	49%	42%
Switzerland	11%	59%	30%
Turkey	67%	22%	11%
United Kingdom	30%	39%	31%
United States	13%	48%	39%

Source: OECD



It is also important to note that there is a risk of overestimation of Ireland's ranking at the higher end of the spectrum due to the differences in the education systems (for example, in Finland, all tertiary education refers to courses with duration greater than 2 years; if only tertiary education with duration greater than 2 years was considered, Ireland's performance would not be as good as currently suggested by the data).

On the other hand, there could be some underestimation at the bottom of the education distribution. Due to low unemployment levels over the last several years, there is a significant share of persons who have entered the labour force and who have low educational attainment, but who, on the other hand, have acquired uncertified skills through work experience and whose level of skill would rank more favourably internationally if this was taken into account. That said, the same could be true for some other countries, given that low unemployment is not unique to Ireland.

4.1.1 Reading Literacy

Internationally, Ireland ranks poorly in terms of adult literacy; 500,000 adults (25 percent of the labour force) were found to have difficulties with simple literacy tasks in the IALS survey in 1995. Given that literacy and education levels are strongly correlated, a finding of significant numbers of persons with low literacy levels in Ireland can be linked to the finding that approximately 37 percent of adults in Ireland have not completed upper secondary education. The relatively high dispersion of literacy levels in Ireland coincides with the high proportions of the adult population at both ends of the education spectrum: approximately 30 percent at lower secondary education or less and equal proportions at tertiary level. More recent evidence from the PISA study, however, indicates that literacy in Ireland has improved among young people since the IALS study in 1995: in 2003 Irish 15 year-olds were ranked 7th out of 40 in terms of reading literacy, although performance in mathematics literacy (20th) and scientific literacy (16th) was weaker.

While Ireland performs well in the PISA study for reading literacy, the respectable ranking of 7th is based on a mean score which disguises a wide variation in capability among Irish 15 year-olds. For example, while 9 percent were categorised as being capable of completing sophisticated reading tasks, 10 percent were classed as being incapable of carrying out 'basic reading tasks, such as locating straight-forward information, making low-level inferences of various types'. Furthermore, there is a pronounced gender difference in ability: the mean male score is 6 percent below the mean female score.

The disparity in reading literacy levels amongst primary school students is also worth noting. According to the Educational Research Centre, there is a substantial deviation in literacy performance between students attending designated disadvantaged primary schools and the average performance across a standardised sample of primary schools; 30 percent of 3rd class pupils and 27 percent of 1st and 6th class pupils in disadvantaged schools achieved scores at or below the 10th percentile (the marker commonly used to identify pupils in need of learning support) compared with just 10 percent of pupils at each level in the standardised sample⁹³.

Literacy skills are essential for participation in both society and the labour market. Adults with literacy difficulties are at a severe disadvantage and may be unable to avail of further educational and training opportunities. In order to address this issue, the DES has very considerably increased funding for adult literacy, mainly provided by the VECs. Currently, about 35,000 adults per annum benefit from adult literacy classes. In addition, the DETE has established a Workplace Basic Education Fund designed to deliver workplace basic education programmes. In both 2005 and 2006, the State provided €2 million towards the fund, which is managed by FÁS in conjunction with the National Adult Literacy Agency (NALA).

The 2006 Joint Oireachtas Committee on Adult Literacy⁹⁴ report makes a number of recommendations. These include:

- Aiming to reduce the proportion of the population at the lowest level of literacy by at least half within the next 15 years;
- Increasing funding from the €25m level in 2006 to €100m by 2013, with an additional €25m for improved ancillary services supports and capital spending;
- Carrying out an over-arching evaluation of the National Adult Literacy Programme 2000-2006, in relation to the policy objectives and targets which were set for the Programme during that period;
- Drawing up an implementation strategy for the National Adult Literacy Programme for the period 2007-13;
- Completing specifications for adult literacy levels which harmonise with the NFQ Levels 1, 2 and 3, ensuring that the adult literacy specifications are based on a holistic, multi-dimensional definition of literacy and numeracy;
- Developing a multi-faceted assessment strategy suitable for identifying and progressing the levels of skills of adult literacy learners, which includes a wide range of assessment modes, and captures the multi-dimensional nature of adult literacy and numeracy skills; and
- Carrying out a national adult literacy survey within the next twelve months and again after every three years, in order to provide a means of assessing progress of the National Adult Literacy Programme 2007-13.

4.1.2 Mathematical Literacy

While Ireland's PISA ranking of 20th out of 40 countries for mathematical literacy⁹⁵ of 15 year-olds (again based on average score) is particularly unsatisfactory, the variation in performance is even more disquieting. For example, in terms of overall mathematical ability, 40 percent of Irish 15 year-olds were classed as being unable to 'select and apply simple problem-solving procedures' or even to 'execute clearly described procedures'. For the mathematical sub-category of spatial and geometric relationships this proportion rises to 52 percent. In the top ranked country, Finland, the corresponding proportions are 22 percent and 25 percent, respectively.

A further cause for concern in relation to the future stock of mathematical capability is the sharp decline in the proportion of candidates taking higher-level mathematics in the Leaving Certificate examination in recent years: this has dropped from 25 percent of the overall cohort in 2001 to 18 percent in 2005.

In summary, Ireland's current performance for scientific and mathematical literacy is inconsistent with our stated national objective of transitioning to a knowledge-based, innovation-driven economy.

4.1.3 Scientific Literacy

Ireland's PISA ranking of 16th out of 40 countries for the scientific literacy⁹⁶ of its 15 year-olds, based on average score, is unsatisfactory. In addition, 13 percent of the cohort is classed as being unable to 'recall simple factual scientific knowledge' or to 'use common scientific knowledge in drawing or evaluating conclusions'; in Finland the corresponding proportion was only 6 percent.

⁹⁴ Houses of the Oireachtas Joint Committee on Education and Science (May 2006), *Fourth Report, Adult Literacy in Ireland, Dublin*

⁹⁵ Defined by the OECD as 'an individual's capacity to identify and understand the role that mathematics plays in the world, to make well-founded judgements and to use and engage with mathematics in ways that meet the needs of that individual's life as a constructive, concerned and reflective citizen.'

⁹⁶ Defined by the OECD as 'the capacity to use scientific knowledge, to identify questions and to draw evidence-based conclusions in order to understand and help make decisions about the natural world and the changes made to it through human activity.'



Furthermore, while the proportion of candidates taking higher-level chemistry and physics papers in the Leaving Certificate examination has remained approximately constant in recent years, at 10 percent and 11 percent respectively in 2005, the proportion is quite low. The proportion taking higher-level biology has dropped from 29 percent in 2001 to 25 percent in 2005⁹⁷.

4.2 Analysis of Current Skills Supply

This section provides an overview of education/training provision in Ireland. Data, both quantitative and qualitative, is presented on the output of the education and training systems, from both public and private providers.

4.2.1 Public Provision of Education and Training

The overview of public education and training provision for 2005 is summarised in Table 3.

Table 3: Summary of Public Education and Training Outputs by Level and Field, 2005

Education level (CSO categories)	Total	Education	Humanities and arts	Social science, business, law	Science	IT	Engineering and construction	Agriculture and veterinary	Health	Services
Lower Secondary ¹	56,750									
Upper Secondary ¹	57,422									
Further Education and Training ²	64,053	6,072	2,149	9,112		3,130	23,840	2,740	6,661	10,349
Third level: Higher certificate/ Ordinary degree ³	18,838	243	1,092	5,850	772	1,619	4,360	348	2,890	1,664
Third level: Honours bachelor degree ³	24,725	1,288	4,982	7,565	2,246	2,178	2,667	273	3,022	504
Third level: Above honours bachelor degree ³	12,759	2,340	1,529	4,223	808	722	813	109	1,997	218
Total	234,547	9,943	9,752	26,750	3,826	7,649	31,680	3,470	14,570	12,735

Source: FÁS SLMRU

¹ Relates to numbers sitting the exam.

² Data from FETAC on awards issued in 2005 at all levels (including those not placed on the NQF currently, it excludes 56,811 Records of Achievement which cannot be assigned a field). The majority of the awards are major awards but minor and special purpose awards are also included.

³ These figures relate to 2004 graduation data.

School System: In 2005, 56,750 candidates sat the Junior Certificate and 57,422 sat the Leaving Certificate in the same year.

Universities & Institutes of Technology: 18,838 graduated with higher certificates or ordinary Degrees, 24,725 graduated at honours bachelor degree level and 12,759 at above honours bachelor degree. Enrolments in higher certificate/ordinary degree courses are on the decline as more students opt for honours degree programmes.

Enrolments at honours bachelor degree and postgraduate level are increasing. The number of students graduating is on the increase at all levels. Business and law courses produced the highest number of graduates in 2004 at higher certificate/ordinary degree and at postgraduate level, and the second highest at honours bachelor degree level after arts and humanities.

FÁS: FÁS trains approximately 33,000 unemployed/job-seekers and new labour market entrants annually. This comprises 17,000 persons receiving skills or occupationally specific training, with the remainder attending more generic or foundation courses. In relation to the former category, this includes about 8,000 apprentices (primarily in construction and almost exclusively male), 2,000 traineeships (many in healthcare/childcare) and 7,000 specific skills courses (across a wide range of areas with a particular concentration on computer and engineering skills).

Teagasc: Approximately 2,800 awards were made by FETAC for Teagasc programmes in 2005.

Fáilte Ireland: Approximately 2,100 awards were made for further education courses in 2005.

PLCs: In 2005, 69,829 awards were made. Of these, over 56,000 were for Records of Achievement. The remaining 13,000 awards (all major awards) were in the following disciplines: health and welfare (41 percent), social sciences, business and law (30 percent) and humanities and arts (14 percent). Over 90 percent of those participating on these courses have the Leaving Certificate.

4.2.2 Upper Secondary Level/Adult Education

The completion of upper secondary education is a commonly used measure of the success of the formal education system. There are a number of ways of measuring output at upper secondary level.

Firstly, it is useful to look at the retention of pupils in second level schools. The methodology employed for this indicator involves taking a cohort of entrants to the first year of the junior cycle and tracking their performance through each subsequent year of their participation in state-aided second-level schools. This methodology does not take account of important educational pathways outside this system (such as apprenticeship training) and, in effect, pupils leaving school to undertake these programmes are treated as early school leavers for analysis purposes. This analysis was last undertaken by the DES for the 1996/1997 entrant cohort, who typically, would have sat the Leaving Certificate examination in 2001/2002⁹⁸.



Of the 64,068 pupils who commenced the junior cycle programme in September 1996, 77.8 percent completed the senior cycle and sat the Leaving Certificate examination (established or applied) in either 2001 or 2002. This represents a decrease of 0.2 of a percentage point over the 1995 retention rate. The retention rate has not changed significantly since 1991, when the retention rate stood at 77.1 percent⁹⁹.

When this rate is adjusted to allow for factors such as emigration, death and students opting to pursue their senior cycle education in private institutions, the adjusted Leaving Certificate retention rate for the 1996 cohort was 81.3 percent¹⁰⁰. The Leaving Certificate retention rates for males and females were 72.1 and 83.8 percent respectively, indicating the existence of a significant gender gap. This mirrors the experience of other OECD countries.

A second indicator of those gaining qualifications at upper secondary level is the percentage of the population aged 20 to 24 who have completed upper secondary education or equivalent (NFQ levels 4 and 5) which currently stands at 86.1 percent¹⁰¹. This figure includes all those in this age cohort who have completed upper secondary education or an equivalent qualification at NFQ levels 4 or 5. This indicator has been used because it captures young people achieving level 4 or 5 qualifications either through the Leaving Certificate or through alternate routes. Ireland currently performs well on this indicator, but lags the leading countries such as Norway which have retention rates of up to 96.3 percent.

Educational Disadvantage and Retention

The DES has adopted a broad-based approach to tackling early school leaving, focusing on school retention, and on the recognition of attainment and the special needs of vulnerable groups. The approach comprises: legislative change, such as the establishment of the National Educational Welfare Board as a single national body with responsibility for school attendance; curricular reforms, such as widening the educational experience available to students through such programmes as the Junior Certificate Schools Programme, the Leaving Certificate Vocational Programme, and the Leaving Certificate Applied; and preventative measures such as the School Completion Programme and the Home–School Community Liaison Scheme.

DEIS (Delivering Equality of Opportunity in Schools), the action plan for educational inclusion was launched in May 2005. The action plan focuses on addressing the educational needs of children and young people from disadvantaged communities, from pre-school to second-level education (3 to 18 years) and represents a shift in emphasis away from individual initiatives, each addressing a particular aspect of the problem, with a new plan adopting a multi-faceted and more integrated approach. DEIS provides for a standardised system for identifying levels of disadvantage and a new integrated School Support Programme (SSP). Included in the SSP are 873 schools – 670 primary and 203 post-primary. The DEIS action plan is to be implemented over five years, commencing in the 2005/2006 school year, and will involve an additional annual investment of €40m on full implementation.

The National Educational Welfare Board (NEWB), established in 2002 under the *Education (Welfare) Act, 2000*, provides a comprehensive approach to addressing the issue of early school leavers as well as promoting regular school attendance and tackling the problems of absenteeism. The NEWB improved attendance at school by 4 percent in 2004/2005 in areas where educational welfare officers are working intensively; they have also resolved 20,000 cases of students with reported school attendance difficulties since January 2004¹⁰².

99 Five cohorts have been analysed to date in this series of reports. The first commissioned report was in 1991.

100 Note: the baseline projection for the future skills supply assumes a retention rate to Leaving Certificate of 82 percent.

101 Eurostat, *Structural Indicators 2005*

102 www.newb.ie

The School Completion Programme¹⁰³ is designed to support the retention of young people aged 4 to 18 years in education by providing a number of interventions in areas of disadvantage. This is a cross-community approach involving primary and post-primary schools, parents, communities, and relevant statutory and voluntary agencies. The programme is funded under the National Development Plan, assisted by the European Social Fund. In 2004, 300 primary and 112 post-primary schools participated in this scheme, representing 17,000 pupils. Furthermore, 53 second level schools involved in the Stay in School Retention Strand of the School Completion Programme continued to be funded for the 2004/2005 school year.

Other programmes aimed at tackling educational disadvantage include *Giving Children an Even Break* and the *Home–School Community Liaison Scheme*.

Early School Leavers

The main programme for early school leavers is the YouthReach programme. This targets young people between 15 and 20 years of age who have left school early without or with incomplete qualifications. The programme is run through out-of-school centres provided by VECs and a network of community training centres (formally community training workshops) funded by FÁS and ten 'Justice Workshops' funded by FÁS and the Department of Justice, Equality & Law Reform. Young people are given the opportunity to attain FETAC awards (at NFQ level 3 and 4), the Leaving Certificate Applied, as well as Junior and Leaving Certificate subjects. The programme is funded by the Department of Education & Science and the Department of Enterprise, Trade & Employment; in 2004 it operated in 88 centres, providing places to 3,258 people at a cost of €44.6 million. Of those who completed the course, 72 percent went on to employment or further education or training.

Adult Education Programmes

Senior Traveller Training: A parallel programme in a culturally appropriate setting is delivered in the 33 Senior Traveller Training Centres. There is no upper age limit in the Senior Traveller Centres, designed to encourage parents to participate, given the influence this exerts on their children's participation in school¹⁰⁴. There were 35 senior traveller-training centres in operation in 2004, with 1,076 places available at a cost of €19 million.

Post-Leaving Certificate Courses (PLC): The PLC involves full-time courses of one or two years in duration. Programmes provide integrated general education, vocational training and work experience with the opportunity of attaining FETAC awards at NFQ levels 5 and 6. This is supplemented by accreditation by private/professional bodies in certain disciplines. In 2004, 210 training centres provided 28,588 places at a cost of €104.4 million. According to the ESRI, 85 percent of students who completed the programme in 2004 progressed to employment or further education or training. It is worth noting that 72 percent of all PLC students are female¹⁰⁵.

¹⁰³ All figures in this section relating to expenditure and participation are sourced from the Department of Education & Science's Annual Report 2005 unless otherwise stated.

¹⁰⁴ www.education.ie

¹⁰⁵ ESRI, The Post-Leaving Certificate Sector in Ireland: A Multivariate Analysis of Educational and Employment Outcomes, June 2006



Back to Education Initiative: The Back to Education Initiative is aimed at young people and adults. This scheme is offered on a part-time basis, enabling people to combine education and training with other commitments. A scheme of free tuition and reduced fees applies. Under the Back to Education Initiative, 10 percent of provision is set aside to support projects proposed by community education groups. 16,155 places are on offer through VECs at a cost of €9.3 million while a further 2,277 places are provided through community centres at a cost of €1.6 million.

Local Development Social Inclusion Programme: This scheme has provided a number of models of good practice in supporting young low-skilled workers – for example, the programme undertaken by the Dublin Employment Pact, FÁS and the DES in conjunction with Northside, Clondalkin and Tallaght Partnership companies. This Programme is aimed at early school leavers who have been in employment for 6 months. Following an evaluation, the programme is currently in the first stage of implementation by six Dublin Partnership companies and has been extended to include rural areas of Wicklow and Kildare¹⁰⁶.

Adult Literacy/Community Education: The main providers of adult literacy services are the VECs. Adult Literacy programmes involve the provision of basic education, including reading, writing and numeracy skills, to adults whose skills are inadequate for functional participation in everyday life. In 2004, 33,873 students participated in such programmes, which cost €20.36 million to fund. Other schemes addressing literacy levels in 2004 included the television series READ WRITE NOW, Breacadh (aimed at Irish speakers and run through the VEC sector), as well as the provision of English classes to 8,000 immigrants.

Community-Based Education: The DES provided grants to VECs totalling over €8.3 million to support local community-based education groups.

Education Equality Initiative (EEI): The National Development Plan and the EU Community Support Framework have provided €4.4m to support projects which address the learning needs of educationally disadvantaged adults. Phase Two of the project ran until June 2006. Expenditure for this scheme in 2004 was €0.8 million.

Vocational Training Opportunities Scheme (VTOS): This scheme provides education and training courses up to two years in duration for unemployed people. This initiative provides the opportunity of attaining qualifications at Junior and Leaving Certificate level as well as FETAC awards. In 2004, 113 centres provided 5,639 places, at a cost of €60 million. Of those who completed the scheme, 68 percent continued on to employment or further education or training.

The following table is an estimate of participation in adult education in Ireland compiled by Aontas. Aontas highlight that 'every year approximately 300,000 adults participate in education in both formal and informal settings in Ireland. While there is no comprehensive database of statistics for participation in adult and community education courses available nationally, AONTAS endeavours to collect relevant statistics on an ongoing basis. These statistics are collected from a wide range of sources'¹⁰⁷.

¹⁰⁶ NESF (2006) *Creating A More Inclusive Labour Market*

¹⁰⁷ <http://www.aontas.com/>

Table 4: Participation in Adult Education in Ireland

Scheme	Numbers	Date	Source
Literacy Schemes	34,000	December 2004	National Adult Literacy Agency (NALA)
Senior Traveller Training Centres (STTCs)	1,485	December 2004	Further Education Development Unit, Department of Education & Science
Vocational Training Opportunities Scheme (VTOS)	5,538	January 2005	Further Education Development Unit, Department of Education & Science
	4,753	December 2004	Further Education Development Unit, Department of Education & Science
Post Leaving Cert Courses (PLCs)	28,588	March 2005	Further Education Development Unit, Department of Education & Science
Community Education	40,000+ participants in women's groups	2004	AONTAS Estimate
Back to Education Initiative (BTEI) – Formal and Informal Strand	9,835	December 2003	Further Education Development Unit, Department of Education & Science
Mature students aged 23+ years – Full-time in HEA institutions	19,445	January 2003	Higher Education Authority
Mature students aged 23+ yrs – Full-time in Institutes of Technology	9,578	2004	Further Education Development Unit, Department of Education & Science
Night-time/evening courses	147,000	2000	White Paper, Department of Education & Science
Learning – Oscail	2,500	2005	Oscail
Total			302,722+

Source: Aontas

4.2.3 Acceptances at Third Level

Analysis of CAO data in *Table 5* reveals that between 2000 and 2005, there was an overall decline in CAO acceptances for level 6/7 courses (certificate/ordinary degree level) in technology-related disciplines.

Acceptances for engineering courses and computing courses decreased from 14.5 percent and 13.7 percent in 2000 respectively to 12.1 percent and 6.3 percent in 2005. On the other hand, CAO acceptances for construction-related courses at levels 6/7 increased, going from 12.7 percent in 2000 to 16.2 percent in 2005.

For health-related level 6/7 courses, CAO acceptances increased from 1.5 percent in 2000 to 3.1 percent in 2005. Acceptances for agriculture and veterinary courses also showed a small increase from 1.7 percent in 2000 to 2.7 percent in 2005.

Increases in CAO acceptances for courses in arts and humanities, education, social services and other services were also recorded. The largest increase was in acceptances for courses in social services, which went from 2.1 percent in 2000 to 6.5 percent in 2005. This was followed by services, which increased from 6.7 percent in 2000 to 8.8 percent in 2005. By contrast, CAO acceptances for business and law stood at 28.5 percent in 2005, which is a decrease from the 2000 figure of 31.2 percent.

**Table 5: CAO Level 6/7 Total Acceptances by Discipline, 2000-2005**

Discipline	Acceptances 2000	Acceptances 2005
Engineering	2,420 (14.5%)	1,599 (12.1%)
Construction	2,128 (12.7%)	2,136 (16.2%)
Computing	2,288 (13.7%)	833 (6.3%)
Science	1,226 (7.3%)	808 (6.1%)
Total Technology	8,062 (48.2%)	5,376 (40.8%)
Health	253 (1.5%)	407 (3.1%)
Agriculture and Veterinary	277 (1.7%)	363 (2.7%)
Total Health, Veterinary and Agriculture	530 (3.2%)	770 (5.8%)
Arts and Humanities	1,439 (8.6%)	1,229 (9.3%)
Business and Law	5,226 (31.2%)	3,755 (28.5%)
Education	0 (0%)	41 (0.3%)
Social Services	359 (2.1%)	855 (6.5%)
Services	1,123 (6.7%)	1,165 (8.8%)
Total Other	8,147 (48.7%)	7,045 (53.4%)
Total All	16,739 (100%)	13,191 (100%)

Source: CAO

The proportion of students choosing courses in technology disciplines at level 8 (honours degree) through the CAO process has also declined in the period 2000-2005 from 31.7 percent to 23.9 percent (*Table 6*). A decline has occurred in all disciplines within technology, excluding construction, with the most significant decline occurring in computing courses (from 8.7 percent to 4 percent). Engineering and computing courses have experienced a decline in both absolute figures and in the overall proportion of students accepting courses. The proportion of students accepting places in science courses also declined, although the absolute numbers studying science increased.

Acceptances in health, veterinary and agriculture disciplines have grown significantly over the period 2000-2005. This is primarily due to the introduction of level 8 courses in nursing and the increase in the number of courses in areas such as physiotherapy and occupational therapy.

The proportion of students accepting courses in the 'other' category has remained relatively static over the period 2000-2005, with slight increases in the proportion of students choosing courses in disciplines such as education, social services and services. A slight decline occurred in the proportion of students accepting courses in business and law, but overall there was an increase in student numbers.

Table 6: CAO Level 8 Total Acceptances by Discipline, 2000-2005

Discipline	Acceptances 2000	Acceptances 2005
Engineering	1,664 (8.0%)	1,206 (4.8%)
Construction	609 (2.9%)	1,116 (4.5%)
Computing	1,809 (8.7%)	995 (4.0%)
Science (non healthcare)	2,495 (12.0%)	2,665 (10.7%)
Total Technology	6,577 (31.7%)	5,982 (23.9%)
Agriculture and Veterinary	324 (1.6%)	284 (1.1%)
Nursing	0 (0.0%)	1,822 (7.3%)
Medicine	330 (1.6%)	306 (1.2%)
Dentistry	66 (0.3%)	63 (0.3%)
Other Healthcare	443 (2.1%)	1,175 (4.7%)
Total Health, Veterinary and Agriculture	1,163 (5.6%)	3,650 (14.6%)
Arts and Humanities	6,237 (30.1%)	7,359 (29.5%)
Education	1,515 (7.3%)	2,083 (8.3%)
Business and Law	4,847 (23.4%)	5,269 (21.1%)
Social Services	78 (0.4%)	236 (0.9%)
Services	311 (1.5%)	405 (1.6%)
Total Other	12,988 (62.7%)	15,352 (61.4%)
Total All	20,728 (100%)	24,984 (100%)

Source: CAO

4.2.4 Private Provision of Education and Training

The private provision of education and training is summarised in *Table 7*. Awards are summarised by sector, level and full/part-time status. In total, 11,493 students obtained a tertiary qualification from private educational institutions in 2005. This represents just under 17 percent of total tertiary awards.

Table 7: Summary of Private Education and Training Outputs by Level and Field, 2005¹⁰⁸

Level	Business			Accounting			Management			Social Studies			Education			Other		
	FT	PT	N/A	FT	PT	N/A	FT	PT	N/A	FT	PT	N/A	FT	PT	N/A	FT	PT	N/A
Postgraduate	183	614	91	0	994	0	19	9	188	10	0	0	0	0	0	155	43	0
Degree	693	262	181	83	4	203	222	7	15	98	5	131	72	394	0	419	115	53
Sub-degree	193	3612	99	88	0	0	298	54	1241	178	0	123	57	43	0	206	20	18
PLC	0	877	0	0	0	0	0	0	0	0	0	0	0	0	0	87	31	0
Unknown	0	451	0	0	0	0	0	334	0	0	0	200	0	0	109	18	5	0
TOTAL	1069	5816	371	171	998	203	539	404	1444	286	5	454	129	437	109	885	214	71

Source: SLMRU

108 The data in this table excludes private providers offering programmes which lead to FETAC Awards.



Data was not available to allow for an accurate estimate of the level of private provision of training which is undertaken by companies and individuals.

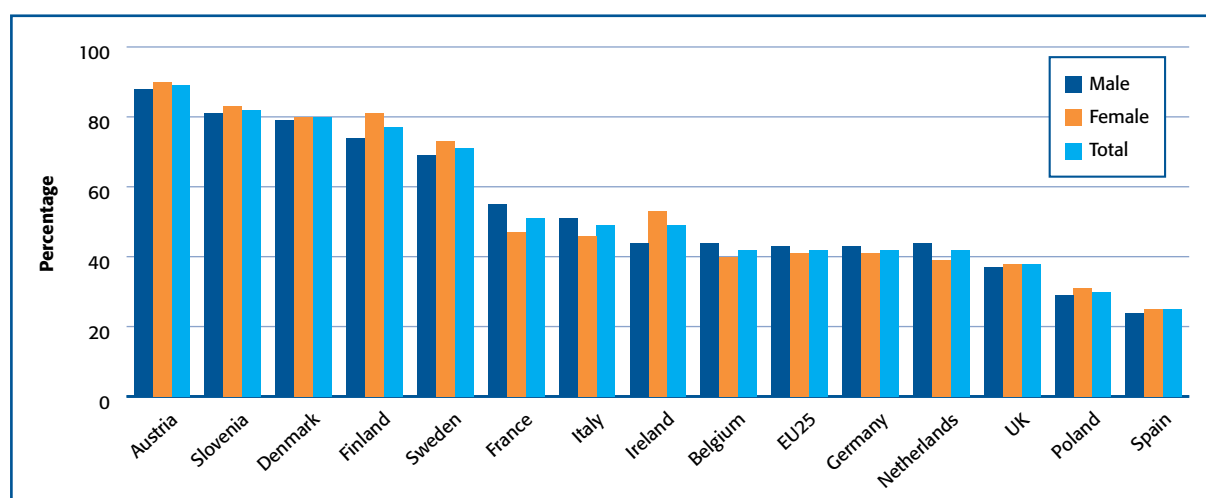
4.2.5 Continuing Learning

Additional to the outputs listed in 4.2.1, 190,000 persons undertook state-sponsored in-employment training, including 125,000 participants on Safepass courses. FÁS, Skillnets, Teagasc, Fáilte Ireland and the City and County Enterprise Boards were the main providers of state-funded, in-employment training.

Also of note is the role of Enterprise Ireland (EI). The EI strategy document highlights the importance of developing intensely market-focused and innovative firms and has prioritised development in sectors such as life sciences, food and ICT software¹⁰⁹. EI has also emphasised the importance of driving improvements in productivity and, in response, have created a specific Client Management Development and Mentoring division to oversee the provision of human resource development initiatives that will equip EI clients with the necessary skills and management capabilities to compete internationally.

Eurostat estimates that 42 percent of EU residents aged 25-64 and 49 percent of Irish residents in the same age cohort participated in some form of learning in 2003¹¹⁰. This data is illustrated in *Figure 20*.

Figure 20: Participation in Learning, 2003



Source: Eurostat

Although Ireland's performance is above average, many countries have significantly higher rates. It should be noted that these figures relate to any form of learning, including informal reading. In this context it is striking that over half of adults in Ireland stated that they did not do any learning in 2003. Ireland's above average performance also masks relatively poor participation rates in non-formal training¹¹¹. According to the 2003 Eurostat Labour Force Survey, 16.5 percent of people aged 25-64 in the EU engaged in non-formal education over the previous 12 months. This compares with 14 percent in Ireland.

A number of studies, including one in 2005 by the Expert Group, have analysed education/training participation of those in the workplace¹¹². These reports show very similar results and largely replicate findings for other countries. The main findings overall are summarised in *Table 8*.

¹⁰⁹ Enterprise Ireland (2005), Transforming Irish Industry: Enterprise Ireland Strategy 2005-2007

¹¹⁰ Eurostat LFS, Ad Hoc module on Lifelong Learning 2003

¹¹¹ Non-formal education and training includes all types of taught learning activities which are not part of a formal education programme.

¹¹² EGFSN, Data Analysis of In-Employment Education and Training in Ireland, 2005

Table 8: Training of those in Employment: Recipient Characteristics

Recipient characteristic	Key findings
Gender	Women receive more training than men
Age	Younger persons receive more training than older persons
Education attainment	Higher educated receive more training than lower educated
Employment status	Employees receive more training than self-employed
Occupation	Professionals and managers receive more training than craftspersons and labourers
Terms of employment	Full-time employed receive more training than part-time Permanently employed receive more training than temporary
Tenure	Those with tenure greater than one year receive more training than those with shorter tenure
Region	Those employed in Dublin region receive more training than those in other regions
Union membership	Union members receive more training than non-members

Engagement in continuing learning will dictate the future productivity of those currently employed in the workforce; and continuing learning will dictate the ability of workers to transition to 'new' jobs in the future.

4.2.6 Gender Differences

Significant gender imbalances are apparent in the patterns of performance and achievement across all strata of Irish education, training and employment. In this section some of the more noteworthy instances of this phenomenon are highlighted.

Second-Level Education

Male under-performance relative to their female peers at second level has been widely reported. Females stay longer in formal education and achieve better educational outcomes. As previously mentioned, a study of the 1996 second-level entry cohort found that the Leaving Certificate retention rates for males and females were 72.1 and 83.8 percent respectively¹¹³.

More females take Higher Level Leaving Certificate papers and they achieve higher grades in the examinations. An analysis of 2005 results reveals that (for example) 60 percent of honours grades on Higher Level English were awarded to females¹¹⁴. A notable exception, however, is physics. More than twice as many males as females take the Higher Level paper. This too is cause for concern in view of the importance of physics for careers in science and engineering.

Overall performance can be gauged by looking at the gender distribution of CAO points. In 2005, 62 percent of those candidates in the top-scoring CAO cohort (i.e. those securing 450+ points) were female¹¹⁵.

Post-secondary Education

At post-secondary level, both the apprenticeship programme and Post-Leaving Certificate (PLC) education exhibit marked gender imbalance: enrolment in the PLC sector is predominantly female (72 percent); conversely, the apprenticeship programme is entirely (99+ percent) male¹¹⁶. Taken in conjunction with the extreme gender streaming, the lack of progression from the apprenticeship strand of training is a cause for concern.

¹¹³ *Retention Rates of Pupils in Second-Level Schools: 1996 Cohort*, Department of Education & Science, 2005.

¹¹⁴ Data is taken from the State Examinations Commission.

¹¹⁵ *Discipline Choices and Trends for High Points CAO Acceptors 2005*, Dr. Sean McDonagh (unpublished).

¹¹⁶ *The Institute of Technology Sector and Future Skills*, Dr. Sean McDonagh (unpublished).



Higher Education

Significantly more females than males are pursuing honours degree programmes at third level: 59 percent of those accepting CAO offers on Level 8 courses in 2005 were female¹¹⁷. This pattern will have enduring implications for the gender make-up of skills in the future workforce. Furthermore, the propensity to participate in life-long learning is strongly correlated with prior educational attainment.

Strong gender streaming is evident on higher education courses with females dominant on life science courses and males dominant on engineering courses. The greater proportion of females securing high points in the Leaving Certificate is accelerating female domination on high-point courses such as medicine.

There is however evidence that females have a lower propensity to pursue postgraduate study, even in fields in which they dominate at undergraduate level¹¹⁸.

Employment

The traditional gender streaming between occupations (for example, females in 'caring' professions, males in engineering and construction professions) is still evident in the make-up of the current labour force. This has been augmented in recent years by new patterns of segregation such as the increasing feminisation of the teaching profession, particularly at primary level.

The relatively low level of female entrepreneurship in Ireland is also an aspect of concern. Despite Ireland's relatively high international ranking in terms of its overall level of entrepreneurial activity, males outnumbered females by 2.6 to 1 in early stage entrepreneurial activity in 2005¹¹⁹.

Looking across the entire labour force, the female participation rate, which has improved significantly in recent years, stood at 52.5 percent in the second quarter of 2006 and still lagged appreciably behind the male rate of 72.8 percent¹²⁰. Alternatively, the employment rate for males and females aged 15-64 was 77.3 and 58.8 percent respectively.

Conclusion

The gender imbalances highlighted above are not unique to Ireland; similar patterns can be observed across other OECD member states. Nevertheless, a concerted effort is required to redress these marked imbalances. Aside from the negative cultural and social consequences of these disparities, allowing them to persist would constitute a major source of economic inefficiency and a waste of resources.

4.3 Labour Force Stock Projections for 2010 and 2020 based on a 'No Policy Change' Scenario

This section provides projections of the skills profile of the labour force in 2010 and 2020, based on a baseline 'no policy change' supply scenario. The starting point for these projections was the population forecast of the working age population provided by the CSO and based on the CSO M1F1 scenario on migration and fertility rates¹²¹. The principal assumptions underpinning this 'baseline no policy change scenario' are as follows¹²²:

117 CAO, Board of Directors Report, 2005

118 Based on DES data on third-level graduations

119 Fitzsimons, P., & O'Gorman, C., (2005), The Global Entrepreneurship Monitor 2005: The Irish Report

120 CSO, Quarterly National Household Survey, Quarter 2 2006. Note: The rate in 1998 stood at 44.4 percent. This improvement has been a major driver of the expansion of the labour force over the intervening period

121 (CSO, Population projections 2006-2036)

122 Full details of the methodology and assumptions are available at www.skillsstrategy.ie in EGFSN (2006) The Current and Likely Future Supply of Skills and Qualifications: An Input by the FÁS Skills and Labour Market Research Unit to the National Skills Strategy Research

- Completion rates for Junior Certificate of 96.1 percent and 96.6 percent for males and females respectively; these rates were taken from the DES/ESRI report (Annual Survey of School Leavers 2004);
- Completion rates for Leaving Certificate of 79 percent and 85 percent (of the total Leaving Certificate age cohort) for males and females respectively, as per DES/ESRI report (Annual Survey of School Leavers 2005);
- Twenty percent of males in the 15-19 cohort register for apprenticeship based on the 2005 registration data for FÁS apprenticeship programme; 55 percent of all new entrants have Leaving Certificate; 44 percent have Junior Certificate and 1 percent have primary education;
- Completion rate for apprenticeship programmes of 72 percent (FÁS);
- Thirty percent of apprentices complete apprenticeship programmes by the age of 21, 64 percent by 22, 88 percent by 23 and 100 percent by 24;
- Based on the DES/ESRI School Leavers Survey 2005, 7 percent of males and 16 percent of females in the total cohort complete Post Leaving Certificate/Vocational Preparation Training courses (PLC/VPT)¹²³;
- Entry into higher education is assumed at 55 percent for both genders (HEA, Who Went to College, 2004);
- Entry into sub-degree programmes for both genders is assumed at 32.4 percent; entry into degree programmes for both genders is assumed at 67.6 percent (DES);
- Entry into cert/diploma programmes for both genders for institutes of technology and other providers are assumed at 33 percent and 2 percent respectively (DES, 2005);
- The completion rate for university degree programmes for both genders is assumed at 83 percent (HEA, 1992);
- The completion rate for institutes of technology degree programmes is assumed at 87 percent (Council of Directors of IoTs, 2005);
- The completion rate for certs/diplomas for both genders is assumed at 70 percent (Council of Directors of IoTs, 2005);
- It is assumed that 74 percent of those completing third level sub-degree level programmes progress to third level degree (HEA, First Destination Survey); we further assume that 87 percent of them will successfully complete degree programmes;
- On average, people progressing from sub-degree to degree level complete their degree programmes by the age of 22;
- Twenty-five percent of degrees are awarded to persons by the age of 21, seventy-five percent by 22 and 100 percent by 23;
- The absolute size of the labour force is expected to increase from approximately 1.97 million in 2005 to 2.4 million in 2020, a rise of 21.8 percent. The results suggest that there will be an overall increase in the education level of the labour force over the coming years: the share of persons with lower than secondary education will decline, while the share of those with further and higher education will increase.

¹²³ There is a lack of data on the educational background of participants on these courses and we assume that these individuals have the Leaving Certificate; if this is not the case, the numbers in the cohort with the Leaving Certificate is slightly underestimated and the number with the junior certificate or lower education is overestimated; however, the error is unlikely to be significant for the final result.

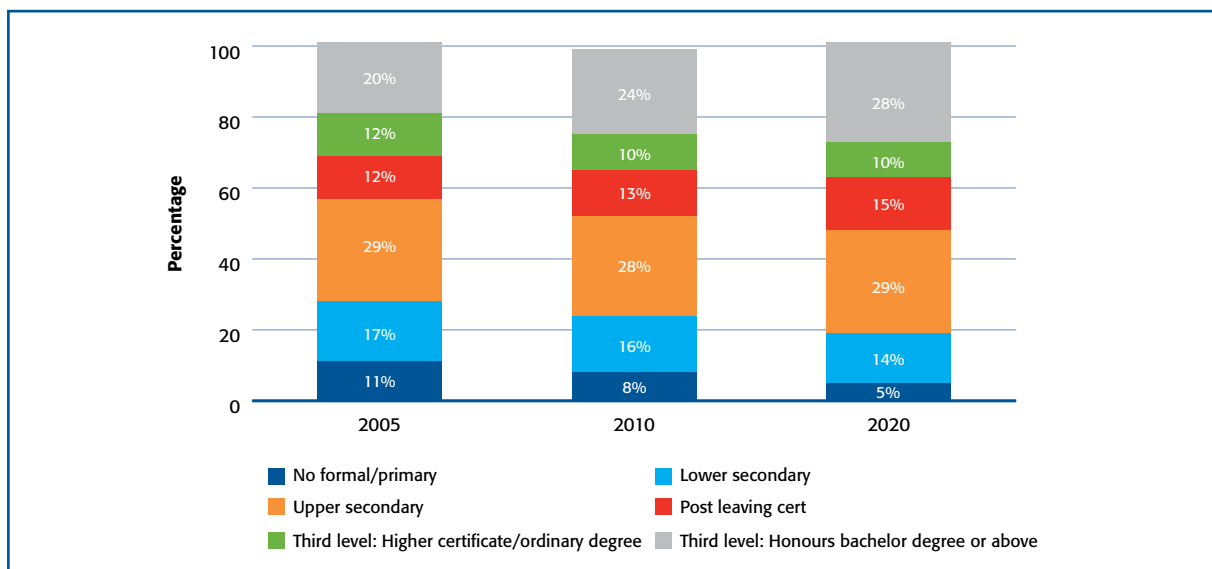


By 2020, it is estimated that:

- 5 percent of the labour force will have no formal/primary level qualifications;
- 19 percent will have below upper secondary education;
- 29 percent will have upper secondary as their highest level of educational attainment;
- 28 percent will have attained education equivalent to third level honours bachelor degree or above;
- The share of the labour force with third level qualifications is expected to rise to 38 percent by 2020, up from approximately 20 percent in 1991 (from the census of that year) and from 32 percent in 2005;

These projections are illustrated in *Figure 21*.

Figure 21: Labour Force Projections by Education Levels (Relative)



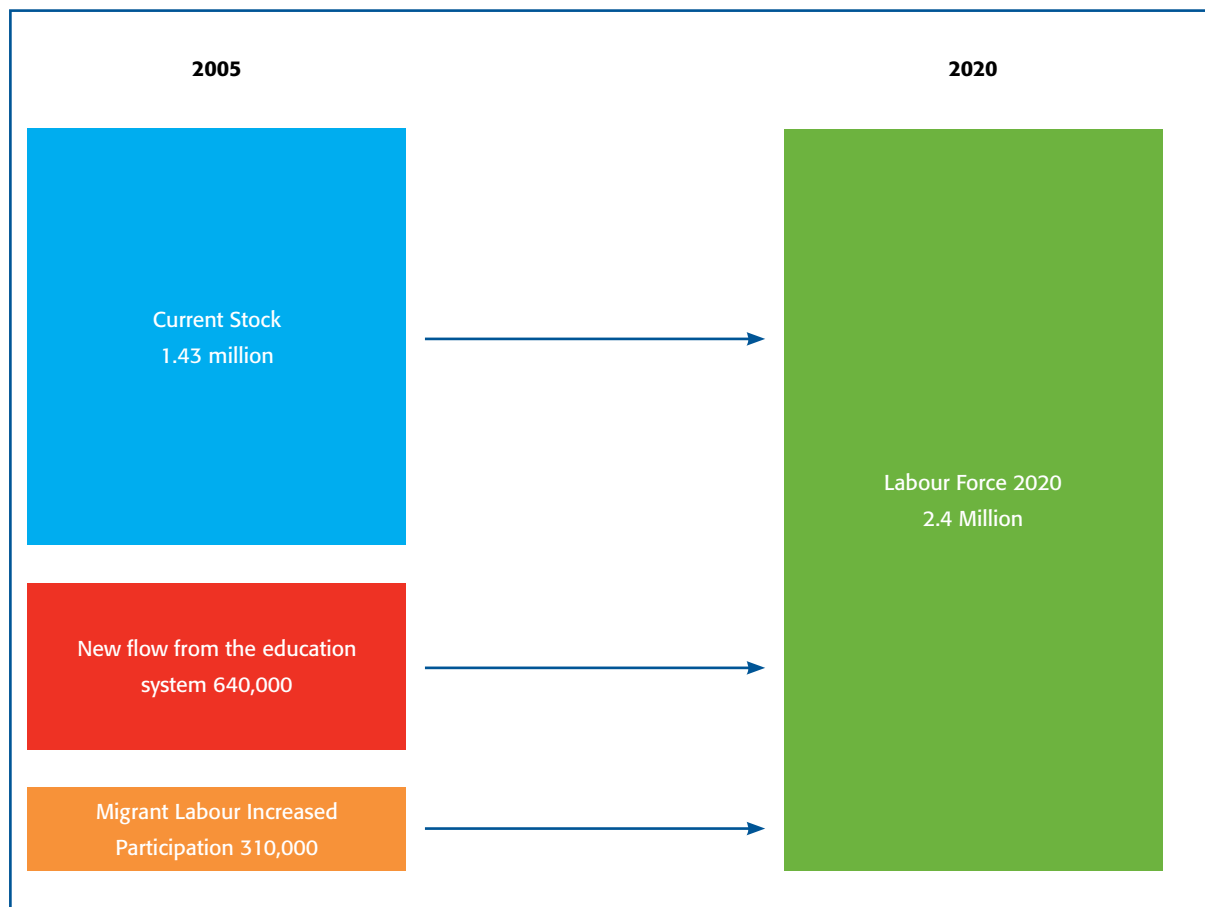
Source: SLMRU

Based on a 'no policy change' scenario, the results show an expected increase in the education level of the labour force in the coming years. This is mainly due to those in the older cohorts (who typically have a poorer educational profile) exiting the workforce due to retirement and those in the younger cohorts and migrants (who typically have a better educational profile), entering the workforce. However, the move towards higher education is incremental and follows established trends. It must be recognised that in 2020, half of the working age population will be over 40: it will consist of those currently aged 25-50 who will still be in the working age population in 2020 and who, in general, have already left the formal education system. In other words, it is the education profile of the existing stock, rather than the inflow, that will be a major determinant of the future shape of the Irish labour force. This implies that, without a significant level of upskilling of the existing stock, no major shift in the education distribution of the working age population can be expected by 2020.

4.4 Labour Force Supply Projections to 2020 based on a 'No Policy Change' Scenario

Best estimates forecast a labour force of 2.4 million people in 2020. The flows into the labour force are demonstrated in Figure 22.

Figure 22: Labour Force 2020



This forecast labour force is likely to consist of 1.43 million people who are already in the labour force, approximately 640,000 young people who will enter from the formal education system and approximately a remaining 310,000 will come through increased participation and net immigration. It is self evident that if one wants to influence the skills profile of the labour force in 2020, one needs to concentrate on the largest supply – that is, on those in the current labour force.

Table 9 summarises the estimated inflow of 'new entrants' from the education system (not including migrants). Column one shows the education level. The second column presents the estimated total 'new' supply by education level. The third column shows the 'new' supply adjusted for persons who are expected to participate in the labour market. The estimated inflow across all levels, in terms of those expected to participate in the labour market, will be in the range of 640,000 or 43,000 annually over the period 2005-2020. The inflow from third level is estimated at 16,500 annually (247,100 over the 15-year period).

It is important to note that the projections by field of study do not take account of upskilling of the working age stock aged 25+ in 2005. The model also does not take account of the progression of students from further education and training into third level and thus may overestimate the supply at the further education and training level, and underestimate the supply at third level. Finally, as before, our projections on the



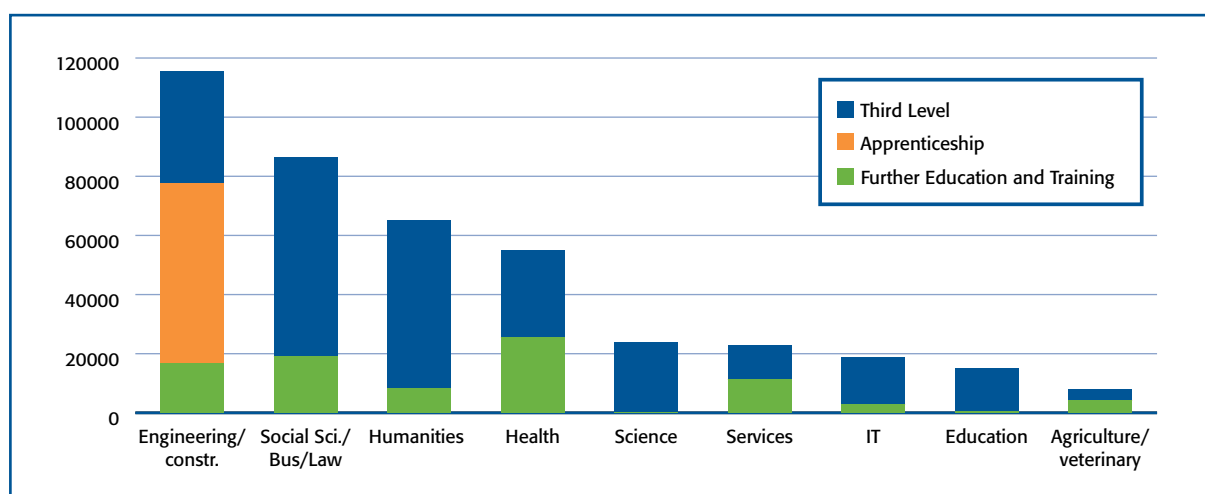
'no policy change' scenario are based on the assumption that participation in third level education will remain at 55 percent throughout the projection period which, in tandem with the demographic levelling off prior to 2012, leads to lower output. This means that these projections by field may to some extent be underestimating the actual 'new' supply at third level by 2020.

Table 9: 'New' Supply between 2005 and 2020 by Education Level: Total and Labour force

Education level	Total 'new' supply by 2020 (age cohort 15-39 in 2020)	'New' supply to labour force from 15-39 cohort in 2020
No formal/primary	35,600	9,100
Lower secondary	110,700	46,700
Upper secondary	240,800	171,000
Further Education	172,700	149,500
Third level: Certificate/ordinary degree	16,600	14,200
Third level: Honours degree or above	278,800	247,100
Total	855,200	637,600

Table 10 shows the inflow into the labour force from the 15-39 age cohort in 2020 broken down by education level and field. The greatest inflow is in engineering and construction, through the apprenticeship programmes and other FÁS courses. These results are based on the current participation in apprenticeship programmes, which is extrapolated to illustrate a 'no change' scenario. Inflows from social sciences and humanities are estimated at approximately 150,000 persons (or 10,000 annually), with the majority coming through the third level programmes (although a significant share coming through PLC courses). It is estimated that just below 20,000 additional persons with IT skills will be available to meet recruitment demand by 2020 (approximately 1,300 annually); 85 percent at third level and the remainder from further education. This data is also illustrated in Figure 23.

Figure 23: New supply in 2020 by Education Level and Field



Source: FÁS SLMRU

Table 10: 'New' supply in 2020 by Education Level and Field

Education Level	Total	Education	Humanities & arts	Social science, business, law	Science	IT	Engineering & construction	Agriculture & vet	Health	Services
Primary	9,100									
Lower Secondary	46,700									
Upper Secondary	171,000									
Further Education and Training	88,600	600	8,200	19,000	200	2,800	16,900	4,200	25,500	11,200
Apprenticeship	60,900	0	100	0	0	0	60,800	0	0	0
Third Level: Certificate/ordinary degree	14,200	0	1,200	3,900	700	1,400	4,100	400	1,100	1,400
Third Level: honours degree or above	247,100	14,400	55,600	63,500	23,000	14,700	33,800	3,300	28,600	10,100
Total	637,600	15,000	65,100	86,400	23,900	18,900	115,600	7,900	55,200	22,700

Within the 'honours bachelor degree and above' category, the supply projections in this report do not distinguish between honours bachelor degree, masters and PhD level. However, as outlined in Chapter Two, the Expert Group has already addressed the need for skills at the researcher level and notes the main objectives of the *Strategy for Science, Technology and Innovation (2006)*, i.e. to double PhD output by 2013.

The results by field of education **should be treated as indicative only and are based on current trends in preferences for field of study**. Many factors that influence the field of education have not been modelled. These, *inter alia*, include change in course choice, drop-out rates for individual fields of study, different progression patterns and gender differences in third level education, the impact of initiatives aimed at increasing participation in particular disciplines etc.

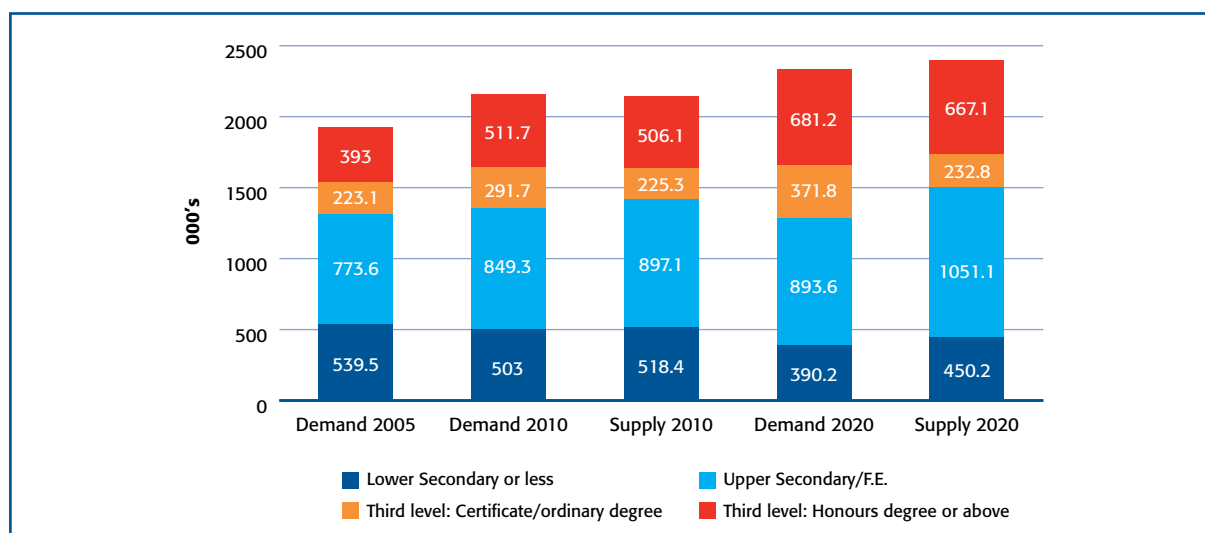
The supply available to meet the recruitment demand by 2020 is estimated to be approximately 640,000 persons (or 43,000 annually). This includes 230,000 persons at upper secondary education level or lower with no specific field attached. In a 'no policy change' scenario, the remainder of this supply is expected to be distributed between the fields as follows: 37 percent in social science and humanities (mostly at third level), 28 percent in engineering and construction (driven strongly by the high participation in apprenticeship); 13 percent in health (further and higher education), 6 percent in science (primarily third level) and 5 percent in IT (provided by further and higher education). The remaining supply is distributed across education, agriculture, services and other.



4.5 Comparison between Overall Labour Supply and Demand¹²⁴

Figure 24 compares the absolute numbers of demand projections and labour force supply estimates in thousands for 2010 and 2020.

Figure 24: Supply and Demand for Skills in 2010 and 2020 ('000s)



Source: EGFSN

For employment in 2010 to reach the demand forecast level, the participation rate would have to rise: the employment rate in 2010 would have to be higher than the participation rate in 2005. This suggests that there will be a tight labour market for the next few years, especially for those with higher education qualifications.

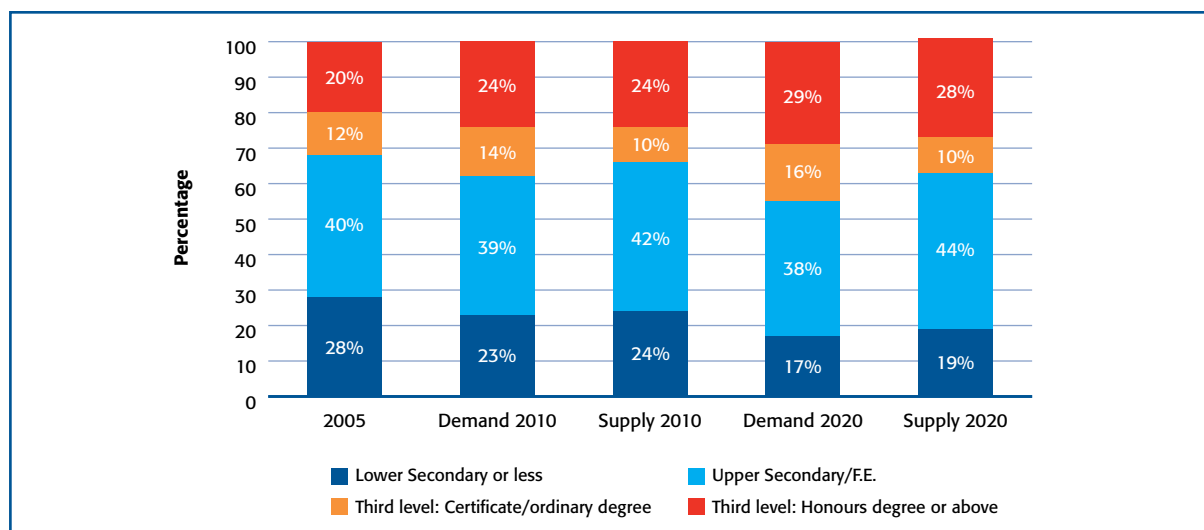
The comparison shows that in 2010 a slight gap at third level honours bachelor degree and above is forecast¹²⁵. A larger gap is projected at third level certificate/ordinary degree. On the other hand, there will be surpluses at both the higher secondary/further education and lower secondary or below levels.

In 2020, according to the comparison, there will be a gap at third level honours bachelor degree and above. A large deficit of approximately 139,000 at third-level higher certificate/ordinary degree is also projected as employment demand will far outstrip labour supply. In 2020, the number of positions available for those with both 'upper secondary/further education' and 'lower secondary or less' education will be much lower than the number of individuals with these qualifications who are willing to work (for example, the forecasts suggest that there will be demand for 390,000 individuals with lower secondary education or less, but that there will be a supply of 450,000 such people). This suggests that low skilled individuals could be unemployed or inactive in Ireland in 2020.

The supply and demand comparison is illustrated in Figure 25 using relative shares at each level of education.

¹²⁴ There are a number of issues that need to be borne in mind when comparing the two sets of data. Firstly, the ESRI is projecting employment while the SLMRU is projecting the labour force. The labour force includes employment and unemployment and is a better representation of supply. Next labour force estimates are for 15 to 64 year-olds. The employment estimates include workers who are 65 and older. (In 2005, there were approximately 38,000 of these or 2 percent of employment). The effect of this for the comparisons is that there is likely to be a small pool of older people who are willing to work over and above the estimates of labour supply here. Employment forecasts from the ESRI are based on a population that is endogenous i.e. the population reacts to the economic conditions forecast in the model, while the SLMRU has based its forecasts on the CSO's population projections which are not explicitly reactive to economic changes. The differences in the overall working age population between the different estimates of population is slightly less than 1 percent in 2010 and less than 2 percent in 2020. These differences, while complicating the comparisons, are small in the context of interpreting the results. The trends and issues raised by the comparison are the same regardless of these minor differences in methodology.

¹²⁵ The analysis, however, does not address the issue of the demand and supply of postgraduate qualifications and what proportion of those with degrees or higher should have masters or doctorates. This issue is addressed in Chapter Five.

Figure 25: Supply and Demand for Skills in 2010 and 2020 (Relative share)

Source: EGFSN

4.6 Implications Arising from ‘No Policy Change’ Scenario

4.6.1 The Lower Skilled will Find it Increasingly Difficult to Access Employment

The main implication arising from the comparisons of the demand side and supply side forecasts for 2020 is that those with low skills will find it increasingly difficult to find employment over the period. This will be true of early school leavers who will find it difficult to access their first employment; it will also affect those in employment with low skills who do not keep pace with changing skills requirements and are forced to transition between employments.

The baseline ‘no policy change’ scenario shows that there will still be significant numbers leaving the education system without the Leaving Certificate or equivalent qualification. The employment projections show that those without skills will find positions hard to come by and will be competing with a large pool of other unskilled or low skilled persons for the same jobs. The need to upskill the current labour force is imperative; otherwise there will be a large number of persons with low skills who are unemployed or inactive, and a corresponding shortage at third level.

4.6.2 Too Few Graduates Available

The Irish education system is also producing too few graduates at third level/higher certificate/ordinary degree level to meet the demand projections. The number of third level graduates needed to meet demand is likely to be around 37,200 annually. In 2004, the latest year for which statistics exist, there were approximately 27,500 graduates at honours bachelor degree level from universities, institutes of technologies and private colleges. There were also a further 20,000 third level graduates at higher certificate/ordinary degree level; approximately three-quarters of these will continue on to honours bachelor degree level, leaving around 5,000 to join the labour force. Thus, with about 32,500 third-level graduates annually who are potentially available to enter the labour force, there is likely to be a shortage of around 4,700 graduates per year¹²⁶.

¹²⁶ The figure is likely to be higher than this as not all graduates will work for a variety of reasons including emigration, illness, disability, family reasons etc.



4.6.3 Requirement for High Skilled Migrants

It should be noted that when projecting forward the 'no policy change' scenario the Group assumed that migrant labour would continue to have as high an educational profile as it did in 2005. This of course may prove to be an unrealistic assumption. However, it does present that possibility that a situation will exist where highly skilled migrants will be able to access skilled occupations while the low skilled resident population find it difficult to access employment. It is clear that the answer is not to attract low skilled migrants – that would further undermine our skills profile and competitiveness position. We need to continue to attract high skilled migrants and upskill the resident population.

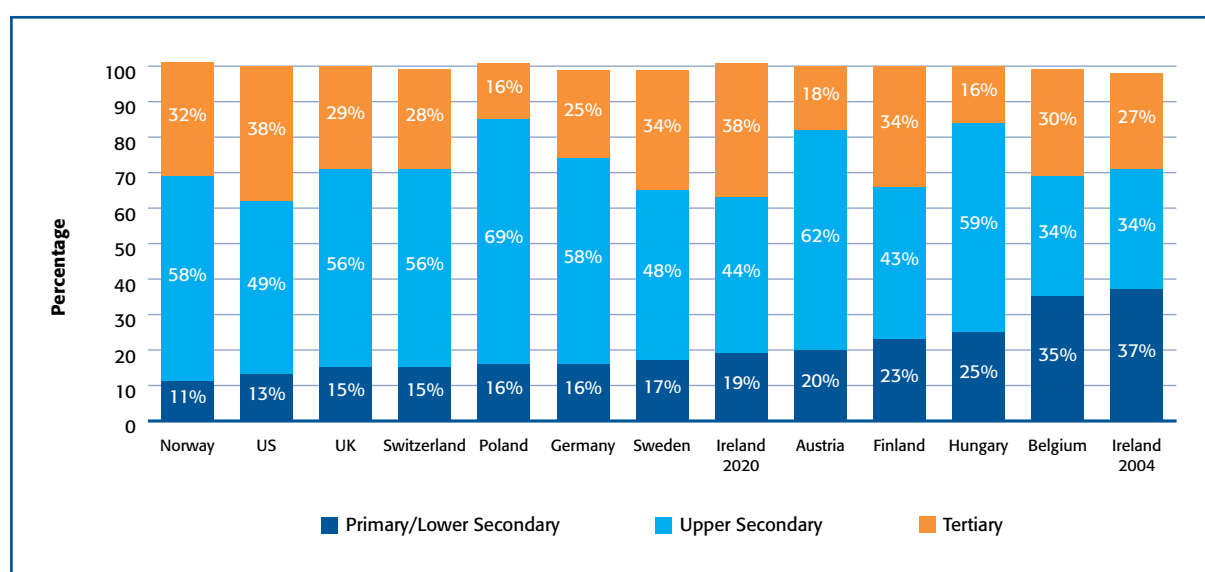
4.6.4 Impact on Wages and Salaries

The supply and demand forecasts would suggest (in a dynamic setting) that the relative wages of individuals with low education will fall dramatically and (unless artificially constrained by a minimum wage or generous social welfare benefits) they should find work at this wage. At the other end, if there is a large gap at sub-degree level, then wages will rise and degree holders will be tempted to take these jobs. This could affect the type of education being chosen by people, with an increasing preference to participate at third level.

4.6.5 Impact on Ireland's Future Competitiveness

Set out in Figure 26 is Ireland's standing in 2004 based on OECD statistics ranked by lowest level of educational attainment. Ireland ranks 12th out of the 12 countries chosen. Slotting in the projected educational profile in 2020 based on the 'no-policy change' scenario Ireland moves up 5 places, again compared to the other countries' 2004 results. But of course it is reasonable to assume that other countries will also be improving over the period to 2020. Therefore, based on 'no policy change' the Group believes that Ireland is likely to lag significantly behind other OECD countries over the period to 2020, based on the proportion of the labour force with low levels of educational attainment. However, it must be acknowledged that at the third level Ireland currently performs well.

Figure 26: Labour Force by Highest level of Education Attained



Source: EGFSN, OECD

4.7 Vision for Labour Force Skills Profile in 2020

In order to develop as a competitive, innovation-driven, knowledge-based, participative and inclusive economy, Ireland will need to aspire to a more ambitious educational profile for the labour force in 2020 than the baseline 'no policy change' scenario outlined in 4.3. While the Expert Group considers that the existing education and training system has served Ireland well to date, it also believes that a 'no policy change' stance will not be sufficient in the future to maintain economic and social progress.

The key arguments for moving towards the 'New Economy Vision' that exceeds baseline demand trends are that:

- The economy will progress to a new higher level supply-demand equilibrium driven by the supply of skills;
- Higher levels of educational attainment drive innovation and productivity and increase levels of entrepreneurship within the economy;
- Increasing the educational attainment of the lower skilled increases the likelihood of their participation in the workforce, thus increasing total productivity;
- Higher educational attainment is correlated with higher incomes;
- A better educational profile makes Ireland more attractive as a location for foreign direct investment; and
- There are wider social benefits from reducing the number of low skilled; including increased social cohesion, improved health, and reduced levels of crime.

It is appropriate, therefore, to outline a possible vision in relation to the desired educational profile of the labour force in 2020. The desired vision should be ambitious, but also realistic and achievable.

The vision which is being proposed by the Expert Group meets these aims. The proposed vision would see Ireland meet and exceed the forecast demand for skills at the higher end of the skills spectrum (above NFQ level 4). The reasoning for such a vision relies on the assumption that neither demand nor supply is predetermined. Further, the Expert Group believe that it is not possible to have too many highly educated graduates in society. By ensuring a steady supply of high skilled workers, the State can foster further increases in productivity, innovation and entrepreneurship, thereby maintaining Ireland's attractiveness as a location for foreign direct investment and providing an additional boost to demand. The Expert Group's vision would also see a significant reduction in the numbers of people in the labour force with below upper secondary education. As well as ensuring that individuals at this level have the appropriate skills to access employment, there are significant social benefits from reducing the number of individuals with low skills.

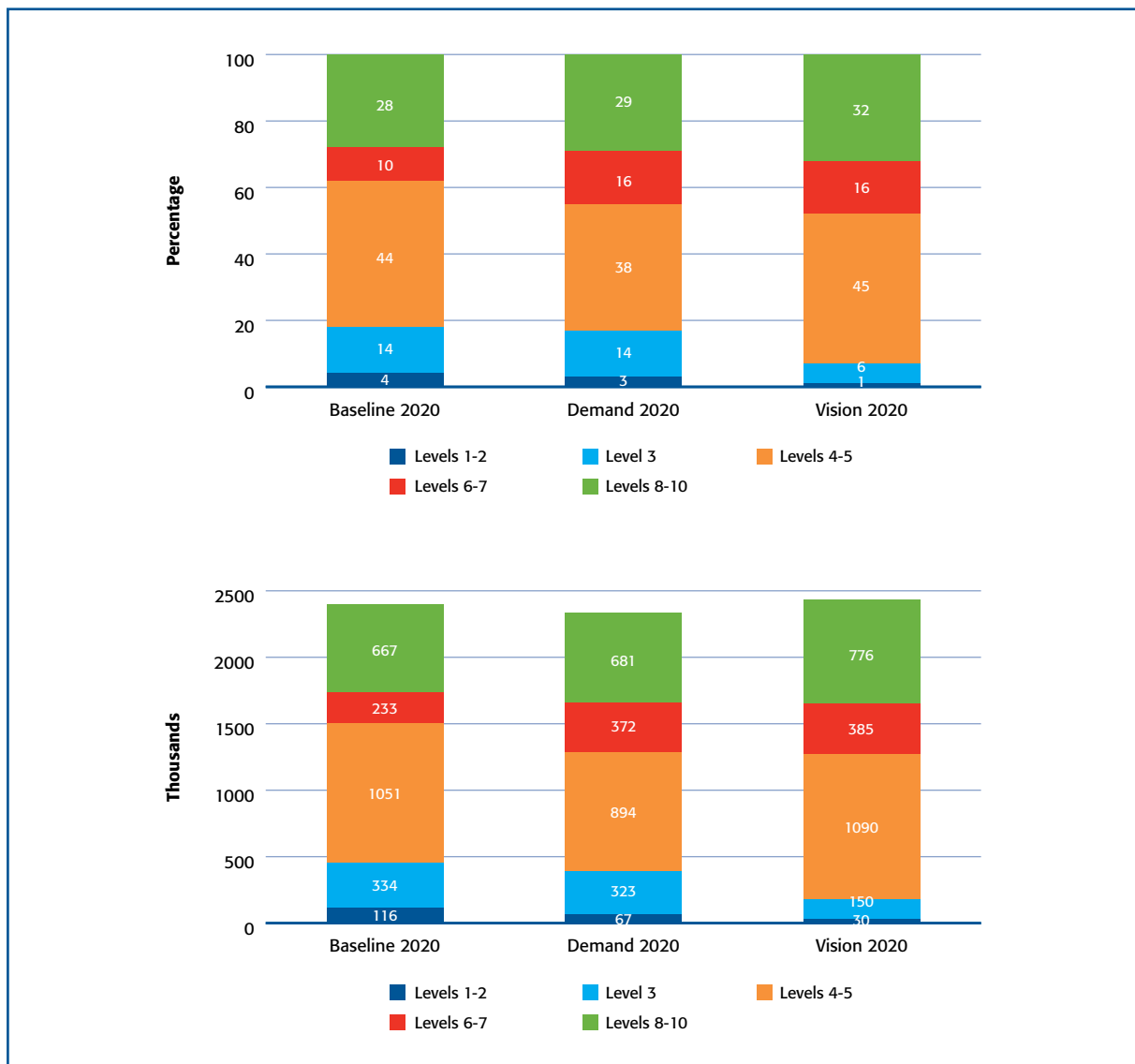
The Expert Group proposes a vision of a competitive, innovation-driven, knowledge-based, participative and inclusive economy with a highly skilled labour force by 2020. The practical implications of this vision would see:

- 48 percent of the labour force with qualifications at NFQ Levels 6 to 10;
- 45 percent of the labour force with qualifications at NFQ levels 4 and 5; and
- Only 7 percent of the labour force with qualifications at NFQ levels 1 to 3.



This vision is illustrated in *Figure 27* in both absolute and relative terms. Both graphs include Ireland's baseline 'no policy change' scenario (column 1), the forecast demand for skills in 2020 (column 2), and finally the vision which the Expert Group believe Ireland should aim to achieve by 2020 (column 3).

Figure 27: Vision for Education and Training Attainment in 2020



Source: Forfás, SLMRU, ESRI

NFQ Levels 1 and 2: The proportion of the labour force with qualifications at NFQ levels 1 or 2 would decline to just 1 percent from 4 percent in the baseline model.

NFQ Level 3: The proportion with qualifications at level 3 would decline from 14 percent to 6 percent.

At NFQ levels 1, 2 & 3, forecast supply is actually lower than forecast demand, suggesting that these jobs might be temporarily filled either through migration or through the resident population being employed at levels below that which would best utilise their skills. However, in the long run, the availability of higher-level skills will assist in driving demand for higher-level jobs.

NFQ Levels 4 and 5: Due to the numbers moving onto higher levels of education and training, the proportion of the labour force with qualifications at NFQ Levels 4 and 5 would increase to 45 percent¹²⁷.

NFQ Levels 6 and 7: It is envisaged that the proportion of the labour force with qualifications at NFQ levels 6 and 7 would increase significantly to 16 percent, thus meeting demand. Demand at this level grossly exceeded supply under the baseline scenario.

NFQ Levels 8, 9 and 10: The proportion of the labour force at NFQ levels 8, 9 and 10 would expand from 28 percent to 32 percent, and would exceed forecast demand. Within these levels, significant capability should be built at level 10, in line with the strategy for *Science, Technology and Innovation 2006*.

4.8 Summary of Supply and Demand for Skills to 2020

The labour force will grow to 2.4 million by 2020. Approximately 1.4 million of the current workforce will still be in the labour force in 2020. An additional 640,000 young people will come into the labour force from the formal education system. The remaining additional 310,000 will be made up of immigration and increased participation by the existing population.

Table 11 below (Column 1) shows the 2005 skills (educational attainment is used as a proxy for skills) profile for Ireland. OECD comparisons of this profile with that of other OECD countries are unfavourable. In 2004, only 6 out of 27 OECD countries had a worse performance than Ireland in terms of the percentage of the labour force who had only attained up to lower secondary qualification.

If we simply extrapolate current provision and demographic trends and do not add to training and education output, the educational attainment of the labour force will have improved. This baseline 'no policy change' scenario is set out in Column 2, Table 11. However, it is important to remember that our main trading competitors will also have improved their educational profiles and that if Ireland is to compete effectively, it will need to build competitive advantage in the area of skills.

Comparing these baseline 'no policy change' educational attainment projections (Column 2) with projected demand in 2020 (Column 3), leads to the conclusion that by 2020 there will be:

- A slight shortage at levels 8 to 10;
- A significant shortage at levels 6 and 7; and
- Surpluses at levels 1 to 5 with the possibility that a large number of low-skilled individuals will be unable to find suitable employment.

Ireland's ambition should not be to simply meet projected skills demand based on an extrapolation of current observed trends. If Ireland is to develop competitive advantage in world class skills, education and training, and transition to a knowledge economy in which skills drive innovation, productivity and entrepreneurial activity, it requires a skills profile which substantially changes the equilibrium – that is, one that is skewed towards higher levels of skills attainment. Such a profile is set out in Column 5, Table 11. The challenge for Ireland is to move from the baseline 'no policy change' scenario set out in Column 2 to the vision of a skills profile for the new knowledge economy set out in Column 5.

¹²⁷ Although apprenticeships are placed at level 6 on the NFQ, for the purposes of this report they are classified according to the CSO Quarterly National Household Survey as post Leaving Certificate education which has been included at NFQ levels 4 and 5 in Section 4.7 and in Chapter 5.

**Table 11: Skills Profile of Ireland's Labour Force – Absolute and Relative Share Grouped by NFQ level**

NFQ Level	Column 1	Column 2	Column 3	Column 4	Column 5
	Current Skills Profile (2005)	Baseline Skills Profile in 2020 based on 'no policy change' to Supply	Baseline Projected Demand for Skills in 2020	Unmet Skills Needs (Column 3 less Column 2)	Vision of Skills Profile for 'New Knowledge Economy' in 2020
Levels 8-10	20% 393,000	28% 667,000	29% 681,000	14,000	32% 776,000
Levels 6-7	12% 223,100	10% 233,000	16% 372,000	139,000	16% 385,000
Levels 4-5	40% 773,600	44% 1,051,000	38% 894,000	(157,000)	45% 1,090,000
Levels 1-3	28% 539,500	18% 450,000	17% 390,000	(60,000)	7% 180,000
Total	100% 1,929,200	100% 2,401,000	100% 2,337,000	–	100% 2,431,000

Chapter 5: Conclusions and Recommendations

Achieving the Proposed Objectives

In order to achieve the proposed objectives set out in *Chapter 4*, action is required at a number of levels:

- The proportion of the population aged 20-24 with NFQ level 4 or 5 awards should be increased to 94 percent, either through completion of the Leaving Certificate or through equivalent, more vocationally oriented programmes. The retention rate at Leaving Certificate should reach 90 percent by 2020.
- An additional 500,000 individuals within the workforce will need to progress by at least one NFQ level. Specifically, 70,000 individuals will have to be upskilled from NFQ levels 1 and 2 to level 3; 260,000 up to levels 4 and 5; and 170,000 to levels 6 to 10. The cost of the proposed upskilling to levels 3, 4 and 5 is estimated over a thirteen year period at €153 million per annum; the cost of upskilling at higher levels is estimated over a thirteen year period at €304 million per annum.
- The progression rate to third level education will have to increase from 55 percent to 72 percent.

Develop Skills for Economic Growth

All relevant government departments should together facilitate the development of skills that support economic development.

In relation to specific skills shortages, progress in implementing the recommendations in recent reports of the Expert Group on *Sales & Marketing and Management Development for SMEs* as well as the EGFSN's *Fourth Report* should be reviewed, and the outstanding recommendations should be implemented.

Science, Engineering, ICT and R&D skills are an integral part of a knowledge-based economy and their promotion remains important.

Ireland requires a third level fee structure which reflects its economic and social needs. The Expert Group notes and welcomes the commitment in *Towards 2016* to establish a fund which will 'alleviate the fees in public institutions for part-time courses at third level for those at work who have not previously pursued a third-level qualification' and looks forward to its immediate implementation.

Implement a One-Step-Up Approach

An implementation mechanism under the auspices the Department of Enterprise, Trade & Employment and the Department of Education & Science should be put in place to coordinate the activities of all stakeholders under *One-Step-Up*.

A *One-Step-Up* approach needs to involve a wide range of providers including Universities, Institutes of Technology, Vocational Education Committees, Skillsnet, FÁS and other development agencies and education providers. The initiative should be communicated clearly to all key stakeholders, and should incorporate the following key elements:



- Systematic identification of the needs of individuals and enterprises;
- Flexible and responsive training provision;
- A high profile National Media Awareness Campaign;
- An accreditation/quality assurance system; and
- Adequate funding.

Target the Low Skilled and Educationally Disadvantaged

As a general principle, individuals who do not currently hold a qualification equivalent to NFQ Level 4 or 5 should be assisted to achieve such an award, through either full- or part-time study, without incurring tuition costs and with a level of subsistence, where appropriate, provided by the State.

The State should continue to support and, where necessary, increase funding initiatives targeted at addressing educational disadvantage, the second-level retention rate, and low literacy levels.

Integrate Migrant Workers

The system for recognition of international awards should be reviewed to ensure that it is meeting its objectives and that the facility is widely communicated to employers and international employees. Procedures to identify those migrants who most need English-language training are also required. The provision of this training needs to be extended, with a distinction being maintained between adult literacy and migrant English-language proficiency. A strategy is required to ensure that migrants integrate into the formal education and training system at all levels and specifically that migrant children are successfully integrated into the Irish education system, particularly at primary and secondary level.

Generic Skills

Substantial evidence points to the fact that certain key generic skills are growing in relative importance in the workplace: basic skills (in particular, literacy), people-related skills, and conceptual skills. These skills should be prioritised and embedded into all publicly funded education and training provision in so far as possible.

Basic Skills

Literacy is a basic foundation skill and the Expert Group notes the recommendations of the report *Adult Literacy in Ireland (2006)*. Mathematics is fundamentally important to the educational and economic well-being of the country. For this reason the review process at second level needs to be expedited and prioritised, and once completed should be accorded immediate consideration by all relevant stakeholders. Furthermore, the success of the revised primary mathematics curriculum needs to be evaluated and any positive lessons built upon at second level ensuring continuity for the learner. Given the importance of mathematics, a strategic approach to its development needs to be adopted.

Collect and Disseminate Information

Timely and relevant flows of information are vital for all stakeholders. To this end, the Expert Group advocates that its recommendations in two recent reports – *Careers and Labour Market Information in Ireland (2006)* and *Analysis of In-Employment Education and Training Data* – should be implemented.

5.0 Introduction

This chapter proposes strategic objectives for consideration by Government and outlines some policy responses designed to achieve those objectives.

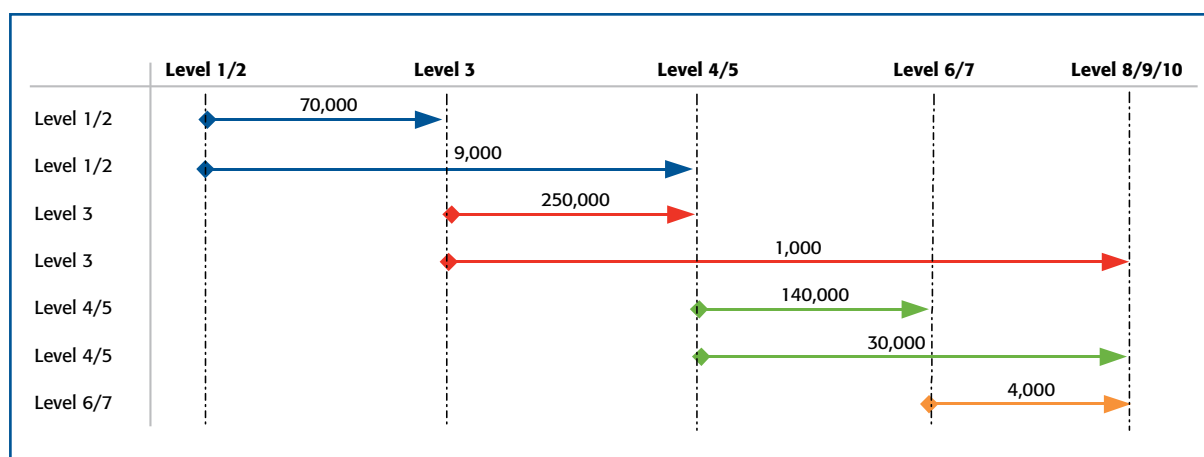
The forecast figures used in this report and the figures associated with the proposed vision set out in this chapter are indicative only of the order of magnitude of the challenge facing Ireland. They should be regarded as such rather than absolutes.

5.1 Achieving the Required Skills Profile

In order to move from the 'baseline no-policy-change scenario' to the desired vision in Table 11 in Chapter 4, a number of changes to assumptions of the baseline model outlined in *Section 4.3* were required. Firstly, the underpinning assumption in relation to Leaving Certificate retention has to be adjusted, from the baseline model assumption of 82 percent average to a situation where the Leaving Certificate retention rate reaches 90 percent by 2020, equivalent to an average of 86 percent over the period. Secondly, the progression rate to third level education would have to increase from 55 percent to 72 percent. Thirdly, significant measurable additional upskilling of the workforce would need to take place. The upskilling required to achieve this vision entails defined numbers of individuals (who have qualifications at certain levels) attaining qualifications at higher levels of the NFQ. This is illustrated in *Figure 28*. All of the other assumptions outlined in the baseline model remain the same.

There are differences in total employment under the 'baseline' scenario (2,401,200) and the 2020 vision (2,431,000). This is due to the fact that, as the educational attainment of those in the working age population increases, participation in the labour force also increases. The labour force participation rate under the baseline model is 70.2 percent while under the 2020 vision it is 74 percent. There is an implicit unemployment rate of 4.4 percent under the baseline scenario and 3.8 percent under the 2020 vision. 3.8 percent could be regarded as a frictional unemployment rate.

Figure 28: Additional Required Flows between NFQ Levels to achieve Vision, 2005-2020



In order for the vision to be achieved:

At Levels 1 and 2: Approximately, 70,000 additional persons must progress from NFQ levels 1 and 2 to NFQ level 3, and 9,000 individuals must progress to NFQ levels 4 and 5. This would still leave 30,000 individuals with qualifications at Levels 1 or 2 as their highest level of educational attainment.



At Levels 3: Approximately 250,000 additional persons must progress to NFQ levels 4 and 5 and 1000 people must progress to NFQ levels 8, 9 and 10.

At Levels 4 and 5: A total of 140,000 persons must progress to NFQ levels 6 and 7 and an additional 30,000 individuals must progress to NFQ levels 8, 9 and 10.

Levels 6 and 7: A total of 4,000 persons must progress from levels 6 and 7 to NFQ levels 8, 9 and 10.

In total this would involve upskilling 480,000 people by at least one level and an additional 30,000 by at least two levels over the period 2006-2020. In many instances, the amount of training time required to move from one NFQ level to another is significantly longer than a single year and so it is probable that several cohorts will need to be upskilled simultaneously.

The analysis in *Chapter 4* recognised that the population is not homogenous; different age cohorts have different average levels of educational attainment and so will require differing forms of upskilling. The appropriate education and training interventions for younger and older cohorts will need to be considered.

5.1.1 A Dual Approach

A dual approach is required if the vision set out in *Section 5.1* is to be achieved:

- i) The proportion of new entrants to the labour force leaving formal education with Level 4 and 5 qualifications needs to be increased; and
- ii) Within the labour force, significant numbers will need to be educated and trained to a higher level than they have currently achieved.

5.1.2 Increase Retention Rate at Upper Secondary Level

The percentage of the population aged 20 to 24 having completed upper secondary education or equivalent (NFQ levels 4 & 5) currently stands at 86.1 percent¹²⁸. This figure includes all those in this age cohort who have completed upper secondary education or an equivalent qualification at NFQ levels 4 or 5. This indicator has been used because it captures young people achieving level 4 or 5 qualifications either through the Leaving Certificate or through other alternate routes. Ireland should aim to increase the proportion of the population aged 20-24 with level 4 or 5 awards to 94 percent. This requires an increase in the retention rate to Leaving Certificate and an increase in the numbers completing NFQ level 4 and 5 qualifications.

The most significant route to attaining a level 4 or 5 qualification for younger cohorts is through the established Leaving Certificate, the Leaving Certificate Vocational programme (LCVP) or the Leaving Certificate Applied (LCA) programme. The Leaving Certificate completion rate is particularly important as it provides for progression to third level. In order to achieve the vision set out in *Section 5.1*, the Expert Group estimates that 90 percent of all students will have to complete the Leaving Certificate by 2020¹²⁹. The current retention rate is 81.3 percent. The Expert Group believe that this is an achievable target while acknowledging that retention rates at second level have remained virtually unchanged over recent years despite the introduction of numerous initiatives. Improved Leaving Certificate completion rates are an essential prerequisite if Ireland is to enhance its educational profile over the medium and longer term.

Achieving such a completion target will involve a range of actions across the full spectrum of educational and vocational institutions. In particular, consideration should be given to the strengthening of vocational options for students within the formal upper secondary level system and leading to level 4 or 5 qualifications.

¹²⁸ Eurostat, *Structural Indicators 2005*

¹²⁹ This would represent an average retention rate of 86 percent over the period to 2020

The factors which contribute to students leaving the formal education system early are not confined to post primary education. They also straddle the pre-primary education (of which there is little state provision) and primary levels and are closely correlated with social disadvantage. Efforts to tackle the problem of educational disadvantage, therefore, must involve connected policy between the Department of Social & Family Affairs and the DES.

As discussed in *Section 4.2.2*, the DES currently has several schemes in place, at various levels within the education system, which are designed to address special needs and specific types of disadvantage. These include the DEIS initiative targeting disadvantage, placement in special classes and units, the 'Stay in School' retention strand of the school completion programme. These programmes provide valuable services, and are often a safety net for vulnerable members of society. However, there appear to be high levels of non-completion amongst Youthreach and FÁS Community Training Workshops participants. The outcomes of these programmes are at level 3. In order to rectify this situation, providers should strive to ensure that all courses designed to accommodate students who do not complete upper secondary education lead to a qualification within the National Framework of Qualifications and lead to certification, ideally at levels 4 & 5.

Information relating to the suite of programmes available to early school leavers, the numbers participating in the programmes and their outcomes in terms of accreditation for participants is difficult to access. Increased strategic coherence across this sector is required.

Increased emphasis on the gender divide (as set out in *Section 4.2.6*) in terms of performance at second level is also required. This may require making modifications to existing programmes or developing alternative programmes of study.

5.1.3 Moving People 'One-Step-Up'

The main way in which the Vision of a skilled labour force in 2020 will be achieved is through upskilling those within the labour force. Upskilling will come through a combination of adult education and training.

Taking the additional numbers to be upskilled at each level of the National Framework of Qualifications as outlined in *Figure 28* in *Section 5.1*, a crude calculation can be undertaken (by dividing by 13 years) to arrive at the annual number of 36,000 additional people receiving awards at each level which would be required to achieve the Vision based on an even distribution across the 13 years¹³⁰. The 13 year period spans 2008 to 2020. This is seen as the most realistic timeframe to allow for the implementation of a National Skills Strategy, the allocation of funding and a ramping up of initiatives to realise the additional output required.

Table 12: Additional Required Output per annum¹³¹

	NFQ Level 3	NFQ Level 4 & 5	NFQ Level 6 & 7	NFQ Level 8, 9 & 10
Additional Output (Individuals Achieving Awards) per annum	5,500	20,000	10,500	2,500

It would be inappropriate to be overly prescriptive as to how the additional numbers at each of these levels should be met, given that later in this chapter there is a call for new, innovative and flexible modes of delivery which do not already exist. In fact, new ways of meeting the needs of those within the workforce is a prerequisite for achieving this level of upskilling. However, current successful providers also need to reflect upon which of the current offerings might be augmented in order to achieve this additional output.

¹³⁰ In reality, the additional output is likely to be lower in the first few years and higher in the latter years, due to the time it takes to implement initiatives.

¹³¹ Numbers have been rounded



NFQ Level 3: The upskilling required to level 3 would take place among those who currently have a low skills base at levels 1 and 2. As already stated in this report, literacy is a significant issue for this cohort. Therefore, any schemes should be underpinned by strong literacy initiatives. Additional numbers at this level are most likely to come through adult education, in the form of participation in VTOS, and the Back to Education Initiative.

NFQ Levels 4 and 5: Upskilling to levels 4 and 5 would be achieved through a combination of adult education (specifically targeting those that wish to return to take the Leaving Certificate as adults); increased emphasis on PLC programmes through VECs, leading to major awards at levels 4 and 5; and increased training of those in employment by FÁS, Skillnets, Fáilte Ireland, Teagasc, and BIM leading to major awards at 4 & 5. FÁS should consider how their apprenticeship model can be further developed and rolled out to the adult workforce, leading to awards which straddle levels 5 and 6.

NFQ Levels 6 and 7: The main response at this level is likely to come through the institute of technology sector and, if viable, through adult apprenticeship. The preferences of the school-leaving cohort are currently moving away from courses leading to qualifications at levels 6 and 7. Based on current preferences a dramatic shortfall is predicted at this level over the period to 2020. This is seen as primarily hampering skills supply in the workforce at the technician level although these will be in demand. The challenge for institutes of technology is to reach out to enterprise and provide flexible training options at these levels.

NFQ Levels 8, 9 and 10: Given the significant projected rise in the demand for professional qualifications, universities, institutes of technology and professional bodies should work together to meet demand at this level, guided by the *Strategy for Science, Technology and Innovation (2006)* and working within the National Framework of Qualification.

5.2 Implementing a One-Step-Up Approach

One-Step-Up, as originally envisaged by the Enterprise Strategy Group, was a proposal to upskill as many of the population as possible, both to drive the development of a knowledge economy and to prepare workers to live and prosper in such an economy. Part of the objective of this study is to set out appropriate strategic objectives for the implementation of the *One-Step-Up* initiative and to indicate its potential components.

The OECD report *Promoting Adult Learning 2005* highlighted the role that Governments can play in promoting adult learning by creating the structural preconditions to maximise the returns from investment in adult learning; promoting well-designed co-financing arrangements; improving delivery and quality control; and working to improve policy coordination and coherence. Lack of motivation, lack of time, and financial constraints remain the key barriers to adult learning. The Expert Group believes that there are a number of interlinked elements required to operationalise fully the *One-Step-Up* approach.

i) Identify Individuals' and Businesses' Skills Needs – Career Guidance and Mentoring for Those in Work

The level of demand for training and education is not commensurate with the perceived need for it. One of the reasons is that individuals and businesses are not aware of their skills shortcomings. In order to engage with individuals and firms and meet their needs, individuals and enterprise need to be able to assess their strengths and weaknesses from a skills perspective. The Expert Group have previously recommended strong career guidance and mentoring for those in the workplace and better skills assessment tools to be available to individuals on-line¹³². Enterprise agencies (FÁS and Enterprise Ireland), representative organisations and Skillnets should continue to assist companies in identifying the training needs of their employees.

Brokerage systems to help companies identify their needs and source training are being used elsewhere. The opportunities presented by such systems should be further investigated. Ways of capturing this data and feeding it back to education and training providers should be designed to identify required training specifically tailored to either the individual or company. This would give individuals or companies ownership of their own training programmes. The development and rollout of such a system should be linked to a central careers website.

ii) Greater Awareness of the Benefits of Education and Training

Employers and employees alike need to be made aware of the benefits of continued education and training, as well as the opportunities available to them. This could be achieved through a high profile National Media Awareness Campaign¹³³. Such a campaign should highlight the value of education and training to both employers and employees: increased productivity for the firm, higher wages and increased future employability for the employee. It should also direct individuals to the planned central careers website (see (i) above). This campaign should be reinforced through a partnership approach and underpinned by the dissemination work undertaken by the NCPP as part of the National Workplace Strategy. Employer and employee representative groups should engage at the level of the firm to demonstrate to their members the value of upskilling. The NCPP, FÁS, Skillnets and other providers should work together to develop case studies and share learning.

iii) Flexible and Responsive Provision

The provision of education and training courses should reflect the needs of individuals and enterprise. This would foster improved linkages between the education system and enterprise, as previously recommended by the Enterprise Strategy Group. The accelerating pace of change at all levels within the economy, and particularly in relation to skills, necessitates flexible and responsive provision. There must, therefore, be genuine dialogue between those providing education and training and those demanding it. The provision of workplace based training which is fitted around working hours needs to be actively promoted.

The tertiary education system in particular has an opportunity to exploit the expanding market for further learning. Capacity in third level has increased over recent years. In the medium term up to 2012 the size of the school leaving cohort – the traditional third level client base – will level off or decline marginally. However, this is likely to be offset through increased progression to third level and through the effects of migration on demographics. Third level institutions which want to grow can do so by reorienting their offerings towards those in the workforce in need of upskilling. A *One-Step-Up* approach needs to involve a wide range of providers including universities, institutes of technology, vocational education committees, Skillnets, FÁS, development agencies, and other relevant education and training bodies.

iv) Accreditation/Quality Assurance

All of the education and training undertaken as part of a *One-Step-Up* initiative should be accredited and quality-assured within the context of the National Framework of Qualifications. As well as ensuring that an element of quality control is maintained, accreditation facilitates progression and also ensures that upskilling is captured in a meaningful way which will allow individuals, employers and the State to maximise the returns from their investment.

A strong accreditation system should be fundamental to any National Skills Strategy. Ireland has been amongst the leaders within Europe in relation to the development of a National Framework of Qualifications. The NQAI, awarding bodies, and providers of education and training now need to ensure that the utilisation of the framework is maximised and that its functions and value are widely communicated.



Recognition of prior learning is an allied issue which needs to be further progressed in order to make *One-Step-Up* a reality.

v) Funding for 'One-Step-Up'

Funding is required to operationalise a *One-Step-Up* approach. The Expert Group has not made detailed calculations in relation to the costing of individual elements of such an initiative as part of this research. Broad estimates place the cost of the proposed additional upskilling to levels 3, 4 and 5 at €153 million per annum over the period 2008 to 2020. The cost of upskilling at the higher levels 6, 7, 8, 9 and 10 is estimated at €304 million per annum over the period 2008 to 2020. It is suggested later in *Section 5.6.2*, that costs at the higher level should be met through a tripartite arrangement between the State, employers and individuals. Some of the cost at the higher level may be netted off against recent investments at that level which have not yet taken effect in terms of increased output. These figures are estimated based on OECD statistics on average expenditure per student at various levels of education, and do not include income support, additional wage compensation or any form of subsidy to employers¹³⁴.

5.3 Continuous Learning

In addition to moving people's skills up a level, it is important that those in the labour force keep their skills up-to-date. This is true even for those who will remain in the same occupation over the period under review. This may not necessarily mean moving up a level, but rather may involve undertaking new learning at the level they are already at. This learning should lead to accreditation in the form of minor or special purpose awards in the National Framework of Qualifications.

As noted earlier, only about half of Irish adults undertake any form of learning activity during a year¹³⁵. Comparisons of education/training of adults show that Ireland lags behind many countries and, in particular, is considerably behind the Lisbon lifelong learning target that 12.5 percent of adults should be engaged in learning. Currently, the Irish rate is 7.4 percent. Thus, there is a need for a roughly 50 percent increase in formal adult learning to achieve the Lisbon target.

It is worth noting that encouraging people already in employment to re-engage with the education and training system will be challenging. The attitude and disposition of these people has been, in part, shaped by their previous experiences of the education system and specific steps may be required to tempt them back into formal or non-formal education training.

5.4 Types of Skills Required

5.4.1 Sectors and Occupations

It is difficult to predict with certainty the required skills mix to meet both the demands of enterprise and the requirements for effective participation in the wider community over the period 2020. However, the projections contained in this report provide a broad indication of the occupations and sectors in which additional skills will be required.

¹³⁴ OECD *Education at a Glance* (2006). The OECD figures provide estimates of annual expenditure on educational institutions per student for all services. They are based on direct, annual expenditure, public and private, on educational institutions in relation to the number of full-time equivalent students enrolled in these institutions. The underlying data relates to the year 2003 and was collected by the OECD in 2005. 'All services' includes core educational services (also referred to as instructional services) and ancillary services such as transport and meals. Public subsidies for students living expenses are excluded. As such they should be regarded as the basic cost of provision. These figures were adjusted for inflation by Forfás. For levels 6-10, the adjustment was made based on advice from the Higher Education Authority.

¹³⁵ This includes formal, informal and non-formal education and training.

The sectors identified as showing significant employment growth include: finance and business services, public administration, education and health, market services, building, distribution transport and communications¹³⁶. In addition to these, the ESG believed that high value-added manufacturing would continue to be a key component of Ireland's enterprise base. After considering our existing strengths and sectoral prospects, it put forward an indicative list of opportunities for further development/ future growth in high value-added manufacturing in a broad range of sectors including medical devices, pharmaceuticals/biotechnology, ICT, engineering, food and consumer goods. Based on Expert Group research, broad occupational groupings exhibiting significant employment growth into the future include managers and proprietors, science and engineering professionals, business, legal and other professionals, health associate professionals, clerical, sales occupations, carers, other service and protective activities, and other associate professionals¹³⁷.

Part of the State's role is to facilitate timely and relevant information flow between enterprise, education and training providers and to ensure that there is a system which continually communicates changing skills requirements to those both in the workforce and within the formal education system. In particular, the Expert Group recognises that its own role will be vital in ensuring that policymakers are kept up-to-date with the latest labour market trends and shifting skills demands.

The processes currently in place at regional and sectoral level for passing information between enterprise and training providers needs to be reviewed. Specifically at regional level, the role of key agencies (EI, FÁS and the IDA Ireland), providers in further education and higher education (VECs, institutes of technology, universities), and county and regional structures should be examined to establish how they can play a greater role in ensuring that skills needs are identified and communicated widely and in a timely manner.

The Expert Group has already commented on many of the features of a system which communicates changing skills requirements to those both in the workforce and within the formal education system in *Careers and Labour Market Information in Ireland (2006)*. The key recommendations therein, which include the development of a central careers portal and a strengthening of career guidance for both adults and students, retain a particular relevance in the context of a *National Skills Strategy*¹³⁸.

Finally, much of the forecast employment growth is likely to occur in 'managerial and proprietorial' occupations as well as 'business, legal and other professionals'. Consideration should be given as to how demand for these occupations will be met through provision by the formal tertiary sector and the professional bodies responsible.

5.4.2 Generic Skills

The report highlights the need for an increasing range of generic skills in order for individuals to operate successfully within society and the economy. The principal generic skills identified were:

- **Basic/fundamental skills** – such as literacy, numeracy, using technology;
- **People-related skills** – such as communication, interpersonal, team-working and customer-service skills; and
- **Conceptual skills** – such as collecting and organising information, problem-solving, planning and organising, learning-to-learn skills, innovative and creative skills.

¹³⁶ All of these sectors show positive net employment growth in excess of 23,000 positions between 2005 and 2020

¹³⁷ These Occupational groups show positive net employment growth of in excess of 25,000 positions between 2005 and 2020

¹³⁸ These recommendations are outlined in detail in Appendix K.



These skills should be prioritised and embedded into all publicly funded education and training provision in so far as possible. DES and DETE should act to ensure that these skills are being acquired and explicitly assessed at all levels of the education and training system. In this context, the accreditation of prior experiential learning needs to be part of the assessment and accreditation process. This is of particular importance as a link in the chain of policies and actions designed to encourage upskilling within the labour force.

In terms of literacy, in May 2006 the Oireachtas Committee on Education and Science published a paper entitled *Adult Literacy in Ireland*. The Expert Group notes the recommendations of that report and highlights the particular importance of a number of them:

- The proposal that the long term objective should be to halve the number of persons on the lowest level of literacy – as defined by the IALS – and to do this in half a generation, or 15 years;
- As an intermediate step, the proposal that during the course of the National Development Plan 2007-13, a programme should be implemented which will require a quadrupling of the adult literacy tuition budget from €25 to about €100 million by 2013 with an additional €25 million for improving ancillary and support services;
- The recommendation that the number of students annually engaged in literacy programmes should be doubled, and that the average number of hours of instruction per student be increased; and
- The commitment to evaluation and quantifiable objectives, as well as the Committee's call to consider various financing methods.

5.4.3 Disciplines and Curricula

Forecasts suggest that the largest outputs from the tertiary education system over the period to 2020 will be in the areas of 'social science, business and law' (25.8 percent), followed by 'humanities and arts' (21.7 percent) and 'engineering and construction' (14.5 percent). The strategically important subjects of science and IT are forecast to account for 9.1 percent and 6.2 percent of tertiary graduates respectively¹³⁹.

The development of a knowledge economy is dependant on a strong supply of scientists, engineers and technologists. Ireland also needs a strong cadre of researchers if it is to meet its strategic objectives for Science, Technology and Innovation and fulfil its EU commitments under the Lisbon agenda¹⁴⁰. While it is possible to import such skills through immigration channels, in order to develop a sustainable science/technology base in Ireland, it is necessary to ensure that there is an adequate and certain domestic supply of these skills. The Government should, therefore, continue to promote Science, Engineering, ICT and R&D skills as an integral part of a knowledge-based economy.

For students to pursue these disciplines, they must have a strong foundation in mathematics. The results from Leaving Certificate 2006 give cause for concern; out of a cohort of 54,110 students¹⁴¹, just 14 percent secured an honours grade (grade C3 or higher) in higher level mathematics – this contrasts with 43 percent of students achieving a similar grade in English. Looking at the science subjects, there were also low levels of achievement; 7 percent, 8 percent and 23 percent of the full Leaving Certificate cohort secured an honours grade in higher level physics, chemistry and biology respectively.

¹³⁹ As highlighted previously, analysis of CAO acceptances by discipline from 2000 to 2005 show a significant fall-off in interest in engineering and computing at levels 6, 7 & 8, and a fall-off in science at levels 6 & 7. This obviously impacts on the number of graduates from these disciplines.

¹⁴⁰ The Heads of EU States agreed the European Research Area (ERA) project at the Lisbon Summit in 2000 as a contribution to making Europe the most competitive knowledge-based economy by 2010. At Barcelona in 2002, they set two targets (1) a target for Europe of achieving Gross Expenditure on R&D as a % of GDP of 3% by 2010; with (B) two thirds (i.e. 2%) to come from the private sector.

¹⁴¹ From State Examinations Commission data; this figure includes the total number of candidates sitting the Leaving Certificate (Established), the LC Vocational Programme and the LC Applied Programme. It also includes both external and repeat candidates.

Since a C+ grade in higher level mathematics is a prerequisite for most engineering and some hi-tech courses, it is clear that the Leaving Certificate results automatically exclude the vast majority of students from pursuing these careers. Furthermore, a pass in mathematics is required for students wishing to progress to many other third level courses. Thus, 26 percent of the Leaving Certificate cohort in 2006¹⁴² had limited opportunities to participate in tertiary education, solely on the basis of their mathematics results. Poor performance in mathematics, however, is not just an educational concern. It also has potentially severe economic consequences, given Ireland's desire to develop a knowledge economy. In this respect, the current NCCA review of the post-primary mathematics curricula is to be welcomed.

Mathematics is fundamentally important to the educational and economic well-being of the country. For this reason the review process at second level needs to be expedited and prioritised, and once completed should be accorded immediate consideration by all relevant stakeholders. Furthermore, the success of the revised primary mathematics curriculum needs to be evaluated and any positive lessons built upon at second level ensuring continuity for the learner. Given the importance of mathematics a strategic approach to its development needs to be adopted.

The NCCA's work on senior cycle reform adopts the premise that, by 2010, school culture will have changed fundamentally to one where senior cycle students are treated as adults, have a greater say in the running of the school, have more flexibility, less supervision and greater time for self directed learning.

The NCCA proposals envisage the re-structuring of senior cycle programmes into subjects, short courses and Transition Units; the re-structuring of LCVP/Transition innovative features into Transition Units such as work-related learning, special studies, community participation, arts education, ICT literacy, study skills etc.; and a senior cycle that can be 2 or 3 years in duration.

The NCCA, at the request of the Minister for Education and Science, is currently undertaking a review of all Leaving Certificate subjects with a view to embedding key skills such as learning to learn, information processing, personal effectiveness, communication, critical thinking and working with others and to providing for a second assessment component in subjects where this does not already exist. The NCCA has also been requested to develop, as an exemplar, a short course in enterprise education.

The work on reconfiguration of subjects is underway and Phase 1, which will prioritise maths, science and languages, is due to be completed in 2007.

5.4.4 Skills for the Enterprise Sector

As previously set out in this report, the ESG identified skills in the area of sales and marketing, supply chain management, R&D, language skills and management skills in general as important from an enterprise development perspective.

Equally, EI has identified a vision for the development of the indigenous sector which will require the development of those skills. Ireland needs to continue to support indigenous enterprise to identify their skills needs and to develop those skills which are critical to the development of the sector.

Management development is of particular importance. Management capability has a cascade effect on the level of upskilling undertaken by employees. The Small Business Forum and the Expert Group on Future Skills Needs have highlighted the need for the creation of a management development council during 2006. This recommendation now requires action.

¹⁴² This proportion of the full cohort of 54,110 is composed as follows: 4,371 achieved below grade D at either Higher Level or Ordinary Level; 5,104 sat the Foundation Level paper which does not satisfy minimum entry requirements for some third level courses; 1,721 on the LC (Established) and Vocational programmes did not sit any mathematics paper; and a further 3,155 took the Leaving Certificate Applied Programme.



5.5 Addressing the Skills Needs of Migrant Workers

As previously highlighted, immigration will continue to play an important role in Irish economic development over the years ahead. As part of the single European labour market, over 200 million EU citizens are now entitled to live and work in Ireland. This presents the State and the enterprise sector with a valuable resource as well as a number of challenges. It is acknowledged that the skills profile of immigrant workers in Ireland in the recent past has exceeded that of the resident population. It is also widely acknowledged that migrants are operating in occupations below that which one would expect, given their educational profile. There are a number of explanations for this but two to be noted and addressed from a skills perspective are the issues of comparability of international qualifications and English language skills.

5.5.1 Recognition of International Qualifications

Recognition of the international qualifications held by migrant workers is very important to preserve the efficiency and flexibility of the Irish labour market. In order for migrants to be able to access the labour market effectively, Irish employers must be able to recognise and compare the migrants' qualifications, whether academic, professional or vocational.

The National Qualifications Authority of Ireland has led the development of an integrated policy approach to the recognition of international qualifications. It has now established a one-stop-shop for the recognition of international qualifications, Qualifications Recognition Ireland¹⁴³. The Authority has also related the Irish National Framework of Qualifications to systems of qualifications in other countries and this helps in making comparisons. Any international qualification can be compared with the National Framework of Qualifications and advice can be provided accordingly. The Authority can also refer an applicant to a professional regulatory body as appropriate. The Authority is currently developing systems which address the issue of comparability of international awards and it is important that this work progresses quickly.

In 2006, it is estimated that the Authority will have processed nearly 2000 applications for advice in relation to comparing international qualifications with Irish ones. The Authority has a communications strategy in place for this service which includes identifying groups of representative bodies for migrant workers and ensuring that they are aware of the service. The Authority is also working with FÁS in terms of the employment services provided in Ireland and for those considering coming to Ireland. A more broad marketing campaign is now underway. In addition, the Authority is commencing a review of the effectiveness of the advice provided by it to date with a view to enhancing its relevance.

However, it still appears to be the case that there is a lack of awareness among both employers and migrant workers about the opportunities available to have international qualifications recognised. In further developing and implementing its communications strategy it is vital that the Authority addresses the current awareness deficit. The possibility of linking an awareness initiative to the National Workplace Strategy could also be explored in this context.

5.5.2 English Language Provision

It is vital that migrants have an adequate grasp of the English language in order for them to participate in both the labour market and society in general. English language-training support, therefore, is a vital tool if the enterprise sector, the migrants themselves and society are to benefit from large-scale immigration. As well as impacting on the immediate employment prospects of migrants, English language proficiency can determine the success or failure of integration measures and the individual's prospects for progression within employment. It is generally accepted that the language proficiency of parents has a direct impact on the success of their children in school.

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Work is already underway in tackling this issue. In 2004, the Adult Literacy Service responded to the English language needs of approximately 8,000 immigrants¹⁴⁴. While this progress is to be welcomed, the continuing occupation gap and large annual inflows of immigrants indicates that a larger response may be required. DES in conjunction with DETE and other stakeholders should examine language programmes currently in existence elsewhere in order to determine best practice in delivering language training; as well as delivery mechanisms, such a review should consider funding methods as well as mechanisms most suited to identifying individuals most in need of language training.

A related, long-term issue is the integration of migrants into the formal education and training system at all levels. Particularly of concern is the integration of migrant children into the Irish primary and post-primary school system. It is important that language or cultural differences do not result in the migrant population becoming educationally disadvantaged. While this issue was not reviewed as part of the research for this report, it is perceived to be an important one from the perspective of both the future of the labour market, and from a societal perspective.

5.6 Investment in Education and Training

Evidence shows that investment in education and training yields positive results for the State, individuals and employers. While expenditure in Ireland on education and training lags levels in leading OECD countries, the challenges facing policymakers here cannot be solved by simply increasing spending on education or training. Rather, as indicated in *Chapter 3*, policymakers need to focus on ways of improving educational and training outcomes.

That said, given the ambitious targets outlined earlier in this chapter, certain interventions will require an element of increased funding. Programmes tackling educational disadvantage, literacy and early school leaving are resource intensive, and tend to require significant levels of person-to-person contact.

The Group acknowledges that there is already significant investment by the State in education and training and it recommends that this investment continues with a focus on those areas yielding successful results. The Expert Group makes recommendations in the following areas.

5.6.1 The Low Skilled

There is a substantial number of low skilled workers employed in Ireland. This has significant implications both for the individual (in terms of their employability in a rapidly changing workplace) and for the economy as a whole (in terms of their impact on overall productivity levels). Those in vulnerable sectors within the economy or in geographically isolated areas require particular attention. *Towards 2016* makes particular provision for the upskilling of these workers, and the Vision for 2020 outlined in *Section 4.7* shows a marked reduction of the numbers within the labour force that would have skills at lower levels. Research outlined earlier shows that there is a similar return from investing in the low skilled as there is from investing in the intermediate or high-level skills. The main distinguishing factor, however, is that the low skilled are less likely to be offered, seek or avail of training. There is a greater need, therefore, for positive intervention at the low skilled level by the State.

The Expert Group notes the existing funding available under the Back to Education Initiative and believes that, as a general principle, those that do not currently hold a qualification commensurate with a qualification at levels 4 and 5 on the National Framework of Qualifications should be able to achieve such an award, through full- or part-time study, without incurring tuition costs. It further believes that a level of subsistence should be provided by the State, where appropriate, for full-time study. The funding mechanisms and costs of such a subsistence scheme need further evaluation.



It is recommended therefore that the estimated 153 million euro per annum tuition costs of moving 270,000 people from levels 1, 2 & 3 to levels 4 & 5 should be funded by the State¹⁴⁵.

The Expert Group has not undertaken a detailed analysis of the funding mechanisms that are required to stimulate participation by employers and employees in 'One Step Up' learning or which best fit the requirements of the Irish context. Recently, such mechanisms are being employed in other countries, mostly operating as initial pilots at this stage. Ireland is well placed therefore to benefit from experiences elsewhere and to adopt a model that is best suited to our requirements, in particular the potential deadweight effect if the mechanism is not carefully targeted.

There are a number of funding mechanisms which might be suitable for such a purpose in an Irish setting. A couple of examples are outlined briefly below.

The Expert Group has formed a tentative view that the most effective way to ensure flexible and responsive provision of training may be to empower individuals and enterprises through funding, rather than through direct support for providers. Such mechanisms require further research and analysis. The provision of funding directly to end-users, if properly structured to avoid the possibility of fraudulent abuse, can catalyse the development of a market where the consumer is the arbiter of what should be supplied and in what form. Many such schemes provide allowances which cover part of participating in training (in Austria, Germany, Switzerland, the Netherlands and the UK) in the form of vouchers and/or allowances, enabling users to have a choice among training providers. Some programmes are available generally but the majority are targeted at those with low skills and low incomes. In the UK, since 2004 eighteen Employer Training Pilots (ETPs) have been in operation, enabling employees to attain basic skills and NVQ-2 level skills. This programme provides financial incentives in the form of paid time off for employees and wage subsidies for employers.

5.6.2 Those in Employment

Ireland requires a third level part-time fee structure which reflects its skills, economic and social needs. The Expert Group notes and welcomes the commitment in *Towards 2016* to establish a fund which will 'alleviate the fees in public institutions for part-time courses at third level for those at work who have not previously pursued a third-level qualification' and looks forward to its immediate implementation. The Expert Group has not researched the wider issue of third level part-time fees for those who already have third level qualifications as part of this study.

However, based on the analysis of returns to education and training set out in *Chapter 3*, it seems reasonable that a tripartite contribution from the State, employers and individuals would continue in relation to the upskilling of those at work who are moving to higher skills levels i.e. NFQ Level 6 qualifications and above. The estimated cost (€304 million per annum) of upskilling the additional 172,000 number of people to levels 6-10 as set out in *Section 5.1* should be dealt with in this way.

Several policy options and mechanisms in existence have already been reviewed by the OECD, notably:

- Co-financing mechanisms involving employers, including corporate tax deductions (as operated in Austria, Luxembourg and the Netherlands) and payback clauses, which have been found to raise overall training provision.
- Provision of incentives/subsidies to particular groups, including individual learning accounts, paid learning leave, or other incentives to encourage part-time learning.

¹⁴⁵ Over a 13 year period

The OECD have found, that for those groups which have a relatively high demand for training but nevertheless receive little employer sponsored training (for example, women, immigrants, temporary workers), raising individual incentives is likely to yield a better outcome than channelling co-financing through employers¹⁴⁶. The relevant OECD findings should be taken into account when considering the most appropriate policy interventions for the Irish labour market.

Individual Learning Accounts (ILAs), are a mechanism which allows a tripartite alliance of employers, employees and the State to contribute to individual savings schemes which can only be used for upskilling purposes. Pilot ILA schemes have already been introduced in a number of countries, including Canada, the US and the Netherlands. Both the Canadian and the US schemes are limited to assisting those below a certain income and/or asset threshold, while in the Netherlands, the ILA scheme targets disadvantaged groups with low levels of educational attainment.

There have been calls in recent years for the introduction of *Paid Learning Leave* as a mechanism to increase participation in life long learning. Whether such a scheme would have the desired effect in an Irish context has yet to be determined. In the interim, recognising the need for low-qualified employees to obtain formal, off the job, education/training opportunities to move *One-Step-Up*, FÁS intends to pilot initiatives that will contribute to such wage costs. Specifically, it proposes to run two pilots in 2007 that will cater for paying employers who release their employees for education/training courses the national minimum wage in respect of certified attendance. The pilots will be organised under the direction of a social partner steering group and involve poorly qualified adults in the North West region and younger poorly qualified employees in the greater Dublin area. The outcomes of this pilot should feed into the evaluation of paid learning leave.

Early examination of the various mechanisms adopted elsewhere to encourage participation in continual learning and timely implementation of best international practice is required.

5.7 Develop Integrated Policy Approach

5.7.1 Integrated Government Policy

In order to meet the skills needs of the Irish economy as set out in this report, a coherent policy approach spanning several government departments is required, in particular, an integrated policy approach between the DES and the DETE. An implementation mechanism which coordinates the activities of all relevant stakeholders is also essential.

Policy initiatives should be 'learner' and 'enterprise' centric rather than being developed from the perspective of education or training providers. This approach would be demonstrated by adopting agreed national objectives, increased co-operation between both departments and their agencies and co-funding of initiatives. In relation to *One-Step-Up*, an integrated policy approach would also be enhanced if an implementation mechanism under the auspices of DETE and DES was put in place to coordinate the activities of all stakeholders.

Efforts to tackle educational disadvantage will require policy responses from the Department of Finance and the Department of Social & Family Affairs in addition to the DETE and the DES.

¹⁴⁶ OECD, Employment Outlook, 2003. Detailed discussions on various policies to promote adult learning and evaluations of these programmes are also available in the OECD reports *Beyond Rhetoric: Adult Learning Policies and Practices (2003)*, and *Promoting Adult Learning (2005)*



5.7.2 Role of the Educational Institutions

Changing demographic and economic circumstances are creating demand for new types of skills, and hence education and training. This poses significant challenges and opportunities for the third level sector in particular. In order to deliver the types of services demanded by consumers (both enterprises and individuals), universities and, in particular, institutes of technology (IoTs) will have to deliver flexible, market driven solutions. This will require these institutions to tap into market trends and to develop improved linkages with potential customers.

Recent developments in the Higher Education (HE) sector are significant in this context. Structurally, bringing the IoTs within the remit of the HEA and providing them with greater managerial discretion through the *Institutes of Technology Act, 2006*, will facilitate them in developing and responding in an increasingly flexible way. At a strategic level, it unifies the publicly-funded HE sector. It is important to note that the distinctive roles of the universities and the IoTs are to be maintained, in particular their applied and regional focus.

The Strategic Innovation Fund (SIF) is a competitively driven resource stream to drive organisational transformation. It is intended to foster collaboration between institutions in competing for funding that aims to:

- Incentivise and reward internal restructuring and reform efforts;
- Promote teaching and learning reforms, including enhanced teaching methods, programme re-structuring at third and fourth level, modularisation and e-learning;
- Support quality improvement initiatives aimed at excellence;
- Promote access, transfer and progression and incentivise stronger inter-institutional collaboration in the development and delivery of programmes;
- Provide for improved performance management systems and meet staff training and support requirements associated with the reform of structures and the implementation of new processes; and
- Implement improved management information systems.

There is a growing recognition that the strength of the Irish HE system, which consists of a relatively large number of institutions with diverse missions, will only be fully realised through institutional collaboration. The system aims to build world class quality and capacity and it is intended that the Fund will allow institutions to draw on their considerable respective strengths and form strong partnerships across sectoral and other barriers.

The *Strategy for Science, Technology and Innovation* initiative builds on a number of pillars of research activity already taking place most of which is within the HE sector. Eight government departments who have a particular role in research policy and funding will, for the first time, now co-ordinate their activities. The strategy will, among other things, help to build capacity and capability in both basic and applied research across the HE sector.

The *Action Plan 2005-2007*, published in December 2004 by the National Office for Equity of Access to Higher Education, identifies a number of practical goals which will help to achieve further progress. Among these goals are: the development and implementation of a national framework of access policies and initiatives so as to ensure that all disadvantaged schools, areas and communities are linked to the access programmes and routes of entry of at least one higher education institution in their region; the creation of new and expanded routes of access to higher education, in particular from further education and training and community education; the development of more diverse teaching and learning strategies in higher education so that the needs of a more inclusive student population are met; and ensuring adequate financial support and resources for learners, communities and education providers.

Currently, it is difficult to establish the extent to which educational institutions are adapting to their changed circumstances. In view of the essential role that the institutes of technology are expected to play in Ireland's future social, cultural and economic development, Forfás and the Higher Education Authority (HEA), in conjunction with DES and DETE are undertaking a review of the capabilities and capacities of the Institutes to underpin enterprise growth.

The objective of the review is to develop a comprehensive view of the diversity and depth of the Institutes' activities and to provide indications of the future potential of the sector, as an input to national policy formulation. The review is examining the following areas in order to reflect the breadth of activity that is taking place in the Institutes:

- Education and training;
- Research and innovation;
- Collaboration;
- Company formation;
- Resources and staffing; and
- Strategic development.

The review is comprised of a combination of a survey and site visits. The review results will be available early in 2007 and should help to inform the National Skills Strategy.

5.7.3 Implementation

DETE and DES should agree a mechanism to monitor and report on the implementation of the National Skills Strategy. Consideration should be given to publishing a report on an annual basis detailing progress.

5.8 Challenges and Opportunities

The Expert Group's vision of Ireland in 2020 in which a well educated and highly skilled population contributes optimally to a competitive, innovation-driven, knowledge-based, participative and inclusive economy requires that significant challenges are met by Government, enterprise and individuals. The rewards for meeting these challenges are great. The costs of not meeting these challenges are equally high.

Ireland now possesses an opportunity to determine the shape of its economy going forward. A highly skilled, well educated population will drive productivity, innovation and entrepreneurship and increase living standards for all. The consequences of inaction will be a labour force that does not meet the needs of future industry much less act as a driving force in shaping that industry.

The objectives that the Expert Group has outlined to achieve its vision are ambitious. Significant upskilling of those in employment, increasing the leaving certificate retention rate and increasing progression to third and fourth level will require a sustained and coherent effort by all stakeholders. Ireland can learn from best international practice in relation to skills development while at the same time developing its own innovative policies which reflect the nuance of Ireland's particular stage of development.

World class skills, education and training can provide Ireland with a unique competitive advantage which will allow us to remain ahead of the curve economically, while improving living standards in a participative and truly inclusive society.



Appendix A: Bibliography

- Anderson, J., (1995), *Development of expertise: Cognitive Psychology and its Implications*, New York, W.H. Freeman and Company
- Autor, D.H., Levy, F., and Murnane, R.J., (2003), *The Skill Content of Recent Technological Change: An Empirical Exploration*. Quarterly Journal of Economics, 118(4), MIT Press, Harvard, November 2003
- Autor, D. H., (2001), *Why do Temporary Help Firms Provide Free General Skills Training?*, Quarterly Journal of Economics, 116, pp.1409-1448
- Bailey, T., (1990), *The Changing Occupational Structure*, Conservation of Human Resources, Columbia University, Document No. B-7
- Barrett, A., & McCarthy, Y., (2006), *An Analysis of Immigrant Earnings and Welfare Usage in Ireland*, Presented to Dublin Economic Workshop, Kenmare, Ireland, October 2006
- Barro, R., (1991), *Economic Growth in a Cross Section of Countries*, Quarterly Journal of Economics 106, pp.407-443
- Barro, R., (1997), *Determinants of Economic Growth: A Cross-country Empirical Study*, MIT Press, Cambridge, MA
- Barro, R., and Sali-i-Martin, X., (1992), *Public Finance in Models of Economic Growth*, Review of Economic Studies, 59, 4, pp.645-661
- Barro, R., Sali-i-Martin, X., (1995), *Economic Growth*, McGraw-Hill, New York
- Barron, J.M., Berger, M.C., & Black, D.A., (1999), *Do Workers Pay for On-the-Job Training?*, Journal of Human Resources, 34, pp.235-252
- Barron, J.M., Black, D.A., & Lowenstein, M.A., (1989), *Job Matching and On-the-Job Training*, Journal of Labour Economics, 7, 1, pp1-19
- Barry, F., (2006), *Future Irish Growth: Opportunities, Catalysts, Constraints*, Quarterly Economic Commentary, Spring 2006, ESRI
- Bassanini, A., & Scarpetta, S., (2001), *Does Human Capital Matter for Growth in OECD Countries*, Economics Department Working Papers No. 282, OECD, Paris.
- Becker, G.S., (1962), *Investment in Human Capital: A Theoretical Analysis*, Journal of Political Economy, 70(5)
- Becker, G., (1993), *Human Capital*, 3rd edition, Chicago University Press, Chicago.
- Benhabib, J., & Spiegel, M.M., (1994), *The Role of Human Capital in Economic Development, Evidence from Aggregate Cross-Country Data*, Journal of Monetary Economics, 34, pp.143-173.
- Bishop, J., (1990), *Job Performance, Turnover and Wage Growth*, Journal of Labour Economics, 8, pp. 363-86
- Blakemore, A., and Hoffman, D., (1988), *Seniority Rules and Productivity: An Empirical Test*, Arizona State University, mimeo

Blundell, R., Dearden, L., Costas, M., & Sianesi, B., (1999), *Human Capital Investment: The Returns from Education and Training to the Individual, the Firm and the Economy*, Fiscal Studies, 20(1)

Bradley, J., (2003), *Human Capital and Economic Growth: What do we Know?*, Presentation to the FÁS Labour Market Conference 2003

Buchanisky, M., (1994), *Changes in the US Wage Structure, 1963-1987, Application of Quantile Regression*, Econometrica, 62, pp. 405-458

Cairney, T., (2000), *The Knowledge Based Economy: Implications for Vocational Education and Training: A Review of the Literature*, Centre for Regional Research & Innovation (CRRRI), University of Western Sydney. Centre for Research and Learning in Regional Australia (CRLRA), University of Tasmania. November 2000.

Callan, T., & Harmon, C., (1999), *The Economic Return to Schooling in Ireland*, Labour Economics, 6, pp. 543-550

Callan, T., and Wren, A., (1992), *Male-Female Wage Differential Analysis and Policy Issues*, Economic and Social Research Institute General Research Series, Paper No. 166, Dublin

Card, D., (1999), *The Causal effect of Education on Earnings*, in *Handbook of Labour Economics*, Ashenfelter, O. and Card, D., (eds.), Elsevier, New York, pp.1802-1863

Card, D., (2001), *Estimating the Return to Schooling: Progress on Some Persistent Econometric Problems*, Econometrica, 69, pp.1127-1160

Carneiro, P., & Heckman, J., (2003), National Bureau of Economic Research

Coles, M., (2005), *National Qualification Frameworks*, Draft discussion paper for the Education and Training Foundation, 22 December 2005, Draft 2

Committee on Techniques for the Enhancement of Human Performance: National Research Council, (1999), *The Changing Nature of Work: Implications for Occupational Analysis*, National Academy Press, Washington D.C.

Cooper, R.N., (2005), *Living with Global Imbalances: A Contrarian View*, Policy Briefs in International Economics, PB05-3, Institute for International Economics

Cotton, K., (1993), *Developing Employability Skills*, School Improvement Research Series (SIRS)

Curry, P., Sherry, R., Tunney, O., (2003), *What Transferable Skills should Students Acquire in College?* DCU/TCD/WIT

Dearden, L., Reed, H., & van Reenan, J., (2005), *The Impact of Training on Productivity and Wages: Evidence from British Panel Data*, The Institute of Fiscal Studies, Working Paper 0516, UK

Dearden, L., Reed, H., & van Reenan, J., (2000), *Who Gains when Workers Train?*, The Institute of Fiscal Studies, Working Paper 00/04, UK

De la Fuente, A., & Domenech, R., (2000), *Human Capital in Growth Regressions: How Much Difference does Data Quality Make?*, Economics Department Working Paper, 262, OECD, Paris.

DELNI, (2006), *Northern Ireland Compendium on Higher Education Statistics Revisions*

Denny, K. & Harmon. C., (2000), *The Impact of Education and Training on the Labour Market Experience of Young Adults*, IFS Working Paper, 00/08.



- Denny, K. & Harmon, C., (2001), *Testing for Sheepskin Effects in Earnings Equations: Evidence for Five Countries*, *Applied Economics Letters*, 8, pp. 635-637
- Department of Education & Science, (2005) *2004 Annual School Leavers' Survey of 2002/2003 Leavers*
- Department of Education & Science, (2000), *Learning for Life: White Paper on Adult Education*
- Department of Enterprise, Trade & Employment, (2002), *Report of the Taskforce on Lifelong Learning*
- Department of Enterprise, Trade & Employment, (1997), *Human Resource Development*, White Paper
- Department of The Taoiseach, (1997), *Towards 2016: Ten-Year Framework Social Partnership Agreement 2016-2015*
- Deutsche Bank Research, (2005), *Global Growth Centres*, March 2005
- Dickerson, A and Green, F., (2002), *The Growth and Valuation of Generic Skills*, SKOPE Research Paper No 26. Spring 2002, Centre on Skills Knowledge and Organisational Performance, Oxford and Warwick Universities
- Durkan, J., Fitzgerald, D., & Harmon, C., (1999), *Education and Growth in the Irish Economy*, Chapter 6 in Barry, F., (ed.), *Understanding Ireland's Economic Growth*, Macmillan, Dublin
- EGFSN, (2006), *Skills at a Regional Level in Ireland: A Study of Skills Demand at a Regional Level for Specified Enterprise Sectors*
- EGFSN, (2005), *Data Analysis of In-Employment Education and Training in Ireland*
- EGFSN, (2005), *Skills Needs in the Irish Economy: The Role of Migration*
- Eivers, E., Shiel, G., & Shortt, F., (2004), *Reading Literacy in Disadvantaged Primary Schools*, Educational Research Centre
- Ellström, P., (1998), *The Many Meanings of Occupational Competence and Qualification*, in W.J.Nijhof & J.N. Streumer (eds.), *Key Qualifications in Work and Education*, Dordrecht, Kluwer Academic Publishers
- Englander, A.S., & Gurney, A., (1994), *Medium Determinants of OECD Productivity*, *OECD Economic Studies*, No. 22, pp. 49-109
- Enterprise Strategy Group, (2004), *Ahead of the Curve: Ireland's Place in the Global Economy*
- ESRI, (2006), *Ex-ante Evaluation of the NDP*, Unpublished
- ESRI, (2005), *Medium Term Review 2005-2012*
- ESRI, (2003), *The Mid-Term Evaluation of the National Development Plan and Community Support Framework for Ireland, 2000 to 2006: Final Report to the Department of Finance*
- European Commission, (2003), *Employment in Europe 2003. Recent Trends and Prospects*, Directorate-General for Employment and Social Affairs
- European Commission, (2004), *Key Competencies for Lifelong Learning: A European Reference Framework*, Directorate General for Education and Culture, November 2004
- European Commission, (2005), *Implementing the Educational and Training 2010 Work Programme: 2005 Progress Report (Ireland)*

- Eurostat, (2006), *Employment in High Technology*, Statistics in Focus 1/2006
- FÁS, (2006), *The Irish Labour Market Review 2005: A FÁS Review of Irish Labour Market Trends and Policies*
- FÁS, (2005), *FÁS Training Strategy*
- Felstead, A., Gallie, D. & Green, F. (2002) *Work Skills in Britain 1986-2001*, Centre for Labour Market Studies, University of Leicester
- Ferguson, R.W. Jr., (2005), *US Current Account Deficit: Causes and Consequences*, Remarks to the Economics Club of the University of North Carolina
- Fleming, P., Harley, B. & Sewell, G. (2004) *A Little Knowledge is a Dangerous Thing: Getting Below the Surface of the Growth in 'Knowledge Work' in Australia*, *Work Employment and Society* 18(4): 725-747
- Florida, R., (2002), *The Rise of the Creative Class*, New York
- Foray, D., (2004), *The Economics of Knowledge*, Massachusetts Institute of Technology
- Forfás, (2006), *The Changing Nature of Manufacturing and Services: Irish Trends and International Context*
- Forfás, (2006), *A Baseline Assessment of Ireland's Oil Dependence: Key Policy Considerations*
- Forfás, (2006), *The Future of Manufacturing in Ireland*
- Frenkel, S., Korczyński, M., Donoghue, L. & Shire, K. (1995) *Re-constituting Work: Trends Towards Knowledge Work and Info-normative Control*, *Work, Employment and Society* 9(4): 773-796
- FUTMAN, (2003), *The Future of Manufacturing in Europe 2015-2020L The Challenge for Sustainability*
- Gagné, R.M., Briggs, L.J., & Wager, W.W., (1988), *Principles of Instructional Design*, New York
- Gemmell, N., (1996), *Evaluating the Impacts of Human Capital Stocks and Accumulation on Economic Growth: Some New Evidence*, *Oxford Bulletin of Economics and Statistics*, 58, pp.9-28.
- Greenlagh, C. A., & Stewart, M.B., (1987), *The Effects and Determinants of Training*, *Oxford Bulletin of Economics and Statistics*, 55, pp. 171-189
- Griffith, R., Redding, S., & van Reenan, J., (2000), *Mapping the Two Faces of R&D: Productivity, R&D, Skills and Trade in an OECD Panel of Industries*, Mimeo, Institute of Fiscal Studies.
- Grilliches, Z., (1997), *Estimating the Returns to Schooling: Some Econometric Problems*, *Econometrica*, 44, pp1-22
- Hamilton, R., (2005), *Education, Demographics and the Irish Economic Miracle*, *Quarterly Bulletin* 2 2005, Central Bank of Ireland
- Harmon, C., Oosterbeek, H., & Walker, I., (2003), *The Returns to Education: Microeconomics*, *Journal of Economic Surveys*, 17, pp.115-155
- Harris, Dr. C, (2005), *Democratic Citizenship Education in Ireland*
- Heckman, J.J., Lochner, L.J., & Todd, P.E., (2003), *Fifty Year of Mincer Earnings Functions*, National Bureau of Economic Research Working Paper, No. 9732



- Hess, W., (2006), *Going Outside, Round Tripping and Dollar Diplomacy: An Introduction to Chinese Outward Direct Investment*, Global Insight
- Hudson, S.J., (200x), *Challenges for Environmental Education: Issues and Ideas for the 21st Century*
- Hungerford, T., and Solon, G., (1997), *Sheepskin Effects in the Return to Education*, *Review of Economics and Statistics*, 69, pp.175-177
- ICTU, (2006), *Offshore Outsourcing: The Implications for Ireland*
- IMF, (2006), *World Economic Outlook 2006: Globalisation and Inflation*
- IMF, (2004), *Ireland: Selected Issues*, IMF Country Report No. 04/349
- Jenkins, H., (1995), *Education and Production in the United Kingdom*, Nuffield College. Oxford, Economics Discussion Paper no. 101
- Johnson, G., (2004), *Healthy, Wealthy and Wise?*, New Zealand Treasury Working Paper
- Judson, R., (1998), *Economic Growth and Investment in Education: How Allocation Matters*, *Journal of Economic Growth*, vol. 3 (December 1998), pp. 337-59
- Kane, M., Berryman, S., Goslin, D., Meltzer, A., (1990), *The Secretary's Commission on Achieving Necessary Skills: Identifying and Describing the Skills Required by Work*, Pelavin Associates Inc. Washington, September 1990.
- Kearns, P., (2001), *Generic Skills for the New Economy, Review of Research*, Australian National Training Authority
- Kongsrud, P.M., & Wanner, I., (2005), *The Impact of Structural Policies on Trade-Related Adjustment and the Shift to Services*, OECD, Economics Department Working Papers No. 427
- Lane, P.R., & Ruane, F., (2006), *Globalisation and the Irish Economy*, Institute for International Integration Studies Occasional Paper, No.1/March 2006
- Lynch, S.M. & Black, S.E. (1995), *Beyond the Incidence of Training: Evidence from a National Employers' Survey Working Paper 5231*, National Bureau of Economic Research, US
- McCarthy, J., (2002), *3.3 Million US Services Jobs to go Offshore*, Trends, Forrester Research
- McDonagh, S., & Patterson, V., (2002), *Some Factors Affecting the Flow of Students to the Institutes of Technology to 2010*, Skills Initiative Unit, Council of Directors of the Institutes of Technology
- McIver Consulting, (2003), *Report of the Steering Group to the PLC Review Established by the Department of Education & Science*
- McKinsey Global Institute, (2006), *Services and Ireland's Long Term Growth*, *The McKinsey Quarterly*, 2006 Number 2
- McKinsey Global Institute, (2005), *The Emerging Global Labor Market*, McKinsey & Company, June 2005
- Mankiw, N.G., Romer, D., & Weil, D.N., (1992), *A Contribution to the Empirics of Economic Growth*, *Quarterly Journal of Economics*, May, pp. 407-437.
- Moretti, E., (2005), *Social Returns to Human Capital*, National Bureau of Economic Research, Research Summary

- National Centre for Partnership and Performance, (2005), *Working to our Advantage: A National Workplace Strategy*
- National Centre for Vocational Educational Research (2003), *Defining Generic Skills: At a glance*, NCVER, Adelaide
- National Competitiveness Council, (2005), *Annual Competitiveness Report 2005*
- National Qualifications Authority of Ireland, (2001), *Towards a National Framework of Qualifications: A Discussion Document*, November 2001
- NESC, (2005), *Strategy 2006: People, Productivity and Purpose*, Report 114, National Economic & Social Development Office
- NESC, (2005), *The Developmental Welfare State*, Report 113, National Economic & Social Development Office
- NESF, (2006), *Creating a More Inclusive Labour Market*, Report 33, National Economic & Social Development Office
- NESF, (2005), *Early Childhood Care and Education*, Report 31, National Economic & Social Development Office
- Niskanen, W.A., (1998), *Challenges to Capitalism in the 21st Century*, A speech to the Symposium on Deregulation in the Global Marketplace: Challenges for Japan and the United States in the 21st Century, 6 April 1998
- Nolan et al., (2006), *Day In, Day Out – Understanding the Dynamics of Child Poverty*, Combat Poverty Agency
- OECD, (2006), *Education at a Glance 2006*
- OECD, (2005a), *Growth in Services: Fostering Employment, Productivity and Innovation*
- OECD, (2005b), *Trade and Structural Adjustment*
- OECD, (2005c), *Promoting Adult Learning*
- OECD, (2005d), *Beyond Rhetoric: Adult Learning Policies and Practices*
- OECD, (2003), *The Sources of Economic Growth in OECD Countries*
- OECD, (2003), *Employment Outlook 2003*
- O’Connell, P., (2004), *Who Generally Trains? The Effects of Personal and Workplace Characteristics on Training at Work*, Seminar Paper SP2004-05, ESRI
- O’Donoghue, J. McQuade, E and Murphy, M. *The Competencies for Next Generation Employability. A Community of Practice (COP) Report*. University of Limerick, June 2004.
- O’Neil, H.F. ed. *Workforce Readiness: Competencies and Assessment*. Lawrence Erlbaum Associates. New York and London 1997.
- Park, J.H., (1996), *Measuring Education Over Time*, Economics Letters, 60, pp. 425-428.



- Park, J.H., (1999), *Estimation of Sheepskin Effects using the Old and New Measure of Educational Attainment in the Current Population Survey*, Economics Letters, 62, pp 237-240
- Pilat, D., (2006), *The Changing Nature of Manufacturing in OECD Countries*, Directorate for Science, Technology and Industry, DSTI/IND(2006) 1
- Pilat, D. & Wölfl, A., (2005), *Measuring the Interaction Between Manufacturing and Services*, STI Working Paper 2005/5, DSTI/DOC(2005) 5
- Roche, Dr. F., & Tansey, P., (1992), *Industrial Training in Ireland*, A Report to the Industrial Policy Review Group
- Rychen, D.S & Salagan, L.H. (Eds.), (2003), *Key Competencies for a Successful Life and a Well-functioning Society*, OECD, November 2003
- Schultz, T.W., (1963), *The Economic Value of Education*, Columbia University Press, New York
- Schultz, T.W., (1981), *Investing in People*, The Economics of Population Quality, University of California Press, Berkeley
- Skillnets, (2006), *Building Skills and Competitiveness: Training Networks Programme Report 2002-2005*
- Skillnets, (2005), *Case Studies from the Skillnets Pilot Project: Measuring the Impact of Training and Development in the Workplace*
- TASC, (2005), *The Report of the Democracy Commission: Engaging Citizens – The Case for Democratic Renewal in Ireland*
- Thompson, P., Warhurst, C. & Callaghan, G. (2001) *Ignorant Theory and Knowledgeable Workers: Interrogating the Connections Between Knowledge, Skills and Services*, Journal of Management Studies 38(7): 923-942
- Triplett, J.E., & Bosworth, B.P., (2000), *Productivity in the Services Sector*, Brookings Institution, Prepared for the American Economic Association
- Turner, T. & D'Art, D. (2005) *Is There a New Knowledge Economy in Ireland? An Analysis of Recent Occupational Trends*, Department of Personnel and Employment Relations Working Paper Research Series: Paper No. 07/05, University of Limerick
- Watson, D., McCoy, S., & Gorby, S., (2006), *The Post-Leaving Certificate Sector in Ireland: A Multivariate Analysis of Educational and Employment Outcomes*, ESRI and Department of Education & Science
- Watt, P., (2005), *Approaches to Cultural and Ethnic diversity and the Role of Citizenship in promoting a more inclusive Intercultural society in Ireland*
- West, M., (2000), *State Intervention in English Education 1833-1891: A public Goods and Agency Approach*, Discussion Papers in Economic and Social History, Number 37, October 2000, University of Oxford

Appendix B: Membership of Sub-Group

Organisation	Representative on Steering Group
DETE	Dermot Mulligan (Chair)
EGFSN	Dr. Sean McDonagh
FÁS	Roger Fox
ICTU	Paul Sweeney
Forfás	Andrew McDowell
DETE	Pat Hayden
DES	Ruth Carmody
IBEC	Aileen O'Donoghue
CIT/EGFSN	Dr. Brendan Murphy
HEA	Fergal Costello
Forfás/EGFSN	Martin Shanahan (Project Manager)



Appendix C: Membership of Reference Group

Organisation	Representative on Reference Group
Skillnets	Alan Nuzum
NQAI	Dr. Anna Murphy
FETAC	Dr Rhona Dempsey
HETAC	Dr Peter Cullen
ISME	Mark Fielding (alternate Liz Carroll)
IDA Ireland	Enda Connolly (alternates Jim Whelan, Pat Howlin)
EI	David Hedigan
CIF	Peter McCabe
Teagasc	Pat Daly
Fáilte Ireland	Aidan Pender (alternate Kevin Moriarty)
IVEA	Eamon Kinch
Dept. Finance	Ann Nolan
EGFSN	Senan Cooke

Appendix D: List of Submissions Received

Aontas
American Chamber of Commerce Ireland
Association of Business & Innovation Centres
Association of Secondary Teachers of Ireland
Athlone Institute of Technology
Bord Iascaigh Mhara
Bord Bia
Chambers Ireland
Construction Industry Federation
Cork VEC
Dublin Institute of Technology
Engineers Ireland
Further Education and Training Awards Council
Higher Education and Training Awards Council
Dun Laoghaire Institute of Art, Design and Technology
InterTradeIreland
Institute of Physics in Ireland
Irish Computer Society
Limerick Institute of Technology
National Adult Literacy Agency
National Centre for Partnership and Performance
National Economic and Social Forum
National University of Ireland, Galway
National University of Ireland, Maynooth
University College Cork
Western Development Commission

The Expert Group appreciates the contributions of those that took the time to make formal submissions during the course of this research and also the contributions of those who provided valuable advice during consultation meetings. It is not possible in one document to reflect the depth of understanding and detail which was provided. However, this detail has informed the Group's thinking and will also inform its future policy advice in many areas.



Appendix E: Background Papers

Publisher	Title
FÁS SLMRU	The Current and Likely Future Supply of Skills and Qualifications: An Input by the Skills and Labour Market Research Unit to the National Skills Strategy
Forfás	The Changing Nature of Generic Skills
ESRI	Current Trends in Occupational Employment & Forecasts for 2010 & 2020
Publica	The Changing Nature of Skills within Selected Occupations
University College Cork	Human Capital and Productivity in the Irish Context

The full text of these background papers is available at www.skillsstrategy.ie.

Appendix F: Membership of Expert Group on Future Skills Needs

Anne Heraty	CPL Resources PLC	<i>Chairperson</i>
Senan Cooke	Waterford Crystal Ltd.	<i>Member</i>
Jack Golden	Cement Roadstone Holdings PLC/IEI	<i>Member</i>
Una Halligan	Hewlett Packard	<i>Member</i>
Joe McCarthy	Arkaon Ltd.	<i>Member</i>
Dr. Sean McDonagh	<i>Former Director of Skills Initiative Unit</i>	<i>Member</i>
Dr. Brendan Murphy	Director, Cork Institute of Technology	<i>Member</i>
Aileen O'Donoghue	IBEC	<i>Member</i>
Peter Rigney	ICTU	<i>Member</i>
Linda Tanham	Mandate	<i>Member</i>
Martin Shanahan	Forfás	<i>Head of Secretariat</i>
Ruth Carmody	Dept. of Education & Science	<i>Advisor</i>
Pat Hayden	Dept. of Enterprise, Trade & Employment	<i>Advisor</i>
Andrew McDowell	Forfás	<i>Advisor</i>
Fergal Costello	Higher Education Authority	<i>Advisor</i>
Roger Fox	FÁS	<i>Advisor</i>
Anne Nolan	Dept. of Finance	<i>Advisor</i>



Appendix G: Research and Secretariat Support

Research and secretariat support for this study was provided by the Forfás and Skills and Labour Market Research Unit in FÁS.

Forfás	Martin Shanahan Kay Hallahan Eamonn Cahill Conor Hand Mary Dalton Aisling Penrose
Skills and Labour Market Research Unit (FÁS)	John McGrath Jasmina Behan Barry Comerford Ann Marie Hogan Joan McNaboe Caroline Shally

Appendix H: Publications by the Expert Group on Future Skills Needs

Report	Date published
The National Skills Bulletin	December 2006
Careers Information and Labour Market Information	July 2006
International Digital Media Industry: Implications for Ireland	July 2006
Skills at a Regional Level in Ireland	May 2006
SME Management Development in Ireland	May 2006
Monitoring Ireland's Skills Supply: Trends in Education/Training Outputs	January 2006
Data Analysis of In-Employment Education and Training in Ireland	December 2005
The National Skills Bulletin	October 2005
Skills Needs in the Irish Economy: The Role of Migration	October 2005
The Demand & Supply of Foreign Language Skills in the Enterprise Sector	May 2005
Skills Requirements of the Digital Content Industry in Ireland Phase I	February 2005
Innovate Market Sell	November 2004
The Supply and Demand for Researchers and Research Personnel	September 2004
Literature Review on Aspects of Training of those at Work in Ireland	June 2004
Financial Skills Monitoring Report	November 2003
Responding to Ireland's Growing Skills Needs – The Fourth Report of the Expert Group on Future Skills Needs	October 2003
The Demand and Supply of Skills in the Biotechnology Sector	September 2003
Skills Monitoring Report – Construction Industry 2003/10	July 2003
Benchmarking Education and Training for Economic Development in Ireland	July 2003
The Demand and Supply of Engineers and Engineering Technicians	June 2003
The Demand and Supply of Skills in the Food Processing Sector	April 2003
National Survey of Vacancies in the Private Non-Agricultural Sector 2001/2002	March 2003
National Survey of Vacancies in the Public Sector 2001/2002	March 2003
The Irish Labour Market: Prospects for 2002 and Beyond	January 2002
Labour Participation Rates of the over 55s in Ireland	December 2001
The Third Report of the Expert Group on Future Skills Needs – Responding to Ireland's Growing Skills Needs	August 2001
Benchmarking Mechanisms and Strategies to Attract Researchers to Ireland	July 2001
Report on E-Business Skills	August 2000
Report on In-Company Training	August 2000
The Second Report of the Expert Group on Future Skills Needs – Responding to Ireland's Growing Skills Needs	March 2000
Business Education and Training Partnership 2nd Forum, Dublin	March 2000
Business Education and Training Partnership; Report on the Inaugural Forum, Royal Hospital Kilmainham	March 1999
The First Report of the Expert Group on Future Skills Needs – Responding to Ireland's Growing Skills Needs	December 1998



Appendix I: List of Acronyms

ASCO:	Australian Standard Classification of Occupations
BIM:	Bord Iascaigh Mhara
BMW:	Border Midland Western
BPO:	Business Process Outsourcing
CAO:	Central Applications Office
CAP:	Common Agricultural Policy
CEB:	County Enterprise Board
CIF:	Construction Industry Federation
CSO:	Central Statistics Office
CTU:	Coastal Training Units
CVET:	Continuing Vocational Education and Training
DES:	Department of Education & Science
DETE:	Department of Enterprise, Trade & Employment
EES:	European Employment Strategy
EGFSN:	Expert Group on Future Skills Needs
EI:	Enterprise Ireland
EIU:	Economic Intelligence Unit
ERA:	European Research Area Project
ESG:	Enterprise Strategy Group
ESRI:	Economic and Social Research Institute
ETP:	Employer Training Pilot
FDI:	Foreign Direct Investment
FETAC:	Further Education and Training Awards Council
GDP:	Gross Domestic Product
GNP:	Gross National Product
GVA:	Gross Value Added
HEA:	Higher Education Authority
HEI:	Higher Education Institutes

HETAC:	Higher Education and Training Awards Council
IALS:	International Adult Literacy Survey
IBEC:	Irish Business and Employers Confederation
ICT:	Information and Communications Technology
ICTU:	Irish Congress of Trade Unions
ILA:	Individual Learning Account
IoTs:	Institutes of Technology
ISCED:	International Standard Classification of Education
ISCO:	International Standard Classification of Occupations
KIS:	Knowledge Intensive Services
LCVP:	Leaving Certificate Vocational Programme
LLL:	Lifelong Learning
NALA:	National Adult Literacy Agency
NCC:	National Competitiveness Council
NCCA:	National Council for Curriculum Assessment
NCPP:	National Centre for Partnership and Performance
NCVA:	National Council for Vocational Awards
NDP:	National Development Plan
NESC:	National Economic and Social Council
NESF:	National Economic and Social Forum
NEWB:	National Educational Welfare Board
NFC:	National Fisheries College
NFQ:	National Framework of Qualifications
NQAI:	National Qualifications Authority of Ireland
NVQ:	National Vocational Qualification
ODI:	Outward Direct Investment
OECD:	Organisation for Economic Cooperation and Development
PISA:	Programme for International Student Assessment
PLC:	Post Leaving Certificate
PSA:	Public Service Agreements



- QNHS: Quarterly National Household Survey
- RFC: Regional Fisheries Centre
- SFA: Small Firms Association
- SFI: Science Foundation Ireland
- SLMRU: Skills and Labour Market Research Unit
- SOC: Standard Occupational Classification
- TES: Teacher Education Section
- VEC: Vocational Education Committees
- VET: Vocational Education and Training



Appendix K: Key Recommendations from Other EGFSN Reports

Recommendations from Languages and Enterprises: The Demand & Supply of Foreign Language Skills in the Enterprise Sector

Recommendation 1: National Languages Policy

A National Languages Policy should be formulated by the Department of Education & Science, in collaboration with the National Council for Curriculum and Assessment (NCCA), to provide an integrated and coherent approach to language education, in all learning contexts. This policy should be driven by the cultural, social and economic needs of learners and the state. In particular, it should be cognisant of the future requirements of the enterprise sector, as identified by the development agencies and industry associations.

Recommendation 2: Language Education

- (i) The work of the NCCA in reviewing the senior cycle is strongly endorsed, in particular as it relates to a new approach to language education at second level;
- (ii) The Modern Languages in Primary Schools pilot programme should be integrated into the mainstream curriculum and made available to all primary schools;
- (iii) The Post-Primary Languages Initiative should likewise be expanded and the existing language provision at post-primary level should be reviewed in the light of the lessons learnt, to increase the quality and value of the language learning experience for students;
- (iv) The importance of foreign languages as a life skill, as a promoter of cultural awareness and as a means of enhancing the value of other skills, intellectual or vocational, must be reflected in the teaching of languages at all levels of the education system.

Recommendation 3: Language Careers

IDA Ireland, Enterprise Ireland and IBEC should collaborate to build up a portfolio of case studies of the range of career opportunities open to those with foreign language skills. This portfolio should be made available to career guidance teachers, with appropriate backup, for dissemination to students.

Recommendation 4: Frameworks

The National Qualifications Authority of Ireland (NQAI), in collaboration with the Further Education and Training Awards Council (FETAC), the Higher Education and Training Awards Council (HETAC), the universities, the Dublin Institute of Technology (DIT), the NCCA, and the State Examinations Commission (SEC), should reference language competency as measured by the Common European Framework of Reference to the *National Framework of Qualifications*.

Recommendation 5: Awards

Subsequent to the implementation of Recommendation 4, FETAC, HETAC, the universities, DIT and the SEC, in consultation with the NQAI, should devise an appropriate award matrix for language learning by referencing each of their own awards, including grading/classification within these, as appropriate, within the National Framework of Qualifications against the Common European Framework of Reference. A key benefit of this exercise would be a better awareness and appreciation among employers and students alike of the language value inherent in particular courses.

Recommendation 6: IBEC European Orientation Programme

IBEC and Enterprise Ireland should capitalise on the success of the European Orientation Programme to date and consider how it might be expanded. For students, it provides clear evidence of the link between language skills and career options, and for enterprise it demonstrates how language skills can contribute to export success.

Recommendations from Careers and Labour Market Information in Ireland

Recommendation 1: Development of a Portal

The Department of Enterprise, Trade & Employment and the Department of Education & Science should explore the feasibility of developing a central Irish careers portal or coordinated gateway site. This would contain information on careers, courses and the labour market, organisational/company profiles, a range of assessment tools and testimonials, a guidance helpline and appropriate linkages to related sites.

Recommendation 2: Promotion of Existing Career Sites

The lack of advertising of career sites has had a negative impact on their use. Their existence (Qualifax, Career Directions, Grad Ireland etc.) should be widely promoted to all potential users in the media. All guidance professionals should also be advised to introduce students and FÁS clients to these sites during contact hours. If a national portal is to be established, a high impact publicity plan should be developed from the outset.

Recommendation 3: Improving Access to Useful Labour Market Information

Both the availability and accessibility of labour market information should be improved on careers databases. The availability of labour market information should be articulated on the home page of careers databases or an eventual portal. Information should be understandable by the widest possible range of target groups and as such should be readable, highly summarised and visually presented where possible. More academic and detailed labour market information should also be available for those who wish to conduct research or wish to be further informed.

Recommendation 4: Improving Existing Career Guidance and Information Resources

- (i) A wider range of reputable self-assessment tools, including CV builders, should either be made available directly on Irish careers sites or through appropriate linkages. The best use and limitations of these tools should be highlighted.



- (ii) The Departments should ask guidance bodies (Institute of Guidance Counsellors, the Association of Graduate Careers Services in Ireland, the Institute of Technology Careers Advisory Network and FÁS Employment Services) to examine how best to communicate the demand from all groups for informal information delivered by recent job holders and students about day-to-day work and course experiences.
- (iii) There is a need for institutions to continually review their prospectuses and course information to provide maximum relevant information for prospective students. Institutions should benchmark themselves against best international practice.
- (iv) The Department of Education & Science, the Department of Social & Family Affairs and the Department of Enterprise, Trade & Employment should examine how careers information, in the context of existing adult guidance services, might be adapted or extended to meet the needs of those who are not currently attached to the education or training system. Such groups would include those who are unemployed, under-employed, facing possible redundancy or absent from the workforce for long periods because of caring responsibilities.

Recommendations from SME Management Development in Ireland

Recommendation 1: Provide an accessible central point of reference for information on courses and other learning services for managers.

Recommendation 2: Assist SMEs in identifying their needs, and support them in satisfying those needs.

Recommendation 3: Identify market gaps, where current and latent demand for management development is unsatisfied.

Recommendation 4: Prepare and disseminate advice to industry, trade and professional bodies that have significant numbers of SME principals as members on developing and delivering informal learning opportunities for these members.

Recommendation 5: Induce the supply side of the market – providers of management development courses, including higher education institutions – to respond to identified gaps and to the demand of SMEs. Together with individual SMEs and their representative organisations, assist in the development of course content relevant to the needs of SMEs.

Recommendation 6: Review and certify the quality of provision.

Recommendation 7: Promote the use of structured business networking for management development.

Recommendation 8: Develop management diagnostic tool kits that allow SMEs to identify their own specific management development needs, and ensure that these diagnostic tools are widely distributed amongst SMEs.

Recommendation 9: Demonstrate and publicise the benefits of management development through Irish SME case studies that show the payoffs delivered by management training.

Recommendation 10: Continue to provide financial support for management development activities where justified on public policy grounds.

Recommendations from Innovate Market Sell: A Review of the Sales, Marketing and Innovation Capabilities of Irish Exporting SMEs Report

Recommendation 1: Align third level marketing and sales curricula more closely to the needs of SMEs.

- Incorporate modules that focus on the practical capabilities required by SMEs in third level marketing and sales curricula;
- Make industry placements an essential part of all business, marketing and sales degree courses;
- Improve networking between third level institutions and SMEs – for example, by increasing and pooling the resources allocated to industry liaison; and
- Incorporate marketing and sales modules in curricula of technical disciplines in third level institutions.

Recommendation 2: Provide training in sales and marketing for personnel in SMEs with no qualification and/or insufficient sales and marketing training.

- Develop training programmes to upskill sales personnel from a technical background in sales and marketing competencies.

Recommendation 3: Make training more accessible, focused and action-oriented, and provide on a sectoral basis, where possible.

- Expand the number of tailored, action-oriented, sector-specific training programmes, aligned to the level of experience of participants and accessible to SMEs.

Recommendation 4: Assist SMEs to source experienced sales staff.

- Provide support in recruitment (for example, sourcing personnel through targeting, financial support, etc); and in human resource management (for example, defining skill gaps, job specifications, remuneration packages, etc.)

Recommendation 5: Develop world-class marketing and sales competencies among SMEs.

- Develop an awareness campaign to highlight the merits of improved marketing and sales capabilities;
- Develop a portal to facilitate sharing of best practice in marketing and sales;
- Provide a marketing and sales capabilities benchmarking service – for example, using a marketing and sales capability scorecard as developed in this study for Irish SME needs; and
- Develop placements of SME personnel within MNCs to learn best practice.

Recommendation 6: Improve sales management in SMEs.

- Provide sector-specific sales management training and support in sourcing experienced sales managers; and
- Provide advice on IT solutions for sales management.



Recommendation 7: Promote innovation among SMEs.

- Develop an awareness campaign to increase SME awareness of the importance of innovation;
- Provide an innovation auditing service to SMEs – for example, using an innovation capability scorecard as developed in this study for Irish SME needs;
- Encourage collaboration between the innovation and marketing functions in SMEs to ensure innovation is market led; and
- Provide support to SMEs in identifying future innovation trends.

Recommendation 8: Cultivate expertise in innovation.

- Make innovation an integrative subject at third level;
- Provide basic skills training in innovation process management for technical and marketing staff;
- Develop a portal to facilitate sharing of best practice linking marketing and innovation;
- Support placement of SME innovation personnel within MNCs to learn best practice;
- Expand the number of tailored, action-oriented, sector specific training programmes; and
- Develop innovation management processes tailored to SME needs.

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