

Guaranteeing Future Growth

University Research and Education, an Investment Priority. National Plan 2000 - 2006

Summary

This contribution by The Conference of Heads of Irish Universities to the debate on Ireland's next National Plan makes the case for significant additional investment in university infrastructure, research and education over the period of the Plan.

National priorities for investment in the period 2000-2006 must address the requirements of universities as being the primary producers of graduates and researchers who will shape and drive economic growth and social development well into the next millennium. Ireland's future economic growth is increasingly dependent on knowledge based industries. Unless the historical deficit in investment in university infrastructure is addressed through this National Plan, Ireland's competitive edge will be eroded and this growth will not be realised.

In the report, C.H.I.U. sets out new benchmark statistics giving the most relevant comparisons with competitor countries.

They demonstrate the achievements of Irish Universities over the past ten years:

- One of the lowest young graduate unemployment rates in the OECD. Only those in Switzerland, the US and Germany fare better.
- One of the lowest graduate unemployment rates. In the case of male graduates, surpassed only by Austria and the US.
- One of the highest returns from university education both to the person and to the State in revenue.

However, a history of under investment is also evident:

- Irish universities have higher student teacher ratios than most other OECD countries.
- Public expenditure per student and as a % of GDP is lower than most other OECD countries.
- The expenditure on university R&D as a % of GDP is the joint lowest of all OECD countries.

The National Plan proposals of ICTU and IBEC as they relate to investment in universities are reviewed in the context of the critical contributions of Social Partners in planning national economic and social development.

The provisions in the new national plan on third level education and research will be largely influenced by three recent reports:

- ESRI "National Investment Priorities for 2000-2006"
- National Competitiveness Council (NCC) 1999 Report
- ICSTI Overview of the Technology Foresight Report

This contribution from C.H.I.U. challenges some of the key assumptions in these reports.

The views of the ESRI on third level enrolment up to 2006 do not tally with even the Higher Education Authority conservative projections which predicted continued growth to approximately 120,000, and whose predictions for 1997/98 were exceeded by 2000. The assumption that future investment in third level education can be facilitated through savings due to falling numbers is therefore incorrect.

C.H.I.U. also challenges the targets set by the National Competitiveness Council Report, the ambition of which is to place Ireland in the top 25% of OECD countries. The aim should be to be at the leading edge in the development of human capital if we are to maintain our competitive position as a high tech economy in the global knowledge-based world of the next century.

The Technology Foresight Report is particularly important in the view of C.H.I.U. It identified two areas, information and communications technology and biotechnology as the key knowledge based industries of the future. The National Plan must position the university sector to deliver the world class expertise and research capabilities which are necessary to underpin these key components of future economic growth.

Major investment in university research in the other science and technology areas, from which future new strategically important developments will evolve, is advocated, as well as in the areas of the Arts, Humanities and Social Sciences, whose central importance to the successful and harmonious development of the knowledge society is emphasised.

In making proposals for future economic and social development, it is essential to ensure an adequate supply of highly skilled workers and researchers by setting targets for participation rates in third level education. These targets must be informed by a vision of the overall skills' requirements of Ireland's knowledge-based society of the future and the strategic positioning of our competitors.

A number of key targets are suggested in this report including a total university entry level in 2005 of 18,000 and in 2010 of 22,400 school leavers and mature students and an increased enrolment of 8,250 post-graduate research students by 2006. The issue of social inclusion has been prioritised with a minimum target of 50% of each social cohort suggested as having access to third level education by the year 2015 (recent participation rates are 19% for socio-economic group A and 13% for socio-economic group C). Phased improvements are proposed in student/teacher ratios from a current OECD high of 22:1 to the OECD average of 17:1 by 2010.

Among the investment proposals designed to achieve these targets are:

- n A package of infrastructure measures requiring average annual investment of £215m for the period of the plan.
- n A range of recurrent programmes covering the areas of research, quality improvement, skills supply, social inclusion and lifelong learning requiring average annual investment of £134m for the period of the plan.

1. Universities and the National Plan

1.1. The National Plan which will set the strategies for national economic and social development at the beginning of the new millennium, must fully acknowledge that universities, as the primary providers of higher learning and research in the country, have a key contribution to make to that future development and must, accordingly, provide for increased investment in the higher education sector as a priority strategic investment.

1.2. This strongly held C.H.I.U. position is reinforced by the fact that since the preparation of the last national plan, the State has confirmed in law as objects of the universities, that they "support and contribute to the realisation of national economic and social development" and "promote the cultural and social life of society". [Universities' Act, 1997]

1.3. Irish universities play an important role in socio-economic and cultural development through their many functions in the fields of the Arts, Humanities, Social Sciences and Economics as well as in Science and Technology.

- Their primary role is to provide a high quality education, appropriate to the needs and potential of the student and the demands of society, as economically as possible. Today, more than ever before, that role includes life-long learning, and flexible education through specialised modular courses and distance learning. Post-graduate qualifications are more important now, especially for those intending to work in the private sector. Irish universities have a very good record in education, as shown by the employability of their graduates at home and abroad.
- The second most important role has always been the generation of original knowledge, technology and skills through research, especially public good research. While product development is more the province of industries, they have been aided both directly and indirectly by university research. The quality of research in Irish universities has improved over the last fifteen years as evidenced by the number of refereed publications and their citations in international journals.
- This quality is also evident from the participation by Irish universities in the Framework Programmes of the EU. As only the top twenty or twenty five percent of proposals are funded, the competition for funding is severe and demands excellence. All projects must be submitted by an international team, generally led by a private sector company. The acceptance by EU industry of

Irish universities as partners is a clear signal of respect and confidence, and of the relevance of Irish university researchers to the needs of Europe's industry. There were Irish participants from all sectors in 984 projects in the Fourth Framework Programme (up to November 1997), and of these, Irish universities participated in 380 projects.

- Over a period of time Centres of Excellence have grown out of university research units. These are very important in establishing a critical mass of research effort in a particular specialisation, which strengthens credibility for the university and for Ireland in that area. An important example is the National Micro-Electronics Research Centre, University College Cork.
- The supply of well educated and highly motivated graduates and post-graduates available in Ireland, together with the existence of Centres of Excellence constitute an important element in attracting Foreign Direct Investment [FDI] into Ireland. Neither of these factors would be in place if it were not for the universities' sustained efforts despite inadequate levels of investment over the last two decades.

1.4. Transfer of the results of academic research into industry has become progressively more important in the last twenty years. This is achieved in a number of ways:

- Hundreds of campus companies have been established by researchers to exploit ideas arising from their research work. These are sometimes located in dedicated Business Incubation Centres on the campus, in which outside firms can also establish themselves and profit from proximity to the university.
- Technology transfer to companies through collaborative R&D projects, provision of technical services, consultancy and information.
- The establishment of formal inter-university and university-institute collaboration networks, the Programmes in Advanced Technologies [PATs.]

1.5. Particularly now with the changes in public administration, and the growing importance of Regional Authorities and regional identity, the universities have an increasing role in their own geographical areas, in conjunction, as appropriate, with the Institutes of Technology. This takes the form of collaboration with local action groups and local authorities in tackling social problems, such as education for disadvantaged children and adults, addressing problems related to drug, alcohol abuse and crime.

1.6. Universities are also taking an active part in local enterprises and rural development, as well as in helping the commercial sector at a more local level, for example through providing specialised training. The establishment of Business Incubation Centres has been an important part of the universities' role in fostering an innovation culture in SMEs.

1.7. The universities can assist in implementing the recommendations of the Technology Foresight exercise conducted by the Irish Council for Science, Technology and

Innovation (ICSTI). More of the universities' research activities are now being funded by the HEA and the DES, and are determined more by the universities' own priorities whereas funds received from Enterprise Ireland, support, in the main, activities of more immediate and direct relevance to industry. The universities are also funded on their own initiative by the EU Framework Programme, by various international research foundations and by private fundraising. They are thus in a stronger position to contribute to the broader goals of national development.

1.8. The scope, level and quality of knowledge or intellectual capital that will be needed to

sustain and drive economic growth into the new millennium will not be supplied by a continuation of past ad hoc and stop-go approaches to the development of the university sector. What is required is a confident, imaginative and progressive approach to the planned development of the sector. This must be informed by a clear vision of the extent of the high-level knowledge, skills and competences which people will need, and have to update continuously in order to shape and successfully manage Ireland in the year 2020.

1.9. We cannot continue to plan reactively and belatedly as in the case of government responses to recent critical skills needs at graduate level. The lead-in time required to supply skilled graduates can be three to five years and more when new facilities need to be provided. We must move boldly into a proactive planning mode because, as our recent spectacular growth has amply demonstrated, it is the very availability of highly educated and skilled people that is now the principal factor driving economic and social development in our increasingly knowledge-based society.

1.10. Investment policies must be geared to raising the knowledge and skills of the population

to the highest level possible, more advanced and leading-edge than those of our keenest competitors. If the government is truly committed to ensuring that Ireland remains a top economic performer in a knowledge-based global economy, it must put in place visionary policies, ambitious targets and creative and innovative strategies to educate and train people of all socio-economic classes, ages and abilities to their full potential so that their contributions to economic and social development can be maximised. A quantum leap is required in planning for, and investment in, access to universities and in third-level teaching, learning and research.

1.11. Government and the Social Partners must approach the preparation and the content of

the National Plan with a vision of Ireland in the high-tech and high spec knowledge-based world of the first half of the next century, as a mature and confident country with a prosperous, sophisticated, caring, cultured and just society. Central to their planning strategies must be a clear view of the level of human capital that will be required in order to ensure that the vision becomes a reality. Ireland's future economic and social development will largely depend on the extent to which the State is prepared to invest in maximising the country's intellectual and creative capital which the universities can provide.

2. Investment in Knowledge Capital

2.1. Universities are key to development in the knowledge-based society

Development in modern societies has become more and more dependent on investment in knowledge capital. National priorities for investment in the period 2000-2006 must address the funding needs of the universities as the primary producers of the graduates and researchers who will shape and drive economic and social development well into the next millennium. Graduates and researchers trained in 2006 will still be working in 2040.

2.2. Knowledge-based industries

Further expansion of technology-based industries and new generations of high tech firms coming on stream will be required to sustain economic development. This will not happen without a major programme of investment to enlarge the quantity and improve the quality of research, technology transfer and know-how.

2.3. Expansion and under-investment in universities

Over the last 30 years the Irish university system has had to cope with a phenomenal expansion of over 280% in enrolments of full-time students. The pressure of competing demands on a limited educational budget in contending with a growing youth population resulted in severe under investment in the infrastructure of the universities. This has placed an enormous strain on university accommodation and facilities and led to an inevitable concentration on providing student places in disciplines not requiring equipment, laboratories and other costly facilities. As a consequence also, library and other support services, necessary for the proper functioning of a university were also underdeveloped. Policies for the funding of university accommodation must recognise that a holistic environment, which includes central infrastructure and social and cultural spaces, is needed to train the well educated and well rounded graduate.

2.4. Consequences of Under-investment

Irish university infrastructure stock compares badly with universities in other EU countries. There is an historic infrastructural deficit in Irish universities which if not addressed will seriously undermine the quality of training provided for university undergraduates and post-graduates. Concentration on provision of places for school leavers, because of excess of demand over supply, has resulted in seriously inadequate provision for disadvantaged and mature students. Scarcity of resources combined with pressure from expanding enrolments has resulted in under investment in providing and modernising accommodation, in harnessing new technologies for teaching, learning and administration, in meeting the access, progression and accreditation needs of the socially excluded, mature students and the employed and in gearing-up to meet the challenges of Lifelong Learning.

2.5 The policy focus on the provision of low-cost undergraduate places to meet evergrowing

demand meant that facilities were not developed for post-graduate researchers, particularly in the science and technology areas which involve high demand for modern equipment and laboratory facilities. The relatively low level of public funding

for R&D in Ireland compared to the international experience puts this country at a competitive disadvantage in sustaining and developing high tech industries which will inevitably require workers with more sophisticated high-quality skills.

Providing for wider access to universities

2.6. Increased funding is required to provide new accommodation to upgrade the pedagogical, administrative and support facilities and services and install modern equipment and technologies. This is needed to ensure the relevance and quality of courses and to provide for the flexibility of delivery, including outreach and distance facilities, required to meet the learning needs of the socially excluded and the demands of a life-long learning society.

2.7. The experience of universities to-date has clearly shown that the inadequate level of

state financial support available to first-time and second-chance students from disadvantaged backgrounds acts as a major barrier to their accessing and completing third-level education. An enlightened policy aimed at developing the knowledge and skills of the socially excluded must transform a social welfare type system of student support for the disadvantaged, into a positive programme of investment in human capital. Attractive financial incentives, well above the current rates of relevant maintenance grants and welfare payments, must be offered to students from disadvantaged backgrounds in order to significantly increase their participation rates at third level.

Research/Higher Skills

2.8. A strong and vibrant research community across all disciplines including Science,

Engineering, the Arts, Humanities and Social Sciences is a basic requirement if Ireland is to build its future on knowledge-based industries and services and at the same time develop a balanced, equitable, cultured and inclusive society.

2.9. Students and researchers must be trained in modern laboratories with state-of-the-art

equipment to meet the needs of the high tech industries on which Ireland increasingly depends for its economic growth. This reality argues strongly for increasing significantly the level of public funding in high tech skills training and R&D over the period of the National Plan. In this regard, the particular neglect of state funding for basic and strategic research, which in the main, is conducted in Ireland by university researchers, must be addressed. This year's Basic Research Grant Scheme allocations highlighted this ongoing inadequacy. Funding was available for only 81 proposals out of the 460 (17.5%) submitted by university researchers, and even then, the level of funding per project is extremely low by international standards. Increasing the supply of high tech graduates and researchers must be adopted as a key strategy for creating, attracting and expanding knowledge-based industries with strong R&D capacities.

2.10. Social innovation and insight will be at least as important as technological innovation

and insight in the development of the knowledge based society. Today's leading organisations and economies are placing a premium on creativity and innovation

rather than efficiency and predictability. In this regard, the Humanities provide unique insights into the processes of human creativity and innovation that underpin wealth creation and quality of life. The importance of organisational and social change in the development of the knowledge society and its micro counterpart the, "learning organisation", must be a focus for major research in the social sciences and humanities.

2.11. The key to establishing world class research centres is to attract world class researchers.

Centres of Excellence are built around researchers with excellent track records. The services of such researchers can only be secured, in what is a world-wide market for top research talent, by universities being able to offer internationally competitive levels of resources, facilities, assistant researchers and pay. Clear and attractive career opportunities are required for researchers. The widespread over-reliance on short-term employment contract staff is unsatisfactory for both staff and university and has a pervasively negative impact on the research environment.

2.12. The synergy between teaching and research is axiomatic. Furthermore, embedding the multi-national enterprises [MNEs] in Ireland is a priority of industrial policy, and building a strong and internationally credible research base is essential for this. Such a research base, which can spawn new commercial products and processes, will help the development of indigenous industry, another cornerstone of industrial policy.

University/Industry Collaboration

2.13. A major factor in determining Ireland's ability to maintain its economic development will be the level of commitment to deeper and wider collaboration in research and development by industry and universities. The inadequate facilities in universities have militated against universities developing a robust and comprehensive framework for strategic and creative Research, Technology and Innovation [RTI] partnerships with business. The aim should be to follow the example of universities with strong records of commercial exploitation e.g. the 4000 MIT-related companies employing 1.1 million people with annual sales of US \$232 billion.

2.14. Dedicated funds for university collaboration with industry and transfer of technology from universities to industry must be a priority. Such applied research has proved very useful to industry in the past, as evidenced by the take up of Applied Research Grants. Building on experience to-date, a variety of models can be used to manage and network university based units, provide flexibly for structures for collaboration with industry interests and cater for the mix of basic research, strategic research and more frontline technology transfer operations.

3. International Competitive Benchmarks

The role of the universities in promoting socio-economic development is fully recognised in Ireland. That role is even better appreciated by our competitor countries, where university education is seen as an essential resource and is funded accordingly. Benchmark statistics are provided in the OECD 1998 tables below which give the most relevant comparisons with competitor countries. From them, it is apparent that in Ireland:

- Irish universities have higher Student Teacher Ratios than most other OECD countries [Table 1]
- The absolute expenditure on university education per student is lower than in many of our competitor countries [Table 2]
- The direct public expenditure on university education as % of GDP is lower than most OECD countries [Table 3]
- The expenditure on university R&D as a % of GDP is the joint lowest of all OECD countries [Table 4]

Despite the above, Ireland has:

- A world class output of refereed publications from the universities in international journals
- Some of the lowest young graduate unemployment rates of OECD countries. Only those in Switzerland, the US and Germany fare better [Table 5]
- Some of the lowest graduate unemployment rates in the workforce as a whole, bettered only by Austria and the US in the case of males [Table 6]
- Some of the highest returns from university education both to the person and to the state in revenue, particularly the latter. [Tables 7, 8 & 9]

The achievements of the universities have been consistently excellent, especially considering the relatively low levels of funding provided. Not shown in the tables are two aspects of the universities' performance:

- Their record of success in participating in the highly competitive EU Framework Programme, as measure of their research excellence [Para 1.3, third bullet point]
- An output of graduates who are employable anywhere in the world

With a level of funding comparable to that of universities in our competitor countries, the contribution from Irish universities to the individual student and to the well-being of the economy would be much greater. It is essential to raise the level of investment in the universities at least to that of our competitors, if Ireland is to develop as a knowledge-based economy, trading in a competitive international market. Many countries regard Ireland as a serious competitor, and actively benchmark us. The competition is two-sided and pro-active.

Table 1. University student: staff ratios in selected OECD countries

Country	Student: staff ratio
Austria	14.5

Germany	12.5
Ireland	21.6
Netherlands	18.7
United States	14.1
Hungary	9.9
Czech Republic	11.7
OECD average	16.7

Table 2. Expenditure on university education, US\$/Student

More than \$10,000	Australia, Sweden, Canada, Switzerland, United States
\$8-10,000	Germany, Denmark, Japan, Norway, Netherlands, New Zealand
\$6-8,000	Austria, Belgium, Finland, France, Ireland, Portugal, UK, Czechia
\$4-6,000	Spain, Italy, Mexico, Hungary
\$2-4,000	Greece

Table 3. Direct public expenditure on university education as % of GDP

Direct public expenditure on Country university education as % of GDP	Country
1.6%	Sweden
1.5%	Canada, Finland, Norway
1.2%	Australia, Denmark
1.1%	Netherlands, Switzerland, USA
1.0%	France, Germany, Portugal
0.9%	Austria, Belgium, Ireland
0.8%	Greece, Spain, UK
0.7%	Iceland, Italy
0.5%	Japan

Table 4. HERD as a percentage of GDP

Country	1992	1993	1994	1995	1996
Australia	0.42	n/a	0.40	0.42	0.45
Austria	n/a	0.52	n/a	n/a	n/a

Belgium	n/a	0.45	0.44	0.43	n/a
Canada	0.40	0.40	0.39	0.37	0.36
Denmark	0.40	0.41	n/a	0.47	0.42
Finland	0.48	0.45	0.44	0.46	0.47
France	>0.37	0.39	0.36	0.39	0.39
Germany	0.43	0.44	0.43	0.42	0.42
Greece	n/a	0.19	n/a	0.22	n/a
Iceland	0.41	0.32	0.33	0.42	0.36
Ireland	0.24	0.25	0.26	0.27	0.25
Italy	0.27	0.28	0.27	0.26	0.25
Japan	0.55	0.58	0.57	0.52	0.42
Netherlands	0.60	0.60	0.59	0.60	0.60
N. Zealand	0.31	n/a	0.29	0.30	n/a
Norway	n/a	0.47	n/a	0.45	n/a
Portugal	0.27	n/a	n/a	0.20	n/a
Spain	0.26	0.29	0.27	0.27	0.28
Sweden	n/a	0.87	n/a	0.79	n/a
Switzerland	0.66	n/a	0.65	n/a	0.67
Turkey	0.33	0.30	0.24	0.26	0.28
UK	0.36	0.37	0.39	0.38	0.38
USA	0.40	0.40	0.40	0.39	0.39
OECD	0.36	0.38	0.38	0.37	0.37

Table 5. Percentage of university graduates unemployed after 1 and 5 years

Country	Unemployed after 1 year	Unemployed after 5 years
Spain	45	18
Finland	10	8
France	25	8
Ireland	8	5
Denmark	17	5
Switzerland,US,Germany	5	0

Table 6. Unemployment rates (%) for people aged 25-64 by education level

Country	Below upper second		Upper second		Third, non-university		University	
	Men	Women	Men	Women	Men	Women	Men	Women
Australia	10	8	6	7	5	4	4	3
Austria	6	6	3	4	2	2	2	3

Belgium	10	19	5	11	3	4	3	5
Denmark	10	13	6	8	5	3	4	3
Ireland	16	19	6	8	5	6	3	4
Italy	7	14	6	11	n/a	n/a	5	10
Spain	16	28	12	25	12	27	9	17
UK	15	7	8	6	5	3	4	3
US	11	11	6	4	4	2	2	2

Table 7. Personal and fiscal returns, %, from university education in 1995

Country	Personal		Fiscal	
	Men	Women	Men	Women
France	20	27	12	8
Canada	14	22	7	7
Australia	14	22	10	10
Belgium	14	7	8	13
United States	12	13	8	8
Denmark	8	7	8	8
Sweden	8	7	6	4
Ireland	15	average	12	average

Table 8. Difference in average annual earnings as between people with upper secondary education and with university education

Men	+%	Women
n/a	90-100	Ireland, United Kingdom
France,USA,New Zealand	80-90	USA
Finland,Portugal	70-80	Canada,Switzerland,France,Portugal
Australia,Ireland,United Kingdom,Italy	60-70	Finland
Czechia,Sweden	50-60	Czechia,Turkey
Canada,Germany,Norway,Turkey	40-50	Australia,Germany,Hungary,Netherlands,Turkey
Switzerland,Denmark	30-40	Denmark,Italy,Sweden
Netherlands	20-30	New Zealand

Table 9. Mean annual earnings for 25-64 year old males as % of mean annual earnings of those with upper second qualifications:

Country	Below upper second	Tertiary non-university	University
Finland	-10	+125	+185
France	-15	+125	+182
United States	-35	+118	+182
Portugal	-40	?	+180
Italy	-25	?	+175
Ireland	-22	+120	+175
United Kingdom	-20	+118	+160
Germany	-20	+1110	+150
Spain	-40	-20	+140
Denmark	-15	+105	+140

Source: OECD, 1998

4 Context for C.H.I.U. Proposals

4.1 Planning Process

While the Government has ultimate responsibility for producing the National Plan it will not do so in a vacuum. It will be influenced by the commentaries and recommendations of key recent reports on economic and social development. Social partnership also provides a structured process for representatives of employers and trade unions to contribute to the preparation of the Plan. C.H.I.U., therefore, considers it important, before setting out the universities' development targets and investment priorities for the National Plan, to review priorities identified in influential reports and by social partners and their relevance to universities.

4.2. Recent Reports

4.2.1 In recent months, three important reports in particular have been published which discuss issues in Ireland's socio-economic development and recommend future priorities for investment.

- ESRI "National Investment Priorities for 2000-2006"
- National Competitiveness Council (NCC) 1999 Report
- ICSTI Overview of the Technology Foresight Report

Although written from different perspectives, all three have much in common, and recognise the role of education in underpinning growth in Ireland's knowledge-based economy. Because the reports are likely so have a strong influence on the formulation of the National Plan C.H.I.U. in this paper reviews and corrects, where necessary, recommendations and comments made in the reports as they relate to universities.

4.2.2 The first mentioned report -ESRI "National Investment Priorities for 2000-2006 - was

commissioned by the Department of Finance for the purpose of informing the preparation of the National Plan and is wide ranging and comprehensive in its scope. Because such ESRI reports have in the past, significantly influenced national economic and social planning, particular attention is paid to the latest report. [Section 5]

4.2.3. The National Competitiveness Council (NCC) 1999 Report is important because the Council is representative of the Social Partners and there is need to highlight the priority it attaches to investment in higher education and research as a key means of Ireland gaining a competitive edge in the increasingly knowledge-based global economy. [Section 6]

4.2.3. The Technology Foresight Report of the Irish Council for Science Technology and Innovation (ICSTI) is highly significant because it focuses on knowledge as one of the main drivers of prosperity and well being and seeks to identify areas of research and emerging technologies likely to yield the greatest economic and social benefit in the future. [Section 7]

4.3 Views of Social Partners

C.H.I.U. considers that government must have due regard to the views and proposals of both IBEC and ICTU, as Social Partners. Through partnership discussions on the preparation of the Plan they are uniquely positioned to influence the eventual proposals and the principles and policies which will underpin them. They have a corresponding responsibility to ensure that the long term strategic investment, measures in human capital, which are necessary to secure a prosperous and equitable future, are put in place. Accordingly, investment priorities of ICTU and IBEC for 2000-2006, as they relate to universities are also reviewed. [Section 8]

5. ESRI "National Investment Priorities for 2000-2006"

5.1. This ESRI Report acknowledges the part played by education in Ireland's recent economic growth and considers "that the broad area of investment in education will play an important role in promoting balanced and sustainable growth in the economy in future decades" and that "Overall investment in human capital will remain a high priority". However, the report fails to set a vision for the high quality knowledge and skills required to sustain economic and social development into the next millennium or to take a sufficiently long-term view of the planning perspective required for third-level educational provision. Investment in higher education in the period 2000-2006 must take cognisance of the increasing percentage of the population with higher-quality skills that will be needed to shape and drive economic development well into the next century.

5.2. As evidenced by its adherence to "the baseline of unchanged levels of service

within the educational service" the report is complacent in regard to resources required to meet the challenges facing higher education in terms of quantity, quality and relevance, if it is to underpin the future development of the country well into the next millennium. The ESRI mistakenly takes the view that because "by 2006 the number of 19 to 21 year olds is estimated to fall by nearly 10 per cent, with further falls over the following 5 years" "the likely reduction in numbers in the system by 2006 must be taken into account". This view contrasts with the earlier statement that "Obviously the continued rise in participation in third level education will to some extent offset the expected fall in numbers in the 18 to 22 age group over the next planning period, requiring some increase in funding".

5.3. No projections are provided to support this ill-supported conclusion of a reduction in third-level numbers which completely ignores the conservative projections of the Report of the Steering Committee on the Future Development of Higher Education 1995 [SCFDHE]. That report, produced for the Higher Education Authority, projected that enrolments in third-level education would continue to grow from 102,000 in 1999 to 120,000 in 2006 and its projections for last year were exceeded by 2000. This growth in third-level enrolments will be boosted by the recent announcement of the provision of a additional 5,400 third level places for technicians and graduates in Engineering and Software. Furthermore, the Report of the Expert Skills Group on Future Skills Needs recommended that "The situation of research students should be specifically examined, with a view to increasing their numbers". When addressed, this will further expand enrolment projections.

5.4. The ESRI Report states that "the first priority in education remains the needs of those children who are currently being failed by the education system". Participation rates in third-level of almost 90% for the higher professional group contrasts starkly with just 13% for the unskilled manual group. Yet the report does not suggest targets for provision of third level places for those groups who are badly underrepresented in higher education. The SCFDHE in its projections for 2006 made no specific provision for places for increased participation of students from disadvantaged backgrounds. Significant numbers of additional places and adequate supports for students need to be provided in order that meaningful progress can be made on this important equality issue.

5.5 Likewise while acknowledging that "Ireland has the second lowest rate of mature student entry in third level in the OECD." as pointed out by C.H.I.U. "2.3 per cent here whereas the average in the OECD was 19.3 per cent" (Table 10) again no targets are proposed for places for mature student entry. On average, for every one mature student who enters the third level sector five others are denied the chance. Demand for places by mature students is increasing rapidly but the SCFDHE-projected enrolment for 2006 provided only 10.9% of entrant places for mature students, a rate barely over half that of our average competitor.

Table 10. Mature Student Entry to University-level Third-level Education

Country	Percentage of New Entrants into University-level Third-level Education aged 26 and over
Norway	31.3
Hungary	28.9
Denmark	28.0
Sweden	27.6
New Zealand	23.1
UK	22.5
Canada	19.4
USA	17.0
Germany	15.8
Netherlands	12.1
Austria	10.8
Switzerland	10.7
Turkey	10.1
Greece	4.6
Ireland	2.3
France	0.0
Average	19.3

5.6. The ESRI Report compounds the mistake in relation to projections in the advice given

that "Further expansion of third-level buildings, should, wherever possible, be avoided in the light of the impending fall in numbers in the relevant age group". The view expressed that "even where there is an increase in continuing education or other new services these can very often be provided through a fuller utilisation of existing facilities" is not supported by any analysis and ignores the enormous pressure placed on university accommodation and facilities by the massive growth in numbers which has not been matched by state investment in university buildings and equipment. The provision of capital for buildings and equipment over the period 1988-1999 is shown in Table 11. While student enrolments increased by 89% in the decade, annual capital expenditure on buildings decreased by 29% from a level of £342 per place in 1988 to £243 in 1998. High building inflation costs during the period further accentuates the decrease.

Table 11. State capital investment in Irish universities

Year	Building grants, £	Capital equipment grants, £
1988	11,299,500	1,850,000
1989	1,300,000	1,600,000

1990	19,026,857	1,500,000
1991	7,661,081	2,000,000
1992	16,567,545	2,050,000
1993	14,813,355	2,109,800
1994	12,105,603	2,000,000
1995	13,256,898	4,000,000
1996	18,200,500	0
1997	17,088,160	2,311,821
1998	16,815,000	2,000,000

5.7. C.H.I.U. strongly contends that the conclusion reached in the report that there is "scope for savings due to falling pupil numbers" does not apply to universities and consequently rejects the view that "very significant improvements can probably be met with a relatively limited increase in real resources". The suggestion that third level institutions should allow fuller use of their facilities ignores the fact that at present overcrowding, and the provision of evening, weekend and out-of-term courses have all resulted in very high levels of utilisation of facilities for teaching and study. These are in fact open to a wide range of people.

5.8. C.H.I.U. endorses the ESRI view that "the provision of necessary infrastructure for development is just as important as the provision of other services such as water, roads, public transfer and social cultural and recreational infrastructure". It also welcomes the recognition "that some buildings are in very poor state of repair and will need significant work done on them over the course of the next planning period" and that "other buildings may require modification to provide access for disabled users". The view that a combination of outreach services and modern communications could prove to be important in bringing services provided by universities to a wider audience is also supported but will require substantial investment to implement.

5.9. The tentative statement that "in the past there has probably been an under provision for equipment in the education system" is in itself a gross understatement and cannot purport to be a conclusion of an analysis of any depth. It ignores a number of reports which have highlighted the serious equipment deficit in universities and the state's negligence in this area when compared with levels of state investment in equipment in universities in competitor countries. Annual provision for equipment (Table 11) decreased from a level of £53 per student in 1988 to £31 per student in 1998, during a period of high inflation and only increased in 1999 with the yet-to-be-allocated additional funding of £5m from the Education Technology Investment Fund. The equipment deficit for research alone [excluding teaching requirements] was estimated in 1995 to be £50m [CIRCA]. Unless this deficit is seriously and systematically addressed, there is the imminent danger that the training of our graduates for high tech industries on what is obsolete equipment will be exposed.

5.10. The Report acknowledges that "there will be a need to adjust expenditure in the third-level sector, providing for new needs and improvements in quality". However, the stance adopted by the ESRI of suggesting an allocation of resources "from a base-line of unchanged pupil-teacher ratios" ignores the importance of the student-teacher ratio as a comparative measure of quality of service. The present ratio at 22:1 is higher than the OECD average of 17:1. It is unacceptably high compared to our competitor countries e.g. Germany 13:1 and must be reduced. [Table 1, Section 3]

5.11. The ESRI Report states that "the abolition of third-level fees was an undesirable development". This development did not result in any increased funding for universities. In large part it simply increased state expenditure to replace private income which the universities earned from their students. The current arrangements are inherently inequitable in that they do not apply to part-time or post-graduate students. Any move to withdraw exchequer funding for fees should not result in the state reducing its level of investment in higher education.

5.12. C.H.I.U. welcomes the ESRI's confirmation of the high priority now being attached to "knowledge capital" as a determinant of economic growth and to the critical role of R&D in the accumulation of that capital. The ESRI Report acknowledges "the relatively low level of funding of R&D compared to the international experience" and concluded that "there is a strong case for significantly increasing the level of public funding over the period of the Plan". The report also states that "The funding for basic research appears to be quite low".

5.13. Unfortunately the ESRI allows itself be persuaded by the fallacious view that "the case for substantial public funding of R&D is lessened to the extent that as a small open economy we can benefit from knowledge and human capital spillovers through trade and FDI links". This is despite the contradictory view expressed elsewhere in the report that "It has also to be recognised that it is not possible for a small country to "free ride" on research activity conducted in other countries". It must also be realised that adopting the results of international research is not cost-free and cannot be achieved without researchers with the training and expertise and credibility needed to access, to understand and to interpret research conducted in other countries. Therefore, the suggestion that we should strive (p. 93) to reach the EU average of 1.84% of GDP spent on total R&D, or less, is indefensible as Ireland cannot afford to be an average economy. We must aim to be better than our competitors.

5.14. C.H.I.U. welcomes the ESRI proposals (p.223) for a wide ranging RTI programme and that within the programme separate budgets and separate procedures should be provided for the funding of basic research and for applied research. In relation to increased expenditure on R&D, C.H.I.U strongly supports the ESRI clear recommendations that basic research "which pushed forward the frontiers of human knowledge" and strategic research which is supportive of national strategic objectives "should grow substantially more than the overall total".

5.15. Universities are centrally important to the success of the following measures and activities proposed as critical elements of the RTI programme recommended by the ESRI:

- the establishment of technology based firms e.g. campus companies
- strategic collaborative partnerships involving industry and colleges
- industry-college applied research
- international collaboration to encourage Irish access to foreign research and technology
- collaboration between colleges and across research disciplines
- promoting North-South collaboration
- ramping up the quality and quantity of research, transfer of technology and expertise
- development of regional science/technology parks, strategic research centres of excellence and advanced communications links between the colleges and such centres.

If strategic collaborative partnership is to become an effective reality universities must be consulted in the formulation of strategies, structures, schemes and procedures to implement the various measures.

5.16. C.H.I.U. welcomes the ESRI Report's recommendation that the public sector should pay for research underpinning the policy making process and wishes to point out the relevance of research undertaken by university academics which informs public policy making and review but which is not commissioned or funded by appropriate government departments or agencies. Such independent research is generally done in the area of the Arts, Humanities and Social Sciences has traditionally been badly under resourced. The recent fund of £500,000 per annum for a Research Council for the Arts, Humanities and Social Sciences, while welcome, needs to be multiplied to a level comparable to the funding available for such research in other countries.

6 National Competitiveness Council (NCC) 1999 Report

6.1. The issue of competitiveness is crucial to Ireland's continued economic development.

Being a small economy, Ireland is very open and trades up to 80% of GDP. Outputs from high tech industries - electronics and software, healthcare, engineering and pharmaceuticals and chemicals - account for most of our exports. Our competitors are, therefore, the advanced industrialised countries in the global economy, and some newly industrialised and emerging countries.

6.2. The UK is still our biggest single market and supplier and is also one of our

biggest

competitors. The Nordic countries compete effectively with us in that the development of social partnerships is well advanced, leading to stable prosperous economies. We are facing new competition from the former centrally-planned economies, such as Czechia, Poland, and Hungary. All of these countries have low labour-cost rates and are in line to join the EU. Some, such as Czechia and Hungary, have long engineering traditions, and are targets for Foreign Direct Investment [FDI], which might have come to Ireland. Asian economies also pose threats to Ireland and to other European countries.

6.3. The National Competitiveness Council [NCC] in its 1999 Report acknowledges that

- A key requirement of competitiveness strategy in the longer term is to transform the Irish economy into a source of international best practice through continued investment in the Irish people and the creation of so-called knowledge assets through the promotion of R&D and Innovation.
- Human capital is a vital strategic resource in an increasingly "knowledge-based" economy. The education system can build long term competitive advantage for the economy.

6.4. The Council draws attention to some of the challenges facing the country in building competitive advantage which are relevant to universities:

- Ireland is among the lowest ranked OECD countries in the proportion of persons between 21 and 29 in full-time education.
- The percentage of 18-21 year olds enrolled in tertiary education at 31.4% may distort Ireland's position in the upper OECD quartile, somewhat, since entry into third level tends to occur at an older age in many EU countries.
- Ireland's international ranking for non-business R&D expenditure as a percent of GNP is in the third quartile (of the 28 OECD countries). This is a measure of the weakness of the knowledge-based infrastructure in the country.
- The proportion of science and engineering degrees in the leading country, Finland, in 1996 was 39% of the total degrees awarded compared to 32% in Ireland. The output of science and engineering bachelor degrees amounted to 9% of the 24-year-old population in Finland, and 5.7% in Ireland.
- Skills are an essential element of long-term competitiveness, and there is a need to alleviate pervasive skills shortages in the economy. These seriously threaten Ireland's capacity to realise its medium term growth potential, through their impact on wage cost-competitiveness, prospective FDI flows, and the development of high value- added Irish-owned enterprises.
- The funding of non-business sector researchers is disproportionately low, due to employment of postgraduates rather than post doctoral researchers and support technicians. The output of scientific refereed papers is low (in the third quartile).

6.5. The NCC advocates "improvements in the percentage of the working age population educated to third level" as one of seven critical issues for public policy action which can make a major contribution to Ireland's medium term competitiveness. The

Council also calls for an increase in the fraction of science and technology degrees awarded in relation to the total, and in business R&D (BERD) as a percentage of GNP.

6.6. The Council advocates -

- measures to alleviate these skills shortages, including increasing the numbers of people available to work, strengthening the links between education and the world of work, and increasing the numbers qualifying each year with high technology skills.
- the promotion of life-long learning in the economy as a crucial element in ensuring the continued upgrading and renewing of human capital in the economy, to meet future needs.

6.7. While C.H.I.U. agrees broadly with the NCC's views, it is concerned that a target to place

Ireland in the first quartile of several indicators is not sufficiently ambitious to gain and maintain an edge over our keenest knowledge-based competitor economies, who are also in the first quartile. It seems self-evident that it will not be enough in the future to be as good as the competition but that we must aim to be better. If Ireland is to achieve and retain a lead position in a global, knowledge-based economy, we must seek to be the best at providing for and maintaining the highest level of knowledge skills in the workforce. Aspirations to be in the top ten per cent are more realistic, though it is better to invest at least as much as our keenest competitor.

7. ICSTI Technology Foresight Report

7.1. The Technology Foresight exercise conducted by ICSTI, the Irish Council for Science,

Technology and Innovation, concluded that Ireland, in order to reposition itself as an internationally recognised knowledge-based economy, needed a knowledge framework formed of a multi-level, interlinked partnership between higher education, industry, Government and society. C.H.I.U. supports, as a priority for investment under the National Plan, the "quantum leap in investment" required to fill the gap identified in the framework - "the need for a world class research capability of sufficient scale in a number of strategic areas within our universities and colleges".

7.2. The knowledge framework should in future realise, inter alia -

- RTD [Research Technology and Development] intensive indigenous and overseas compa
- internationally recognised competitive RTD base involving industry, universities and colleges
- an attractive career structure for researchers to work in Ireland
- investment in the physical and human infrastructure

7.3. The Foresight Report identified specific roles for universities:

- Undertaking public good research in and with Centres of Excellence, themselves operated on a partnership basis with industry and government, giving more effective technology transfer and industry-education co-operation. Centres should be networked to related research and teaching in other Irish institutions, and must be allowed, and prepared, to pay for high quality staff.
- Education of a highly skilled workforce in third level, and subsequently in the workplace, through continuous professional development in the context of a life-long learning approach. This will require the definition and delivery of new
- Provision of "fourth level" education, that is post-graduate, to the highest levels of research and technology development. This is currently an area of weakness in Ireland, due to the low level of funding for third level research, the absence of real career opportunities for researchers, and the pressure to accommodate increased numbers of undergraduates.

7.4. The report recommends the provision of an additional average £100m per annum over the next five years to fill the identified gap in world class research. C.H.I.U supports this proposal which will provide for investment in physical and human infrastructures, provide increased funding, better facilities and an attractive career for researchers, grow an RTD base involving universities, colleges and research institutes which are internationally recognised, and help develop RTD intensive and advanced technology based firms.

7.5. It is important, however, to recognise that the £500m fund recommended is in respect of science and technology and focuses particularly on niche areas of Information and Communications Technologies [ICT] and Biotechnology and is for a period of five years compared to the seven year span for the National Plan. The Report also advocates continued funding for the development of third level research, thus providing the high tech skills that industry needs now. It does not cover the many research disciplines, other than S&T which contribute to the development of knowledge and expertise that will be essential if we are to cope with the organisational, managerial, financial, social cultural and personal challenges that accelerating technological developments will pose for the knowledge-based society

7.6. Of its nature, ICSTI is concerned rather narrowly with science and technology, and while C.H.I.U. supports the Technology Foresight recommendations, the role of the social sciences and of the humanities in socio-economic development must be stressed as well. ICSTI does highlight the problems caused by lack of interest in scientific education in school children, and there is a role for social scientists in helping to solve this potentially very serious problem. Despite, and to some extent because of, its economic growth in recent years, Ireland faces many broader social problems related to disadvantaged sectors of society, chronic unemployment linked to low skill levels, crime and substance abuse. There is a role for the humanities and social sciences in

helping to solve these very serious problems, and in providing people with the skills to contend with the implications of technological advances.

8. Investment Priorities of Social Partners

8.1. National Development Plan 2000-2006 - IBEC's Submission to Government

8.1.1. IBEC in its submission to Government proposed the following four key priorities for the National Plan 2000-2006

- Eliminating Ireland's infrastructure development gap
- Addressing competitive deficits including sectoral initiatives
- Employment and human resource development
- Balanced regional development

IBEC argues that there should be a universal recognition Post-1999, that EU funding should be available to support programmes which are essential to national competitiveness and sustainable employment. C.H.I.U. supports this position on the understanding that it covers measures to promote social inclusion. C.H.I.U.'s view, however, is that the National Plan should be a comprehensive plan for economic and social development which would provide for the use of Exchequer resources to promote economic and social goals wider than those qualifying for EU Structural Fund support.

8.1.2. Under its top priority; Infrastructure, IBEC estimates the cost of filling the Infrastructural

Gap under the heading Education, Science and Technology at third-level at £1,120m. This figure does not take account of the need for ongoing investment to modernise existing facilities. C.H.I.U. proposes that planned provision should be made to bridge this gap over the period of the Plan. IBEC recommended that Government use PPP financing techniques and EU co-financing to leverage up private investment in public infrastructure and services. Universities have already promoted private investment in the development of university infrastructure as evidenced by the joint Government £60m capital programme and the £180m research infrastructure initiative.

8.1.3. Under Priority 2 Competitiveness - key actions endorsed by IBEC which are relevant to

universities and which C.H.I.U. supports include boosting the Educational Technology Investment Fund, an increase in funding for technology activities and innovation, strengthening links between industry and third-level colleges, increased support for basic research and expanding the Information Society initiative.

8.1.4. Under Priority 3 - Employment and Human Resources Development- universities have a

key role to play in tackling skills shortages, supporting and providing training programmes in partnership with business and facilitating return to work through access/foundation programmes for adults leading on to a range of degree courses. Support for programmes developed by universities which meet national objectives in these areas should be provided for in the National Plan.

8.1.5. As regards IBEC Priority 4 -Regional Development- universities, in conjunction with

Institutes of Technology, make a critical contribution to regional development by attracting inward investment and in providing skills, consultancy, expertise, technical services, R&D, and innovation and by developing campus companies and by generally collaborating with industry. Through outreach services a university's contribution extends to regions outside the one in which it is located. The input of universities to regional development must be acknowledged and supported in any comprehensive programme for regional development.

8.2. Building a New Relationship between Ireland and the European Union ICTU

8.2.1. C.H.I.U fully supports ICTU's view that "the National Development Plan must be based on the priorities for the future and not on the outdated demands of the past". C.H.I.U.

strongly concurs with the ICTU position that the poor mouth approach of the past in relation to EU funding should be abandoned in the preparation of the National Plan. C.H.I.U considers that this will only truly be achieved if a comprehensive economic and social development programme is formulated which covers the full range of priority areas for investment and which is not constrained by the expectation of EU funding or the anticipated eligibility conditions for such funding. As ICTU points out "Investment programmes will require a significant commitment of own resources including well structured and properly regulated public/private partnerships over the next decade".

8.2.2. ICTU advocates a commitment to the continuation and reinforcement of the building blocks on which our success is based including the area of education and training and proposes four main investment priorities

An Integrated Programme for Urban Living

An Integrated Programme for Education and Lifelong Learning

An Infrastructure Programme

A Social Inclusion Programme

The role of the universities in relation to each of these priorities is described in the following paragraphs.

An Integrated Programme for Urban Living:

8.2.3. C.H.I.U welcomes ICTU's recognition of the major contribution that

universities and

Institutes of Technology make to the economic development and social life of major towns and cities. It endorses the proposal that links between universities and economic and technological development should be strengthened in an all-embracing context of maximising social and economic progress rather than in just a narrow education budgetary context. C.H.I.U. also supports ICTU's proposal for the development of an integrated plan to enhance the contribution of universities to the economic and social development of their communities which would include greater access to facilities.

An Integrated Programme for Education and Lifelong Learning

8.2.4. C.H.I.U. agrees with the priority attached by ICTU to the need for investment in Lifelong

Learning and to approach planning for Lifelong Learning on a systematic and a partnership basis involving government, the social partners, and the education/training providers. It shares ICTU's belief that access to lifelong high quality education and training should constitute a central plank of Ireland's strategy to consolidate its success and build for the future.

8.2.5. According to the OECD there are four aspects to Lifelong Learning at third level and a systematic approach to planning needs to include provision for each them. They are:

Foundation learning: preparing for life and lifelong learning at an advanced level
Expanded Options: boosting skills, knowledge and competences for school graduates
Second chance: bringing in older adults who did not participate when they were younger
Second bite: upgrading, altering or refreshing the skill and knowledge base of those with third-level qualifications.

8.2.6. The OECD also propose new approaches and directions to Lifelong Learning which would comprehend:

- a continuing, lifetime relationship between learners and higher education
- new ways to think about standards and qualifications
- new partnerships and links -within, across and outside sectors and levels
- new approaches to securing and using resources

The OECD further advocates a continuing lifetime relationship between learners and higher education moving from a "one-way, one-time" activity to more frequent transitions between third-level education and adult life.

8.2.7. A well resourced programme to modernise third level education provision in order to respond to the growing demand for upgrading knowledge and skills and to meet the access, progression and transfer needs of learners provided for in the Qualifications (Education and Training) Bill 1999, should be a key component of the proposed integrated programme for education and Lifelong Learning. Provision would have to

be made for a progressive system of paid leave and flexible working conditions and for comprehensive child-care facilities so as to facilitate both workers and those seeking work to engage in lifelong education and training.

An Infrastructure Programme

8.2.8. C.H.I.U. proposes that as part of an infrastructure programme the National Plan should

address the infrastructure deficit in universities which has been caused by the failure of state capital investment to match the explosion in student numbers over the last two decades. The general levels and standards of laboratories, equipment, libraries, IT infrastructure and PC access for staff and students and facilities for research, lag far behind those of universities in our competitor countries and must be addressed under the National Plan.

8.2.9. C.H.I.U. supports the priority advocated by ICTU for the upgrading of the national

telecommunications network including a broadband infrastructure to which the universities should be given access on favourable terms. Universities and Institutes of Technology in Ireland are already disadvantaged compared to their counterparts in other countries by the substandard and outdated networking infrastructure. C.H.I.U. is proposing that provision be made in the Plan for the development of a high-speed broadband national and international networking infrastructure for higher education and research.

8.2.10 C.H.I.U. welcomes the importance attached by ICTU to the quality of the environment and

the recognition that employment in environmental research and development related activities remains very low compared to other European countries. Increased funding for university research on environmental matters would begin to redress this shortcoming.

A Social Inclusion Programme

8.2.11. C.H.I.U. agrees with ICTU "that aside from its justification on grounds of social equity,

investment in human capital is essential if growth in the labour supply is to match the demands generated by economic growth". C.H.I.U proposes that the following statement in the UNESCO Declaration on Higher Education for the Twenty First Century be adopted as the basis for government funding of provision for access to universities:

"In keeping with Article 26.1 of the Universal Declaration of Human Rights, admission to higher education should be based on the merit, capacity, efforts, perseverance and devotion, showed by those seeking access to it and take place in a lifelong scheme at any time, with due recognition of previously acquired skills. As a consequence, no discrimination can be accepted in granting access to higher education on grounds of race, gender, language or religion, or economic, cultural or social distinctions, or physical disabilities".

8.2.12. As mentioned earlier [para 5.4] C.H.I.U. proposes that the government should

set a policy target of a minimum third level participation for young people from any socio-economic group of 50% and that targets should be set for participation by mature and second chance students which would at least match those of our competitors. Adoption of targets would require the provision of adequate funding for additional places and facilities, for enhanced realistic student supports and for foundation, access and outreach programmes to build on the initiatives already being taken by third level colleges.

8.2.13. North/South Dimension

C.H.I.U. endorses ICTU's view that all broad programmes under the National Plan should have a North/South dimension. The universities are uniquely placed through the Conference of University Rectors in Ireland [CRI] to promote co-operation between universities and university/industry collaboration North/South and East/West. Irish Universities, last year, submitted almost 100 North/South projects for funding in an overwhelming response to a request from the Department of Education and Science for projects. There was bitter disappointment among university staff, who invested much time and effort in preparing the proposals, when no funding was provided. Since then, CRI has established a full-time office with a Project Director to promote North/South and East/West co-operation.

9. Development Targets

9.1. In setting targets to ensure an adequate supply of highly-skilled workers and researchers

the question is not - what can we afford? - the very question which seems to have governed the ESRI in its report on investment priorities. Rather should the question be - can we afford not to? We need visionary strategic planning for participation in third-level that will seek to optimise the knowledge-based skills' capabilities of the maximum numbers of people. This will require targets for:

- graduates
- post-graduates
- post-doctorates
- disadvantaged groups
- mature students, second chance, upskilling, return to work

9.2. Targets are also necessary for improving the quality of education and research, by

reducing the student/teacher ratio, providing new and upgraded libraries and laboratories, and by providing modern state-of-the-art equipment for teaching and research to respond to the more disparate needs of a greater variety of students in a lifelong learning context.

9.3. These targets must be accompanied by other supporting measures to increase the labour force, such as:

- providing incentives and supports for married women to enter third level education
- improving the retention level in secondary education and therefore in third level, especially of disadvantaged and mature students
- introducing a comprehensive scheme of paid study leave for workers and flexible learning-friendly working conditions
- providing conditions to discourage graduate emigration
- encouraging the return of emigrants

9.4. There are at the moment 66,000 students in universities. Projections for third-level enrolment have traditionally been constrained by concentration on provision for direct entry of students after post-primary schooling. Government policy is to maximise retention in second-level education and the current target is to have 90% of the cohort completing Leaving Certificate. This will undoubtedly further increase the proportion of the relevant age cohort seeking third level education. Official projections for school leavers with Leaving Certificate are as follows:

1998/1999	71,000
2005/2006	61,000
2010/2011	56,200

9.5. In 1998/99 approximately 20% of the cohort of school leavers enrolled in universities.

The following OECD view which relates to participation rates at third-level offers a clear competitive background against which to set targets for participation

"many countries are experiencing or envisage the phenomena of mass participation from which universal participation may be projected. Whereas two decades ago "universal" was taken to mean 50per cent of the age cohort, now it may be 80 per cent or more".

Redefining Tertiary Education, OECD 1998

In this context a distribution of 30% each for universities and institutes of technology, and 20%+ for other tertiary education would appear reasonable as a target for 2010/2011.

9.6. Mature Students: A target for university participation by mature students as a percentage of total overall full-time entries should match and eventually surpass that of our competitors by the year 2010/2011. Appropriate targets proposed are 25% of entrants for 2010 and 15% for 2005/6.

Year	School Entrants	Mature Entrants	Entrants
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Total			
2005/2006	15,200	2,800	18,000
2010/2011	16,800	5,600	22,400

9.7. Overall Entry Targets:

Targets for university entry would be as follows:-

These higher numbers of entrants together will increase enrolments in universities by approximately 11,600 by the year 2005/6. Some of this increase has already been planned by the extra places allocated to universities in the software skills package and the additional 2,154 degree places announced for universities in response to the Report of the Expert Group on Future Skills Needs. Expansion could be designed to continue to respond to the changing skills needs of the economy.

9.8. Social Inclusion:

As a minimum target, 50% of every social cohort should have access to tertiary education, in contrast to the present participation rates of 19% for socio-economic group A and 13% for socio-economic group C. Systematic progress should be made towards achieving this goal by the year 2015 as part of a comprehensive set of measures to tackle the underlying causes of educational disadvantage.

9.9. Postgraduate Researchers:

In the year 1996/1997 the ratio of postgraduate research students to undergraduate students in universities was 1:10. We must aim for a ratio of 1:5 by 2010 in order to establish a research capacity adequate for the knowledge world of the next century. An interim target of 1:7.5 should be set for 2005/6. The 1996/1997 ratio would, if maintained in the context of the projected overall increase in enrolments, result in 6250 graduate research students in 2006. The proposed target would increase the number to 8250 requiring 2000 extra postgraduate research places. Research students need to be supported at a realistic level so as to compete with the attractive packages from universities overseas and job offers.

9.10. Quality:

9.10.1. Student/Teacher Ratios:

The standard of Irish university education and research compares favourably internationally but, because of poor student/teacher ratios, it does so from a very disadvantaged position in terms of the critical contribution that the level of staffing makes to quality. Graduate courses are also delivered over a shorter number of years, on average, than in foreign universities. Factors underpinning the quality of education being provided in Irish universities must be put on a competitive basis with those in other countries. Lectures in Irish Universities deal with 29% more students than the OECD average and 69% more than their German counterparts. There should be phased improvement of the student/teacher ratio to at least the OECD average over 10 years.

9.10.2. Quality Improvement:

Investment is also needed at an increased level to enable the universities to discharge their statutory obligations in relation to Quality Improvement/Quality Assurance and Faculty Review. Additional funding will also be required to provide support for professional development, for updating teaching skills etc. Adherence to good international practice would require an allocation equivalent to 5% of staff costs.

9.11. Buildings/Equipment

Adequate provision must be made to address the equipment deficit in universities and for ongoing re-investment in equipment to bring it up to the level of specialisation of world-wide industry and academia in our competitor countries, for both teaching and for research. Capital expenditure is also required for buildings and for facilities to cope with expanding student numbers and to compensate for past under-provision. Depending on the age and condition of buildings it is estimated that annual reinvestment in buildings should be made at the rate of 5% to 15% of their replacement value. It must be remembered that the lead-time in commissioning new buildings will be several years at least, and immediate action is therefore required. Even repairing and refurbishing existing buildings takes time. A more streamlined approval and payment system for capital projects is a vital requirement. Equally, if private investment in universities is to be maximised, a more enlightened and much less bureaucratic approach by government to tax relief on private contributions to university developments is vital.

9.12. High-Speed Broadband National and International Networking Infrastructure for Irish Higher Education and Research.

Significant investment in high-speed broadband networks is necessary to position Ireland at the leading edge of international telecommunications developments. Ireland's National Education and Research Network [HEAnet] has more than 30 subscriber institutions nationwide and a user base in excess of 100,000 people. It needs to be upgraded and expanded in order to bring it to the standards of research networks across the US and Europe which have moved to the next generation of network infrastructure. Ireland's third-level researchers, staff and students must have access to high performance research applications which are available in the UK and European and US education networks if we are to continue to produce the skilled workforce that will be vital to Ireland's capacity to attract and develop world leading technology companies.

This will involve

- implementing a broadband national network for Universities and Institutes of Technology
- the establishment of a broadband link to Belfast which will facilitate large-scale North-South and East-West collaboration between third-level colleges
- activating access to European higher education and research institutes through the TEN-155 pan-European network
- establishing high-speed connectivity to the US Internet

9.13. HERD

Present public spending on R&D in the third level sector (HERD) is far too low at 0.25% of GDP and must be increased to at least 0.5 % of GDP in line with our competitor countries.

10 Investment Proposals

10.1. Infrastructure investment measures 2000-2006

A comprehensive, cohesive and integrated programme of additional investment in university infrastructure and operations is recommended to meet the targets set for universities to maximise their contribution to national development. It is proposed that the investment would be financed by a combination of EU Structural Funds and the Exchequer and by private/industry investment under PPPs, where possible. The following set of measures are proposed:

- **Research and Skills Measure** to provide the infrastructure, facilities and equipment in universities necessary to develop critical masses of leading-edge skilled workers and researchers in areas such as ICT, Biotechnology, Advanced Manufacturing Technologies, and Pharmaceuticals. By optimising such investment in the provision of physical facilities aligned to a programmatic approach to research support, the fund could reinforce specialisation within university research, facilitate collaboration across disciplines and between colleges and promote North/South collaboration. **Fund £490m**
- **Centres of Excellence Measure** to provide university facilities required to develop world class research centres of excellence and a ranges of services and activities to enhance collaboration and interaction with business, to promote technology and knowledge transfer and strengthen higher skills development. **Fund £210m**
- **Enterprise Centre Measure** to support universities, in conjunction with industry, in creating enterprise centres to equip scientists and engineers with entrepreneurial and business skills and to develop the transfer and exploitation of knowledge and know-how. **Fund £140m**
- **Modernisation Measure** to provide for the expansion and modernisation of university infrastructure, equipment and facilities in order to cater for wider and more flexible access to university and to underpin the quality of teaching and other services and ensure their relevance to a more varied student population for an era of lifelong learning. If annual stock of buildings, including central service buildings, is valued at £20,000 per student place, the total stock value of university buildings is £1,320m. A renewal programme at the rate of 5% per annum would be a minimum required for the modernisation of buildings. **Fund £460m**
- **Social, Cultural and Recreational Measure** to address the deficit in infrastructure caused by concentration of capital works to deal with the expansion in university enrolments and the scarcity of exchequer funding for capital projects. Significant investment is required to bridge the infrastructural deficit if universities are adequately to meet the growing need to provide for the social, cultural and recreational development of their students. With the right facilities the universities can be developed as social, cultural and recreational

centres to meet the needs of the wider community guaranteeing effective and efficient use of facilities. **Fund £85m**

- **Measure to build an All-Ireland and international inter-university superhighway.**

Universities' capacity to develop research, to contribute to national and regional development, and to develop North/South collaboration is hindered by the lack of advanced communications link between the colleges. A North/South high speed, state of the art, technological superhighway between the nine universities on the island of Ireland and the Institutes of Technology, networked internationally, will enhance the capacity of the universities to collaborate and communicate with the global academic community and contribute to the economic, social and cultural development of regions and communities on the island of Ireland. The proposal is set out in more detail in the Appendix. **£126m.**

10.2. Recurrent Programmes

Targeted programmes of investment in universities will be required to meet the future skills needs of the economy and the balanced and equitable development of society. Amounts quoted below represent the additional total extra funding required for the seven year period of the National Plan.

10.2.1. Research Programme

A comprehensive and integrated programme of continued investment in basic, strategic and applied research is required. It should provide schemes for-

- Basic research projects proposed as strategic priorities of universities **£80m**
- Basic research grants proposed by researchers and approved by peer review **£70m**
- Schemes to fund advanced collaborative research projects between universities and industry to be allocated on a competitive basis **£210m**
- Arts, Humanities and Social Sciences Research Council **£45m.**
- Scholarship fund to be provided to universities to finance research postgraduate students and post-doctoral fellows on a competitive basis in line with overall college research plan. Research grants should provide attractive financing arrangements for researchers and research students **£50m.**

10.2.2. Quality Improvement Programme

Schemes to improve the quality of higher education and research -

- Improvement in student/teacher ratio- **£250m.**
- Establishment of QI/QA units and operation of QI/QA programmes and professional development of staff **£80m.**

10.2.3. Skills Supply Programme

Additional numbers of student places would require extra funding over the period of the Plan. Some of this funding has already been approved as part of the ETIF software skills package and the recently awarded additional places in response to the Expert Group on Future Skills Needs report.

£60m.

10.2.4. Social Inclusion Programme

Programme to combat social exclusion by providing schemes and facilities aimed at improving access to university courses by students from disadvantaged backgrounds, including second chance students, and by impaired or disabled students.

- Increased targeted funding for universities to develop outreach and foundation programmes for students from disadvantaged backgrounds.
£25m.
- Funding for universities to cater for the special needs of students with impairments or disabilities.
£10m.
- Additional financial support would be required for students, including mature students, to supplement maintenance grants under the Higher Education Grants Scheme and relevant social welfare allowances should be increased and transformed into education/training payments providing a financial incentive to them to take up third level courses.
£50m.

10.2.5. Life Long Learning Programme

- Scheme aimed at increasing numbers of mature students on full-time degree courses to levels comparable to or better than our competitors, would be funded under the above Skills Supply and the Social Inclusion Programmes.
- Scheme to support development by universities in conjunction with business/industry/unions of a menu of flexible, lifelong learning opportunities for workers to continue to update and upgrade their knowledge and skills.
£8m.

APPENDIX

Development of a High-Speed Broadband National and International Networking Infrastructure for Irish Higher Education and Research.

1. Background

HEAnet is Ireland's National Education and Research Network with more than 30 subscriber institutions nationwide and a user base in excess of 100,000 people. The national research networks across the US and Europe have moved to the next generation of network infrastructure. Significant investment in high-speed broadband networks is necessary to position Ireland at the leading edge of international telecommunications developments.

2. National Networking

Ireland's third-level researchers, staff and students must have access to high performance research applications which are available in the UK and European and US education networks if we are to continue to produce the skilled workforce that will be vital to Ireland's capacity to attract and develop world leading technology companies.

The implementation of a broadband network for Universities and Institutes of Technology involves establishing fibre backbone and regional nodes and upgrading of ATM and SDH networks from 155Mbps [Megabits per second] to 622Mbps to 2.4Gbps. This would require an additional investment of £4m per annum.

3. Northern Ireland and UK Connectivity

The establishment of a Broadband link to Belfast inter-linking the two national high-speed networks seamlessly would promote and facilitate largescale North-South and East-West collaboration between third-level colleges on project such as e-video-conferencing, supercomputing and distance learning. Establishing a 155 Mbps access to Belfast would require an investment of £3m per annum.

4. European Networking

The launch of the TEN-155 pan-European network represents the next generation of European networking. The high-speed network is the largest international network in Europe, connecting 16 National Research Networks at speeds of up to 155 Mbps. HEAnet has negotiated agreement to establish a Point of Presence in Dublin for access by Irish users to this critical community. Activating this access to collaborate on a pan-European basis for Ireland's researchers requires an annual investment of £4m.

5. US Internet Connectivity

The most heavily demanded resource for Irish researchers and third-level institutions is access to the US Internet. At present "Internet 2" and the Next Generation Internet (NGI) is coming on-stream in America and Canada. High-speed access to the US Internet and the collaboration with developers across a broadband network and access to the resources and research testbeds available there are critical to Ireland's success. Investment required would be £6m per annum.

6. Cost of Proposal

The overall annual cost of establishing and maintaining the national network and its international links would of the order of £18m per annum or £126 over 7 years.