

EDUCATIONAL PLANNING FOR INDUSTRIAL NEEDS

In discussing this subject, I would like to concentrate on five main areas :

- Recent trends in industrial development
- Recent trends in educational development;
- An assessment of the current position in relation to industrial requirements
- Indications of future demand
- The response which will be required from the Educational system.

Trends in Industrial Development

There has been a dramatic change in the Irish economy in recent decades. It has changed from an economy in which the majority of the people in the labour force are employed on farms to one in which the greater part of the productive labour force is employed in industry. Today, almost one third of the population works in an industrial environment and this proportion is likely to grow as the economy becomes more developed. Over the last 20 years, industrial output has grown by approximately 6% per annum and industrial employment by about 1½% per annum. It is likely that this average growth rate will be achieved during the '70s, despite the exceptional circumstances of the first half of the decade when Irish industry had to, simultaneously, cope with the complete abolition of tariff barriers against other Member States of the European Community; a reduction of tariffs to a very low level against the rest of the world; and the worst international recession since the second World War. In 1975 industrial output actually fell by 6%. However, since the trough of the international recession was reached in the Autumn of 1975, Irish industry has maintained an expansion rate close to 10% per annum.

Industrial productivity has maintained an average annual rate of

improvement of approximately 4½% per annum, due to technological change and more modern equipment. It is probable that this rate of technological change will gradually accelerate over the next decade.

This fact was recognised when the White Paper "National Development 1977 - 1980" set a target output from manufacturing industry of 13% per annum, but made allowance for a 6½% annual improvement in productivity. Manufacturing employment is expected to grow by .6% per annum over the period, and to provide an average of 13,500 new jobs in industry each year.

Since these are targets to which the Government committed itself in its White Paper last January, they should provide the guidelines for the development of the supporting infrastructure.

The position may, therefore, be summarised as follows :

For the last 20 years, manufacturing employment has grown by an average of 3,000 per annum. Over the last five years there has been no nett increase in industrial employment. Over the next 5 years, a target annual growth for manufacturing employment of 13,500 has been set. The structure of manufacturing employment has altered significantly over the last decade. Traditional industries, which could only survive behind high tariffs, have disappeared and been replaced by industries based on new technologies. This change in technology has also occurred in the other Member States of the European Community. There are signs that its pace is accelerating.

Furthermore, the trading relationships of the Irish economy have altered significantly since the beginning of this decade. In 1971, almost 90%

of Irish exports were sent to English-speaking countries. Today, this figure has dropped to less than 70%. Trade with continental EEC countries has expanded six-fold.

Present Situation

Despite the fact that the majority of productive employees in the country - without whom the services sector could not prosper - work in industry, there is still remarkable little knowledge of industrial work among parent and teachers, most of whom were educated before this Irish industrial revolution. All too often, still, children are advised to take a job in the bank or the civil service. For historical reasons the rewards of technical skill and knowledge are neither understood nor advocated.

Secondary Education

In fairness, it must be recognised that there is evidence of change in our secondary schools.

TABLE 1

Leaving Certificate Subjects:	1973		1977		% Growth 1973-1977
	No.	% of Total	No.	% of Total	
Physics	2891	11.4	4656	13.2	61.0
Chemistry	4628	18.3	6796	19.3	46.8
Economics	4241	16.8	7406	21.0	74.6
Accountancy	4900	19.4	7150	20.3	45.9
Business Organisation	5347	21.1	9172	26.0	71.5
French	11783	46.6	19763	56.0	67.7
German	583	2.3	1215	3.4	108.4
Total Leaving Cert.	25280		35268		39.5

Table 1 indicates the proportion of students taking subjects of particular interest to industry, and provides some indication of the rate at which this change has taken place since 1973. Since over half the workforce is employed in the goods producing sectors - industry or agriculture - in which a knowledge of technology is of very great importance, the proportion of Leaving Certificate students, taking a science subject, such as, physics and chemistry, is still far too low to meet the needs of a modern economy, which must adapt successfully to technological change. Whereas the proportion of Leaving Certificate students taking French has grown steadily, it is extraordinary that only 3% have taken, or been given, the opportunity to study German, despite the fact that, in 1977, Germany was Ireland's second largest trading partner.

#### Apprenticeship

During recent years, there has been a gradual increase in the number of first-year apprentices, with the exception of the recession year 1975, when the survival of many firms was in question. Apprenticeship training has become more intensive with the normal period reduced from 5 years to 4 years, and a 3-year option, subject to agreement, where the trainee has the Leaving Certificate.

Current localised shortages in many skilled trades indicate that there is need for a considerable increase in the number of qualified craftsmen. Since much of the additional demand will be from new firms commencing production, it is essential that detailed plans are formulated to ensure that there is an adequate supply of skilled craftsmen available to cope with the expected growth in industrial employment. Consideration must be given to factors such as the cost of training, legislative requirements and the ratio between apprentices and skilled

craftsmen. Table 2 shows the pattern of apprenticeship development in recent years.

TABLE 2

First and Final Year Apprentices (on 30th June each year) Registrations:

	1973*	1974	1975	1976	1977	1978	% Change 1973-1978
First Year	2188	2815	2509	2214	2642	3487	59.4
Final Year	3060	3546	3382	3241	3175	3406	11.3

\*Figures relate to May 1973

Third Level Education

a) NCEA Award

The National Council for Education Awards for Certificates and Diplomas at the College of Technology have introduced a new element into the supply for industrial technicians and technologists since the early 1970s.

TABLE 3

NCEA Certificates:

	1973	1974	1975	1976	1977	% Growth 1973-1977
Engineering/ Construction	271	308	366	435	566	108.8
Business/Social Studies	75	179	173	181	282	276.0
Science/Para- medical	96	117	130	177	271	182.3
Total	442	604	669	793	1119	153.2

Table 3 shows the development of the number of students completing national certificates and diplomas in the three main areas related to industry since 1973.

In 1973, the total number of students completing certificate and diploma courses was 442. By 1977, this had expanded to 1119 - a growth of over 150%.

Approximately 50% of these students had taken engineering qualifications. It is particularly interesting to note that a survey, comprising almost 90% of all of those awarded certificates in the 5-year period from 1973 to 1977, indicated that the total of those who emigrated, are deceased, and are unemployed is only 4%. These figures provide a dramatic vindication of the decision taken in the mid-60s to construct the nine Regional Colleges of Technology.

However, since the Irish economy has shown itself capable of absorbing over 550 holders of engineering certificates and diplomas in 1977, which was over twice the 1973 level, this very success raises questions about future requirements.

b) Output from the Universities

The output of engineers, scientists, commerce and business studies graduates has increased by about one third since 1973.

TABLE 4

New Graduates from Universities:

	1973	% to Ind.	1974	% to Ind.	1975	% to Ind.	1976	% to Ind.	1977	% to Ind.	% Growth 1973-1977
Engineering	245	55.9	292	54.4	330	35.7	305	43.6	331	37.5	35.1
Science	352	10.5	399	9.8	481	8.5	505	9.5	546	8.2	55.1
Commerce/ Business Studies	428	9.8	391	4.8	473	4.6	447	8.5	493	6.9	15.2

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Despite this, there is evidence that industry would welcome a significant increase in the number of engineering graduates in disciplines such as

mechanical, production, industrial and chemical engineering. There is no unemployment among engineering graduates having these disciplines. During recent years a large number of engineering graduates have entered employment outside the industrial sector. Industry has had to cope with increased competition from Governmental and service organisations for newly-qualified graduates.

#### Unemployment in Industry

Further evidence of the buoyant demand for people, having technological qualifications, or industrial skills, is provided by the latest occupational classification of the unemployment register.

Table 5 shows an occupational classification of the March 1978 Unemployment Register.

TABLE 5

Unemployment Occupational Classification:

	Numbers	% of Total Unemployed
Food, Drink and Tobacco	1673	1.7
Clothing, Footwear and Textiles	5178	5.3
Wood and Furniture	115	0.1
Metals and Engineering	3454	3.5
Printing and Publishing	260	0.3
Manufacturing Industry	10680	10.9
Total Unemployed	98150	

Of a total of 98,150 on the Register in June 1978, only 11% were in these occupational categories.

Future Demand

Since there has been little, if any, increase in industrial employment between 1973 and 1978, it follows that the industrial demand over this period for skilled workers; and holders of engineering certificates, diplomas and degrees has been due to the demand caused by natural replacement and improved technology within industry. It is likely that, if the White Paper targets for the creation of 13,500 net new additional jobs in industry, each year, are to be fulfilled, industrial demand for skilled workers, technicians and technologists each year will be, at least twice as high as the average annual demand over the last five years.

Furthermore, there is evidence that the increasing technological bias of the economy outside the industrial sector is creating additional demand for people having technical skills and qualifications.

It is essential that appropriate measures are taken by our education and training authorities to ensure that there will be an adequate supply of qualified people to meet the needs of an expanding economy. In particular, it is of the utmost importance that policy decisions are taken now to achieve a major expansion in the number of apprentices for industry and in the number of engineering students in the Colleges of Technology and the Universities.