THIRD LEVEL QUALIFICATIONS
BY ALTERNATIVE MODES OF STUDY

By James J. McGoldrick

Submitted for the Degree of Master of Arts in Engineering Technology.

School of Engineering,
Regional Technical College,
Ballinode,
Sligo.

Supervisor: Mr. Brendan MacConamhna, M.Sc.,Dip.in Stats.,
F.S.S., F.I.M.A.

Submitted to the National Council for Educational Awards,
June 1992.

Dedication

To my wife Stella,

my children

Albertina
Ursula
David
Derville

and to my Mother.

This thesis has not prevously been submitted to this or any other degree awarding body and with acknowledged exceptions is entirely my own work

James J. Mc. Goldrick

Acknowledgements

To my supervisor Brendan MacConamhna for his guidance and advice during the course of my study.

To Mr. J. Cox (Head of School of Engineering) for placing College facilities at my disposal thus enabling me to carry out the research.

To my wife Stella and children for their support during the past two years and the many years before this which has been a continuing source of my inspiration.

To Dr. A. Moynihan for placing his time, company and expertise with Mackintosh computers at my disposal during the presentation of this thesis.

To Mary Barry for the typing skills which have made this presentation possible.

To Francis Lucy M.Sc. for her help in tiding up the final presentation.

Third Level Qualifications by Alternate Modes of Study

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ABSTRACT

Chapter One follows the progress of technological education in Ireland from the Autumn of 1961 when the OECD asked for a survey of the educational systems of each of its member countries, so that there would be a well educated and well trained pool of graduates to take Ireland into the technological age.

Chapter Two follows the history of Sligo RTC from its intake of 38 technician students in the summer of 1971 to an application from over 6,000 prospective students,in the Summer of 1990 to fill the 600 approximate first year technician places on offer, at Certificate, Diploma, Degree and Post Degree level.

Chapter Three addresses the educational progress of students through third level education in a mode other than the norm. It is an analysis of a number of different experiments that have taken place at Sligo RTC and covers courses at Certificate, Diploma and Degree level. It shows how this can be a cost effective method of bringing education to many who have missed the main stream mode. This is termed "Second Chance Education" in the thesis.

Chapter Four develops the idea of using outcentres as a means of taking third level education out to the people, with the resultant benefits of reducing the cost to the student and utilising space now coming available at second level centres, due to a drop in second level student numbers.

Chapter Five developes the ideas expressed in Chapter Four by placing them in a national setting. Further ideas are incorporated which could deal with a large cross-section of the population, e.g. from prisoners to pensioners.

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CHAPTER ONE

DEVELOPMENT OF TECHNOLOGICAL EDUCATION IN IRELAND

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INTRODUCTION

Prior to the nineteen sixties the Irish Economy was largely based on agriculture. The mechanisation of the agricultural industry resulted in decreased employment on the land with a consequent drift of population from rural to urban areas and many emigrated to the UK and the USA.

The Fianna Fail Government of Sean Lemass in the early 1960's abandoned the policy of protectionism, and instead pursued a policy of rapid industrialisation. Grant Aid and Tax Relief incentives were used to encourage foreign multinational companies to establish in Ireland. When Ireland joined the E.C. there was also the additional incentive of a "foothold" in Europe for non-European countries.

The labour requirements of the new industries included semi-skilled machine operators, Technicians and Technologists. This was particularly so in the case of the "High-Tech" industries which the Government particularly wished to attract. It soon became apparent that the Educational System was not producing people with the required skills.The education system of the time (1960-1965) gave very little access to second level education and consequently restricted access to higher education. This lead the government to provide, in 1967, Free Transport and Free Education for second level participants and a new model of second level education i.e. Comprehensive Schools. This greatly increased the cost of education but provided more opportunities to obtain Second and Third Level Education for a greater range of students.

Reports commissioned by the government at this time, including, *Investment in Education* (I.I.E.) and the *Organisation for Economic Co-Operation and Development* (O.E.C.D.) also indicated that there would be a major shortage of skilled personnel in the workplace.

In order to deal with this problem the Government of the day embarked on an ambitious programme of technological training. AnCO (now FAS) was established with the task of training machine operators and craftspersons. The Regional Technical Colleges (R.T.C.'s) were given responsibility for Technician training in the areas of Science, Engineering and Business Studies. The position of Technologists was to be addressed by a new 3rd. level college system, the National Institutes for Higher Education (now University of Limerick & Dublin City University). Students could commence an Ab-initio Degree or continue their studies from the feeder colleges, (R.T.C.'s) to achieve a degree. The funding of the traditional University sector was reorganised through the establishment of the Higher Education Authority.

To encourage student participation in these innovative schemes, there was a training grant for participation at FAS courses and an E.S.F. (European Social Funding) grant for full-time attendance on R.T.C. courses. These grants were of vital importance to the success of these institutions. A significant aspect of this type of education was the development of new types of training programmes, including co-operative education and a greater emphasis on practical work. During the last three decades significant changes have taken place in the industrial base accompanied by innovation in the Education System.

Social and Economic changes in Ireland.

Prior to 1960 the Irish economy was primarily geared to agriculture and service activities. Manufacturing industry existed under the protection of tariffs to deter competition from imported manufactured goods. These manufacturing industries include the Textiles and Leather industries. Many raw materials were not indigenous and therefore needed to be transported for processing. This incurred transportation charges and the export of this product for sale was also a significant cost. The Public Services and the Semi State bodies were the main source of employment up to this time. Emigration had reached 44,000 people a year, mainly from the rural areas where the introduction of mechanisation into farm machinery reduced the work force required in farming. Most of the emigrants, were educated only to Group Certificate/Intermediate Certificate standard and left school to seek work in manual type occupations, or as semi-skilled machine operators. The report *Economic Development* (1958) by T. K. Whitaker acted as the catalyst for a radical change in industrial policy from a Tariff Protection policy to an "Open Export Oriented International Trading Policy".

It was the governments intention to attract large manufacturing companies to set up, not alone in Dublin, but in every large town in Ireland. To actively promote this idea, it set up the Industrial Development Authority (I.D.A.) to actively seek multi-national companies. The Government provided grant aid related to the potential number of employees the new company would provide and there was also tax incentive schemes to allow profits to be tax exempt for a period of time.

The IDA specifically targeted the Chemical, Pharmaceutical, Synthetic Fibre and the Electronic industries. All of the above areas had a high value content added to the work and the raw material involved was neither bulky or heavy, therefore transportation costs were kept to a minimum.

Modern industrial development is dependent on the quality of the work force, i.e. the educational qualifications of the workforce and the number of those qualified and available in the work place. This shortfall was of concern to the Government of the day, causing the Minister for Education to initiate in October 1962, in co-operation with the organisation for Economic Co-operation and Development (OECD), a project known as the *Educational Investment and Planning Programme.* The O.E.C.D. contributed 1,406,734 francs towards the cost of this investigatory programme and provided technical support and information on related developments in member countries.[1]

The shortfall in technically trained personnel referred to previously is illustrated in the following tables.

Table 1.1 1960 2nd Level Examination Statistics

	Intermediate Certificate		**Leaving Certificate**	
	Boys	Girls	Boys	Girls
Entered	7069	8467	4193	3773
Passed	2587	4017	2671	2199
Honours	3458	3603	1046	2199[2]

The leaving certificate figures indicate that the number of qualified students potentially available to proceed to Degree level study equalled about 8,000, if all the students took up the option of University education. Only a small proportion of the qualified students however were willing to take a career in an industrial situation. Table 1.2 shows that in 1964/5 only 1,005 students were studying Engineering at University, while 1,132 students were taking relevant Business options. There were 5,102 students attending Technological courses across a broad educational range.

Table 1.2
Number of Full-Time and Part-Time Undergraduate Students Taking Technological, Technician and Business Related Programmes in the Year 1964/65

Colleges	**Universities**	**Vocational** (Technological)
Courses		
Engineering	1,005	
Business	1,132	2,865
TOTAL	2,137	2,865
GRAND TOTAL	**5,002** [3]	

Table 1.3 shows that in 1960/63 thirty seven students attended Technological Colleges mainly in Dublin, Cork and Waterford and gained Advanced Technician qualifications. These students sat four individual examinations, and these could have been available as Technologists. Fifty two students obtained Intermediate Technician qualifications in the same period, they sat four individual examinations and could be regarded as Technicians.

The 132 students obtaining Elementary Technician qualifications, (1960/63) after four individual examinations, could at this time be regarded as Technicians. The total number of individual certificates at each level, for each examination group (from 1945 to 1963 inclusive) totalled 2,580 individuals. These received one or more recognised Technician Qualifications from the Department of Education.

Table 1.3
Technical School Examinations.(Technological)
(1945-1963)
Average Annual Output -Individual Certificants by Group.

Examination Group	Elementary		Intermediate		Advanced	
	1945/59	1960/63	1945/59	1960/63	1945/59	1960/63
	Annual Average Number of Individual Certificants					
Building	3	14	5	11	3	9
MechanicalEngineering	15	36	6	10	2	8
Motor-Car Engineering	12	30	6	17	2	11
Electrical Engineering	24	50	3	10	1	5
Applied Chemistry	10	2	2	3	2	-
Flour Milling	-	-	1	1	1	1
Food Technicians Diploma	-	-	-	-	-	3
TOTAL	64	132	23	52	11	37
Mathematics	30	138	3	31	2	12[4]

The City & Guilds of London Institute provided a more comprehensive range of examinations in trade and technological subjects than did the Department of Education. There was a greater variety of stages, levels and certificates. The number of subject entries from the Republic in 1963 was 2089.[5]

These graduates could be encouraged to take up positions as Technicians until the coming on stream of graduates from the technological colleges. The *Commission on Higher Education,* on page 219, noted that;

> It seemed clear that even the most optimistic forecast of the educational output for the decade would fall short of the minimum estimated inflow of 5,000 skilled workers required per year therefore by 1979 the deficiency for skilled workers would have assumed formidable proportions.

Before this report was published, (the committee reported in April 1967) the government had accepted that urgent action was necessary and it was decided that Regional Technical Colleges (RTCs) would be established. A *Steering Committee on Technical Education* was set up by the Minister of Education.

STEERING COMMITTEE ON TECHNICAL EDUCATION

In the 1960's, there was a general re-appraisal of the need for technical expertise in the context of a general effort to industrialise. The report of the *Steering Committee on Technical Education* (1967), laid the basis for the setting up of the Regional Technical Colleges, the first of which was built in 1969/70.

The Steering Committee loosely defined the role of the Regional Technical Colleges, and by implication the role of other Technical Colleges, as follows ;

> to educate for trade and industry over a broad spectrum of occupations ranging from craft to professional level, notably in engineering and science, but also in commercial, linguistic and other specialities.

The Steering Committee related the role of the colleges to economic growth, nationally and in their respective regions. They saw a distinction between the the need for technical education and the demand for technical education. The Regional Technical Colleges would provide one means of stimulating the demand for skills which the economy needed. They were particularly concerned that no artificial limitations should be placed on the scope and level of the educational achievements of the colleges. The Regional Technical Colleges, were originally seen to have a predominantly regional role and to this day they continue to have an important regional function. They also increasingly see themselves as meeting national manpower needs in specialist areas, while continuing to draw mainly on the respective regions for student intake.

Third level education was perceived at this time to have structural deficiencies relative to manpower needs. The following Institutions were set up, AnCO.1960, NIHE 1968, H.E.A.1968, RTC's 1970, N.C.E.A.1972, C.A.O.1976, to reorganise Third Level Education and to overcome the difficulties experienced by the manufacturers in relation to staff shortages. The fact that the locations of the educational/training centres give an equitable geographical spread is an important aspect of this post second level education.

The Industrial Development Authority (I.D.A.)

Under the Industrial Development Act,(1969) the Grants Board and the former I.D.A.(1950) were combined to form the new Industrial Development Authority.(I.D.A.) This came at the end of a decade of unprecedented growth in the industrial sector. In the decade 1960/70 500 new factories were assisted in start up operations in Ireland, thus creating 44,000 new jobs. Irish industrialists were involved in 150 of these new factories. In 1970 alone the I.D.A. assisted the establishment of 112 new factories employing 11,000 people. The total grants paid out by the I.D.A,to encourage industrialists in the decade 1960/70 was £348,567,718, In 1966 the export sales value from these factories was valued at £66 million from a total export of £127 million and in 1969 the total export sales in 1966 were valued at £214 million.[6]

Emigration entered a decline and fell in 1970 to 6,000 from the previous number of 44,000 in 1960. The government had aspirations that it would be at zero percent by 1980 but due to a very rapidly rising inflation in the 70's this was not to be realised.

To address the short fall in semi-skilled workers and machine operators AnCO (FAS) was instructed to initiate a training programmes for which training grants were paid to the participants. The N.I.H.E.'s (National Institute of Higher Education) were set up in Limerick and Dublin to counteract the shortfall in Technologists. The R.T.C.'s would address the shortfall in Technicians.

AnCO (An Chomhairle Oiliuna) now F.A.S.

AnCO - The Industrial Training Authority, was established under the Industrial Training Act (1967). It's remit includes training for both industry and commerce. AnCO was set up to raise the skills of the Irish workforce, at all levels of industrial and commercial activities, to the highest international standards .

AnCO is under the direction of a council comprised of representatives of employers organisations, trade unions and the Government. Operationally, ANCO's activities can be described as follows ;

1. Apprenticeship training;
2. Training for individuals (excluding apprentices);
3. Training within companies.

Apprenticeship Training

Apprenticeship schemes are administered by AnCO and cover all apprentices in certain designated trade groups: construction, engineering, electrical, motor, furniture, and printing.

Suitable employers, also offer apprenticeships to young persons. AnCO may also sponsor apprentices directly to avoid under supply of key skills. At the end of 1978 there were nearly 18,000 apprentices registered with AnCO.

The modern apprentice, who is sponsored by his prospective employee and in a designated trade, e.g. carpentry, motor engineering, toolmaking, electrician, is allowed spend the first year of his apprenticeship at a FAS Centre. The apprentice is guaranteed under legislature, (The Industrial Training Act (1967), to receive an educational programme agreed by the Dept. of

Education, FAS and the Congress of Trade Unions. This arrangement complete with a "Log Book" allows a record of experience and minimum levels of achievement at various types of work to be recorded within his/her industry. This helps to prepare the apprentice for changes of a technological nature which may occur during his/her working life.

The educational package consists of a full year at a FAS Centre where during 3.5 days each week there will be an exposure to industrial type work that would be considered as year 1 or year 2 apprentice work. This practical work is complimented by 1.5 days at the R.T.C. where tuition in the subjects Craft theory, Technical Drawing, Communication and Workshop Practice cater for the practical side of the Craft. Reasons for the where? -why? -what? that apprentices ask are addressed to give a broad base of knowledge about the craft. Mathematics and Physics address the analytical skills necessary to pursue a technological course at a later date. This, completes year 1 of the apprenticeship under a scheme known as "One Year Off the Job" training.

Within the next 3 years of his apprenticeship, the student must be released from the work place to attend two periods of eleven weeks full time education at an R.T.C. where again he/she will continue his/her studies of the subjects from the "year off the job". He may also pursue courses of the City and Guilds and would be expected to sit and pass Parts 1, 2 and 3 of the particular examination series relating to the craft.

The apprentice when qualified may wish to continue studying and could register for an N.C.E.A. National Certificate in Technology in Mauntenance. This would allow him/her to be classified as a Technician and capable of dealing with the technology that related to the particular trade. This Multi Skilling National Certificate would include one other trade so that there would be an ability on the part of the apprentice to be multi skilled.

Training for Individuals (not apprentices);

Training allowances, are paid to trainees who are either primarily unemployed or redundant, while they participate on the training courses. The Training Centres are geographically spread throughout Ireland, located in the same towns as the RTC's.with the exception of Carlow, but with the addition of Gweedore in Donegal and Ballina in Mayo. Limerick &Waterford's training centres opened in 1967/68, followed by Galway & Dublin in 1970, Sligo in 1973 and the remainder shortly afterwards. In addition to the training centres there are some mobile training units, used as training centres placed at strategic towns around Ireland.

Training within Companies

Training is also carried out on behalf of AnCO in private firms, State-sponsored bodies, educational establishments and other institutions. The format of this training is similar to that carried out at a FAS centre and allows extra training places for apprentices at no cost to the state.

Grants are given for the training of workers of new industries and for expanding industries or in industries being restructured. All these training grant schemes receive support from the European Social Fund.

Financing AnCO

ANCO's growth from 1967 to its present national network of direct training and training advisory services has involved capital expenditures. In 1978, £3 million was spent on capital items. About half of ANCO's operations, are financed by the E.S.F. In 1978 ANCO's total expenditure as shown in the General Income and Expenditure Account was over £23 million, about £10 million of this being accounted for by income from E.S.F. Nearly all the remainder came from Government grant-in-aid.

Total employment in AnCO at the end of 1979 was over 1,700.[7]

Developments in Education

Developments had to take place in the Higher Educational system to accommodate the perceived increased needs of industry to proceed into the 1970's with an educated workforce capable of embracing the new ideas and technology of the decade. There was also an increase in Second Level student numbers, as a result of the Free transport and Free Education schemes of 1967. In the three years 1967-70, 50,000 new places were provided in 100 existing secondary schools in a total of 2,000 rooms including specialist facilities.[8]

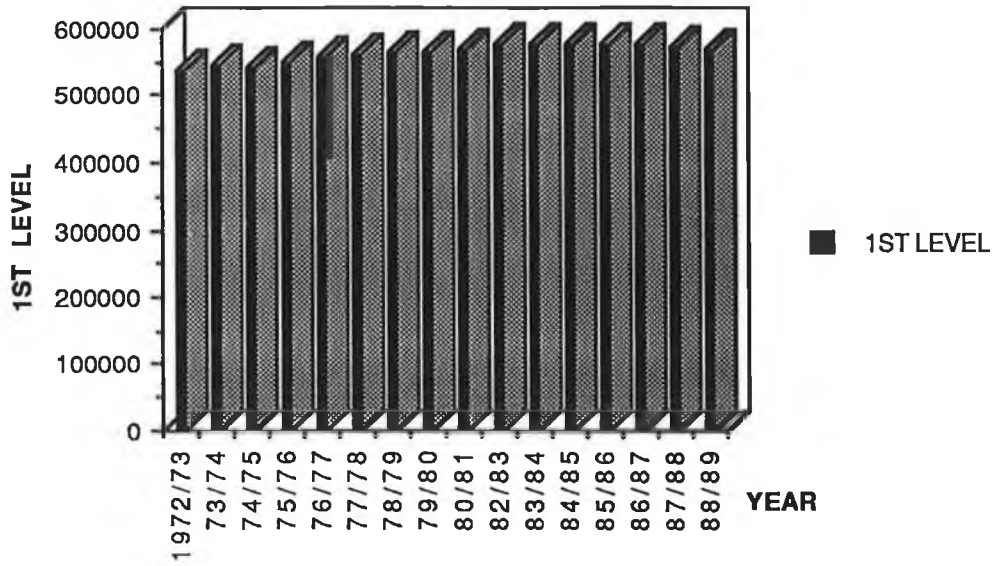
There was also changes in the educational programme of the Vocational schools, Comprehensive schools, and the Community schools, which now included the Leaving Certificate Cycle and therefore increased the numbers available for third level education. These schools were also offering an increased range of subjects which had a relevance in the work place, i.e. Engineering, Science and Commerce. There was now a need to continue this extensive educational programme to third level institutions. A limited scholarship scheme was introduced in 1968 to assist this transfer to third level and to give financial support to the less well off. All these scholarships were "Means Tested".

The increase in student numbers at Second and Third Level Education Colleges continued throughout the 1960's. The increase in the 2nd level numbers rose from 54,019 students in 1953 to 89,205 students in 1963/4. This increase could be attributed to the increasing affluence of the parents of prospective students, who desired a second level education, up to Leaving Certificate, for their children.

Consequently, the number taking Leaving Certificate Examinations rose from 6,700 students in 1957 to 22,090 students in 1969[9] The number of students entering Third Level Education in 1968/69 was 16,913, a 100% increase from 1957/58 when only 8,393 students entered third level education. The number of students at post primary had also doubled from 18,965 in 1960/61 to 36,800 in 1968/69.[10]

The increase in student numbers at each of the three levels of the educational system from 1972-1989 can be seen from the following graphs. (Fig.1.1)

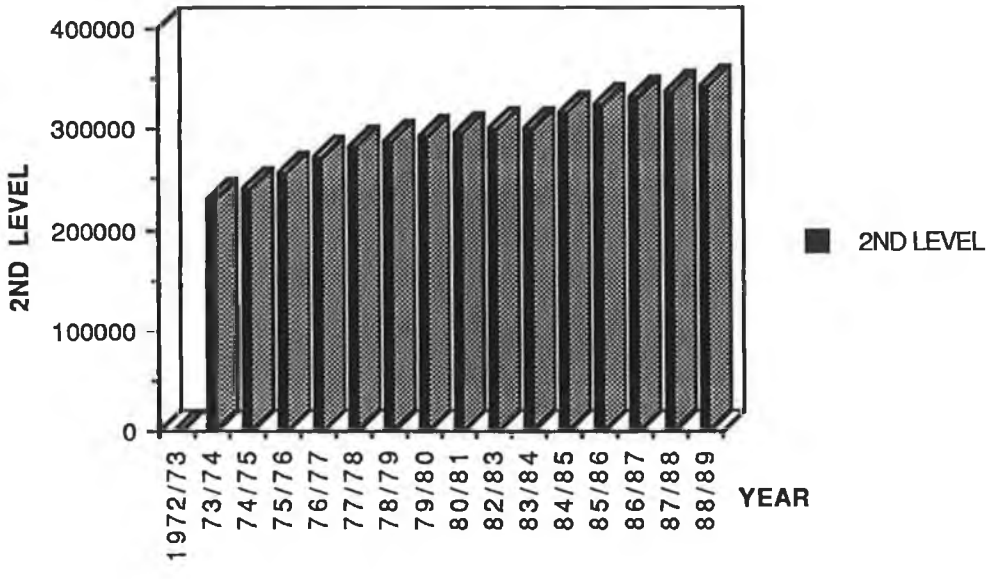
Figure 1.1(A) Student numbers at 1st Level 1972-1989



The percentage increase for First Level Students is very small, this reflects the decrease in the birth rate of Irish families from 1970 onwards.

The increase for Second Level Students is approximately 50%, this reflects the increased participation of Irish students in second level education primarily as a result of the "Free Transport Scheme" and the "Free Educational Scheme" introduced by the government at the end of the sixties.

Figure 1.1(B)
Student numbers at 2nd Level 1972-1989



The percentage increase for Third Level Students is approximately doubled, this reflects the increased participation of Irish students in third level education as a result of the government grant scheme, the coming on stream of the RTC's and the NIHE's.

Figure 1.1(C)
Student numbers at 3rd Level 1972-1989

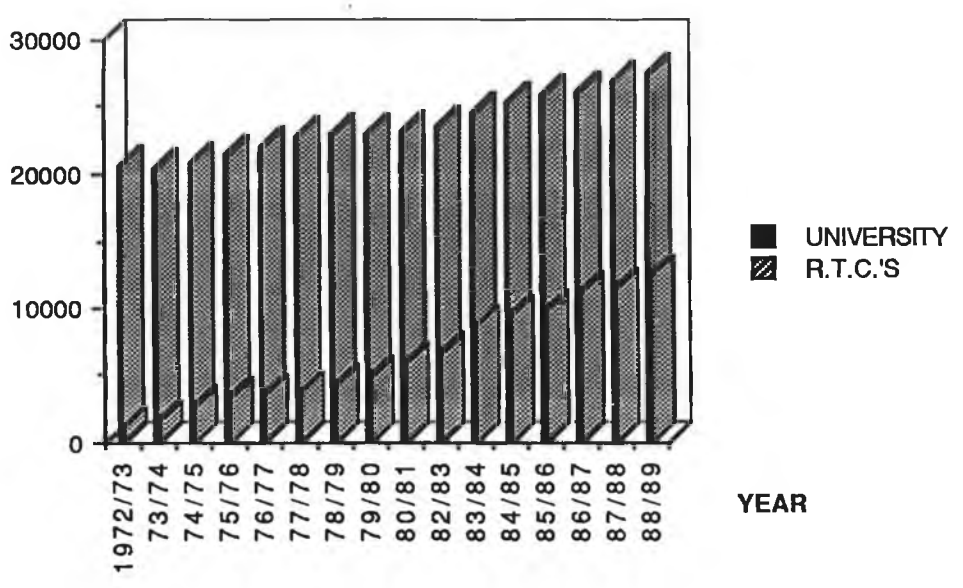


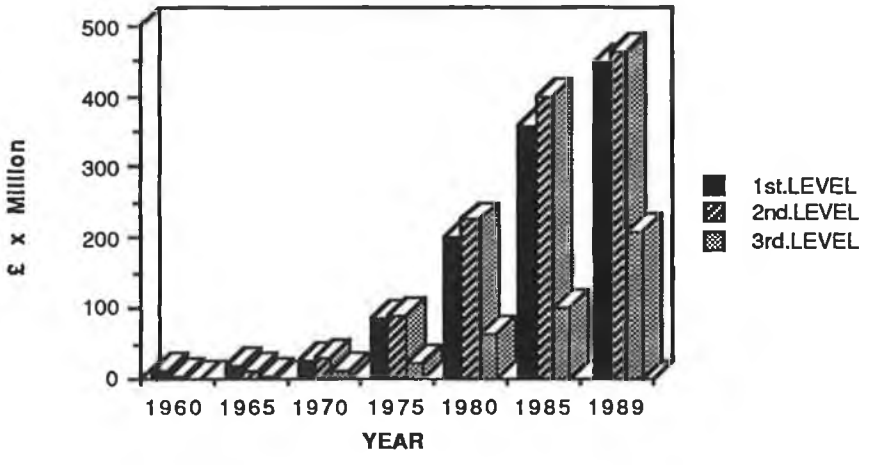
Figure 1.1(C) shows the increase in University students numbers from 22,000 students in 1972 to over 28,000 in 1989. In 1979 however (12,000) only 20% of the estimated student population of 65,000, entered third level education. Fig.1.1(c) also indicates the dramatic rise in the total number of students attending RTC's. In 1973/74 there were 1,214 students, in 1979/80 the numbers rose to 4,274 students. In 1986/87 the number again

rose to 9,885 students and in 1989/90 the student number reached 13,886 students.

This dramatic rise in third level student numbers causes Third Level Education to be the largest growing area of the education expenditure. The estimated expenditure per pupil was £4,500 in 1990 and is estimated to rise to £6,700 by the year 2,000, at a cost of £400 million to the taxpayer[11]

The relevant costs of Primary, Secondary and Third Level Education can be assessed from an examination of Figure 1.2. In particular the rapid rise in the cost of education from 1975 to a total of over £1,000 million in 1990.

Figure 1.2
Expenditure on !st.,2nd., 3rd.,Level Education 1960-89



The Higher Education Authority

This organisation was set up on an ad hoc basis in 1968 to assist the University sector to co-ordinate it's activities. It was given statutory powers in the H.E.A. Act 1971. The function of the HEA is to further the development of Higher Education and it is the funding agency for funds provided by the state for universities and other designated third level institutions. It is envisaged that other Third Level Institutions will come under the authority of the HEA in the years ahead. The briefs of the HEA are as follows:

1. To further the development of higher education.
2. To assist in the coordination of state investment in higher education and preparing proposals for such investment.
3. To Promote an appreciation of the value of higher educational research.
4. To Promote an attainment of equality of opportunity in higher education.
5. To Promote the democratisation of the structure of higher education.

In the course of its work the H.E.A. advises the government on such major issues as the establishment of further Third Level Institutions, reorganisation of the Universities Teacher Training and it has published reports on topics such as student performance at university, featuring enrolment and demands in third level education.

To cater for the changing technology and to provide Technologists and Technicians for the expanding industrial base the Minister of Education issued a statement in Dec. 1968 that ;

(a) The government had decided to allocate the appropriate funds to establish a 3rd level N.I.H.E. Technological College in Limerick.

(b) That the HEA would investigate the question of establishing a body which would award national qualifications in Technological areas.

(c) That the HEA would make recommendations in relation to teacher training for the future provision of higher education. [12]

This statement was in response to the demand by industry for educational establishments to provide more advanced technological and other specialised 3rd level courses. The existence of the need and demand is confirmed by the OECD report, *Investment in Education.* The HEA considered these proposals and included the following points in it's conclusions ;

(1) The provision of an additional university ought to be considered in the national sense.

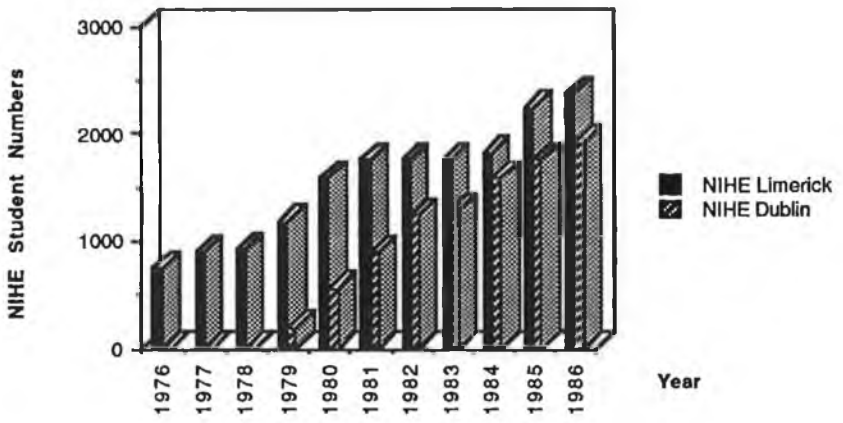
(2) The *Commission on Higher Education* (1960-67) had concluded that the most urgent needs were those of the existing universities and that there was no need for an university at Limerick

(3) A student body of a minimum of 4,000 students would be necessary to efficiently run the institution. It noted that at that time the student population in U.C.C. was 2,907 and at U.C.G. 2,393. The ultimate decision was;

> On the basis, therefore, of our initial recommendation, that a Council for National Awards be established, we see a College of Higher Education at Limerick as especially suited to the pioneering of courses of the type with which such a council would be concerned. We recommend accordingly.[12]

This recommendation was to address the perceived shortfall of trained technicians and technologists and consequently the N.I.H.E.'s and R.T.C.'s were established. They evolved as different institutions to the traditional Universities with much closer links with industry from the start.

Figure 1.3 N.I.H.E. Student Numbers from 1976-86.



N.I.H.E. Limerick was established in 1972 and by 1988 had 5000 students or 3,500 full-time equivalents. In 1975 it became an established college of the N.U.I. In 1981 legislation was enacted to allow it operate autonomously. In 1989 it became the University of Limerick. Thomond College of Education, situated on the N.I.H.E. campus, was established to develop new teacher

education degree programmes and to act as a centre for in-service education for serving teachers. The college provides four degree programmes; General and Rural science; Metal and Engineering Technology; Physical Education; Wood and Building Technology. Each programme is of four years duration, leading to a primary degree (B. Ed.), awarded by the N.C.E.A.

Plassey Technology Park is also situated on the campus. Established in 1977 as a Regional Management Centre to respond in a flexible and innovative way to the needs of industry and business. Plassey Management & Technology Centre has evolved into a self-financing private operation providing over 20,000 days of training per year through continuing education and in-company programmes tailored to industries requirements.

Dublin N.I.H.E. had it's first cohort of 191 students in 1979/80 but by 1986 it had registered 506 first year students for it's courses. In 1989 it became the Dublin City University (D.C.U.). The National Distance Education Centre is located on the D.C.U. campus, offering a range of Open Learning programmes throughout Ireland, e.g. Degree in Information Technology. [13]

Both N.I.H.E.'s offer a range of undergraduate and postgraduate studies to Doctorate level in their three constituent Colleges:
The College of Business, The College of Engineering and Science and The College of Humanities.

The R.T.C.'s were established to address the shortfall in Technicians, as required by industry, as Ireland was now experiencing unprecedented growth in the industrial sector.

Regional Technical Colleges

The functions of the Regional Technical Colleges, according to the *Steering Committee on Technical Education;* (page 11) are,

"It is to educate for trade and industry over a broad spectrum of occupations, ranging from craft to professional level, notably in engineering and sciences but also in commercial, linguistic and other specialities."

The programmes for the colleges included:

1. Junior and Senior Trade Certificate courses on day or block release for local apprentices, and on block release for apprentices from a wider area.
2. Courses for hotel and catering at all levels.
3. Part-time day, block release and full-time courses for technical qualifications at various levels e.g. draughtsman, laboratory assistant, agricultural technician, telecommunication technician.
4. Post Leaving Certificate or Post Senior Trades Certificate. Courses of one year duration for receptionists and courses in secretarial studies in computer programming etc.
5. Courses of two year duration leading to the award of a National Technician Certificate and of three years leading to the award of National Technician Diploma.
6. Courses of more than three years duration leading to a professional or Degree level award.
7. Adult education courses.

The first five Regional Technical Colleges were opened at Carlow, Waterford, Athlone, Dundalk and Sligo in 1970. Three other Technical Colleges, at Cork, Galway and Letterkenny, followed the original five and opened in 1972 and Tralee Technical College was accorded Regional status in 1979. In 1978 the six Dublin third level colleges under the VEC were re-organised as the Dublin Institute of Technology. A HEA study published in 1979 recommended the building of four new Technical Colleges in the Dublin area. Some colleges have specialised in certain subject areas e.g. Athlone RTC in Plastics, Galway RTC in Hotel Management, Sligo RTC in Precision Engineering. Provision exists for transfer of students between various courses on the basis of satisfactory standards of academic excellence.

The aims and objectives of the Colleges are as follows ;

1. They should be flexible, adaptable institutions that provide third level education at all levels.
2. Colleges should respond to national,local,social and economic concerns.
3. They should provide third level education to mature students who had missed third level education for whatever reasons.

The *Steering Committee on Technical Education:* recommended that;

> The colleges should not be forced to adhere to any fixed pattern of courses as their most effective contribution to the needs of society and the economy, demanded that they should be capable of continually adapting to social economical and technological changes.

It also recorded it's dissent from the views of the *Commission on Higher Education,*

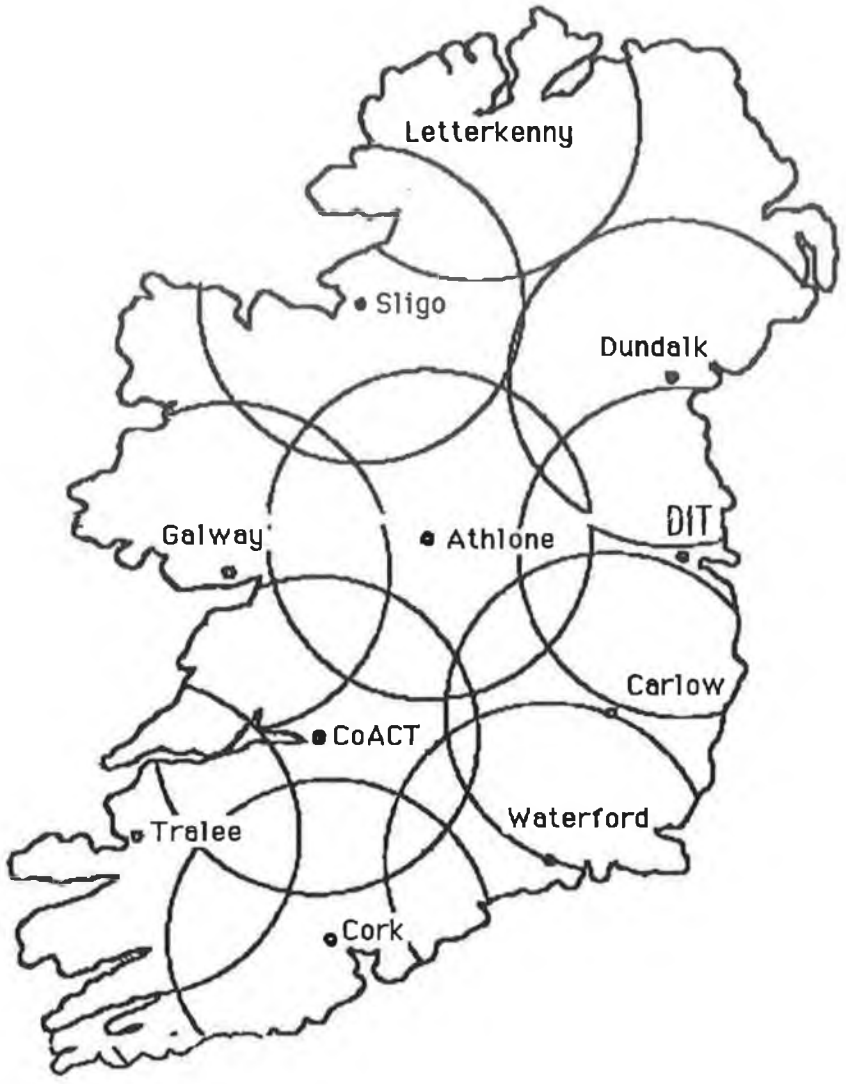
> We also dissent from the suggestion that the level of attainment in such institutions should be limited to pass degree standard ..... the sole criteria of achievement would have to be met. It was argued, that if arbitrary limits were set, potential students living within the vicinity of a college would go to other third level institutions. Staff recruitment would be artificially distorted. There would be a disincentive to the development of new courses and facilities and to the improvement of those in existence. No obstacles should be placed in the path of the development of the RTCs.[14]

Colleges Regional Nature

The RTC's were expected to cater for the specific needs of a region within about a 100 Kms radius of the college. In Figure 1.4 the location of the RTC's can be seen. Due to the geographical location of the RTC's, all students in Ireland, with the necessary prerequisites, could attend courses at an RTC by commuting each day, or by taking five day accommodation at the centre.

Figure 1.4

Student Catchment Area of the R.T.C.'s and D.I.T.



Courses were expected to generally reflect specialisations approximate to their particular region. Colleges were expected to aim particularly to service the needs of industry within a region, and hopefully to attract new industry by their potential to provide trainee manpower and by their ability to quickly meet he industrial training needs.

The extent to which students use the educational facility of an RTC in their own region in preference to an external facility can be seen from an examination of Table 1.4

Table 1.4 New Entrants to R.T.C.'s Classified by Residence 1976/77

RTC	HOME RESIDENCE IN REGION			
	Within Ten Miles Radius of College		Outside Ten Miles Radius of College	
	No. of Students	% of Total	No. of Students	% of Total
Galway	200	36.2	243	43.9
Athlone	47	22.3	129	61.1
Cork	180	39.9	235	52.1
Letterkenny	33	16.4	158	52.1
Waterford	117	30.8	193	45.6
Sligo	99	37.9	119	45.6
Dundalk	164	43.7	198	52.8 [15]

The table 1.4 shows that at that time 1976/77, the colleges attract approximately 80% of their enrolment from within their own region and less than 40% from within a 10 mile radius of the college. Therefore in large urban areas they were not simply local colleges.

The position in 1986 can be seen from Table 1.5. Students were willing to travel to an RTC to obtain a course of their choice. Therefore while most students came from the counties adjacent to their R.T.C. they were still a "Regional" College.

Table 1.5 **New Entrants to RTC's Classified by Residence 1986**

HOME RESIDENCE

Residences in County or Adjacent County of College

RTC	No. of Students	Total at College
Galway	581	745
Athlone	383	617
Cork	768	812
Letterkenny	243	306
Waterford	731	929
Sligo	372	446
Dundalk	436	543
Tralee	293	309
Carlow	686	775[16]

Regional Technical Colleges are administered by Boards of Management. Each College has a Board of Management which operates as a sub-committee of the local Vocational Educational Committee. The validation of the education standards achieved in the RTC's by the National Council for Education Awards (N.C.E.A.) gave national and international standing to the awards of Certificate, Diploma and Degrees of the N.C.E.A.

National Council for Education Awards (N.C.E.A.)

The National Council for Educational Awards Act, 1979 gave a statutory base to the NCEA. which was set up in 1972 as part of a government programme to ensure that education at third level in the Republic, outside of the Universities, kept pace with the rapidly expanding needs of technology and industry in general. Under the legislation, the NCEA has as its general function; to encourage, facilitate, promote, coordinate and develop technical, industrial, scientific, technological and commercial education and education in art or design, provided outside the universities, whether professional, vocational or technical, and to encourage and promote liberal education.

The Council has the power to confer, degrees, diplomas, certificates or other educational awards on persons who the council is satisfied have attended or otherwise pursued courses of study conducted by or provided under the supervision of, an institution to which the act applies, that is, a designated Institution. The NCEA acts as the validating and award giving body for many non University Institutions of Higher Education. It assesses the standard of courses in designated institutions,it also oversees standards of examinations and markings etc. and oversees transferability arrangements of students between the courses of different designated institutions. It therefore has a heavy responsibility for ensuring the standards of courses and awards are such that they will be acceptable both nationally and internationally.

The category of awards currently conferred by the NCEA are one year certificates, National Certificates, National Diplomas, Degrees and Post-Graduate Degrees. During the period 1972-80 the Council awarded 1,075 one year certificates, 6,010 National Certificates and 2,457 National Diplomas and it also conferred 410 Degrees. Engineering, Science and Art & Design accounted for about two-thirds of all these NCEA awards. In the period 1972-1990 the NCEA has awarded 32637 National Certificates, 16257 National Diplomas, 7811 Primary Degrees,214 Master's Degree and 16 Ph.D's.[17]

The percentage breakdown of students numbers in third level education in 1980 were 60% at University, 10% at Teacher Training, 30% at Technological Colleges. This has changed in 1990 with more than half the students, now attending at Universities. The rise in numbers of third level students can be attributed to the following;

(a) A rise due to the increase in "Real Income" of the parents of the pupils.

(b) The rise in Second Level numbers, the introduction of the Higher Education Grant Scheme and the introduction of E.S.F. grants on a limited basis in 1974.

It is the homes of the "Middle Class" again who provide the students. The costs of different courses at University is a factor in the choice by the student of such courses and the perceived opportunity costs, also play a role, i.e., the extra years of study that is required to achieve an income.

GRANTS FOR EDUCATION

The Higher Educations grants are available from the local County Councils. The grant is means tested and relates to the parents income and an academic level must be obtained in the Leaving Certificate by the student. Application must be made for the grant in the year that the Leaving Certificate academic qualification was obtained. The grants are approximately of the same financial value as that obtained from the V.E.C. and the E.S.F.

The V.E.C. provide grants to eligible students i.e. if their parents income is below a certain threshold and they have certain academic qualifications in the Leaving Certificate. They reserve the right not to pay this grant to holders of a European Social Funding grant. An application for the V.E.C. grant must be made in the year that the leaving certificate was obtained. This grant can be obtained for further educational study beyond the National Diploma Award level.

The introduction of the E.S.F. (European Social Funding) grants to students on National Certificate Courses at the Regional Technical Colleges in 1974 was a great boost to the student numbers as the grant was not "means tested". At that time these grants were restricted to specific courses mainly in Engineering and Science and it was not until 1982 that all National Certificates were grant aided. Therefore many students attended Regional Technical Colleges, to avail of these Educational Programmes and they were partly financed by the E.S.F. Grant.

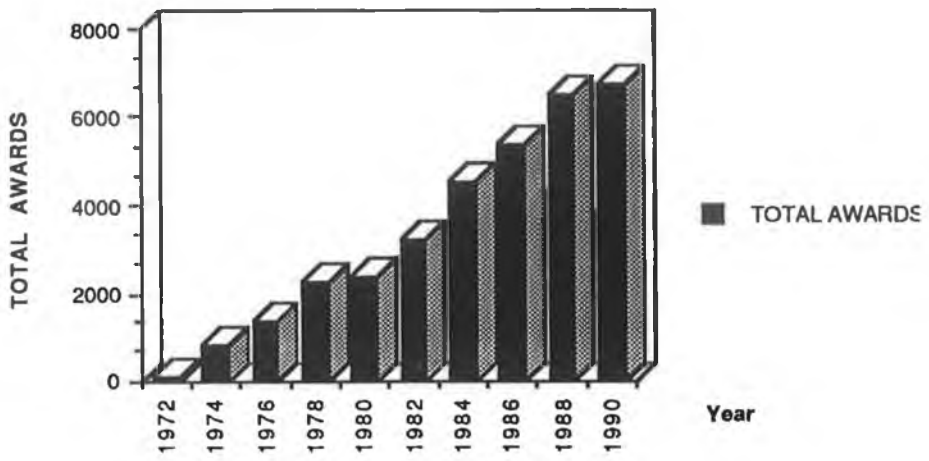
The Social Fund contributed £33.5 million in 1973/74, £53.5 million in 1980, £193.0 million in 1985 and £181.0 million in

1986, expending a total of £1505.8 million on education and training grants.[18]

1989 saw the extension of this grant system to include the Diploma Programmes giving 3 year grants to students attending Regional Technical Colleges, or registered at an R.T.C. and attending other Institutions which have a joint programme with an R.T.C. Initially E.S.F. grants were restricted to students between the ages of 16.5 years and 25 years of age but on the 1st. September 1990 this age limit was extended to age 65 years. This will increase the numbers receiving an E.S.F. Grant, now that the age limit is no longer a prerequisite for those obtaining E.S.F grants on National Certificate and National Diploma Courses (Full-Time or Part-time mode) at Regional Technical Colleges. It will also give those who are seeking employment an opportunity to avail of the grants scheme. This will be particularly attractive to those who were made redundant, to the long term unemployed or to women seeking to return to full-time employment. This increases opportunities for all adult participants on third level courses. The Grant of £1,318 is for those who live more than 15 miles from the college, those who are within 15 miles of the college receive a grant of £525. Those who are eligible for the grant also have no college fees to pay as these are included in the grant.The E.S.F. grants could be identified as a major contributor to the increase in student numbers at the Colleges. This is reflected in Figures 1.5 &1.6 showing the number of graduates who received N.C.E.A. awards in 1972, 93 awards increasing to the 6,753 N.C.E.A awards in 1990 giving a total of 62,279 awards.

Figure 1.5

N.C.E.A. Awards 1972-90



These ranged from National Certificates, to National Diplomas and from Primary Degrees to Ph.D's, and covered such areas as Business Studies and Humanities, Engineering Technology, Science and Paramedical studies.[19]

Figure 1.6

N.C.E.A. Awards in Certificates, Diplomas and Degrees 1972-90

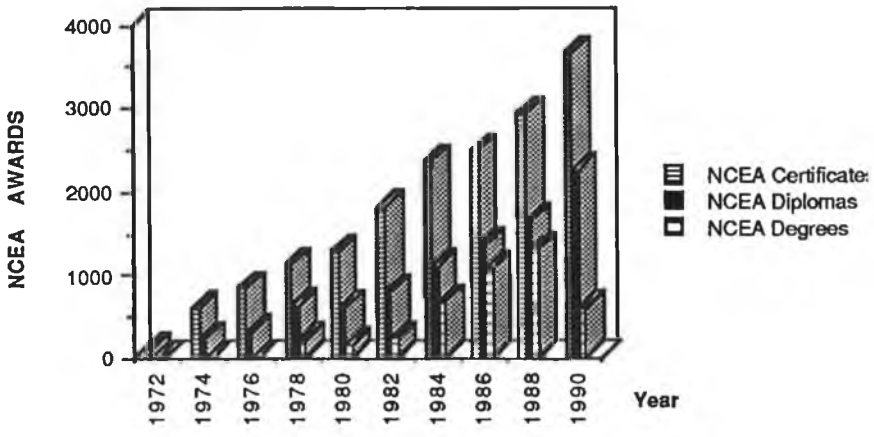


Table 1.6

N.C.E.A Awards Conferred 1972/90

By Academic Level	1972	1974	1976	1978	1980	1982	1984	1986	1988	1990	Cumul.
National Certificate	93	610	841	1129	1289	1806	2366	2491	2920	3656	32637
National Diploma	0	44	294	443	495	652	1054	1211	1482	1686	16257
Primary Degree	0	4	4	200	167	244	688	1081	1314	594	7811
Master,s Degree						1	10	49	75	9	214
Ph.D.								3	2	1	16
By Discipline											
Business St./ Humanities	25	245	483	996	962	1347	2153	2616	2908	3218	27589
Engineering / Technology	42	460	608	761	935	1304	1571	1729	2001	2042	21873
Science/ Paramedical	26	135	256	508	487	550	812	1013	1552	1493	12817
TOTALS	93	840	1347	2265	2384	3201	4536	5358	6461	6753	62279[19]

Students could apply to many colleges, for a range of courses in Third Level Education. The Central Applications Office was set up to address the problems in applications for third level courses.

CENTRAL APPLICATIONS OFFICE (C.A.O.)

The C.A.O is a company limited by guarantee it was founded in January 1976 to provide information for intending students and to process applications for entry to undergraduate degree and diploma courses. It is envisaged that in 1990/91 all applications for undergraduate degrees, diplomas and certificate courses will be processed by and through the CAO. In 1991 all third level colleges will participate through the NEW CAO/CAS SYSTEM. It will be necessary for an applicant to complete only one

application form in order to apply for entry to courses in ALL the THIRD LEVEL COLLEGES. The closing date for applications is normally the 1st. February, and each applicant is given a place on the highest of his/her course preferences which his merit rating will allow. He/she therefore will make their choice of accepting a placement at an RTC college or an National University of Ireland (NUI) college, or Trinity, Dublin City University (D.C.U.), University of Limerick (U.L.) but will not be allowed to accept more than one.

The Role of the N.I.H.E.'s and the R.T.C.'s.

The N.I.H.E,s and the R.T.C. have a similar philosophy and offer courses in the areas of Business, Engineering, Science and Humanities. Their courses are closely associated with perceived industrial needs for training manpower. They offer courses which have a high proportion of Practical Work, using Workshops, Laboratories and co-operative education programmes.

The examination system reflects this innovative practice by allocating marks for Laboratory work, note books and for Projects carried out by the students. Marks are also allocated to the reports submitted by industry, when the student is obtaining Work Experience, during his/her co-operative work placement.

The added attraction of the "Work Experience" is that students and prospective employer meet while the student is providing a service, investigating a problem, or providing a solution to a problem. The employer gets a chance to observe the student and as a result the student often receives an offer of a job, on graduation.

The range of courses in the N.I.H.E. reflect the industrial demands of the country and the need to address our position academically and industrially in the European scene of 1993. The courses currently on offer at the University of Limerick include;
Applied Mathematics - Industrial Chemistry - Materials Science- Production Management - Electronic Production - Manufacturing Technology-Computer Engineering - Electronic Engineering - Mechanical Engineering - Engineering Materials - Production Engineering - Industrial Engineering-Industrial Design- Business Studies - Business Studies and Modern Language - Computer Systems - European Studies and in Public Administration.

A similar range of courses is available at Dublin City University.

The R.T.C.s and Dublin Institute of Technology (D.I.T.s) on the other hand have a large and varied Certificate Programme of two years duration in Engineering - Business Studies and Science. They generally run specialised courses at Diploma level of one years duration which have the certificate level as a prerequisite. A number of Degree programmes exist that are a further two years study with a prerequisite of Diploma Level. All these courses are validated by the NCEA and the students seek an NCEA award. Degree courses at the D.I.T are validated by Trinity College Dublin. Currently the following Degree Courses are available at the RTC's; Hotel Catering Management - Music- Business Studies- Applied Computing- Aquaculture-Chemical Technology-Environmental Science- Polymer Science-Quality Assurance- Construction Management-Electronics- Manufacturing- Mechanical Engineering- Production Technology.

The Lindsay Report (page 13) states that;

> The VEC have shown impressive growth, with total full-time enrolment in third level increased by 105 % since 1980/81, as against a 32 % increase for the colleges in the HEA sector. the growth in enrolment between 1986/87 and 1988/89 was a quite remarkable 16%.

The rate of growth of the VEC Colleges attests to their success and indicates a very strong demand for the type of education and training provided by the Colleges. There is a wide consensus that the Colleges have responded flexibly and resourcefully in both stimulating and meeting this demand. They have in the process contributed effectively to meeting the need for skilled manpower, with particular regard to technician level and related levels,and have made an acknowledged and dynamic contribution to development in their respective regions.

This increase may be for the following reasons :

1. The ESF grant scheme is not means tested and includes payment of the College fees.
2. Increased national demand for Third Level Education. The courses in the RTC and DIT respond to Social and Industrial Developments in the locality. Flexibility of the courses exists and provides an opportunity for students to move up to certificate, from certificate to diploma and on to degree courses either within or between colleges.
3. Provision for short courses for industry and updating of skills for those employed, and again by use of the ACCS mode of Single Subject Certification to grant Credits for effort and endeavour.

4. The geographical location of the colleges which gives easier distribution and access to these colleges by the students.

The increasing student numbers at the R.T.C.'s is reflected in the number of N.C.E.A. Awards (Figure 1.5 &1.6), awarded to the students who follow their own choice of course study. There are approximately 200 separate courses of approved study available in the Colleges, designated under the National Council for Educational Awards Act of 1979. Any one course, particularly in the mainstream of Business and Humanities, of Engineering and Technology, or of Science and Paramedical, may well be available simultaneously in a number of Institutions. It is now fair to claim that higher education, of a standard comparable to Irish Universities is now available throughout the State in R.T.C's.[20]

Although these two types of Colleges, RTCs, and NIHEs, have many aspects of their courses and philosophies in common and that both their courses are of a technological nature, it is important to note that each belongs to a different system of higher education. The RTC's have their academic awards conferred by the N.C.E.A. The N.I.H.E.'s, now the University of Limerick and Dublin City University, have their awards conferred by the N.U.I.

Modality Systems of Higher Education

Therefore in the technological sector there are two different awarding bodies and two different bodies controlling finances to each system. The H.E.A. control the N.U.I. allocations while the V.E.C. control the R.T.C's. This came about as a result of different political parties in the state having different educational ambitions for the Colleges of Technology.

P.Faulkner, Minister of Education (69/73) in the Fianna Fail government, set up a "Binary" system of Higher Education in 1972. The National Council for Educational Awards (NCEA) was allowed confer the awards within it's structure of National Certificates, Diplomas, Degrees and post graduate Degree, to be parallel but not an integral part of to the National Universities of Ireland (N.U.I.) awards. Faulkner was the first to draw attention to the heavy imbalance in higher education, in favour of the arts and humanities and to relate this imbalance to the economic and industrial development taking place at this time to the "overall needs of the nation". This analysis of the output of the higher education system led eventually to a policy of quotas, limited access and positive discrimination in favour of the technological sector.

> In the technological sector he established, in 1972, the National Council for Educational Awards with responsibility for the promotion and validation of courses and the related awards in the non-university institutions.[21]

In 1974 R. Burke, Minister of Education (1973 to 1977) in the Coalition Government, stated that;

> His proposals on Higher Education, constituted a reversal of the policy being pursued by Fianna Fail on the relationship of the Universities and Technological Sectors. He favoured a "Comprehensive" structure in which the National Institutes of Higher Education (N.I.H.E's.) would be recognised Colleges of a University.[22]

This resulted in the the moving of the NIHE's under the umbrella of the HEA. and the Degree awarding rights being withdrawn from the NCEA., these were not restored until 1980. The eventual scheme to emerge and be established in the technological sector was the Binary System.

The R.T.C. colleges are now at a cross roads in their development. The Minister of Education has indicated her intention to introduce new legislature as a matter of urgency. She has indicated; that under the present review of the Vocational Educational Act, Legislation for the R.T.C.,s may be in place before September 1992. and that;

1. The Colleges will stay in the V.E.C. system.
2. The Colleges will have autonomy in all financial matters.
3. The College Academic Council will have legislative stature and be responsible for academic affairs including admissions, course structures, research and Course Boards.
4. The Colleges will have legal authority to co-operate with industry on research and related activities.

These points could be a step forward towards a combination of the "Binary" system and the "Comprehensive"system whereby the H.E.A. is the comprehensive funding body for all Third Level Education. The function of the N.C.E.A. as an awarding body maintains the Binary function.

National Council for Curriculum and Assessment

To allow the Second Level Schools to prepare their students for Technological advances made over the last two decades and for a Technological Education the National Council for Curriculum and Assessment (N.C.C.A.) has introduced a Leaving Certificate that takes an account of the needs of Education and Industry with a very innovative curriculum.

The National Council for Curriculum and Assessment (page 3) of their Consultative Paper May 1990 states that;

> The Vocational Leaving Certificate is a subset of the leaving certificate with greater specification of subjects; students must attempt Irish, two subjects from the Construction Studies Group, Engineering and Technical Drawing, a modern European language and at least one from the 31 other subjects listed. These listed subjects include Technology, Music, Keyboard Skills, Italian and Spanish.
>
> Developments such as the Vocational Leaving Certificate programme are welcome and should be maintained. However a broader range of subjects is required with specific reference to gender-bias. [23]

The new programme came into effect with first year students in 1989. It is hoped that this particular type of Leaving Certificate will introduce areas of technology into second level education and it is receiving E.S.F. funding of 60% of the total budget, expended on this type of education. In the last 18 months the Department of Education has committed expenditure to provide 300 C.N.C. (Computer Numerical Controlled) lathes and milling machines at a cost of £3 million pounds to the schools holding this type of educational programme. 1000 Personnel Computers (P.C.) were also provided. These were of a larger capacity than the Apple and Commodores P.C. computers, already in service at 2nd. level schools. These new computers are capable of using C.A.D. (Computer Aided Drawing) packages to design the model and then draw it, then stimulate "cutter paths" that could be generated to make the model and finally to "down load" the total information to the C.N.C. machine for execution of the work. This is exactly the method that industry adopts for it's manufacturing procedures.

Technological Changes

The last decade saw another revolutionary change in both our life style and in advances in technology. The introduction of computers plus the increase in our knowledge of electronics allowed for an increase in our ability to automate industry. The robot was now a more sophisticated machine capable of moving in all directions. With computer control this could be programmed to do a lot of repetitive work up to a high standard. This was also the decade of Quality Control and Quality Assurance and Eolas a government Science & Technology semi state body have promoted the concept of an International Standard (I.S.O.9000) and the obtaining by industries of this prestigious standard to allow them compete in

the European dimension of 1993. Production methods had become very labour cost conscious, as the cost of labour was rising each year and becoming a larger percentage of the manufacturing costs. Therefore it was becoming more important to "Make It Right First Time" to have "Zero Defects" and "Just in Time" as the work philosophy of the workplace. There was now a move to automate all processes if possible, to make only acceptable goods at all times to the consumers specification and to provide these only when needed. i.e. the "Just in Time Philosophy" (J.I.T.). Now there would be no warehouses full of goods waiting to be processed and with good Quality Assurance Standards, all goods could be guaranteed to the customer. Manufacture of scrap could be a thing of the past. Computer Numerical Control CNC machines could be programmed to cease production when the limit of the specification was about to be exceeded. This mode of manufacture does cause workers to be made redundant, or placed on short time, or on flexi-time or shared jobs. Therefore their is a need by workers for an educational package to help them stay as part of this work force. With changing technology there is now a need to re-train and to re-educate the work force about four times during their employable life.

There will also be a need for Third Level Courses to reflect this change with courses like; Computer skills, Electronic servicing, Automation C.N.C. (Compute Numerical Control) C.A.D., Information Technology, Marketing, Languages, Tourism and Entrepreneurial Skills. There is now a shortage of pupils to fill the different second level schools, which are now available for a different kind of education, Out-Centres for Third Level Colleges holding courses in technology suited to local industrial needs.

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11.	Who Goes To College?	Page 12
12.	Steering Com.on Tech. Ed.	Page 11 &27
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CHAPTER TWO

HISTORY OF SLIGO REGIONAL TECHNICAL COLLEGE

1970 - 1990

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LOCATION OF REGIONAL TECHNICAL COLLEGES

Introduction

Sligo is situated in the North-West of Ireland, approximately 210 km from Dublin and Belfast. It is approximately 110 km away from each of the nearest RTCs which are Letterkenny, Athlone and Galway. Sligo Town is situated in an agricultural hinterland and has a population of approximately 20,000 people who derive their income from a number of industries such as Light Engineering, Tool making, Pharmaceuticals and Magnetic Tapes production and from a wide selection of service industries.

Initially the people of Sligo and of it's Catchment Area, approximately 120 Kms around Sligo, did not readily understand the type of Third Level Educational System that the Regional Technical College brought to the region. There were very limited number of Technician courses available at the larger Vocational Schools. (known as Technical Schools) It would take the prospective students and their employers time to grasp that a person would be employable after only two years of third level education.

The college developed with time and from the mid 1970's has instigated a number of courses which responded to the Industrial needs of the area. These were also the developments of particular members of staff, who had an interest in their own specialities. Staff interests resulted in the following centres and courses. The National Toolmaking Centre, the Degree in Environmental Science, The National Diploma in Tool Design and the Joint Degree with an N.C.A.A. Institution in Chemistry and Biology.

The introduction of the E.S.F. funding in 1974 and the much improved job prospects of the graduates gave a great boost to the student numbers.

In the past decade Sligo College has made a number of innovative applications to the N.C.E.A. for courses which were first in their field in Ireland. These were as follows:

(a) The first Degree in Environmental Science,

(b) The first National Diploma in Quality Control and Tool Design. This had a co-operative programme as part of its educational programme, with a specified work experience specification so that the learning curve was to the forefront of the work experience.

(c) The first B.Sc. Degree in Engineering in Quality Assurance, again with a co-operative placement.

(d) The first joint Degree Programmes with an English Polytechnical College.

THE DECADE 1970-1980:

Sligo officially opened on the 1st September 1970. It had 38 full-time students on Technician courses, 8 students on the National Certificate in Business Studies, 16 students on One Year Office Skills, and 14 students on the National Certificate in Science. 92 apprentices also attended on Day Release/Block Release courses with 106 evening students also attending such courses. The total number of Lecturers, Administration and Support staff in that year was 31. The complete Academic staff consisted of a Principal, 3 Heads of School and 15 Lecturing staff.

There are two noteworthy points in relation to courses which commenced in Sligo Regional Technical College in 1970/71.

1. There were no full time School of Engineering students enrolled for that particular year.
2. Art was not originally a designated course for the College but one for which the Department of Education subsequently granted sanction.

A two year course in Secretarial Studies was introduced, into the School of Business Studies Programme and an additional course that year was a nine month full time course for students wishing to become either Chartered Accountants, Certified and Work Accountants,or Certified and Corporate Accountants. The Chartered Accountancy Course and the Course for the Chartered Institute of Management Accountants are now classified as Degree equivalent courses in the School of Business Studies.

The following year, 1972, saw the introduction of a foundation course of at least one year's duration in the Department of Art

and Design for students who wanted to take an Art and Design course. The School of Science proposed a two year course in Agricultural Science and Technology. These courses have now been absorbed into the National Certificate in Science. The highlight for the R.T.C.'s in that year was the setting up of the National Council for Educational Awards (N.C.E.A.). The N.C.E.A has played a very important part in the development of the Colleges, particularly in the manner in which the public so quickly recognised and accepted it's awards. The N.C.E.A. brought a major emphasis to the development of new courses which reflected Industrial, Technological and Community needs.

Sligo R.T.C. was always aware of the importance of Apprenticeship Training and had Block Release courses of eleven weeks for Toolmakers, Motor Mechanics, Carpenters and Post Office Technicians. There was a Day Release programme for Electricians and Fitters from the AnCo Centre in Sligo. A course was designed under the jurisdiction of C.E.R.T. (Council for Education, Recruitment and Training for the Hotel Industry) for those who wanted to follow a career as Chefs and Cooks in hotels and guest-houses. A Hairdressing apprentice course was jointly provided by AnCO and the School of Business Studies, the latter providing tuition on a one day release basis while the former provided tuition and practical training for the remaining four days of the week. This course is still in operation today. In 1974/5 Sligo was designated as the National Centre for the Education of Toolmaking Apprentices and offered courses leading to the Department of Education Junior and Senior Trade Certificate. These courses were the only courses designed especially for Toolmaking Apprentices.

The area around Sligo is the home of toolmaking in Ireland. This came about in 1952 when the Gallagher brothers set up an industry outside Sligo to manufacture Door Handles for the construction industry and they found that all tools had to be imported from the U.K. In 1956 they set up Tool & Gauge, the first toolmaking company in Ireland. From this company came the expertise for others to set up their own toolmaking companies. Hanson Scales came to Sligo in 1960 because of the expertise available at Tool & Gauge. This was the start of an industrial activity around Sligo which needed more training in toolmaking to sustain it.

The highlight of 1974 for the RTCs was the introduction of the European Social Fund grants (ESF). A number of courses in the Colleges attracted grants for students under a special European Training Programme scheme coordinated by the Department of Education. The student attending these Third Level programmes in that year received a weekly grant of £8.30 and in addition no fees were charged. The weekly grant was paid for 36 weeks. In Sligo RTC. the grant applied to the following courses; Civil Engineering Technician Skills, Science Technician Skills, (this course on Pollution Control was to be the forerunner of the Degree in Environmental Science), Mechanical Engineering Technician Skills and Secretarial Skills. There was no "Means Test" applied to this grant. Other grant schemes available to students in 1975 were the VEC Scholarship Scheme and the Higher Education Grants Scheme, both schemes were "Means Tested," and were available to students following Certificate and Diploma courses at an RTC, under the same conditions as the Local Authority Award grants to Universities.

A National Diploma in Environmental Science was added to the National Certificate and Diploma in Science in 1975. This was a further step by the college towards achieving the Degree in Environmental Science. At the latter part of this decade, a post National Certificate Module in Sanitation and Water Pollution was introduced at the request of the Department of Local Government. A National Diploma in Analytical Chemistry was also introduced by the School of Science. Up to that time, no other National Institute had offered a course of training in Analytical Chemistry. In 1979/80 the School of Business Studies branched into the area of Child Care and established a National Diploma in Child Care. This three year Diploma course was designed to help the Child Care Worker in every aspect of his/her work.

As the decade came to a close the College had 545 full time students in 34 different classes covering differing topics within the Schools of Engineering, Science and Business Studies. 561 apprentices were also attending the College on a day release/block release basis and there were 283 part-time students following the part-time programme.
The full-time academic staff was as follows:-
School of Engineering, 33 staff School of Science, 14 staff
School of Business Studies, 26 staff.

There was also a large Part-Time staff bringing their business skills and knowledge into the lecture rooms for the benefit of both Full-Time and Part-Time students. A major extension was added to the College because numbers of students continued to increase. This increase established the outstanding advances made by the College since its opening in 1970.

THE DECADE 1980-1990

In 1981 the School of Science commenced an Honours B.Sc. Degree in Environmental Science, and the School of Business Studies also introduced a National Diploma in Art.

In 1982 an agreement was reached between the Teachers' Union of Ireland and the Department of Education which gave the College an Academic and an Administrative structure. There were now graded teaching positions e.g. College Teacher, Lecturer I, Lecturer II. On the administrative side there was Section Head, Grade LII, Head of Department, SLI, Head of School, SLII.

New courses were introduced to prepare for Ireland's entry into the European Community. The School of Business Studies introduced a National Certificate in Languages and Marketing in 1984. The School of Engineering introduced a National Diploma in Quality Control also in 1984, this was of two year's duration. One year was spent in paid industrial placement, introducing the idea of 'work placement' as part of the 'learning process' (i.e. that the factory floor became an extension of the college laboratory) and one year was spent in academic participation. The success of this Co-operative programme led in the following year to the introduction of the National Diploma in Tool Design (1985). This had a similar structure to the Quality Control course. There is one year paid industrial placement and one year academic participation. These courses complimented the need for Irish Industries to produce their own tools and it also used the expertise available in the area. Co-Operative Education had become an integral part of the educational programme of the College.

In 1986/87 the School of Engineering introduced Out-Centres for the National Certificate in Electronics undertaken by attending evening classes on a part-time basis. This was designed to address the lack of opportunity for some students, who for one reason or another did not have the opportunity to avail of a Third Level Education. This led to the provision of a further part-time National Certificate in Mechanical Engineering in 1988, a part-time National Diploma in Automation in 1990 and the availability of a part-time Degree in Quality Assurance. All of these courses are now under the "Accumulation of Credits and Certification of Subjects" (A.C.C.S.) mode of study. The School of Engineering also introduced an Out-Centre in an industrial factory, whereby the employees of that industry were able to proceed with an educational and training packet within their work time and on the factory floor, under the ACCS mode of study. Therefore Sligo R.T.C. is providing a Continuing Education Programme for "Second Chance" students.

In 1987 the School of Business Studies introduced a National Diploma in International Marketing in conjunction with the I.U.T. Montlucon College, France. The course structure involves attending both colleges. Sligo students spend two years at Sligo RTC and the third year in France while the French students spend two years in France and the final year in Sligo.

Another innovative educational programme was introduced by the School of Science in conjunction with Coventry Polytechnic. This was a joint B.Sc. in Chemistry and Biology whereby the respective students alternated between the two institutions, obtaining a Diploma from Sligo RTC in year 3 and a Degree from Coventry

Polytechnic in year 4 of the course. The National Certificate in Computing, in the School of Business Studies was so successful that a National Diploma was introduced in 1988.

In 1989, A major renovation programme took place in the Student and Staff Canteen costing £300,000. This enhanced both the building itself and the facilities available to students and staff.

In the decade 1980/1990 the number of full-time academic staff rose to 105 and the number of support staff rose to 36. Full-time student numbers increased to 1,221. There were also 180 block release apprentices, 90 day release apprentices and 500 part time students at the college.[24]

SCHOOL OF BUSINESS and HUMANITIES 1970-90.

Over the last 20 years the School of Business Studies, has increased the variety of courses it has offered. It's student numbers and the job prospects available to it's graduates has increased. The following courses reflect the developments that took place in the school, in the Business Studies area, to cater for the changes in industries both locally and nationally.

The school now has a National Diploma (N.D.) in Computing, and the advances made in this area over the past twenty years are addressed by the students in this course. Another area of expertise developed at the school is in the area of Marketing and Languages where there is a N.D. in Business Studies and Marketing with a French or German option. This was a joint venture with constituent Colleges in France and in Germany.

The school was involved in the area of professional Accountancy, from it's opening in 1971 (see introduction). In order to meet industrial needs for accountancy graduates it commenced courses in parts one and two of the Chartered Institute of Management Accountants. These courses address the needs of industry to provide trained qualified accountants for positions as financial managers and for managing directors of companies. There is a National Certificate in Secretarial Studies to address the need for Secretaries and Personal Secretaries. This course ensures that maximum use of computers is made, in the office.

The area of Art & Design is catered for with the National Diploma in Industrial Design. The course is of three year's duration. This course addresses the requirements necessary to present a commodity in a form attractive to the customers. It also introduces the student to some engineering practices that may be required in it's manufacture. A National Diploma in Fine Art caters for those who aspire to a teaching qualification in Art or for those who wish to become commercial artists.

Another area addressed by this department is The National Certificate in Social Studies, which is of two years duration, with job opportunities in the private and public welfare services, and the community services.

SCHOOL OF ENGINEERING 1970-90

There have been some exceptional and unique developments in the school of Engineering at Sligo RTC. The staff of the School of Engineering have shown over the past 20 years that it's record of addressing the needs of Industry in the region and on the National front has been a success. The out-standing successes of the School of Engineering's academic programme have been in the quality and type of National Diplomas on offer within the School, each diploma catering for the specific needs of Industry, both locally and nationally.

The twelve month industrial placement, which is an integral part of the National Diploma (N. D.) in Quality Control and the National Diploma (N.D.) in Tool Design, is unique to any Diploma Programme on offer, in any RTC. The proof of the quality of the courses is that a large number of the students are offered permanent employment before they sit their final examinations and the rest are employed within three months of qualifying.

The N.D. in Quality Assurance is addressing the needs of industry, to produce only top quality goods. It trains in the use of management techniques that allow "Just-in-Time" delivery of both goods inwards and outwards. This course aims towards a system of "Zero Defects" in production and this ensures customer assurance of quality at all times. Due to the introduction of the new government laws concerning product liability. This has led the college to providing an Hons. B.Sc. Degree in Quality Assurance which will replace the National Diploma in Quality Control and will address product liability/validation as well as quality matters.

The N.D. in Tool Design introduced new technology to the toolmaking industry in the areas of Computer Drawings and Computer Manufacturing Procedures, using computer driven machines, to ensure accuracy in production tolerances. This was possible due to our very well equipped facilities which are equipped with the latest technology. There will have to be an avenue for upward mobility to Degree status particularly in relation to the new government laws concerning product liability.

The introduction of Diploma/Degree programmes to the School of Engineering, enhances the student's ability to obtain employment and provides a pool of well qualified skilled persons in the region around Sligo.

APPRENTICE EDUCATION 1970-90

Each of the three schools of the Sligo Regional Technical College had apprentice education programmes. The School of Business Studies had hairdressing apprentices, the School of Science had Chef and Cooking Apprentices. The School of Engineering has the largest variety and number of apprentices. The following are the areas that the School of Engineering had apprentice courses in, or have courses in at present; Telecommunication Technicians; Block Apprentice Groups from 1970-1985; Carpentry and Joinery Block Apprentice Groups, 1979-1988; Toolmaking Block Apprentice Groups,1971 to date; Electrician One Year Off-the-Job Groups, 1977 to date; Fitters One Year Off-the-Job Group, 1977-1983; Motor Engineering One Year Off-the-Job Groups, 1977 to date, Blocklaying and Plasterers One Year Off-the-Job Group, 1977/83.

SCHOOL OF SCIENCE 1970-90

Some exceptional and unique developments have taken place in the School of Science over the last 20 years. The School of Science has increased the variety of courses it has offered and consequently the job prospects available to it's graduates has increased. This has resulted in increased student numbers.

The School of Science is the smallest of the three Schools in Sligo Regional Technical College. It has the lowest number of Full-Time lecturing staff and the smallest number of Full-Time and Part-Time students. The School of Science has many innovative courses and has (since 1970) always equipped it's graduates for employment in relative sectors. It has the only Ab-initio Degree Programme within the College, i.e. the Honours B.Sc. Degree in Environmental Science and Technology. It has also successfully joined with an English Polytechnic which provides Sligo RTC students with an opportunity to do an Honours B.Sc. degree in Applied Biology and also an Honours B.Sc. degree in Applied Chemistry. Successful applicants are initially offered a place on the common year 1 of the Certificate programme. Places on the degree course are allocated on the basis of competitive assessments during the first semester. The degree students must maintain a high academic achievement to continue with their degree course. Degree students spend the first and the third years at Sligo RTC and the second and final years in Coventry Polytechnic. This is a very innovative and cost efficient method for students to achieve in an Honours B.Sc.Degree in four years.

RESEARCH AT SLIGO R.T.C.

As the College faces into the last decade of the century, the distance between worthy aspirations and attainable objectives in the area of Research is diminishing. Who would have believed when the college was founded in 1970, that within twenty years Doctoral and Master students would be completing research theses, members of staff would have visited such places as Poland and China to present the findings of their research at international conferences, and that in one year alone, 1989/90, almost ONE HUNDRED THOUSAND PUNTS would be received by the College for new research projects and for research/study visits to overseas institutions? What were no more than aspirations or dreams twenty years ago have today become a reality !

The 1980s in particular marked a dramatic expansion in the College's involvement in research led by the School of Science. By the end of 1990 there were 9 research students following Masters and Doctoral research projects and there were ten externally funded research projects ongoing in the School of Science. In 1990 the first two research students graduated, one with a Masters Degree and the second with a Ph.D. The latter was the first award of a doctorate within the Regional College scheme. The range of research projects carried out in the School of Science has been extensive; from sediment oxygen demand to peat land conservation, from analytical studies of polytar in dermatological creams to the impact of septic tanks on ground water and from research on artificial sweeteners to mine waste revegetation. Just as the range of subjects studied has been extensive so has the source of the funding; varying from very welcome "seed money" from the College to large scale funding

from EOLAS (The Science and Technology Agency of the Department of Energy). It has also received small travel grants from professional associations and salaries for research students have been paid by the Sligo 1916 Commemoration Committee.

A Director of Research has recently been appointed with the School of Science who will coordinate and overview the research students. Recently completed and ongoing research projects and their source of funding include:

- Ground water quality variations in limestone aquifers, EOLAS
- Assessment of chemicals to suppress the bulking of activated sludge; EOLAS/Industry.
- Ecotoxicological assessment of chemicals used in the aquaculture industry; EOLAS/Industry.
- Impact of septic tanks on soil and ground water; Geological Survey of Ireland/AIB
- Manganese mobilisation from soil to ground water; Eolas/RTC
- The assessment of selected biological tracers; Industry
- The hydrogeology of some midland raised bogs; Geological Survey of Ireland/Office of Public Works/The Netherlands Government.
- Remediation of heavy metal mining wastes' Industry
- Production of pigments as a product of yeast fermentation; EOLAS/Industry.

There have not been as many research projects in the School of Engineering. There are three staff members pursuing Master Degrees and one staff member pursuing a Doctoral Degree by research. One research project at present being undertaken in the School of Engineering is in the area of portable bacteriology units, with a funding of £18,000. This research profile will

change with the coming on stream of the National Toolmaking Centre which has received a grant of £1.4 million for the National development of Toolmaking . Sligo RTC is the national centre for Precision Engineering. This will lead to a number of students being involved (2 or 3 students in the beginning) in the area of Computer Aided Drawing (C.A.D.), Computer Aided Manufacture (CAM), Computer Numerical Control (CNC), and their associated fields.

The college has the potential to expand its research activities considerably due to the opportunity provided by the complete integration of the European Community, the breaking down of barriers in Eastern Europe and the doubling of structural funds to Ireland. The expansion must take place on a College-wide basis if the growth of the College as a whole is to be balanced.

CONTINUING EDUCATION

Sligo Regional Technical College recognised, from its first year of operation, the importance of Part-Time courses in its overall strategy for Third Level Educational development within the North West Region. Initially many courses were offered on a Part-Time basis as well as on a Full-Time basis. These utilised a Day Release and an Evening lecture system and were highly successful in attracting many people already in employment in the region who were seeking further academic qualifications.

The College prospectus for the academic year 1971/72 offered 11 part-time/evening courses with four of these attracting sufficient numbers to make them viable that year. Over the following years the evening programme made steady progress as

courses were advertised each year in the College prospectus. In the mid 70's, as the Full Time Courses continued to develop, the resources and facilities of the various Schools in the College came under increasing pressure, due to a great increase in numbers of Full-Time students. This put an ever increasing demand on the availability of lecturing staff to also cover the Part-Time and Evening programme.

In 1979 the School of Business Studies offered for the first time, the National Certificate in Business Studies as an integrated series of modules on an evening basis. In 1982 the Board of Management allocated a structured post in the area of continuing education. This aimed to pursue a more coordinated approach to its part-time and evening programme. In 1986 out-centres were developed to run the National Certificate in Engineering (Electronics) and in 1988 this was extended to incorporate the National Certificate in Engineering (Mechanical). The numbers availing of continuing education have been steadily growing from 181 students in 1981/82 to 500 in the year 1989/90. The current approach to continuing education at Sligo RTC is towards meeting the increased demand for Certificate courses on an evening/part-time basis under the new N.C.E.A. "Accumulation of Credits and Certification of Subjects" (ACCS mode), whereby the student can add his/her subjects together to obtain an award. Table 2.1 shows the proposed programme for the School of Engineering. Therefore Sligo RTC is addressing it's remit of providing a Continuing Education Programme for "Second Chance" students.

Table 2.1

Proposed Courses Under ACCS Mode for 1990-94.
School of Engineering Department of Mechanical/Electronic
N.C.E.A. Qualifications in ENGINEERING ACCS MODE.

DATE	COURSE	STAGE OF COURSE	LOCATION	TOTAL NUMBER Of STUDENTS On CLASS.	COURSE
Sept 90	N.C.Elect.	Year 1	Ballina	12	
	N.C.Elect.	Year 2B	Sligo	19	31
Sept 90	N.C.Mech.	Year 1	B/Shannon	11	
	N.C.Mech.	Year 2B	Sligo	10	21
Sept 90	N.D.Ind.Aut	Year 3A	Sligo	10	10
				TOTAL	62
Sept 91	N.C.Elect.	Year 1	C/town	16	
	N.C.Elect.	Year 2A	Sligo	20	36
Sept 91	N.C.Mech.	Year 1	C.O.S.	16	
	N.C.Mech.	Year 2A	Sligo	18	34
Sept 91	N.D.Ind.Aut	Year 3B	Sligo	10	10
	N.C.Mul-Sk.	Year 1	Sligo	10	10
				TOTAL	90
Sept 92	N.C.Elect.	Year 1	B/Shannon	16	
	N.C.Elect.	Year 2B	Sligo	20	36
Sept 92	N.C.Mech.	Year 1	Ballina	16	
	N.C.Mech.	Year 2B	Sligo	20	36
Sept 92	N.C. Mul-Sk.	Year 1	Sligo	12	
	N.C.Mul-Sk.	Year 2B	Sligo	9	21
Sept 92	N.D.Ind.Aut	Year 3A	Sligo	20	20
Sept 92	B.Sc.Q.A.	Year 4A	Sligo	4	4
				TOTAL	117

Sept 93	N.C.Elect.	Year 1	B/Shannon	16	
	N.C.Elect.	Year 2A	Sligo	20	36
Sept 93	N.C.Mech.	Year 1	Ballina	16	
	N.C.Mech.	Year 2A	Sligo	20	36
Sept 93	N.C. Mul-Sk.	Year 1	Sligo	12	
	N.C.Mul-Sk.	Year 2A	Sligo	18	30
Sept 93	N.D.Ind.Aut	Year 3B	Sligo	20	20
Sept 93	B.Sc.Q.A.	Year 4A	Sligo	4	
Sept 93	B.Sc.Q.A.	Year 4B	Sligo	4	8
				Total	**130**

National Certificate(N.C.) National Diploma (N.D.) National Degree (B.Sc.) Electronic (Elect.) Mechanical (Mech.) Industrial Automation (Ind.Aut.) Quality Assurance(Q.A.) Multi-skill (Mul. Sk.)

A STATISTICAL REVIEW OF THE TWENTY YEARS 1970/90

It is worth noting that in 1835 the Reverend R. J. Bright, principal of the Royal Belfast Academy, stated in a report from "The Select Committee on Foundation Schools and Education in Ireland 1835."

'I would erect in Limerick, Sligo and Cork, Universities on the plan of the Scottish and German university system.'

Third Level Education did not come to Sligo until 1970 when the R.T.C. was established. In 1978 St. Angela's College, a Teachers' Training College in Sligo became a recognised college of the N.U.I. Nevertheless, Sligo's position has grown from a full-time student

intake of 38 in 1971, to one of 1,400 full-time students, approximately, in 1989. There are 29 different full-time courses on offer, with a total of 50 class groups from the three schools at Sligo R.T.C. There were 4,200 applications for the 600 approximate places on first year courses in 1989.

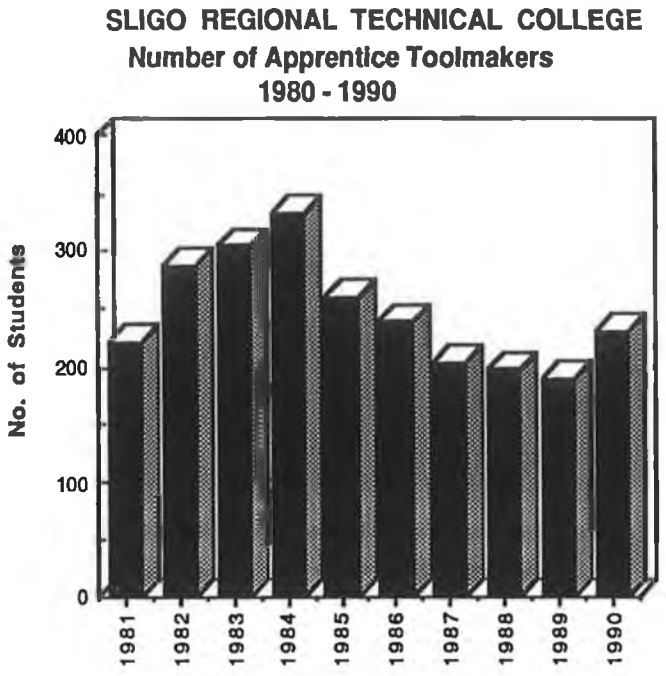
Doctoral Degrees, Masters Degrees, Honours Degrees, National Diplomas and National Certificates are now achievable at Sligo R.T.C. Research at Sligo is given top priority by its staff and students and there was external funding available, in 1989 from the E.C. and Eolas.

The college has had a major extension built in 1977 a canteen renovation in 1989 and a library and computer room extension in 1990. A portion of the college has been reconverted into a new hydraulics and automation laboratory. A new National Toolmaking Centre was installed. £2 million was spent on this in 1989 for new CAD/CNC/3D equipment, the latest in modern technology.

The one sad note is the fall in apprentice numbers and the removal of some apprentice classes from the college. Sligo RTC.is looking forward to utilising this space to increase the full-time student number to 2,000 by the year 2000.

Figure 2.1 shows the increase in the number of apprentice toolmakers at Sligo RTC from the early 1980s, peaking at 334 toolmakers in 1984, then falling to a low of 190 toolmakers in 1989.

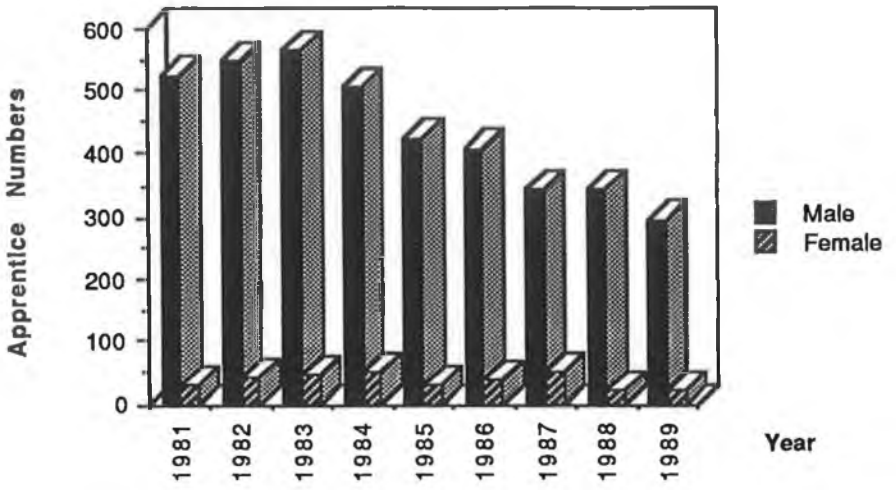
Figure 2.1



This drop in numbers is partly due to the speculative training programme engaged by FAS in the early 1980s, whereby more craft people were trained than industry required. When this policy was changed by the government, in an endeavour to get industry to pay a larger percentage of the training costs, the government set themselves a target of 80% for industrial sponsorship of recruited apprentices by 1989. This caused a natural drop in the number of apprentices who were serving their time. Allied to the industrial recession that took place from the early 1980s to 1988 this policy caused the numbers of apprentices in training to fall. This has now lead to 'Phantom Sponsors' where apprentices are supposedly sponsored and paid by employers but the student does not get paid and in many cases has no employment prospects with this "Phantom Sponsor".

Figure 2.2

SLIGO REGIONAL TECHNICAL COLLEGE
Total Student Apprentice Numbers



The drop in apprenticeship numbers is not fully conveyed on Fig. 2.2. Nationally the peak occurred in 1982 when there were 16,053 registered designated apprentices, in the trade areas of Motor, Electrician, Toolmaking, Fitting, Turning, Welding, Carpentry and other trades falling to a low of 6,237 designated apprentices in 1989. Sligo has lost the following apprenticeship courses since 1980; Block Release Classes in P&T Technicians, Motor Engineering and Carpentry. Day Release Classes in Blocklaying, Plastering and Fitting. It is hoped that 1991 will see the 'bottoming-out' of apprentice numbers, but with apprenticeship training under review there may still be startling news for apprentice training at Sligo RTC. If future government policy is to cease duplication of both finances and resources then all apprentice training could be undertaken at a F.A.S. centre and removed from the R.T.C.'s.

Figure 2.3

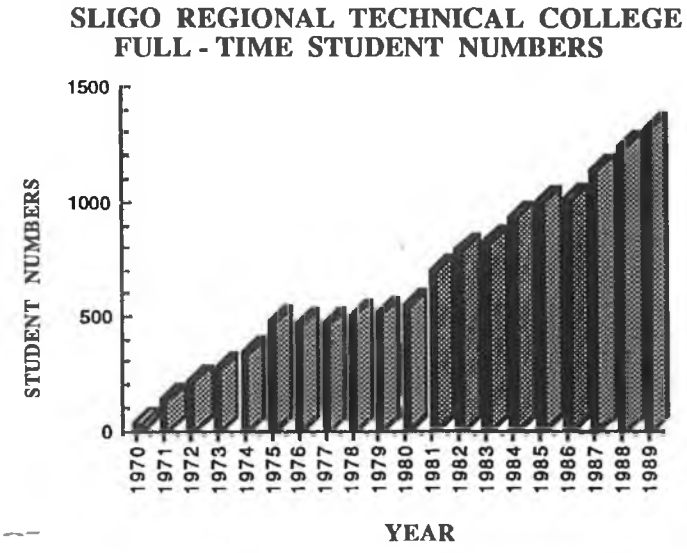


Fig. 2.3 shows the increase in full-time student numbers from a low of 38 students increase in 1970 to a high of 1,323 students in September of 1989. It reflects a number of issues:

1. The increase in value placed on technological education by prospective students, their parents and career guidance teachers at second level colleges.
2. The formalising of qualifications under the NCEA from 1972 onwards and the national and international recognition that such awards have received from employers.
3. The graduates have obtained great job satisfaction in working in the area of their qualifications and have received wages/salaries that reflect their contribution to production/management etc.
4. European Social Funding (ESF) was often a consideration in earlier days, when parents sought third level education for their children but could not afford university fees and accommodation allowances plus pocket money etc. 1974/75 saw the commencement of this scheme and it played a major role in the development of the colleges and particularly Sligo.

Table 2.2

SLIGO REGIONAL COLLEGE

Graduates 1984 - 1989

	'84	'85	'86	'88	'89
One Year Certificate Office Skills	20	-	-	-	-
NC in Business Studies	35	54	38	37	52
NC in Business Studies(Data Processing)	-	10	-	23	10
NC in Business Studies (Evening)	15	3	3	2	9
NC in Business Studies (Secretarial Studies)	30	49	33	25	57
ND in Business Studies Accountancy	15	17	18	11	17
NC in Computing	-	17	16	13	33
ND Computing	-	-	9	5	9
NC Marketing and Languages	-	-	-	19	23
ND Marketing and Languages	-	-	-	14	32
NC in Engineering (Civil)	25	23	21	18	30
NC in Engineering (Mechanical)	15	14	23	21	30
NC in Engineering (Electronic)	13	19	19	24	28
ND in Engineering (Water)	9	8	10	16	10
ND in Technology (Quality Control)	-	14	12	10	15
NC in Constructions Studies	30	22	22	19	33
ND in Tool Design	-	-	11	9	9
NC in Electronics Part-Time	-	-	-	-	12
NC in Science (Applied Biology)	13	6	9	22	13
NC in Science (Applied Chemistry)	8	13	9	12	21
NC in Science (Agriculture)	2	1	-	-	-
NC in Science (Food Science)	-	13	12	12	15
ND in Science (Analyt. Chemistry)	10	7	9	11	13
ND in Science (Environmental Science)	12	9	9	8	12
BSc in Environmental Science	-	21	14	15	7
One Year Cert. in Visual Education	23	25	27	31	27
ND in Art	7	10	10	7	7
ND in Child Care	10	12	7	10	-
NC in Social Studies	-	-	-	-	23
TOTAL	**292**	**367**	**341**	**394**	**547**

The Academic achievement of the students undertaking study at Sligo is reflected in Table 2.2, Some courses have ceased, while others have commenced, this reflect the changing pattern of industrial needs within the area and/or national needs identified by the college. The academic excellence of the students means that, Failure or 'Dropouts' are not in general the result of academic inability.The introduction of Diploma Programmes to the college enhanced the students ability to obtain employment and to provide a pool of well qualified skills in the region around Sligo.

Figure 2.4

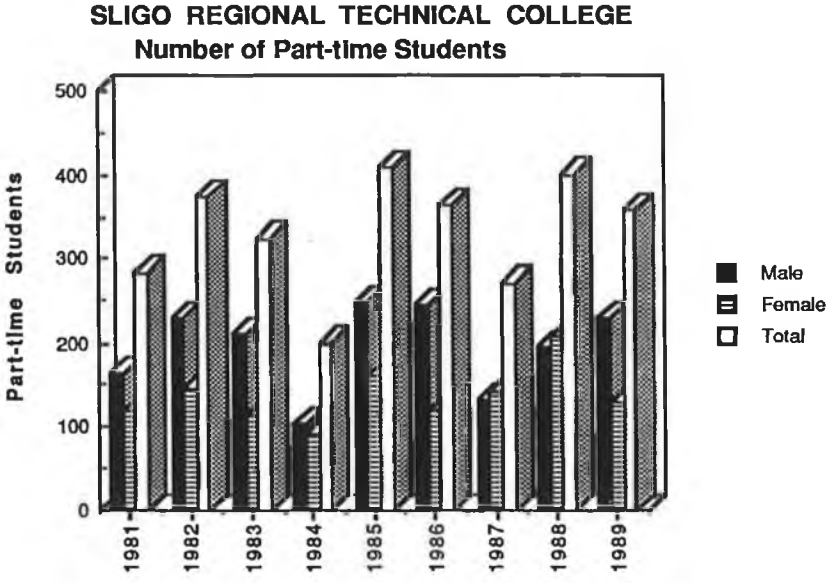


Figure 2.4, shows the number of part-time students attending educational programmes at Sligo RTC over the decade 1980/89. It is very difficult to interpret the number attending college each year, as the course content and duration of the courses were not taken into account in compiling the above figures. Hence, a person attending French for two hours per week is counted as one student, while a student on the National Certificate in Electronics attending for 14 hours per week is also counted as one student.

The policy in the school of engineering is to offer to the public, courses under the ACCS mode leading to a National Certificate or Single Subject Certification. The emphasis on City and Guilds courses is being replaced by N.C.E.A. recognised courses. Students attending evening courses now wish to obtain technician qualifications rather than trade qualifications therefore the emphasis is now on N.C.E.A.awards and not City & Guilds awards.

Figure 2.5

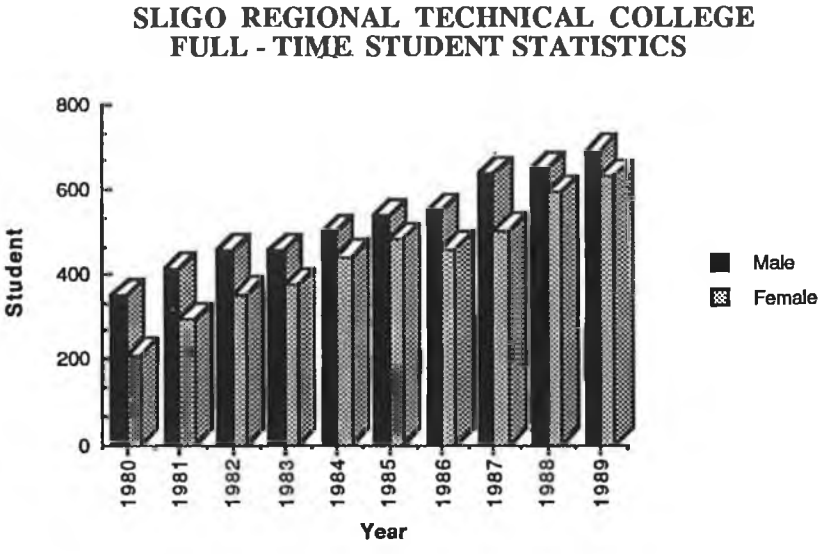


Figure 2.5 shows the number of females at Sligo RTC from 1980 to 1989. The number of females, increased from a low of 39% in 1980 to a high of 48% in 1989. It would be difficult to attribute a cause for the increase except to say that it possibly reflects the increasing decision by women generally to advance their own technical knowledge base and their participation in the workplace.

Figure 2.6a

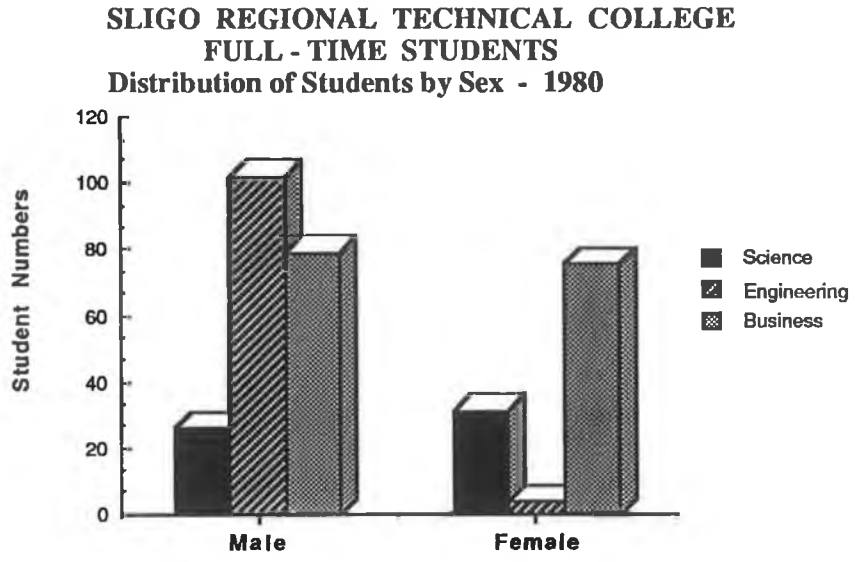


TABLE 2.3

Full-Time Students Registered in Sligo 1980/1990

Distribution by Sex

Table 2.3a -1980

Sex	Science	Engineering	Business
Male	26	102	79
Female	31 (54%)	4 (4%)	75 (49%)
TOTAL	**57**	**106**	**154**

The position regarding the percentage of women participating in Sligo RTC gives cause for concern on a number of fronts.

1. The student numbers shown (Figures 2.6a and 2.6b) and Tables (2.3a and 2.3b) would indicate that the number of females on Business Studies courses has increased from 49% of the student intake in Business Studies in 1980 to 63% of the student intake in 1989.

2. The number of females on Engineering Courses, has increased from 4% in 1980 to 12% in 1989.
This is an unacceptable low increase at a time when job prospects in engineering are expanding.

3. The percentage of females participants in Science has increased from 54% in 1980 to 59% in 1989.

Figure 2.6b

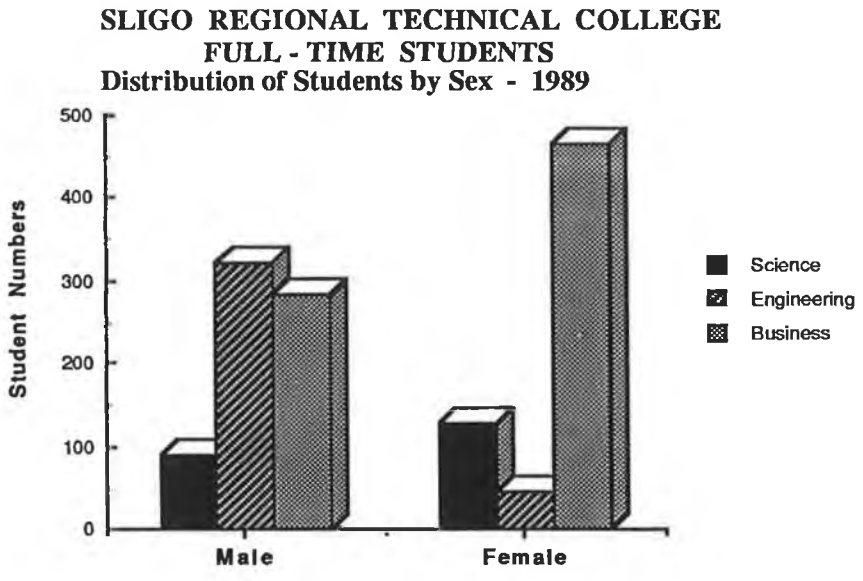


Table 2.3b -1989

Sex	Science	Engineering	Business
Male	87	321	272
Female	126 (59%)	43 (12%)	464 (63%)
TOTAL	**213**	**364**	**736**

Figure 2.7

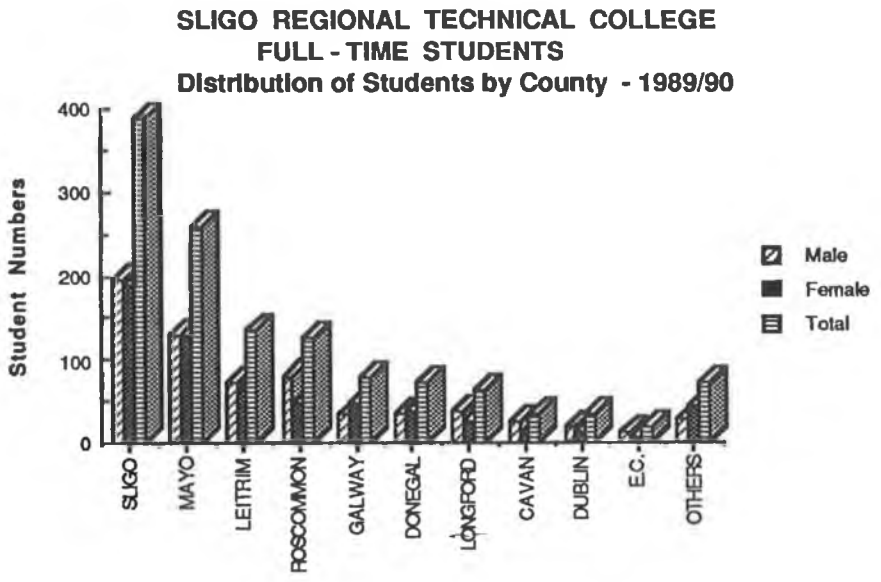


Table 2.4

Sligo RTC Registration of Full-Time Students.

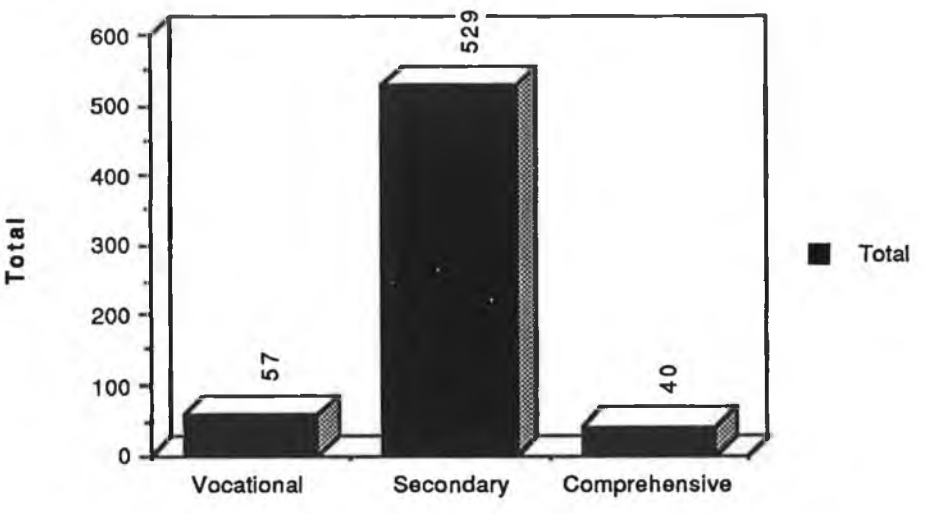
Distribution of Students by County 1989/90

County	Male	Female	Total	Percentage
Sligo	197	190	387	30.2%
Mayo	128	132	260	20.3%
Leitrim	73	63	136	10.6%
Roscommon	81	45	126	9.8%
Galway	33	45	78	6.1%
Donegal	35	38	73	5.7%
Longford	36	26	62	4.8%
Cavan	25	9	34	2.7%
Dublin	20	13	33	2.6%
Others	29	44	73	5.7%
E.C.	11	8	19	1.5%
Total	668	613	1281	100%

Table 2.4 and Figure 2.7 show the different counties which provided students for Sligo RTC in 1989/90. As expected Sligo County provided 387 students or 30% of the total.

Other neighbouring counties provided the following percentage of students; Mayo 20%; Leitrim 20%; Roscommon 10%; Galway 6%; Donegal 5.7%; Longford 2.5%; Cavan 2.6%; the E.C. 1.5% and Others 5.7%. Other included; Meath,15 students; Westmeath, 25 students. Other counties, e.g. Clare, Wexford, Offaly and Waterford provided one student each.

Figure 2.8
SLIGO REGIONAL TECHNICAL COLLEGE
Distribution by Background.



The second level educational background of the new student intake to Sligo RTC in 1989/90 reflects that which is available within the Catchment area. Approximately 70% in the catchment

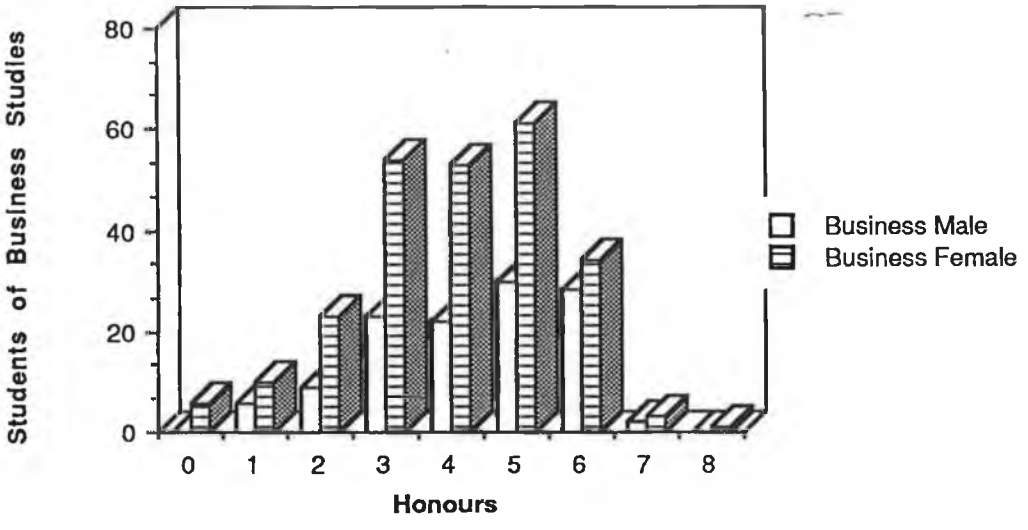
area are secondary students, 20% are vocational students and 10% are comprehensive and other students. 619 Students commenced Year 1 of the various National Certificate courses at Sligo R.T.C. in 1989/90. This intake can be broken down into the following second level educational groups, 85% were secondary school students, 9% vocational school students and 6% comprehensive and other students. (Fig. 2.8). The emphasis on secondary schools possibly reflects the higher educational aspirations of such students and their ability, by a larger percentage, to achieve the points required to gain entry to courses at Sligo R.T.C.

TABLE 2.5
Number of Leaving Certificate Honours of First Year Students Accepted at Sligo Regional Technical College. Distribution by Sex and School 1989

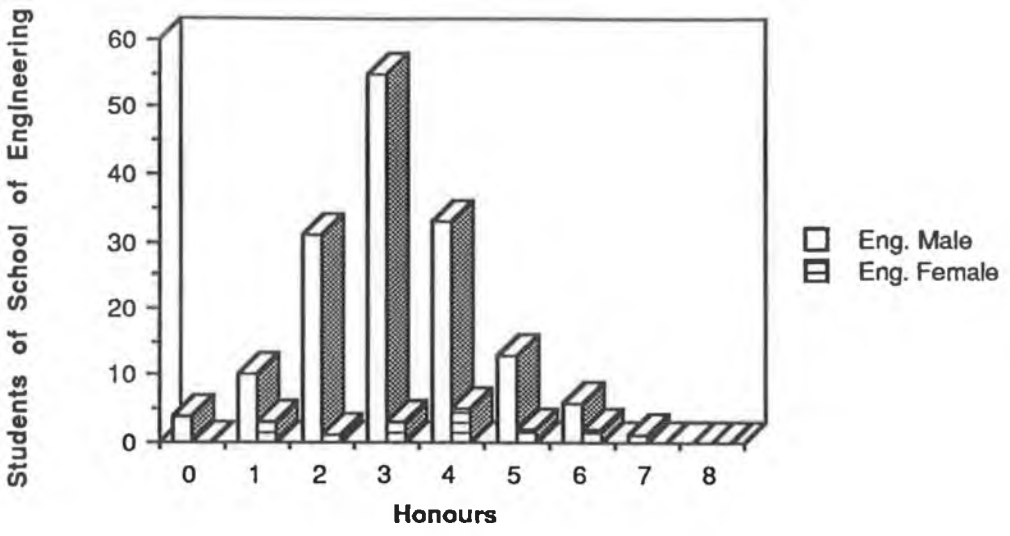
	HONOURS								
SCHOOL	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
School of Business & Humanities									
% Males	**-**	**37**	**28**	**30**	**29**	**33**	**45**	**40**	**-**
Males	0	6	9	23	22	30	28	2	0
Females	6	10	23	54	53	61	34	3	1
%Females	**-**	**63**	**72**	**70**	**71**	**67**	**55**	**60**	**-**
School of Engineering									
% Males	**-**	**77**	**97**	**95**	**87**	**87**	**75**	**-**	**-**
Males	4	10	31	55	33	13	6	1	0
Females	0	3	1	3	5	2	2	0	0
%Females	**-**	**23**	**3**	**5**	**13**	**13**	**25**	**-**	**-**
School of Science									
% Males	**-**	**40**	**31**	**50**	**41**	**28**	**40**	**25**	**-**
Males	2	2	5	10	7	4	3	2	0
Females	0	3	11	10	10	10	5	6	0
%Females	**-**	**60**	**69**	**50**	**59**	**72**	**60**	**75**	**-**

With reference to the applicants for courses in the School of Business Studies (Table 2.5 and Fig. 2.9), 95% of the total number of male students, would hold two or more subjects at honours level at Leaving Certificate. The comparative figure for the female students would be 93%.

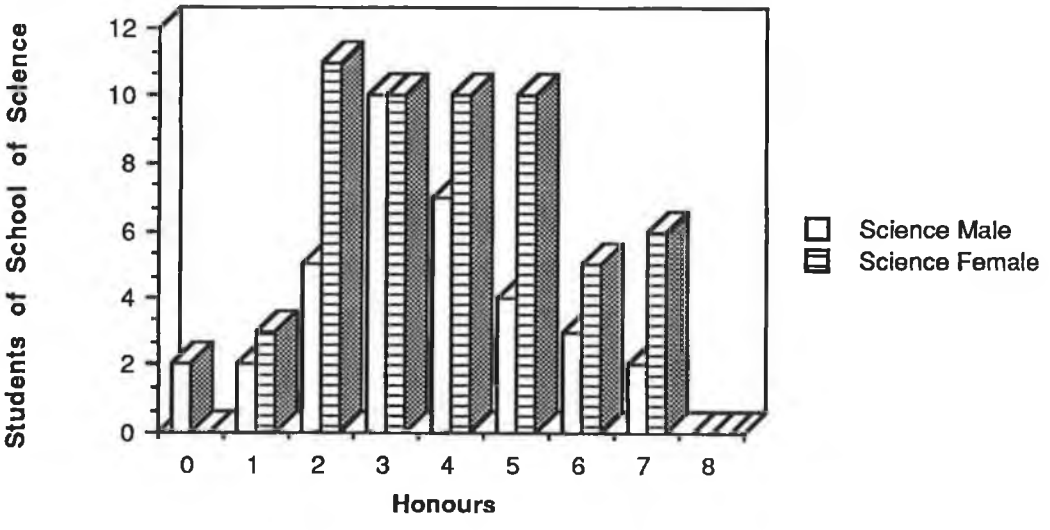
Figure 2.9 Intake in 1989 by Leaving Certificate Results. Business Studies, Engineering, Science.



In The School of Engineering, 90% of the total number of male student applicants, would hold two or more subjects at honours level at Leaving Certificate, while the figure for the female students would be 81%. As the number of female students in Engineering is very low the percentage result may be misleading, but the largest group of females have 4 honour subjects in the Leaving Certificate. (Table 2.5, Fig. 2.9).



In the School of Science, 88% of the total number of male students, would hold two or more subjects at honours level at Leaving Certificate. While the figure for the female students would be 91%. (Table 2.5, Fig. 2.9)



Reference Number 24 College Records 1970-90.

CHAPTER 3

ANALYSIS OF AN ON-GOING EXPERIMENT AT RTC SLIGO ON DEVELOPING AND PROMOTING ALTERNATIVE PROGRAMMES OF STUDY.

3.1 The National Certificate, the National Diploma and Degree programmes using alternative modes of study.

3.1.1 Using out centres to complete year one of the full-time National Certificates.

3.1.2 Using out-centres to bring Part-Time Education to many Students who by their geographical location could not otherwise have availed of it.

3.1.3 The use of full-time programmes to provide part-time courses to special groups i.e. housewives, shift workers etc.

3.1.4 Cooperate with industry on special programmes which incorporate in-house training, on the job experience and special college courses leading to National Certificates.

3.1.5 Integration (through ACCS) of apprentice programmes to National Certificate programmes.

3.1.6 Single Subject Certification and/or Credit recognition for some FAS trainees.

3.2.1 Provision of Diploma outlets for existing full-time and part-time graduates using the methods specified in 3.1.1 and 3.1.2.

3.3.1 Application of the strategy adopted for Certificate and Diploma level courses in 3.1.1 and 3.1.2 above, to complete a Degree or Degree equivalent programmes in cases where such courses exist in the RTCs.

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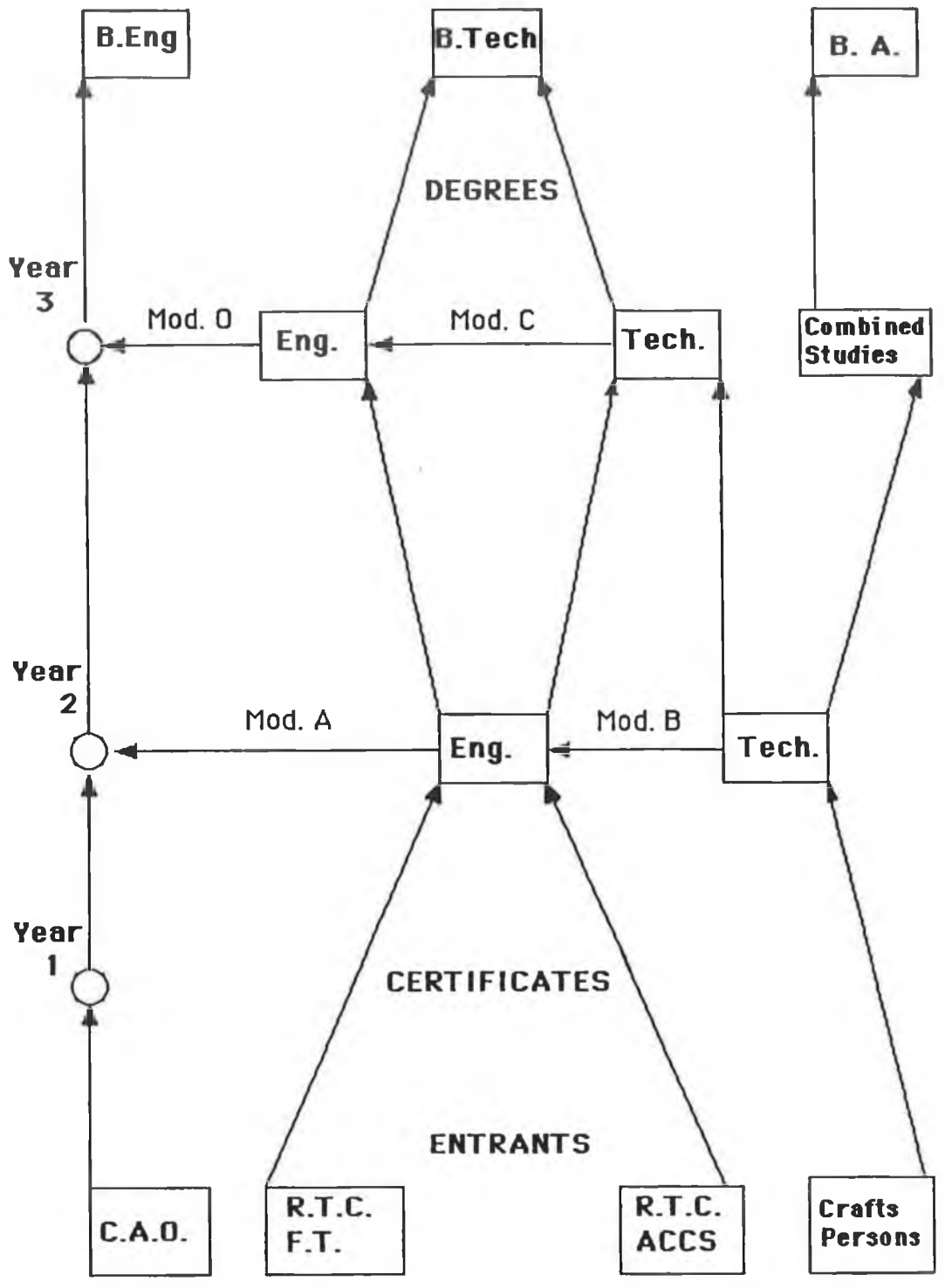
Figure 3.1.0

SLIGO R. T. C.
FLOW CHART FOR ENGINEERING STUDENTS



Introduction

Third Level Education was normally associated with University education and the student's progress can be seen from the Flow Chart(under C.A.O. Fig.3.1.0.) The formal road to professional progress is by applying to the C.A.O. office and the acceptance of the student by a Third Level College to commence a four year Ab-initio Degree.

This chapter addresses the progress through a system of Third Level Education other than the one shown by C.A.O. It examines students who enter Third Level Education as R.T.C. Full-Time Students, or R.T.C. Part-Time students (ACCS.) or Craftspersons. (Fig. 3.1.0) If the student's progress is examined under R.T.C. Full Time, then a student will take 5 years to receive the professional qualification of Bachelor of Engineering (B. Eng.). The extra year is required to complete the conversion module "A" or "O". i.e. To improve the analytical skill of the student.

Students with the potential to achieve can obtain a B. Eng. or a B. Technology (B. Tech.) in 4 years of academic study. This is dependent on the selection of students for entry to the R.T.C. system whose objective is to be high achievers.There must be careful selection of their subjects, addressing the possible lack of analytical skills extra tuition must be provided to make up the deficit of the conversion module,

The position of students opting to use the R.T.C. full-time student route is complex due to the fact that the National Council of Educational Awards (N.C.E.A.) have a structured awards system. The National Certificate of the N.C.E.A. is such an award, which is

usually obtained after two years full time study. A National Certificate can have different titles placed in brackets after the main title e.g. National Certificate in Business Studies (Accountancy) - National Certificate in Science (Chemistry), National Certificate in Engineering (Civil). There are some subsets within the field of the National Certificate in Engineering. If the student studies Engineering in the formal sense then it is assumed that he/she studied the topics, Mathematics, Physics, Engineering Drawing, Computers, Communication, and has added on topics of a more specific nature i.e. Civil Engineering or Mechanical Engineering or Electronic Engineering subjects. Some students opt not to do the formal subjects of Mathematics and/or Physics and this is reflected in the particular N.C.E.A. National Certificate e.g. National Certificate in Technology. Movement of the student from a level of Technology to the professional stream is achievable by a conversion course addressing the Mathematics, Physics or Analytical skills deficits.

If the student studies different areas of the same discipline e.g. Mechanical Engineering and Electronic Engineering then this is reflected in the title of the National Certificate, the Award e.g. National Certificate in Combined Studies. Finally if the student has studied across a broad area of disciplines to achieve a National Certificate standard, he/she would receive the award of National Certificate in Inter-Disciplinary Studies.

Students holding the National Certificate with the grade of Merit (60% plus) or Distinction (70% plus) may proceed along the educational route to the Diploma, or a Pass result (between 40 and 60%) is sufficient provided students have had a minimum of one

years industrial experience. Note that the Diploma can also be obtained in Engineering or Technology or Combined Studies.

Transfer from the Diploma course, to the Degree course is again complex. Students transferring to normal Ab-initio degree programmes are asked to drop a year, i.e. students who were holders of the (3 year) diploma are asked to start on the penultimate year of the Degree. This is not a desirable practice because it leads to a degree in 5 years. A conversion course could be provided by the "host college or the "home college" which would allow the student to transfer to the final year of the degree. Therefore the student has a structured path to a Degree and depending on the subjects taken can achieve a B.Eng. or B.Technology or B.A. Degree in 4 years.

Chapter three will elaborate on how different types of students may proceed from their present third level educational status using the ACCS programme of study and complete the National Certificate and/or the National Diploma and/or the National Degree. The N.C.E.A. in conjunction with the European Community has a common "European Course Credit Transfer Scheme" of subject accreditations whereby the student achieves 60 credits for a full year of study. Hence for year one of the Certificate the student obtains 60 N1 credits, for year two of the Certificate another 60 N2 credits, or 120 Credits equals one National Certificate. This can be continued with 60 N3 credits for a Diploma and 240 Credits equal one Degree. A conversion course may be required to transfer the "N" grade units which are used for undergraduate qualifications to "P" units which are used for the award of a degree. Hence the reason why the RTC students take

five years instead of four years to obtain the award of a degree. Under the R.T.C. Full Time mode, there is also the potential to use Out Centres at second level schools near to some students homes and consequently, allow these students easy travel to a third level centre each day, especially for year one of their Academic Programme.

The alternative to pursuing a third level course by the Full-time mode is to avail of Third Level Education under RTC. ACCS. or Craftspersons.(Fig.3.1.0) This has been carried out formally under different Part-time schemes. Now that the NCEA have introduced their ACCS scheme (Accumulation of Credits and Certification of Subjects) the staff of Sligo RTC. will avail of it to offer this alternate mode of study.

This ACCS mode allows course credits to be obtained for each subject studied and to obtain an appropriate award when the required number of credit points are achieved. The students seeking Third Level Education under R.T.C. ACCS are primarily "Second Chance" students. This chapter will show how these students, adults over 22 years of age, comprised of housewives, the unemployed, those seeking further education and those seeking a job transfer can be catered for, by use of the Accumulation of Credits and Certification of Subjects (ACCS) mode of study. This can be carried out by following their course of study as Single Subjects on the Part Time Programme or in the case of the unemployed or housewives' by using a Part-time Programme within the Full- time programme. They can progress to the Engineering Certificate,then on to the Diploma in Engineering or Technology and subsequently to a Degree course depending on their

interests and/or availability of tuition.

The fourth group under consideration in Chapter 3 is the industrial crafts person or craft apprentice. Using the ACCS. mode of study these craftsperson have already acquired Third Level education, information and industrial experience and it may be possible to express this in a number of N1 or N2 Credit Points, or in exceptional cases in N3 Credit Points. The craftsperson may now wish to 'top-up' with further Credit Points of the appropriate N range and proceed to achieve his/her academic level. It is important to note that he/she may move laterally and take conversion modules to allow him/her choose their ultimate goal.

Section 3.1.1.

Using Outcentres To Complete Year 1 of a Full-Time National Certificate.

<u>Financial & Competitive reasons</u> for non participation at Third Level education

Students who obtain the Leaving Certificate, with reasonable grades, often do not go to a Third Level Colleges because of financial considerations and because of the competition for third level places. Providing out-centres 100Kms. from the RTC's increases the number of places available for third level education and incur a lesser financial burden than that of attending a university college.

Many students' parents cannot provide the finances to send their children to College. If the College was within travelling distance/school bus distance then maybe these students would attend college for third level education. The E.S.F. grant scheme would also be in operation for N.C.E.A. courses thus further reducing the cost of this type of education. There would be no need to provide an accommodation allowance, and the student would be self financing during this period.

Estimated yearly costs of attending a University College.

Rent	£736	Food	£864
Entertainment	£400	Travel	£104
Books	£170	College/	£600
Fees	£1,400	Food/Expenses	
Total		**£4,200**	

The use of second level school buildings would increase the number of places available for third level education. This was also addressed in the *Programme for Economic Progress* , Jan '91 Page 33 where it states;

> In addition, the targeting of places for the disadvantaged would be further strengthened through linkages between specific second level schools and third level institutions.

In 1989 over 60,000 students obtained Leaving Certificates that qualified them for third level education. There was approximately only 32,000 total places available at Third Level made up of:-

University Places	12,000
DIT/RTC	14,000
Agricultural Colleges	4,000

Therefore the option for 50% of the students was to repeat the Leaving Certificate so as to improve their points rating or to give up on a Third Level education. About 5,000 repeat students re-apply to the C.A.O. each year with better Leaving Certificate results and about 3,000 of these students receive offers on a Third Level educational programme.

This cooperative programme involving Outcentres, between the schools will allow more third level places and a lowering of the "points" needed to obtain a third level place.

The cut off point for Leaving Certificate students applying for Mechanical Engineering or Electronic Engineering at Sligo RTC in August 1990 was 27 and 28 points respectively.

Note that the points per grade for the RTC's is as follows:

A	B	C	D	Level
7	5	3	2	0
10	8	6	4	H

Therefore the poorest of the L.C. result student applying for Electronics could have 4 "D's" at H level + 2 "C's" at H Level or 16 + 12 = 28 points. It is worth noting that in 1989/90 the minimum points required were 21 and 23 respectively. Many students of a decade ago were able to pass the National Certificate in Engineering (Mechanical or Electronic) with 12/14 Leaving Certificate points. Lack of third level places increases the "points" needed by the prospective students to pursue a third level education.

Another option for the students is to avail of the ACCS programmes available at some RTC's, or to use Out-Centres as shown in Figure 3.1.1.1 or to opt for Part-Time participation on the Full-Time Mode at an Out-Centre or an R.T.C.

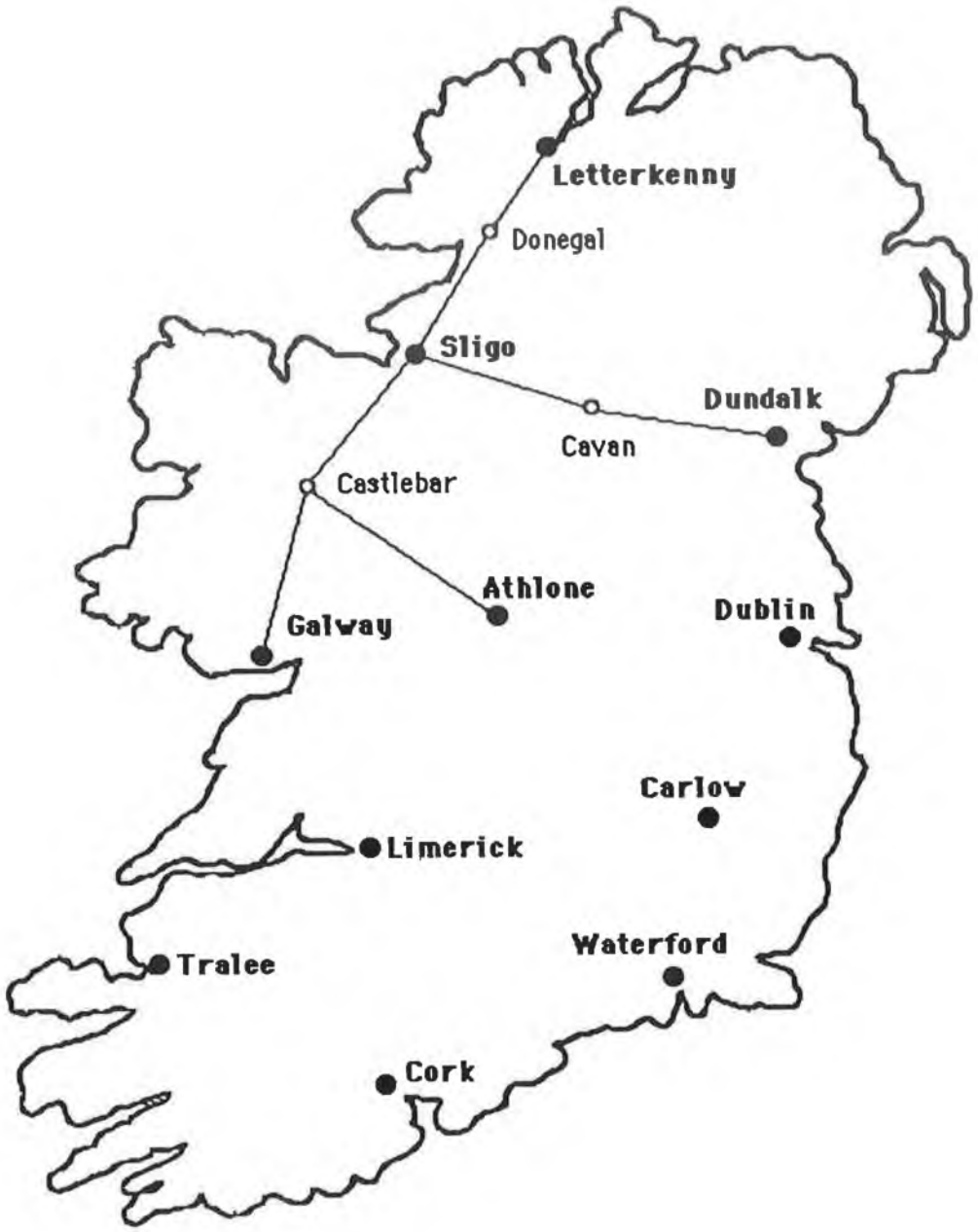
The ACCS mode of study suits the weaker students for a number of reasons.

1. The number of subjects undertaken each year is less than that of the full-time student. Therefore the student has more time for study and less examinations to undertake each year.
2. In the structure of the examinations there is more of an "open book," approach, more group project work and more assignment type work thereby reducing the "closed book" type of examinations.

3. The student can proceed subject by subject keeping his ACCS merit points until he has 120 points and then obtain an NCEA National Certificate.

Although eligible students are available for Third Level courses there are now more students seeking places on Third Level courses than there are places available, due to space, costs, etc. ACCS method addresses this numbers problem. The Third Level R.T.C. institutions could utilise second level facilities to accommodate courses in outlying areas. It is necessary for the R.T.C. Colleges to move to the students. As student numbers at Second Level Colleges have been falling since 1982 due to a decline in the Irish birth rate since 1970 some of these centres mid way between the Regional Colleges could be used for year one of the National Certificate. (Figure 3.1.1.1)

Figure 3.1.1.1



Location of Ideal Out-centres for Year 1 of the National Certificate.

The idea that second level courses should alone take place in second level schools has to be dispelled. This can be achieved by having the Third Level course run at a time when it has exclusive use of the building. The ideal situation would be for the Third Level students to have their own building at the School or failing that to have a timetable which would allow them exclusive use of the building for a specific length of each day. This could be implemented by having classes from 1.00 p.m. to 4.30 p.m. and from 5.30 p.m. to 8.00 p.m. each day, as workshops and laboratories would be free from 4.00 p.m. These laboratories and workshops could be used by third level students from 5.30 pm to 8.00 pm. Another suggestion would be to start the week on Tuesday and finish on Saturday, allowing the R.T.C. students exclusive use of the building on Saturdays. The Part-time National Certificate in Mechanical Engineering Course which will be run by Sligo R.T.C. in Castlebar Vocational School or at Cavan Vocational School situated about 60 miles from Sligo is a working example of this. The First year subjects will be the same as Sligo RTC. i.e. Maths - Physics - Engineering Drawing - Computer - Communications - Workstudy - Workshop Practice - Workshop Theory.

The use of this system could provide an opportunity for a pre 3rd level education programme targeted at the long term unemployed group, now that selected VEC's are providing tuition, 5 days a week for 30 weeks for such groups. If the ACCS scheme discussed above is to be an answer to the problem of the long term unemployed, then the main core subjects, Mathematics, Physics, Computing, Engineering Drawing, English could be started in the Outcentres/VEC schools. This would us enable the students to take

up some of the major subjects at a more leisurely rate and preparing themselves mentally and educationally for undertaking the full programme in the following year.

Administrative Strategy

Lecturing staff could be recruited and paid by the RTC., but this staff should be provided from the area. This staff would not be specifically from the "host" college, but be instead acceptable part-time lecturers paid by Sligo R.T.C. The host College would have to provide an "A" post or at least a "B" second level promotional post to overview the Third Level course(s) and act as course coordinator. The Course Coordinator from the R.T.C. would travel and lecture and liaise between the part-time lecturers at the Out-centre and the full time lecturers at the R.T.C. and solve any problems occurring in the administration of the course.

Students could come to the R.T.C. once a month, on a Saturday and cover the topics C.N.C. (Computer Numerical Control Machine) and C.A.D. (Computer Aided Drawing). Because of the limited resources, in some Second Level schools the students access to C.A.D., which is part of Drawing, could be a problem. This problem would have been addressed if the student, during his monthly visit to the RTC. had a C.A.D package installed on the computers at the College i.e. Autocad,. This package is now available on Apple and I.B.M. Computers and will soon be available on all P.C. computers and could then be taught at the "host" college.

Workshop practice and particularly C.N.C. machining are areas that can be addressed by the use of computer software e.g. "Anima Programmes" which allow machining programmes to be

compiled and cutting profiles generated similar to the industrial situation. Therefore the visit to the RTC each month would give "hands-on" in this particular aspect of the course. Vocational Colleges offering the Vocational Leaving Certificate, will now have this type of equipment available for both C.A.D. and C.N.C. for use on the course. There may be a need to use some time at the RTC to use or demonstrate some of the other practicals. Most second level Colleges have a reasonable library but again the monthly visit to the RTC. could keep the students library projects up to date .

There could be a similar arrangement made to hold the National Certificate in Electronics. Special attention would have to be given to some of the more specialised subjects. The subject Electronics Practical and Electrical Principles Practical would have to be taught at the RTC. in the specialists laboratories. Also a weekly visit by a lecturer in Electronics to the host College could cope with any administrative problems which would arise.

An article in the Irish Times of April 20th, 1989 referred to this type of experiment in glowing terms and explained how, if implemented it would help to increase third level places in County Dublin and also help to fill the empty classrooms of the V.E.C. Vocational Schools. The article concluded as follows ;

> The proposals are tailor-made to solve a number of educational problems simultaneously; they are a pointer towards the kind of flexibility that is needed to adjust the educational system to the changing demographic circumstances. More college places, quickly and at virtually no capital cost.

The staff of Sligo RTC proposed such a course two years ago and has academic approval for these types of courses.

CONCLUSION

There are many valid reasons for taking the R.T.C. out to the students for year one of the National Certificate, some have been explained within the document, (finance, space etc).

Students who are residing at home will be able to spend more time at their studies with improved academic results. Although one advantage to the student and college is that the cost is less than at the third level college. This is not the prime reason for moving the R.T.C. out into the Region. The ambition of Sligo is to be a Regional Technical Colleges providing a main campus and outcentres. Outreach education would give an opportunity to start Pre 3rd level Courses for the weaker students, or the "2nd. Chance" student, and increase the number of Third Level places on offer to eligible students.

The use of second level school buildings and some second level teachers will help to cement the relationship between second level and third level institutions and help curriculum development in each of the different education levels. Each group of teachers would understand what the other does and therefore be aware of problems and be able to suggest remedies, or changes to the curriculum at each level.

SECTION 3.1.2

Using out-centres to bring Part-Time Education to many Students who by their geographical location could not otherwise have availed of it.

Mr. P. MacDiarmada, Director of the National Council for Educational Awards, in his foreword on page 3 of the N.C.E.A. booklet on *Accumulation of Credits and Certification of Subjects*, October 1989 states very clearly the aspirations of the N.C.E.A., the educator and the student when he states;

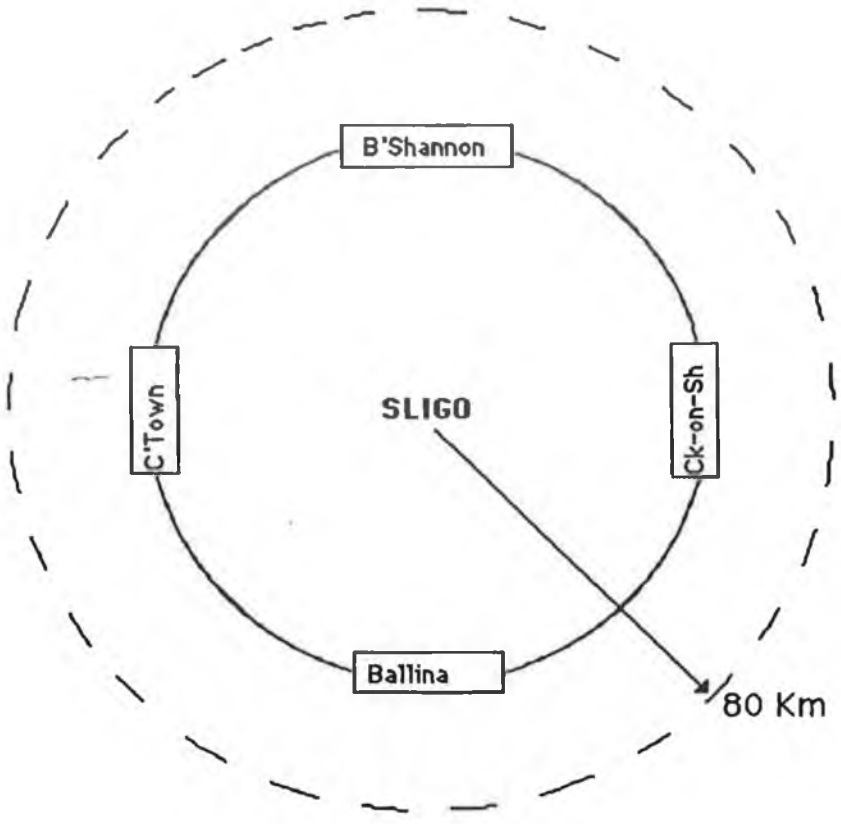
> The Council of the N.C.E.A. has been aware of the need to give formal recognition to achievement by students, on completion of study in one or more subjects. The N.C.E.A. ACCS scheme, will allow students to follow these subjects and to be awarded a subject certificate on their successful completion. It is hoped that this will allow designated institutions, to further develop adult and continuing education programmes. The N.C.E.A. ACCS scheme, should facilitate greater participation by students on a part-time basis and the promotion of adults and continuing education, on a nationwide basis. It has long been the wish of adult students and adult education organisations, that adult students should receive recognition of their achievements, by way of certification.

The educator (in this case the Regional Technical College) in attempting to satisfy the students and the awarding body the N.C.E.A., undertakes to meet all the criteria of both parties.

Figure 3.1.2.1

LOCATION OF REGIONAL TECHNICAL COLLEGES

Figure 3.1.2.2
The Catchment Area for ACCS. Courses Available to Sligo RTC.



The College referred to in this document, is Sligo Regional Technical College, but this could be expanded to include any R.T.C. or any Third Level college. Figure 3.1.2.1 shows the location of the R.T.C.'s throughout Ireland and includes the Dublin Institute of Technology. Figure 3.1.2.2 shows the catchment area for ACCS courses taking a radius of 80 km. from Sligo R.T.C. This is a realistic distance considering time taken to get to the college after work.

Figure 3.1.2.3

Location of RTC's & DIT's showing the Catchment Area for ACCS Courses available to each College.

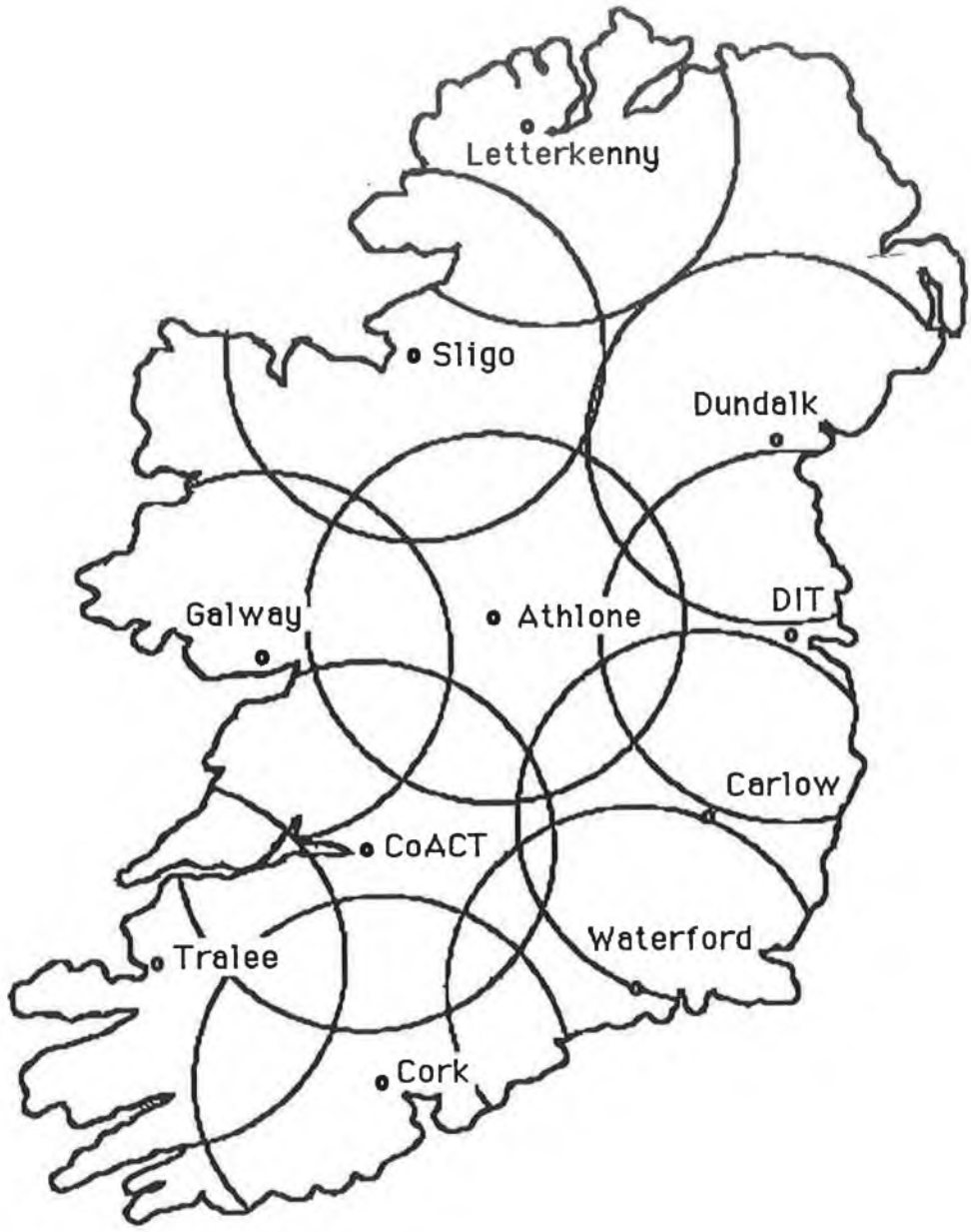


Figure 3.1.2.3 shows how Third Level Education could be available for all the people of Ireland if all the RTC's were to offer N.C.E.A. Certificate Courses under ACCS. There could now be an opportunity for the people in the surrounding areas to obtain a third level education. In this case, the courses specifically mentioned are the National Certificate in Engineering (Electronics or Mechanical). These could be substituted by any National Certificate. The award level for the student in this section is the award of Certificate because this is the first third level qualification obtained and the start of further third level upward mobility. This is also the award which will attract the most students

DURATION

For the Part-Time National Certificate programme to be attractive it must be of reasonable length for the student and it must be cost effective for the student and the R.T.C. The model used is Sligo's part-time Certificate in Mechanical or Electronic Engineering which is of three years duration. Year 1/ 2/3 consists of 2 nights per week, 3 hours per night and on Saturday each alternate week for 8 hours. The project is undertaken in Year 3 on the other alternate Saturday for 8 hours. The advantage of alternate Saturdays to the students is that he/she can be available to do overtime at work on the free Saturdays in year 1&2 or attend to the garden or other matters at home. Also the cost of travel to the centre is reduced by half (remember some students travel up to 100 Kms. to avail of part-time education). The average travel by students to Sligo RTC. is about 50 Kms. (shared transport between the students reduces this cost still further).

The advantages of this mode of operation to the School are increased use of the facilities and as the college students are together as a group for a full day they learn to co-operate and help each other with the different assignments allocated to them.

The class should have its own special nights at the college which would allow for minimum interference to the students' social life and it would create habit forming in the students and also allow common subjects to be taught on a common night, For example, Sligo has Electronic Engineering on Monday and Thursday nights, Mechanical Engineering on Monday and Thursday nights with a common first year Saturday and a common second year Saturday. This also should reduce travel costs as students from different courses and from different years of courses can travel together.

Location of Centres for ACCS programmes

One factor in choosing a course of studies is its location in relation to the student i.e. how far does the student have to travel and can he afford the cost and the time for travelling.? Sligo R.T.C has a policy of bringing the R.T.C. to the students, not the students to the R.T.C, for year 1 of the National Certificates in both Mechanical and Electronic Engineering thereby making the package as attractive as possible for students. Year 2 & 3 take place at Sligo RTC. See Figure 3.1.2.4 for further clarification.

Figure 3.1.2.4

Location of Out-centres for ACCS. Courses at Sligo RTC.

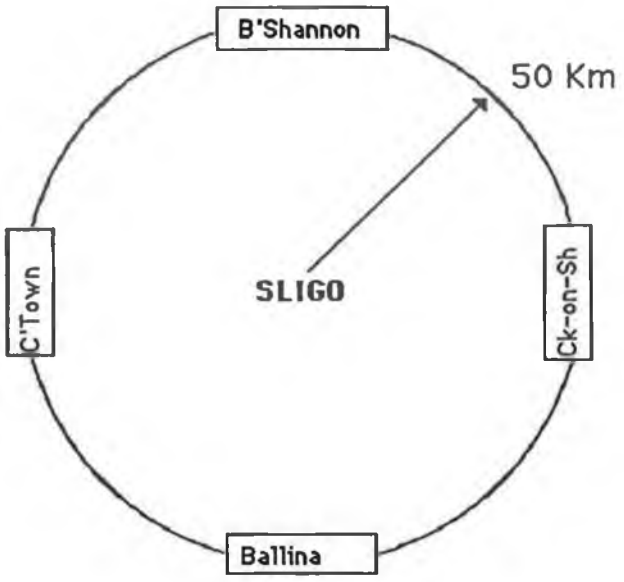


Figure 3.1.2.4 shows the location of the towns used as out-centres for the part-time programme.

Location:

Year	Centre	Topic	Centre	Topic
1987	Ballina	Electronics	Ballyshannon	Mechanical
1988	Charlestown	Electronics	Car.-on-Sh.	Mechanical
1989	Ballyshannon	Electronics	Ballina	Mechanical
1990	Car.-on-Sh.	Electronics	Charlestown	Mechanical

With Sligo City as the centre, Ballyshannon and Ballina are two towns located about 50 km from Sligo. Carrick-on-Shannon and Charlestown are also two towns located about 50 km from Sligo. Figure 3.1.1.2 shows the specific Catchment area available to the Sligo College covered by a radius of 80 km.

In a particular year, say 1988, Year 1 of the Mechanical course would be in Carrick-on-Shannon and Year 1 of the Electronic Engineering course would be in Charlestown. Students on completion of year 1 would continue their studies at Sligo RTC.for years 2 &3.

In the following year 1989, year 1 of the N.C. Electronic and year 1 of the N.C. Mechanical Certificate would have moved clockwise about Sligo so that now the Electronic Engineering starts in Ballyshannon and the Mechanical Engineering starts in Ballina. Students on completion of year 1 would continue their studies at Sligo RTC.for years 2 &3.

In the following year, 1990, the Catchment area of that particular 1st. year course will move through a further 90 degrees placing year 1 of the Mechanical in Charlestown and year 1 of the Electronics in Carrick-on-Shannon and finally in the fourth and last year of the cycle year 1 of the Mechanical will now be in Ballina and year 1 of the Electronic will be in Ballyshannon. This cycle is repeated every four years with the advantage that students in the Catchment area have a choice of attending year one of the part-time National Certificate in Mechanical or Electronic Engineering at an out-centre near them.

The people who wish to avail of this type of course are;
(a) People who wish to change their job position,
(b) People who are out of work or redundant (the new rules which allow people on social welfare benefit to take part on educational programmes, will hopefully encourage people to participate in third level education).

(c) Women whose children have gone to school and have spare time on their hands and/or wish to get back into the job market.
(d) People who see a third level education course as a challenge, or who wish for some mental stimulation or those who wish to take particular aspects of the course for whatever reasons.

Advantages of this method of Education?

1. It allows the College a greater Catchment area of students.
2. It brings third level education out to the country.
3. It is cost effective.
4. If the routine is fixed and standardised then prospective students know that in any one centre there will be an opportunity to study year 1 of one of the National Certificates.
5. Sligo City students can use either the National Certificate in Mechanical Engineering or the National Certificate in Electronic Engineering by travelling to the particular centre on two nights a week with no Saturday travel. Referring to Figure 3.1.2.3 you will see that using this system all prospective students in Ireland could be catered for, if this model was adapted by all the other R.T.C.s.

Contents of the Course

It is imperative that the content of the part-time (ACCS) course is seen to be exactly the same as that of the full-time course otherwise the Certification obtained by one type of student may be deemed to be better or worse than that obtained by the other. If one targets the over 22 years age group then the hours allocated to the content matter should be thoroughly examined. The major differences between full-time 18/19 year old students and

mature students are, in the fields of motivation, endeavour, application, interest and the maturity to apply logic to their learning and understanding. If one couples this to a good textbook per topic, a defined reading list and a good library, one will be able, in all but the skill topics, to reduce the time content by approximately 50%. This is backed up by the results given in the following sector. The skill factors applied in Engineering are those of workshop skills and drawing skills. How can one equal the skill given by longer hours of "hands on" on the full-time programme? One answer is to use computer machine skills. The computer numerical control machines (C.N.C.) will compliment the hand skills required in the workshops. Use of computer aided drawing packages like Autocad will allow students to draw with computers thus offsetting what could have been their average drawing skill. In Electronics the skill factor is coordination, this takes 18/19 year old a longer time to acquire. Mature students generally have good hand coordination and do not require the extra time. The specific hours requirements for the Full-time and the Part-time National Certificate Programmes are shown below.

Hours Allocation for Full-Time Certificate Programme

Year 1	30 hours X 30 weeks	=	900 hours
Year 2	30 hours X 30 weeks	=	900 hours
Total		=	1800 hours

Hours Allocation to Part-Time Certificate Programme

Year 1	10 hours X 30 weeks	=	300 hours
Year 2	10 hours X 30 weeks	=	300 hours
Year 3	14 hours X 30 weeks	=	420 hours
Total		=	1020 hours

As can be seen from the above, the total hours allocated to the part-time programme is only 60% of the total hours allocated to the full-time programme.

Course Results

The effectiveness of this method of education can be measured against the results obtained in the National Certificate in Engineering (Electronics). 1989. The part-time results were as follows.

Fifteen students started the course on year one, of which 12 students passed into year two. These twelve completed year two and passed into the final year with the following result, five passed with Distinction, five passed with Merit and two obtained the result of Pass. The average age of the students was 30-35 years of age. Forty percent of these students had not passed their Leaving Certificate Examination.

On the Full-Time Certificate for the same year, 31 students sat the examination, 7 passed with Distinction, 8 with Merit and 10 with Pass only and 3 received exemptions in some subjects.

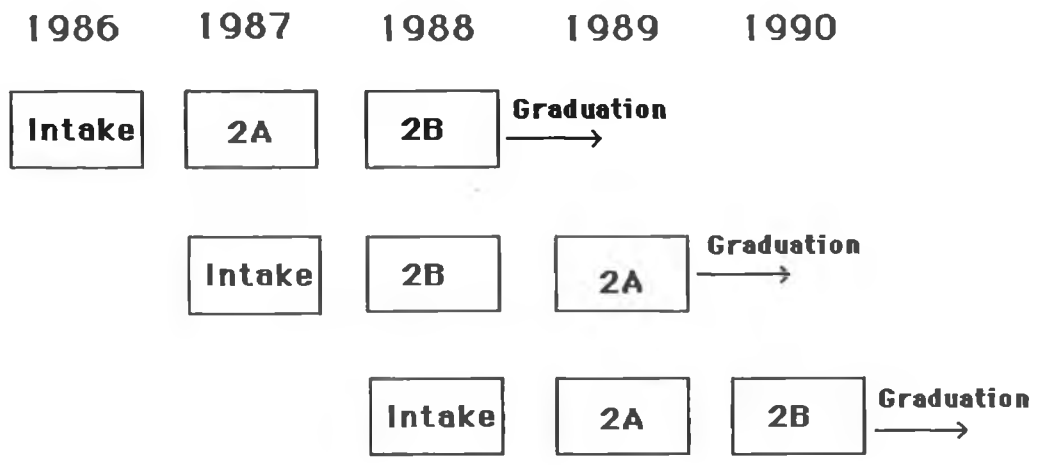
The course is more cost effective if lecturers teach multiple subjects i.e. the teacher of Maths and the teacher of Physics is the same person. One has greater flexibility with subject matter if the lecturer of mathematics and physics is located near to the outside centre. Also further advantages accrue, i.e. if there is snow or fog and the visiting lecturer cannot travel, then one has a lecturer in-situ. Money is also saved on travel expenses for this lecturer travelling to the outside centre.

Subjects on Year 2 and Year 3

The situation is further enhanced if care is taken with the choice of subjects on year 2 and year 3. (Referred hereafter as year 2A and year 2B). If year 2A and year 2B are independent halves, i.e. subjects taught in year 2B are not dependent on year 2A for their progress and visa versa, then students could progress into year 2A or year 2B from year one and take the subjects on offer in that particular second year. Furthermore if there was a mix of analytical and retention type subjects on each second year course then the courses would be balanced.

The success of year 2A and year 2B can now be examined from both the student's and the School's advantage. Student cost is based on numbers. In the experience of the college staff if the student numbers for night courses run over three fixed years was sixteen students on year one, there would be ten to twelve students available to commence year two, (due to academic failure and social inconvenience) and eight to ten students available for year three. Therefore the cost to the students in year three would be double that of the cost to the students for year one. This increase in cost will possibly reduce the numbers that might be available, increasing the cost of tuition and creating a vicious circle.

Figure 3.1.2.5.



Each intake joins the appropriate 2nd. Year,i.e., 2A or 2B. This gives a viable 2nd. Year.

The staff of Sligo R.T.C's. proposed that, if year 2A and year 2B could be two independent halves of an educational programme then students on year 2 could start with subjects on limb 2A or 2B with students from year 3 who are in their final year and completing that limb of the 2nd. year programme. Now there will be approximately 20 students on the second year programme with the same reasonably priced structure. Students come on to the appropriate limb (2A or 2B) from year 1. There can also be a cost saving in year 2 by having common subjects for both National Certificates (Mechanical & Electronic) on limb 2 A and limb 2B.

In the N.C. Mechanical and in the N.C. Electronics Mathematics, Computing, Production Management are subjects which are common to the Electronic Engineering second year and the Mechanical Engineering second year. The cost to the R.T.C. is further reduced if the common night Tuesday or Thursday or the common day Saturday is used to teach the common subjects on

both National Certificates to both second year groups which share the same days for tuition.

A spin off of the above programme is that the job market will have mature students who will not emigrate and who will increase the labour pool for technician type work in their areas.

Course Costings

Cost to the student based on the cost of the course per year.

Tuition Fees	
350 hours at £15.50	£5425.00
Hire charge for room at host College	
2 nights per week per year	£ 500.00
Caretaker/Technician	
on Saturday	£ 200.00
Class Material	£ 200.00
Invigilator Fees	£ 200.00
Mileage Charge for tuition	
based on 35 miles from Sligo	£ 2100.00
TOTAL	£ 9000.00
16 Students per Class @ £250 Course Fee	£4,000.00
Less 55% reduction on costings received from E.S.F.	
(E.S.F. = European Social Fund)	£ 5000.00
TOTAL	£9,000.00

Therefore the costs of this course are approaching a self financing situation and are less than that of the Full-time course, where Full-Time Education, according to the Minister for Education is costing £3000.00 per student per year. The costs of full-time education at Sligo RTC are not, on average as high as this. The annual budget for the college is £4.0 million for approximately 1,500 full-time students.

Aids to Course Studies

It is important to emphasise to prospective students, in discussions, advertisements, leaflets etc., that the first two weeks of the course will be devoted entirely to tuition in elementary Mathematics and Physics, as most mature students are unsure of their ability in these subjects and need reassurance that they are capable of understanding and following the phased introduction of analytical subjects. This is an important aspect when selling the courses to prospective students.

Tutorials during the course are necessary to help the weaker student and selected students are requested to attend for an extra night i.e. Wednesday night. Tutorials are usually student directed. Examinations for part-time students should be influenced by what is required by the lecturer from the student. Tests which demand a large recall or a lot of writing may not meet that requirement. Composition type questions can cause problems for mature students, who may have had very little experience of examinations. (i.e. many of them never studied for the Leaving Certificate Examination)

The ACCS Credit Award Scheme, (see *N.C.E.A. Accumulation of Credits and Certification of Subjects* Oct.89) allows much greater liberties and flexibility. Therefore open book examinations, assignments, multi-choice questions and group tests, are methods which can be used and also any other new methods of evaluation which will allow the assessor to gauge the correct grade for the student.

CONCLUSION

What has Sligo R.T.C. and the School of Engineering in particular achieved with this part-time programme?

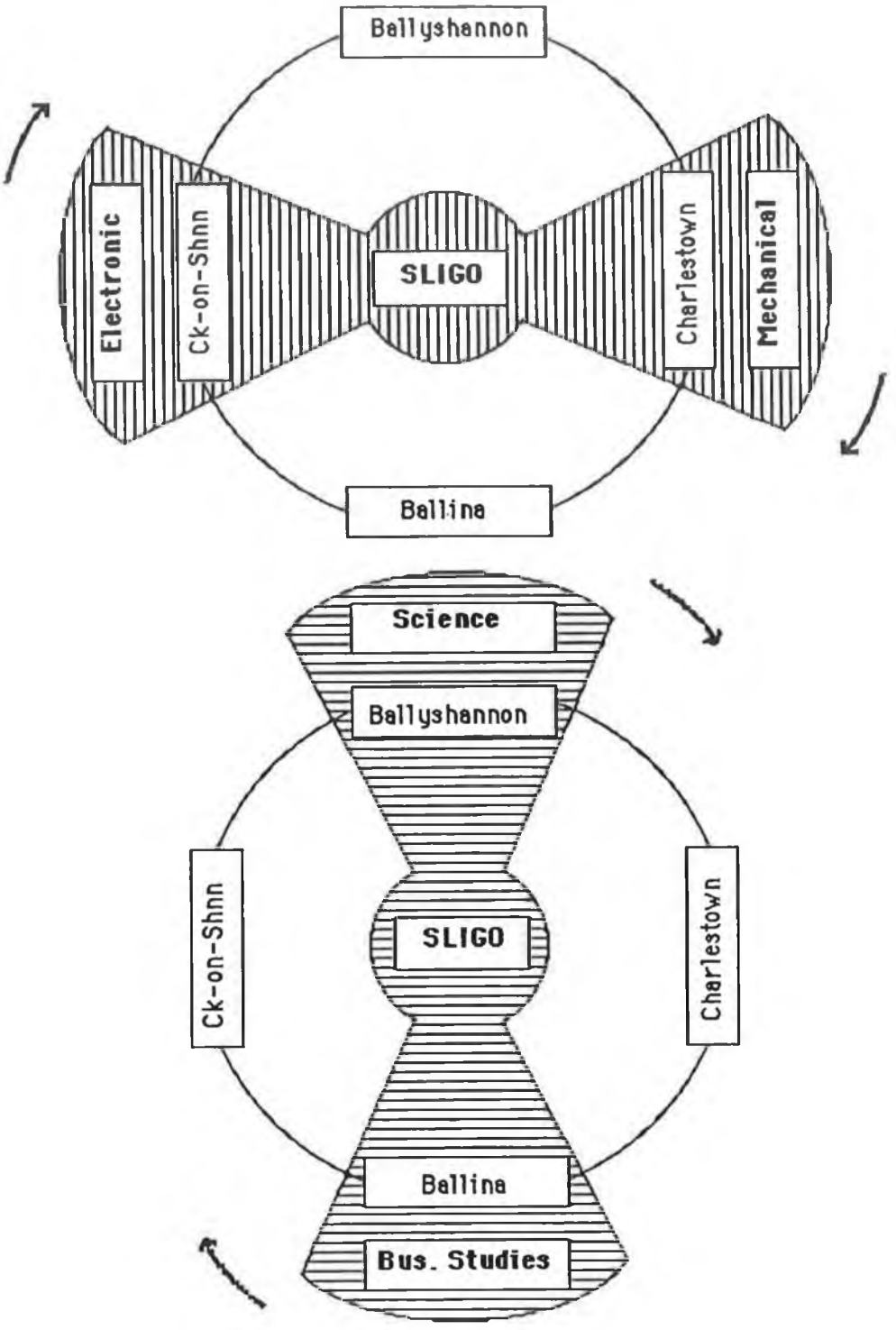
1. It allows 32 people to participate in 3rd Level Education, and take up the National Certificate courses. These students are mostly from the less densely populated areas around the R.T.C. Approximately 24 will go on to qualify each year, equal to the number of graduates from one full-time National Certificate course in the School of Engineering.
2. The cost of the Educational programme is such that a small profit can be generated by these numbers, over the three part-time courses. The cost of a similar full-time course would be a cost of about £80,000. i.e. £3,000 is the approximate cost for an engineering student on full-time education.
3. The graduates would not emigrate as they have commitments i.e. families, jobs in the area. Thereby creating a pool of skilled people available for industry development in the areas around the R.T.Cs.
4. The academic results are excellent. Graduates in 1989 obtained 5 awards at distinction level, 5 awards at merit level and 2 awards at pass level.
5. College facilities are used at night and on Saturdays.
6. Staff have enjoyed the challenge of adult education and the variety of examination procedures allowed, to assess the students.
7. As the ideas expressed in the document have proved successful this scheme should be brought to the attention of all Schools in the College and allow them to add to its attraction.

The New Proposals Involving all Three Schools

In a particular year, see figure 3.1.2.6 the four out-centres are in operation with a first year course in each center of the National Certificates in Mechanical Engineering or Electronic Engineering or Business Studies or Science. Therefore, Mechanical Engineering could be in Charlestown, Science in Ballyshannon, Electronics in Carrick-on-shannon and Business Studies in Ballina. The following year the Catchment area of the student intake, moves 90 degrees clockwise and a different National Certificate takes place and so on each year, until after four years the cycle is complete with each center having the four National Certificates.

The advantages of this scheme are that the host College is used each year and it becomes known that this college participates in third level courses. The subject Mathematics and Physics could have the same lecturer on each course giving continuity of service and understanding of syllabi and assessment procedures.

Figure 3.1.2.6



The location of ACCS Courses for Sligo RTC. The particular Certificate Course moves 90^{0} clockwise each year, i.e., a four year cycle.

SECTION 3.1.3

The use of full-time programmes to provide part-time courses to special groups i.e. housewives, shift workers

Another version of a part-time programme, for those who cannot attend full-time tuition, nor wish to do full-time third level courses, is to attempt the full-time programme on a part-time basis i.e. 9 a.m. to 1 p.m. on each morning Monday to Thursday. In the following year, the course subjects are changed, to accommodate this group, again for the same four mornings giving the equivalent of 30 hours per week over the two year period. This completes year one of the academic programme. It is envisaged that the students are encouraged to attempt year two, in one full year of 30 hours, thereby taking three years to complete the certificate. If not, year two could be attempted in a similar fashion to year one, thereby taking four years to complete the certificate.

The running of two full weeks of maths and physics prior to the commencement of the course in mid September would be essential to this method of education. This would refresh the students minds and strengthen the basic mathematical concepts needed for course participation. The part-time course by night is available to the day course students if learning problems are experienced or if this mode of study is required to compliment or supplement the programme. The other big advantage of this course would be its attraction to women who comprise fifty percent of the population but this percentage is not reflected in their participation within Part-time education, particularly in Engineering.

Women in Engineering

The following excerpt was taken from the Dec. 89 Newsletter, of the Employment Equality Agency,

> 53% of all persons employed in the electronics industry were women, 77% of these were assembly workers as against 31% of male assembly workers, 3% of managers were women. This is compounded by the fact that women are grossly under-represented in technical subjects at second level. Of the 14,125 taking Technical Drawing at Leaving Certificate 352 were female, 5,000 women took physics at Leaving Certificate out of the 21,130 students who sat physics. Of those entering Engineering in a HEA institution in 1987 14% were women.

Women at Sligo RTC.

	No. of Women.	**No. in Class.**	**%**
Women in School of Business Studies.	464	746	**62%**
Women in School of Science. .	126	213	**59%**
Women in School of Engineering.	17	266	**6 %**

The traditional, though now outmoded, attitude to the role of women is still widespread, and sex based differences are still evident in education, vocational training, employment and promotion. Something is needed to make women aware of the improving job prospects in Engineering as well as the job prospects in the Service Industry and Secretarial skills, the here to fore traditional jobs for women.

Fifty percent of the adult population are women and these women have traditionally stayed at home to mind the children. An extract from *"The Labour Force In Figures "* page 9 of E.E.A. publication confirms this;

> In 1987, 32.4% (353,400) of those in employment were women. 99% (669,800) out of the 675,300 engaged on home duties were women. 325,500 were engaged in the formal market. The percentage of married women working increased from 29.2% in 1981 to 31.9% in 1987.
> In 1987 the rate of economic activity for women in the age group 25-34, with no children was 81.8% The rate for women with three or more children was 13.2%. At the same time the economic activity for men in that age group was 96.4%.

Therefore the women are still at home when the children grow up and have gone to school, some are unqualified for any semi-skilled job, some are under-trained and some may have ambitions to improve their qualifications with a view to returning to the labour market. N.C.E.A. ACCS can change this. This group needs to be encouraged to come back to school, remembering that the hours must be arranged to tempt them i.e. **mornings only, Monday to Thursday**. The topics must be properly presented and mixed so that analytical work is balanced with reading matter. Therefore more time is available for personal and group study on the free half days.

This method could be of benefit to males who are redundant and wish to get back into the job market and for those who wish for a mental challenge and have free time in the mornings. It could also benefit those who wish to take a particular topic or subject. Hence, the student could avail of the part-time study during full-time classes with subjects offered in the morning in a particular year and the remaining subjects offered in the morning again,the following year. Subjects would alternate each second year so that the two halves can come together to form a complete unit as already described for year two and three of the part-time National Certificate. This system could also be used by the other schools within the College to attract students.

How do you attract women into education and particularly into Engineering? The answer may be found via a well thought out package of information. This could be achieved by showing that the R.T.C. is a Technological College which has practical classes to help understand the analytical subjects and by explaining the subject detail and the relevant levels of difficulty. These could be explained in a positive light by a female engineer.

Conclusion

Women should avail of this option as they may have commitments to children returning home at 3.30/4 p.m. from school. The course content per year is reduced giving more time to study the subject matter and combined with assignments/joint projects etc. the examinations may not be the terror that they remember from their school days. It should be noted that all who are qualified and available, could avail of this option, or the night option.

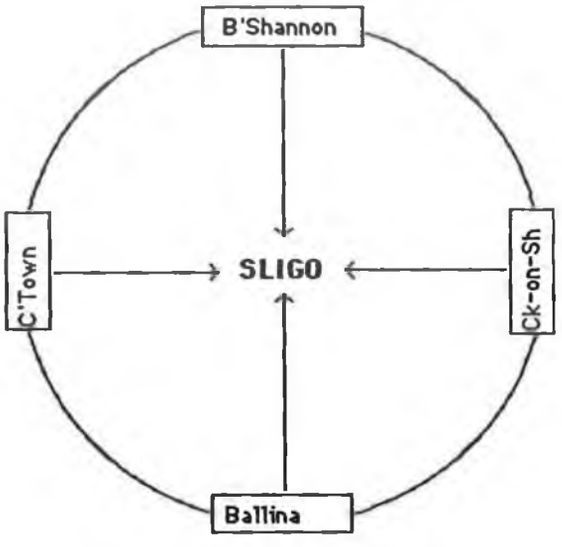
As this method of education is primarily aimed at the large female population, it is important to remember that the root cause of the non-participation of women in Engineering starts at the second level school. Leaving Certificate female students do not consider and therefore do not take an Engineering option. There is a need for an active communication programme geared at parents, female students, career guidance teachers, employers and the public, pointing out the advantages of engineering for women. The contribution that women can make in Engineering could be shown as could the job satisfaction that Engineering can give women. The potential job market in Engineering both in Ireland and in Europe could also be shown.

The whole area of women in Engineering particularly in the Technological area, is very poorly understood. Married women at home and women who have been made redundant from the workplace do not know of the opportunities that are available at 3rd. level institutions. They should be educated in the NCEA ACCS programmes and be given examples of how they can progress through the R.T.C. on full-time and/or part-time courses getting credit for knowledge and skills already attained.

The availability of third level facilites is there at their door step, (see Figure 3.1.3.1) If the Catchment area of a particular RTC. is say 60 km i.e. half-an-hour travel by car from the R.T.C., then all the population of Ireland could avail of this educational opportunity, especially for this mode of study. The N.C.E.A. Council has approved over 400 courses in 32 N.C.E.A. designated institutions giving a total of 5000 subjects.

The N.C.E.A. ACCS scheme will allow students to follow these subjects and to be awarded a SUBJECT-CERTIFICATE on the successful completion of the subject.

Figure 3.1.3.1



The N.C.E.A. ACCS scheme should facilitate greater participation by students on a part-time basis and the promotion of adult and continuing education on a nation wide basis. Now that the rule regarding age limits has been removed from the conditions in relations to payment of the E.S.F. (European Social Funding), Women and the unemployed who partake in the NCEA National Certificate on a full-time basis will receive a grant. There will also be no course fees to pay. They will receive a pro rata payment for participation on an N.C.E.A. ACCS mode of study.

Section 3.1.4

Co-operation With Industry On Special Programmes Which Incorporate In-House, On-The-Job Experience and Special College Courses leading To a National Certificate.

CREDIT FOR EXPERIENTIAL LEARNING

Industry has training packages for its employees, especially for its crafts people and machine operators. These packages are provided to keep staff up to date with modern technology or to achieve multi-skilling so that maintenance and operational costs can be reduced. These industrial workers should receive recognition for their effort and achievement in learning new technology. In this model the R.T.C. will move out to the industry with classes, examinations etc. taking place within the shift times, thereby reducing time losses for employer and employee. Their efforts can be monitored by the NCEA, through registration of eligible employees & courses at an R.T.C. Industrial staff can be guided/directed to an National Technician Award in (a named specific area) aimed primarily at the craftsperson in the industry and/or a National Technology Award in (a named specific area) for semi-skilled Operators.

Industry's philosophy should be to encourage its employees to achieve a National Certificate in Engineering. In order to satisfy the NCEA needs for academic excellence, certain topics would need to be covered within the course of studies being offered to the employee, these are the basic engineering core subjects, Mathematics - Physics - Computing - Engineering Drawing - Communication. These would equate to approximately 60% of the

course of the National Certificate in Engineering, Mechanical Engineering or approximately 70 of the possible 120 ACCS Credit Points required for this course. The rest of the course (if this is possible) would contain subjects which are optional in the full-time National Certificate in Engineering programme with these optional subjects geared to each industry's specific requirements. Subjects such as Hydraulics, Pneumatics, Electricity, Electronics, Quality Control could form the other 40% of the National Certificate Award i.e. 50 Credit Points. This would make a total of 120 ACCS Credit Points, sixty at N1 level and sixty at N2 level.

If industry is unable to provide this 40% option, then consideration should be given to the option of studying subjects from the full-time programme, using the part-time facility. These classes can be either outside the normal class hours or within the normal class hours. During certification of effort and achievement, recognition can be given to skills and knowledge gained during the apprenticeship and in the work environment.

The staff at Sligo R.T.C. have active industrial/educational links and were approached by a major local employer of 400+ employees, this company has an annual in-house training budget of about £250,000. They approached the college with a view to getting certification and/or academic recognition for certain components of their in-house training.

After working with this employer for a number of years and facilitating them through "Single Subjects" certification, discussions and cooperation between the college and the industry

have resulted in a policy of holding the classes inside the factory, having the class times to suit the change in shift times and also holding the examinations to suit the shift times. This gives the college a more humane image and by discussion and participation of the three partners, i.e. industry, education and employees, the needs of each are catered for, and all participate to the overall good of the partners.

SUBJECT MATTER

An example of the subject matter covered was as follows;

National Certificate in Engineering (Plastic Processing)

Mandatory Subjects	**Credit Points**	
	N1	N2
Mathematics	7	5
Physics	5	5
Engineering Drawing	10	7
Computers	5	4
Communication	3	3
Workshop	10	6
TOTAL	40	30

Optional Subjects:	Credit Points	
	N1	N2
Plastics Technology	-	10
Electrical AC/DC plus	5	-
Industrial Control	5	5
Pneumatics	5	5
Hydraulics	5	5
Quality Control	-	5
Materials and Materials Science	4	10
Work Experience	10	5
C.A.D.	5	5
TOTAL	39	50
GRAND TOTAL	79	80

Work Experience is a new subject and is based on the employee obtaining 2 points per year for relevant work experience to a maximum of 10 . N1 points i.e. Year 1 to Year 5 and 1 point per year from Year 5 to Year 10 giving 5 N2 points .

On closer examination of the subjects listed above and using the example of Fitters as our Crafts People then the following NCEA ACCS credit points could be achieved by exemptions:

Mathematics: 7 N1 credit points and 5 N2 credit points.
During apprenticeship exemption could be obtained for the 7 N1 points but not for the 5 N2 points.

Physics: 5 N1 credit points and 5 N2 credit points.
During apprenticeship exemption could be obtained for 5 N1 points but not for the 5 N2 points.

Engineering Drawing: 7 N1 credit points and 10 N2 credit points.
The Credits could be obtained for the 7 N1 points and the 10 N2 points and could be obtained by work project or test, as the apprentice course covers all the drawing completed on the Technician Course.

Computer Studies: 5 N1 credit points and 4 N2 credit points.
No exemptions are obtainable for studies during apprenticeship.

Communication: 3 N1 credit points and 3 N2 credit points.
Civics/English is a subject on apprentice courses and therefore exemption could be obtained for the 3 N1 points but not the 3 N2 points.

Workshop Practice and Theory: 10 N1 credit points and 6 N2 credit points.
All the 10 N1 credit points can be obtained and the 6 N2 could be obtained by work project or test, as apprentice knowledge and skills in this topic far exceed the technician requirements.

Work Experience: 2 N1 Credit points per year for the first 5 years and 5 N2 credit points for the next 5 years.
This is a novel request to the N.C.E.A. and is at present under consideration.

This gives 45 N1 points and 18 N2 points and would be the norm of credit points available to craft workers as exemptions in most industries. The optional subjects, were required by the industry to achieve their aims in relation to multi-skilling and up grading skills which were needed to make them competitive, within their field of industry. The subject matter was acquired by the use of inter-active videos, distance education videos and in-house courses, supervised by key staff within their own industry.

The staff at Sligo R.T.C., provided this subject matter at a time, day and location which suited the industry's requirements of production, maintenance and shift systems. The industrial staff responded by commitment, effort and application to the learning programme. Which is reflected in this example based on the subject Plastics Technology of 10 N2 credit points achieved with 100 hours of lecturing per group.

The average age of the students was approximately 35 years, the oldest being 55 years old. Two had no formal 2nd level education, Five had obtained the Group Certificate. Eight had obtained the Intermediate Certificate.Therefore over fifty percent had not achieved a leaving certificate standard of education.

Twenty-nine students presented for the examination.
The results were as follows, 12 students received the Grade A which reflects excellence, 13 students received the Grade B, reflecting above average, 3 students received the Grade C, reflecting average and 1 student received the Grade D, reflecting just pass. (See Appendix for Students' Profile).

(a) The classes were held in company time, so students were anxious to succeed.
(b) Students wished to receive recognition of their knowledge of the subject, as they were working in this area on a day to day basis and were mature people.

The industry's optional subjects would produce 39 N1 points and 55 N2 points, therefore different groups within the industry needed to achieve different numbers of N1 and N2 points.

If the students ambition is to achieve the National Technician Certificate, then Mathematics and Physics will have to form part of the Credit points and an extra 10 N2 points will be required.
If Mathematics and Physics are not the strong suit of the participants, they could be directed to the National Certificate in Technology. At a future date for those who wish to, they could undertake a conversion course i.e. a topping-up course, MOD "B", as per figure 3.1.0, to transfer from the National Certificate in Technology to the National Certificate in Engineering Award. Remember that all industries will not need, or demand, a high analytical skill, but will require and demand special skills and knowledge, relevant to its own particular industry.

If the employee wishes to achieve the National Technology Award i.e. leaving out the Mathematics and Physics, he/she will be required to make a total of 60 N1 points and 60 N2 points, remembering that the subjects Engineering Drawing, Computer Studies Communication and Workshop are mandatory and those subjects must be covered within the overall totals. If the

student's endeavour is to achieve the goal of the Multi-skilling award, classes are available in the R.T.C. Sligo on all mandatory topics using the Part-Time Day ACCS Mode or Part-Time Night ACCS Mode.

With this particular industry, arrangements had been agreed in relation to shift workers and how they would participate. A point to note was that of the 40 industrial workers who followed the course of instruction , all were men, although this industry does employ 300 women workers. This is another reason for our programme at Sligo designed to attract women into undertaking Engineering Technician Courses. It is another piece of evidence that reinforces the belief of Sligo R.T.C'.s staff that the college should actively encourage women to become involved in Engineering.

Benefits

The benefits to all three participants in undertaking this third level educational programme are ;

Workers

a. Employees will receive a monetary reward for their efforts. when they achieve the award of Craft Technician,
b. They are now more adaptable to further technological change.
c. They have a much broader base to allow them adapt to a job change.

d. Employees get credit with NCEA ACCS credit points for the courses that they had to attend. They are placed on the road to achieving an NCEA Certificate for their efforts.

e. The employees have received credit for previous experience, skills and knowledge.

f. They can continue their progress to Diploma and/or Degree, improving their financial and social position in the industry.

Industry

a. Industry has up-graded its own technology,

b. Multi-skilling has been incorporated,

c. Production costs have been reduced.

The College

The college has,

a. An educational programme which has been paid in total by the employer.

b. Further courses can be provided at no extra cost to the College, as they are part of the college's programme of studies.

c. The college staff improved their relationships with industry and more industrial type projects are available for use on the Full Time Programmes.

This is the real world of production, costing, quality standards and competitiveness. If these things do not happen then the jobs and the company will cease to function. The RTC is privileged to play a part in ensuring that job security is maintained, by providing the educational skills and technology necessary, to keep

industry at the forefront of the production of high quality goods, at standards better than its competitors and at a cost that is acceptable. The costs of this course are such that the employer will meet the total costs of the course and will also cover administration costs so that the college only stands to gain by the relationship. The employee improves his knowledge and skills, partly on the employers time and partly on his own and will receive monetary reward, promotion and greater job satisfaction.

The idea of a Craft Technician Award joins together, the skills of the craft-persons and the intellectual skills of the technician. This combination flourishes within High Technology Manufacturing. The idea of an industry tailored Technician/Craft Technology award, brings great credit to the NCEA and the ACCS mode by allowing the combination of subject which the industry requires. The employee gets credit and recognition of his achievements. The RTC fulfils it's specific regional role in structuring educational programmes for local industrial employers by acting as the catalyst.

CONCLUSION

The partnership of RTC and Industry is a worthwhile exercise in this academic venture with the RTC providing 50% to 60% of the academic package depending on the background of the workers. Industry provides 40-50%, if this is possible within it's industrial requirement The workers could be offered a choice of two qualifications i.e. National Certificate Engineering Technician or a National Certificate in Engineering Technology. This depends on which one best suits industry's and the workers' abilities.

Integration (through ACCS) Of Apprentice Programmes to National Certificates.

INTRODUCTION

The FAS discussion document on apprenticeship states in the proposed "Entry Mechanism to Apprenticeship" on page 11, that

> Standard Entry Requirements are proposed to provide an equitable entry to apprenticeship, which are:
>
> (1) Being 16 years of age or over.
>
> (2) Having an Intermediate/Junior Certificate with 3 Cs and 2Ds. (A technical subject is desirable).

Higher minimum qualifications may be necessary for certain trades in the light of curriculum up-dating and this is noted on page 10 of the same document under "Ladder to Technician Level"

> A clearly defined way of progressing from apprenticeship to technician level will be implemented as part of the assessment and certification system. The proposed system will provide a basis for a recognised career structure where craft workers can attain higher levels of qualification.

i.e. the document indicates an aspirations to incorporate apprenticeship into the structure of the Third Level system. It would appear that these aspirations are not compatible. How can apprentice training and skills be incorporated into Third Level education when the apprentice is not eligible for entry into Third Level education ?. To be eligible to pursue a Third Level course of studies the students must be either over 22 years of age, or a

craftsperson, or have 5 Ds including mathematics and a language, in their Leaving Certificate. It would be to the craftsperson and to the industry's advantage if the craft person had this minimum qualification before taking up his/her craft. It is obvious that all designated apprenticeships will not have to acquire the same level of knowledge nor the same skills.

In considering Craftspeople and their skills, the Precision Engineering crafts people can be considered as a group requiring high knowledge and high skills (at one end of a spectrum), while at the other end of the scale there would be crafts people who require mostly a manual skill or dexterity. In between these there are several other craft, which could require a mix of both abilities. The following crafts could be designated as being in the precision engineering field, Toolmaking, Motor Engineering Electrical and Electronic apprenticeships. Most of the apprentices registered with FAS in Toolmaking, Motor Engineering and Electrical Work have the 5 D's at leaving certificate level required for entry to the third level education system.

The FAS document goes on to state on page 14 ;

> The use of a dual set of resources (FAS and Dept. of Education) for one apprentice place results in considerable duplication and inefficiency. Therefore, it is proposed that all "off the job training" for each module undertaken by an apprentice is delivered at the same location.

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This can and could be achieved if these Precision Craft apprentices received all their training at an R.T.C. The State at little or no expense could have the apprentice craftsperson at a level of the National Certificate in Engineering (Precision), where the person is deemed to have all of the criteria laid down for this award, which would be comparable to the National Certificate in Engineering (Mechanical). The student would hold dual certification i.e. N.C.E.A. Certificate and a Department of Education Craft Award, which would be of benefit to himself, his employer and the customers.

Let us consider Toolmaking as our model and extend it to encompass all other crafts designated as precision engineering. The "One Year Off The Job" programme could be undertaken at the RTC's. The N.C.E.A ACCS programme of part-time studies could be operated to complete their studies.

Comparability of Apprentice and Third Level Subjects

First-Year Off- the-Job Subjects	**Hours**	**ACCS Pts**	**Third Level First Year Subjects**	**Hours**
Maths	4	7	Maths	4
Engineering Science Theory & Practical	4	5	Engineering Science Theory& Practical	4
Engineering Drawing	4	10	Engineering Drawing	4
Workshop Theory	6	5	Workshop Theory	4
Workshop Practice	15	10	Workshop Practice	10
Communications	1	3	Communications	1
Total	34	40		27

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This would give a total of 40 x 1N Credit points i.e. Two thirds of the total number of points required for one year of Third Level education.

With a further two block-releases of 11 weeks each there would be an opportunity to pick up more ACCS 2N Credit points in subjects like Workshop Practice 5 points, Project 10 points, Engineering Drawing 10 points and Human Resource Management 3 points, equal to 30.2N Credit points i.e. half the tuition required for a second year Technician course. This scheme gives apprentices of 18/19 years an opportunity to continue their studies while proceeding with their careers. This means that the craftsperson who obtains/acquires NCEA ACCS points while attending block release will be able to supplement these points with a suitable night class programme obtaining the remaining ACCS Credit points required to acquire a National Certificate.

Further, while attending at an R.T.C. the student would feel an integral part of the College. Apprentices at present feel that they are inferior to the third level students as they do a different course and for a shorter period. Now they will be achieving dual qualifications, Craft and Technician Awards, by this method.

National Certificate in Technology (Maintenance)

If all apprentices who have 5 Ds in their Leaving Certificate were to be registered on the ACCS Programme with the NCEA the following benefits would accrue. All their third level studies could receive credit under the single subject certification, which accumulate as Credit Points for achieving a National Certificate

in Technology (Fluid Power) or (Electrical Power) or (Industrial Electronics) or (Polmer Technology) etc. The basic difference between these certificates is the different emphasis on craft theory and skills, all of the other topics would be similar. To cater for apprentices who do not wish to undertake the study of the analytical skills of mathematics and physics there could and should be, for example, a National Certificate in Technology (Plumbing).

As it is envisaged that apprentice numbers will rise from 2,400 registered apprentices to 3,500 registered apprentices in the next few years and while some may not be able to register on NCEA courses due to lack of entry qualifications, those who can register as third level students should be allowed pursue the ACCS Mode of study to reward their efforts, endeavours and achievements. The better students always added extra part-time educational qualifications in City and Guilds courses, i.e. C&G 225 a Mechanical Technician Certificate in three parts taking approximately 6-8 hours per week over three years. Therefore this craftsperson holds dual qualifications of Technician and Craft. Similarly C.&G. 224 was undertaken by Electrician once again to achieve dual qualification. The Motor Engineering Apprentice undertook a variety of C&G Examinations, to give width and recognition to their efforts to broaden their motor engineering knowledge.

The Part-time NCEA programme, fits these requirements and will allow the apprentices follow the part-time programme by night or partake of subjects from the full-time programme. One can

therefore complete the required number of N1 Credit points and the required N2 Credit points, and have acquired dual qualifications. Craftspeople can achieve their expectations in the world of academia and be much better craftspersons and trainers of future apprentices, able to adapt to future technological changes.

Conversion courses, which cover subjects like Mathematics and Physics, can be organised to allow students to transfer from technological qualifications and to undertake Diploma Courses or proceed to Degree Courses.

Within the revision of the "Apprenticeship Curricula", page 10, "*Apprenticeship a New Approach*" states;

> To implement these proposals apprenticeship curricula will have to be reviewed and revised. This will involve building on the best of the past and incorporating new materials where relevant. The pace of technological change will necessitate continuous up-dating of the curricula. In addition, consideration will be given to incorporating basic training in European Languages.

The philosophy of this section would seem to cater for the dual qualification with all its benefits. The N.C.E.A. Programmatic Review will allow for review of the programme every four years, catering for the updating of the curricula.

Multi-Skilled Craftpersons

Another aspect of modern technology and change is the demand for multi-skilled Craftpersons or the multi-skilled Technicians. The entry qualifications suitable for the Precision Trades i.e. 5 Ds at Leaving Cert. will allow this information, education and skills to be more easily undertaken. The basic "One Year Off the Job" as suggested, has the basis for some multi-skilling especially between Fitting, Turning and Electrical Work and between Electrical and Electronic Work. The Minister of Labour has stated in the foreword to *"Apprenticeship"* that;

'With the advent of 1992 his aim for industry is to earn a reputation which will help to gain for us an enhanced share of European and indeed of World markets.'

If the FAS discussion document of December 1989 is examined taking particular attention of specific sectors of it, i.e. entry qualifications and upward mobility, the following observations could be made. If the educational entry qualifications are not sufficient to achieve what is expressed above then this effort will be lost. If the craftpersons wish to proceed with technician education at a later date it will be at a great cost to themselves and the nation, as they may have to repeat a lot of what would have been covered during their apprentice training. They will also have to devote their time to achieving a qualification that was so readily available during their apprenticeship. This will make technician qualifications less attractive to the craftperson and students upward mobility to Diploma and Degrees less feasible.

CONCLUSION

The cost of this dual qualification is not high in monetary terms, as 66% of the first year National Certificate is achievable during apprentice training. Fifty percent of the second or final year of the National Certificate is achievable during apprentice training and the remainder is achieved on a part-time programme which is self-financing. Therefore there could be a saving per apprentice of £6,000 i.e. £3000/ year for two years. There is a definite possibility of having Multi-Skilled craft persons, with the benefit to industry that this would bring, in the reduction of production costs. There is also a benefit to future apprentices who serve their time under such highly skilled and qualified craftspeople.

For industry these qualifications would be of great value, giving it the opportunity to avail of these craftspeople as Production Managers, i.e. C.A.D./D.N.C. operations would also need the skills of these persons.

For Multi-skilling Technicians (Electrical/Electronic) there would be available Industrial Maintenance craftsperson who could examine the Electronics, the Hydraulics, the Pneumatic and the Electrics. For Multi-skilling Technicians (Motor), the Motor Industry would have graduates who would be able to offer the complete range of diagnostic services in Mechanical, Auto Electrical, Diesel, Petrol Injection, Hydraulics, Pneumatics and Turbo Charging. Management of stores and workshops could also be undertaken by these graduates.

In the other crafts the craftsperson would be allowed credit for all third level course topics and receive the relevant Credit points under the ACCS and Single Subject Certification for achievement and effort. Most of this would be achieved while undertaking their apprenticeship. Further relevant courses that may be undertaken could be counted towards a National Technician Award or National Technology Multi-skilling Award.

Therefore all crafts would benefit and there would be no losses for any of the trades. Precision craftspersons are a special group that are needed as craftspersons to lead the country into 1992 and beyond.

This would reduce duplication of course material with the relevant waste of time by the student and the college. In the area of craft education the more able participants have obtained additional academic qualifications through the "City & Guilds" of London programme of education. This proposal under ACCS provides an Irish based integrated programme, which can lead to full technician recognition. The total cost of apprentice training is estimated at £54 million per year. What figure would be a conservative estimate of the losses, in monetary terms due to unnecessary duplication.? What figure would be a conservative estimate of the losses in study time, due to unnecessary duplication.?

SECTION 3.1.6

Single Subject Certification and/or Credit Recognition for Some FAS Trainees

FAS which replaced AnCO in 1986, has a mandate from the Government to provide industrial training. Therefore its training programmes should be investigated within the NCEA ACCS system, to see if accreditation for its programmes of training could be achieved by its trainees. Courses at FAS have a duration of a maximum of 9 months, to a minimum of days or a single week. Let us take as a model two of the longer courses to show how the scheme could operate.

Electronic Servicing is a course of 6 month duration. Some of the more important topics covered are D.C. Theory, A.C. Theory, Transistor Theory, Circuit Application of Transistors, Digital Theory. These topics are also covered under Electrical Principals and Electronic Principals on Year 1 of the N.C.E.A. National Certificate. Therefore some of the trainees who are eligible for registration under NCEA, could receive the 18 N1 merit points allocated to those subjects on the appropriate National Certificate in Engineering, i.e. recognition for about 1/4 of an academic year the equivalent of 15 ACCS Merit points .

The Computer Numerical Control (C.N.C.) Operators' course is of 6 months duration, and has Leaving Certificate entry qualification. This is the criteria required by the N.C.E.A. for awarding Credits for comparable third level work. The course has topics of C.N.C., Machining Materials, C.N.C. Programming and "Hands On" computer

experience. These subjects are covered in Manufacturing Technology in the NCEA Cert. in Engineering (Mechanical), with 15 N1 Credit points awarded to it.

Conclusions

If this content does not receive merit at this point in time it may result in this effort and achievement being repeated, if and when the trainee opts to pursue further studies on the appropriate National Certificate. If the Credit points were achieved parallel to his course of studies, then his ambitions could be raised and may be he would seek to continue with his studies after leaving FAS, studies which are so readily available in the Sligo area with participation on an ACCS. programme. What is required is cooperation between the FAS centres and the RTC's to organise and record all students who are eligible to participate, so that their efforts can be recorded at the time of achievement. Remember that within the Electronics Servicing Course, at FAS Centres, some students will sit and pass Part 1 City & Guilds 224, others will sit and pass Parts 1 & 2 City & Guilds 224 and a small number will achieve Parts 1, 2 & 3 City & Guilds 224. Those following C.N.C. Programming will sit and pass C. & G. 204 yet they will not receive an Irish recognition for their efforts. This background of trainee ability, application, skill could be directed into a course for Multi-skilling or Technology (Craft). This would combine the best of the two worlds of skill and technology to bring this talent into the workplace providing benefits to both students and industry. There are many such courses at FAS which could be related to different comparable courses within the 5,000 subjects registered within the N.C.E.A. courses.

SECTION 3.2

Provision of Diploma Outlets for Existing Full-time and Part-time Graduates.

Part-Time Diplomas

If a part-time Diploma is to be successful the same criteria that is required for the Certificate programmes must be applied to the Diploma Programme and each item must be considered in detail e.g. entry qualifications,duration, content, location costs. Fig.3.1.0 shows the progress made by the student on the educational ladder.

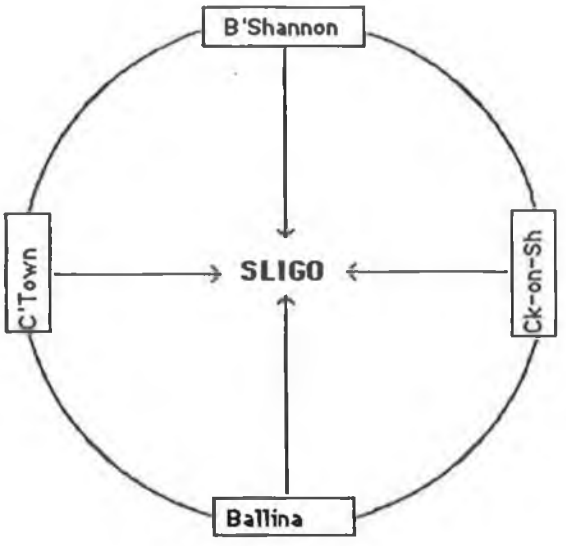
Entry Qualifications

Entry qualifications are as laid down by the NCEA, which states that the student must have a National Certificate, with a minimum grade of Merit or have a National Certificate, at grade of Pass and a minimum of one year's relevant work experience.

Because of restrictions imposed by time and distance it is assumed that the Catchment area for these Diploma ACCS Courses would be no more than a 50 km radius from the College, (Figure 3.2.1). Also if the students' educational background were from more than one discipline i.e. Mechanical or Electronic then the potential number of students who could participate on the courses would be increased.

Note: the Full-time Diploma course is 720 hours duration , while on the ACCS mode the Diploma course hours are 540 hours A saving of 25% in time. Again this will reduce the overall cost of the course to the students and the college.

Figure 3.2.1



For the part-time programme to keep its numbers up, and its fees down, it is required that each half of the course on offer is independent of the other with a mix of practical and theoretical subjects e.g. Limb A and Limb B.

Duration

The course is of thirty weeks duration, for each of the two years, on two nights per week Monday and Thursday, 7.00 pm to 10.00 pm and on each alternate Saturday 9.00 am to 6.00 pm. The strategy for the above arrangement is discussed in Section 3.2.1 and need not be repeated here. It will contain a 60 hours "conversion course" for Mechanical Technicians i.e. Electrical/Electronic Principals to allow them to continue with the Electronic subjects on limb A or B of the course. It will also

contain a 60 hours"conversion course" for Electronic Technicians i.e. Hydraulics / Pneumatics Principals to allow them to continue with the Mechanical subjects on limb A / B of the course.

Content of the Course

The content of the course should be of interest to as many people as possible and to as wide a group as possible. The model used to show this is Sligo's Diploma in Industrial Automation, but could also have been Sligo's Diploma in Quality Control. The contents of each Diploma is such that it will serve to cover different groups of students to which the course is aimed. These include students who hold the National Certificate and wish to have upward mobility to a Diploma knowing the opportunities that this award will bring them in the workplace, or that it will give them an opportunity for a job change. It also includes the students who follow on from the National Certificate under the NCEA ACCS mode, staff of the R.T.C., who may now wish to improve and formalise their qualifications and who have an Engineering background, the staff of the V.E.C. who graduated as Manual Instructors before Thomond College formalised the qualifications with a B. Ed. instructors from the FAS centre, who again were employed as Instructors of craft and skills and who at the time needed no formal third level qualification. All could now have an opportunity to acquire an National Diploma. It could also attract craftspersons from industry who have obtained a National Certificate in Engineering, or a National Certificate in Technology and again if this National Diploma is prefixed with a conversion course, Mod.C. (Fig.3.1.0) it will take students from Technology qualification to a Technician qualification.

Therefore the National Diploma in Industrial Automation is an ideal model to illustrate this theory, because it can draw its candidates from either Mechanical Certificate holders or Electronic Certificate holders. The Diploma is a natural progression for students who had pursued the relevant national certificates and now have employment in the area. It is also a natural follow on for students who have pursued the National Certificate under the ACCS mode and who have acquired a way of life of going to college two nights per week and on alternate Saturdays.

To quote from page 11 of the NCEA booklet on *Accumulation of Credits and Certification of Subjects,* October 1989,

> A student may opt to study a range of subjects within the same discipline but not within a specific area of specialisation in that discipline. An example of this would be of a student selecting subjects from both Mechanical Engineering and Electronic Engineering. If the student successfully completes such a grouping of subjects then he/she receives an award with the area of specialisation designated as, Combined Studies e.g. National Diploma in Engineering in Combined Studies. It maybe that a student would opt to study a range of subjects in more than one discipline if the student successfully completes such inter-disciplinary grouping of subjects then he/she will receive an award having an generic title, Inter-Disciplinary Studies (e.g. N.D.in Inter-Disciplinary Studies).

If the award is to be a Bachelor Degree award, the title Bachelor of Arts only shall apply.

If the Diploma programme was changed to incorporate two subjects as options within the Diploma, then the Diploma could be specifically aimed at the group identified as Lecturers-Instructors-Teachers by the addition of a subject C.A.D. (Computer Aided Design) which includes 2D/2.5D/3D Drawing a necessary attribute for any modern engineering instructor-lecturer-teacher. The other subject could be C.A.M. (Computer Aided Manufacture) this again would further enhance the potential of the instructor-lecturer-teacher and the institution where they work, giving a retraining programme for the lecturer-instructor-teacher in learning about computer controlled machines. The institutions (FAS-RTC-VEC) would gain up-market technology at no cost and no inconvenience to themselves, These subjects could be offered and included within the project, i.e. a project type CAD/CAM.

This strategy was used in Chapter 3.1.5 (Industrial Training) for Certificate holders and there is no valid reason why it cannot be applied here. Whatever topic of an appropriate 3N level that is required by the employer (FAS/VEC/RTC) could be taught using the combined studies option or the inter-disciplinary studies, to give the students what they require in an educational package. This would make their job more attractive and give them more job satisfaction.

Special Groups

There is now an opportunity for validation of the qualifications of different applicants. The applicants could be from several

different categories and hold equivalent or approximately similar entry qualifications i.e. the NCEA National Certificate in Mechanical Engineering or Electronic Engineering. This validation is now possible under the NCEA ACCS mode of study.

FAS Instructors

Members of FAS staff who are craft persons, have been instructors with FAS for more than 5 years and are holders of a full Senior Trades Certificate could be considered as holders of the equivalent of a National Certificate in Technology. They could be offered a conversion course, to validate their qualifications and experience similar to Module "C" used by the staff of Sligo RTC as a conversion course for toolmakers to allow them commence Module 1 of the National Diploma in Tool Design. A similar type conversion course would allow the FAS Instructors entry into the National Diploma in Industrial Automation.

Module "C"

This is a conversion course of approximately 100 hours students-lecturer contact which allows the subjects of Mathematics - Physics - Computer Studies - Engineering Drawing to be studied by students holding a National Certificate in Engineering in Technology, who would need to study all or some of these topics prior to commencing a Diploma Course. At the end of the course the student must achieve the required academic standard in these subjects. The hours of each topic could be , Mathematics 20 hours, Computer Studies 20 hours, Machine Design 40 hours, Engineering Drawing 20 hours.

Industrial Craftspersons

This special group who have already undertaken the National Certificate in Technology should have the same philosophy applied to them, so they also may start the National Diploma in Industrial Automation when they have completed the same entry requirements as that set out for FAS instructors e.g. Module 0.

Trade Teachers at R.T.C.

This strategy could be applied to the Trade Teachers at the R.T.C.s. They were also employed for their craft knowledge and skills and would have five years teaching experience as a minimum. Again they may be asked to sit and pass Module "C" before commencing the National Diploma in Industrial Automation by the ACCS mode.

Trained Teachers

Another category of prospective students are trained teachers i.e. those who undertook a Department of Education two year full-time programme and received a Department of Education Certificate qualifying them as Teachers of Metal Work. This qualification could now be validated as being equivalent to the National Certificate in Engineering. There are two types of prospective students holding this qualification. One is Metal Work Teachers at the Vocational Educational Committee Schools and the other is Trade Teachers at the Regional Technical College. They are similarly qualified and should be allowed direct access on to the National Diploma course.

Conclusion

Offering a Third Level Diploma Programme as outlined above gives an opportunity to those who are eligible to apply for it and to continue with Third Level education with all the benefits that can accrue from the course, i.e. mental stimulation, improved job prospects and job satisfaction.

The number of teachers-instructors who could formalise their qualifications using the ACCS mode, makes this a desirable Diploma both from the students' and employers' point of view. The new knowledge gained is of great benefit to the teachers as it adds to their skills and allows them to keep up with modern technology and in particular in relation to C.A.D. and/or D.N.C. and so be at the forefront of modern technology. It provides the logical vehicle for continuation of the ACCS programme to Degree level, if so desired. The costs again are low, cost is usually a deciding factor against having such courses.

SECTION 3.3.

Degree Programme to Complete a Degree, or a Degree Equivalent Programme, where such courses exist in the RTCS

The achievement of a Degree under the NCEA ACCS programme is the ultimate aspiration of many, who cannot seek a qualification by the normal method. The reward for effort is quite justified, as this qualification may have taken a minimum of 7 years to achieve. Longer than 7 years may be required if the ideal grouping of subjects and levels of N1/N2/N3 merit award points, were not achieved at the time when the student was studying a particular level of award. Some time or effort may be required to change or exchange 3N units for 3P units i.e. a conversion course (Mod.O or Mod C, Fig.3.1.0) so that the student may go on to complete his last 60 x 4P ACCS Merit Points and have the 240 points needed for the award of Degree.

In the discussion document *"Student Transfer from National Diploma Courses to Bachelor Degree Courses"* page 3 states;
'there are many students who as part of their continuing education, would wish to take the latter stages of degree courses on a part-time basis'.

The procedure that staff of Sligo RTC would recommend is for the final year of the Degree to be taken by the student participating on the full-time programme on a part-time basis again by the ACCS mode. The method recommended is similar to 3.1.2 i.e. part-time participation on the full-time programme. The cooperation

of the employer is a basic requirement for participation of the employee on this programme. The employee has now reached his/her last qualification, and would have a problem with attending classes full time. In the case of full-time study the student would have to give up his present employment and this is not feasible or desirable for the student.

A part-time Degree programme is also not feasible for the college because of cost, content, number of students etc. Therefore using the Shift System or Flexi Time or time off, the employee could partake of part- time participation on the full-time course. Due to the fact that the entry qualification is a National Diploma in some special area, the numbers who will be available to undertake a specialised qualification like a Degree, will only be two or three students. The course must be self financing and therefore the cost of running a special course could be exorbitant and beyond the financial resources of the individual or the college.

The strategy of using what is already up and running i.e. the full-time programme and using this with the cooperation of the employer gives both the student and the employer the best advantages. It suits the student because he can still keep his job and learn a new skill and/or technology and can hopefully apply this in the workplace. The employer has an employee who is up-to-date, innovative, dedicated and is participating within his employment using the skills and technology achieved, during his final two years of study.

Using the B.Sc. in Quality Assurance as a model, if the work experience, (which is a basic requirement of the course), is undertaken in the day to day employment then the final year could be achieved in two years by attending for approximately 50% of the class time each year i.e. 10 to 12 hours per week. This will reduce the study load to a manageable level, while causing the least interference with social and family commitments. This will also cause the minimum interference at work, by use of shift system or by cooperative arrangement or Flexi-time.

Conclusion:

This idea of part time participation on the full time programme should suit all people in the service /production industry, They have had an opportunity to test themselves against a progressive level of educational attainments. They also would be able, on a part-time basis and using the ACCS mode, to get recognition for their effort by achieving a Degree.

CHAPTER 4

THE DEVELOPMENT OF OUT CENTRES

AS A MEANS OF TAKING THIRD LEVEL EDUCATION

OUT TO THE PEOPLE.

CHAPTER 4

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Introduction.

This chapter shows how, it may be possible to bring third level education into the work place. To make courses in particular third level areas available on a subject by subject basis by the use of Out-centres and by an expansion of the methods of teaching /lecturing. Many adults have missed out on a third level educational programme due to their geographical location and there was no chance for many of them, to avail of a part-time evening university education. Twelve different ideas of how this type of education may be obtained are expounded on in this chapter.

Why use Out Centres?

The use of out-centres brings together the student and the institution so that both may benefit from the experience. It would also be in the RTC's interest to bring the College out to other educational establishments in the region. The out centre may by necessity, be the Regional Technical College if that institution, is the place where the best knowledge/information is available.

With falling student numbers in the second level colleges there will be places available, in all 2nd.level schools. Equality News Dec.89 Page 9 states that:

> The total number of births in Ireland has decreased from a high of 74,388 in 1980 to 58,864 in 1987. The estimated completed family size in Ireland has declined from 4.0 in 1971 to 2.3 in 1987. This is still above the average in most other E.C. countries where comparative figures are 1.3 (West Germany) to 1.8 (UK).

Out Centres give status to the educational establishment concerned as the school holds third level courses in that establishment. It is less costly as a building for the "Home" College than other alternatives as there is a fixed charge to cover heat/light and caretaking, however capital depreciation would not be included nor would wear and tear on the out-centre buildings.

Costs would be high for the "Home" college if the lecturers' travel costs were added to the cost of lecturing. Therefore the strategy to be adopted in running courses at an Out-centre is to reduce the lecturing hours and the lecturers' travelling costs. The following points could be made to reduce the lecturing costs :-

1. If the centre was used for more than one course then common subjects e.g. Mathematics, Physics, Communication could be taught together on more than the one course.

2. It would help if the number of lectures was reduced to a minimum, without taking away from the content of the course. There are a number of options available to reduce the number of lectures.

2A Use of text books and other specially prepared material: This will allow the students to prepare for the lecture, by reading some or all of the relevant matter before presenting themselves at the lectures. During the lecture, the lecturer may indicate further reading, or work, which is required, using the textbooks etc.

2B Use of Video or Inter-active Video: These aids allow the students to work on their own with minimum supervision. If the lecture had been videoed then the student could run the video, at his own time and at his own pace making notes and addressing the problems raised by the lecturer in the video. The use of inter-active video is a structured method whereby the student, may take certain aspects of the course, again at his/her own pace, learn them and use the information to solve or work a new section, introduced in the inter-active video or video.

2C Less hours of Lecture / Student Contact: These are a norm for adult students, because "Second Chance" students are highly motivated and will interact with the lectures, textbooks and video presentations.

2D Use of Modem: A modem attached to the telephone system can be used where the lecture takes place in one venue but other centres are connected by phone, microphone system and video so that students at many Out Centres can attend the same lecture. It can also be taped and used for the benefit of anyone requiring a rerun of the lecture.

2E Selective tutorials: These will help weaker students, or those identified at continuous assessment examinations as needing special help. This would mean that the tutorial time could be devoted only to those students who need particular help with a particular problem, thereby improving the quality and the quantity of the lecturer's presentation.

2F Group study periods : This means that at a fixed time and at a fixed venue i.e. at an out centre, the students have access to each other, but not to a lecturer. This will encourage the students to discuss the lecture and raise points of interest. It will also allow students to help weaker students who have difficulty with some portion of the lecture and thus encourage the cooperative spirit, so necessary on the factory floor.

2G Course Structure : This will entail a "Round Robin" course structure e.g. one may enter at the beginning of any year and qualify three years later for a National Certificate. This means that there is only one year's course to service, a larger number of students attending the course and therefore more experienced students to help the less experienced and/or weaker students.

3. As the course is envisaged to be a self financing one it is important to keep its cost down, otherwise the cost will deter the participants. (See Chapter 3)

4. Common travel facilities for the students,i.e. use of common nights, will help in reducing travel costs to a centre. (See Chapter 3)

5. Advertising: an explanation of the course detail and the effort required by the participants must be fully addressed . Otherwise many will not partake in the course because of lack of correct information. The costs of the course fees

may therefore increase due to small numbers. Therefore full use should be made of detailed explanatory leaflets, the local newspapers, local churches and the local Adult Education Officer to ensure that all participants are fully informed .

6. A qualifying support course in mathematics/physics may be required at the beginning of the course as many are unsure of their analytical skills. The mathematics course could start at or around Intermediate Certificate level, this point should also be well publicised. (See Chapter 3)

1 Out Centres for the Un-employed

The philosophy and procedure to be adopted here should be similar to that adopted for Out Centres for pre third level courses. The student must be qualified to be registered with the N.C.E.A. and therefore be able to obtain the Credit Points which will be acquired with subjects like Engineering Drawing, Workshop Theory, Computer Studies, Accounting, Microbiology etc. and therefore must be either over 22 years of age, of have the Leaving Certificate with five subjects including Mathematics and a language. This would be of great benefit to the unemployed by increasing their store of knowledge and thus improving their job prospects. Grants are now available for this type of training.

2 Out Centres for Pre Third Level Courses

Vocational schools/Secondary schools could be used as centres to run a pre third level course for those with a weak leaving certificate (100 points), but they must have the minimum qualification for registration as N.C.E.A. students to get ACCS merit points. This proposed course could have some topics of a non-analytical nature, for which credit points could be acquired, but mainly it would address weaknesses in Mathematics-Physics-English. These subjects are core subjects for Engineering or Science and would also benefit students taking Business Studies. The subjects for which credit points could be acquired could be Engineering Drawing and/or Workshop Theory and/or Workshop Practice (workshop practice only if the location had the facilities to address this subject) or else subjects relevant to Business Studies courses or subjects relevant to School of Science courses. The Credit Points so obtained would help to ease the pressure on the student when he/she commences year 1 of a National Certificate in the following year. Funding may be possible under the E.S.F. grant scheme, or the Youth Training Scheme.

3 Out Centres using the Fulltime Courses for Part Time participation

The idea of a split years work is a new idea and the points in its favour need to be explained, so that all can understand how it can operate. The additional "Second Chance" students with "First Chance" students could improve the academic performance of both groups, improving the participation and maturity of the "First Chance" students and assisting the academic progress of the "Second Chance" students.

The prospective students need to be informed of the courses that are available and again the RTC needs to be willing to encourage and to be patient with the "Second Chance" students. Personal tutorials may need to be arranged to overcome deficiencies within the course.

The procedure of split years will be more readily adaptable to Business Studies than to the other two schools if women are to be the main users of this method. More effort will be required from the School of Engineering and the School of Science to get this type of course operational. (See Chapter 3.1.2.)

4 Out Centres for Year 1 of the NCEA National Certificate

The Out Centre could be used for year 1 of the National Certificate on the full-time mode (as explained and elaborated in Chapter 3.1.1.) where the students attend for 30 hours per week, for approximately 32 weeks in the Year and follow a course similar in all respects to the full-time National Certificate held at the RTC. Using the Out Centres to complete Year 1 of the National Certificate on the full-time mode does necessitate the use of a visiting lecturer,who needs to liaise with the other staff members on the course to ensure similarity between the subject matter at the "host" and the "home" College. The visiting lecturer could be available for five / six hours of lecturing on the day he/she visits the Out Centre.

There are many valid reasons for taking the RTC out to the students for Year 1 of the National Certificate all explained within Section 3.1.1. Students who are residing at home will be able to spend more time at their studies with improved academic results. The use of second level buildings and some second level teachers will improve liaison between the staff of the second level schools and the staff of the colleges.

5 Out Centres for Year 1 of the Certificate (ACCS Mode)

Using the Out Centre for Year 1 of the National Certificate on ACCS mode has been explained in Chapter 3, Section 3.1.3. As this is primarily a "Second Chance" educational programme the course will have to rotate among a number of Centres. Again attention is drawn to the new proposal in Chapter 3, where four Out Centres are in operation with courses in mechanical, electronic and business studies. It is important to note how this scheme can operate, so that although there are sufficient students on the course each student gets an opportunity to follow a National Certificate of his/her choice whatever his/her geographical location.

The high second level student numbers which existed in 1980 passed through the second level schools in 1986/1987 and numbers have fallen on a continuous basis from 1986. This would allow all second level schools in Ireland that have space available to be utilised as outcentres and provide an opportunity for students to progress to the National Certificate or Diploma if they so desire.

6 Out Centres within prisons

The prison service already provides a second level education service for it's inmates and this could be expanded. The prospective students are generally from a lower social background and have poor schooling, hence the need for second level education at this time. As the inmates are to be detained for a number of years, a pilot scheme could be launched aimed at some of the National Certificates in Business Studies, or towards obtaining credits under the NCEA credit scheme for Single Subject Certification. Building on the resources available, it is socially very acceptable to give the prisoners a second chance of a full-time job and a place in the community on their release and this could hopefully keep them from returning to prison.

Discussions should be initiated between the NCEA, the Department of Education and the Department of Justice to see how this scheme could be implemented. A start could be made with pre third level study courses, keeping to library type courses as explained in Out Centres for Third Level Courses. The position of prisoners was addressed in *Adult Education in Ireland* on Page 85 where it states that;

> Many prisoners, especially those on short term sentences are in prison because they cannot cope with life. Some of them are illiterate; a great improvement in their condition can be affected while they are in prison.

Adult education can fulfil both preventative and remedial functions for prisoners , by examining their life patterns of prisoners, their crime patterns, and the total care of prisoners

from an educational point of view. Experiments in Adult Education with prisoners is an obvious necessity of our adult education provision. Adult Education agencies should consider it their responsibility to indicate to communities their role in the rehabilitation of prisoners.

7 Out Centres for the Armed Forces

The armed forces provide an apprentice education programme which is aimed at their apprentices. These have leaving certificate qualifications on recruitment, sufficient for them to get recognition for their efforts by the NCEA while at school in the Army Centres during their apprenticeship.

This could be the first step to get recognition for their efforts as explained in Chapter 3.1.5 The next step could then be to introduce extra subjects so that the crafts person could continue his/her education and receive a minimum of a National Certificate or possibly a National Diploma. This would enhance the recruitment prospects of the armed forces and would make the crafts person very employable upon leaving the armed forces.

The present education system could now be expanded to all army personnel who are members of the armed forces for a number of years and if there were provisions for half day classes (Chapter 3.1.2.) then the National Certificate could be achieved over a four year period. The normal recruit may not have a Leaving Certificate qualification and may not be over 22 years of age but could enter a pre third level course. As with a National Certificate

this would greatly enhance recruitment to the ordinary services. Upon leaving the forces, there would be greatly improved job prospects for him/her with this qualification.

With the many workshops available to the armed forces, Engineering could be a possible course for the National Certificate. Also with so many graduates qualified to lecture within the forces a very worthwhile exercise could be carried out with great benefits to all levels of personnel.

The Officers would benefit by doing some lecturing and get to know recruits from a different perspective. The recruits would benefit by getting an opportunity to improve their education, for a portion of each day and know that they were improving their chances for promotion within the armed forces. Their chances for work when they left the armed forces, would also be improved.

The army has use for technicians of many different disciplines and could fill these positions from within their own ranks. Business Studies and Engineering graduates could provide the technicians level work that could relieve more qualified personnel to do work at an level more appropriate to their qualifications.

8 Out Centres on the Factory Floor

Industry always needs to retrain and update it's workforce, because of modern technology and automation. The trade unions are seeking more job satisfaction and job responsibility for their workers and there is a need from the employers for a multi-skilling ability of their workforce. Both are compatible under an ACCS study programme, using In-house courses during company time, with company lecturers wherever possible. The use of external lecturers, (professional lecturers) gives guidance to the standard of the tuition and this could be supplemented for the employees by their use of courses at another Out Centre used for National Certificate under ACCS mode or at the RTC itself.

With such a variety of staff, across many disciplines, there should be an opportunity for all employees to achieve a qualification, that firstly improves the worker both within and outside the factory. Furthermore it improves the job specification that the worker is entrusted with and finally the cost and quality of the product, which must improve with more knowledgeable operators-checkers-maintenance-office people. This is explained in Chapter 3.1.4. in greater detail but the partnership of RTC and Industry in this academic venture is a worthwhile exercise, with the RTC providing 50% to 60% of the academic package (depending on the background of the workers) and Industry providing 40% to 50% of the package within it's industrial requirements.

The workers could be offered a choice of academic qualifications, a N C. in Engineering or in Technology, or in Multi-skilling, whichever suits the needs and abilities of industry and workers.

9 The RTC as an Out Centre

The RTC's themselves must provide a ladder of education opportunity, using some of it's full-time lecturing staff to lecture in part-time education. This section of education, if used by full-time lecturing staff is generally used to "soak up" extra hours of lecturing hours that are available and not to provide the academic excellence that is needed to complement or supplement what the Second Chance students in their region need. Therefore within the RTC's College there should be an Adult Education Officer appointed who would attempt to provide an ACCS programme or equivalent in each of the three schools in the college. This could be a start to providing further educational opportunity to those wishing to avail of it and the market for other courses could all be tested in the RTC's. There is an example of distance education at Sligo RTC is in the School of Business Studies, where the School of Business Studies proposes Ab-initio Franchised Degrees. in the five year plan from 1990 to 1994,

This will allow the students at Sligo RTC to undertake degree programmes at Sligo, which are identical to the degree programmes at another institution, without the cost or inconvenience of attending that institution. The" Host" college, i.e. Sligo RTC, will be able to offer all the degree programmes or portions of them, that the students requires to complete his/her course of study. The" Host" college may use visiting lectures or lecturers from the "Home" college to enhance the compatibility of the programmes at both colleges. A selection of Ab-initio franchised degrees could be as follows;

Ab-initio Franchised Degree

1. Bachelor of Arts in Information Technology with (D.C.U.)
2. Bachelor of Arts, Public Administration (NCEA)
3. Bachelor of Arts, Humanities (DCU) Dublin City University
4. B. Comm. or equivalent with an Irish University,

Add on Degrees to existing RTC's programmes.

The present situation regarding students from the R.T.C.'s transferring to an Ab-initio degree programme is that they transfer to the year of the course equivalent to the duration of their RTC studies less one year. i.e. A 5 year programme of studies to complete a 4 year degree. What is now envisaged is that during the RTC course of studies an accelerated programme of studies or a "Bridging"module will be offered to selected students who will then transfer to the equivalent year of the degree programme at their own institution or another institution.

1. National Certificate in Business Studies plus a bridging module plus two years BSc. (Bachelor in Business Studies)

2. National Diploma in Tool Design plus a bridging modules plus one calender year leading to an Hons. B. Eng.

3. National Diploma in Computing plus a bridging modules plus one calender year leading to a B.Sc. in Computer Applications.

This theme or strategy could open up educational opportunities to all "second chance" students or people within 50 miles of the Centre who wish to pursue "second chance" education.

10 Out Centres to cater for Retirement

With a life expectancy of between 70-75 years of age for todays adults, up to 15% of ones life may be spent in retirement. Therefore retirement may be the beginning of a new academic life, as work, or family commitments may not have given the "Senior Citizen" a chance to take up a new academic topic, or to expand on an old academic topic, or to follow a life long ambition to do a particular course of study. Therefore the senior citizens may become involved in attending Out Centres which are used for pre third level education or Year 1 of a National Certificate. In this way retired people get great satisfaction from proving that the "grey matter" is still active and this can lead to a fuller life and a successful retirement because the habit of knowledge acquisition is never allowed to lapse.

11 Out Centre at a FAS Centre:

FAS has a number of its Centres spread all over Ireland and its full time retraining programmes were discussed in Chapter 3.1.5 & 3.1.6. It would be in FAS's interest to encourage the use of its Centres as a Third Level Educational Centre as it would enhance the students work and ensure that this effort is rewarded with recognition by the N.C.E.A. ACCS credit scheme. FAS has now entered into an evening educational programme. The programme consists of educational modules of approximately 30 hours duration, which have been short and primarily of the single subject type. These however could merit one or two ACCS Credit Points which would allow reward for effort by those students who are eligible to register with the NCEA as third level students.

12 Distance Education Type Courses:

The British Open University programme of studies is an excellent programme of very varied studies and covers all years of that varied programme. Why not buy the right to use the Open University courses of lectures which are available in many disciplines at many levels?. The "Open University" have a big bank of subjects and by use of the R.T.E. television stations or the proposed R.T.E. radio station, these courses could be rerun at different times of the day and evening, to give all a chance to see them and/or to video them. By using the Out Centres the students could come together for tutorials, study periods, visits by visiting lecturers etc. and validate the effort and standards achieved by the students who undertake such a programme of education. This is a well tried out programme of study and has been very successful in England.

Correspondence education, is no longer the traditional method of sending lessons to the students through the post, for the student to attempt and return to the tutor by post, in order to receive a set of model answers. This mode has now been replaced with many different methods of learning, "Correspondence Education" or "Distance Education" or "Open University Education". The multi media approach is now upon us. Another aspects of this is "The Teach Yourself" books or computers using programmable step by step information to supplement/complement the programmes.

The staff of the RTC's ought to be involved in all types of professional third level educational programmes, their function should be to indicate to the students all the different methods of acquiring information.They should explain how to commence or

continue on a course of study using a particular method or a selection of methods. The ACCS mode should be used to monitor the progress, to measure the achievement and to reward the students' effort by ACCS Credit points. Second chance students may be allowed to record their own assessment of themselves, as it is well known, that mature students tend to seek higher standards for themselves than that required by their tutors.

There are many forms of achieving education other than in the formal classroom, with the teacher leading the students along defined routes using step by step procedures. Now the educational programmes must be opened up to allow the student seek and learn at their own pace and this must be the strategy of the RTC's.

Chapter 5

The NATIONAL EXPANSION

of the RESULTS EXPRESSED in the DEVELOPMENT

of ALTERNATIVE PROGRAMMES of STUDY.

CHAPTER 5

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Introduction.

This chapter attempts to show how the ideas expressed in Chapter 3 can be expanded to encompass the whole adult population of Ireland who are seeking third level education, by the use of ten different types of out-centres. This could be achieved by an information/ education programme aimed at the administrators of the third level colleges. There could therefore be ten different types of out-centres (as discussed in Chapter 4)in use throughout Ireland, where third level education could be made available to "Second Chance" students.This could mean that everyone would have an opportunity to improve their educational standards if they so desired.

Informing the Partners:

it will be necessary to educate and/or inform the groups concerned in this combination so that national expansion of this education package to take place and perhaps change their attitudes to Adult education programmes.

There must be therefore an information/education programme aimed at the administrative and lecturing staff, of the RTC's, DIT's and Universities, so that all could contribute to the increase in Third Level Education that could be available to the public. Contact must be made, with the Heads of Schools and the staff of such institutions, by having seminars etc. organised by such bodies as the H.E.A and/or N.C.E.A and/or A.V.E.C.,(Association of Vocation of Education Committees).These would be in addition to discussions, promotional packages and the creation of interest and enthusiasm, for the ideas expressed in Chapter 3.

With the changing emphasis on RTC's, as a source of such knowledge, there must also be a need for management and staff at the RTC's to recruit students for courses, held both inside and outside the normal times. This would allow the expertise of the staff, the laboratories and workshop facilities to be used for periods outside the normal times. Reference is made to this issue in the *Lindsay Report* on page 52 where it states;

> The committee was concerned to observe that the VEC colleges are approaching a position that teaching occupies only half the calender year. This shortening is not being accompanied by an increase in average weekly teaching, or by the use of short or staggered courses to make use of the Colleges in the periods when full time courses are not being thought. It therefore affectively increases salary and overhead costs while leaving output static.

The number of full time students attending Technological Colleges could be further increased if the "snob" value of University College Education could be changed and to quote Garry Hawkes in "*Why we need a balanced educational diet*" ("Briefing" No. 2 March 1990.)

> The most damaging snobbery in education is the promotion of academic and theoretical study as being better than applied learning. Industries such as Engineering are suffering as the Universities and Polytechnics pursue academic excellence at the expense of professional competence.

> Academic Schools, the world over have argued that intellectually bright students should be saved for theory based courses that will teach them to think. The less able, as defined by their ability to perform successfully in examinations, should be excluded from theoretical courses and should be trained in technical skills. He joined the work of B.TEC. because, it is an agency that will work out an effective compromise, teaching students to both do and to think. It is my view that there is no necessary conflict between the theoretical and practical study. I am well aware of the weakness of craft only education. Students need to be taught to think and to be equipped to cope with a lifetime of change.

The success of the NCEA awards and the acceptance by industry of these awards has led to an awareness within "First Chance" students of the wonderful potential available at Technological Colleges and on Technological courses.

Student Loans

Student loans may be another way of increasing the number of students participating in third level education. The idea is, that students in future, will be able to borrow part of the money needed for their living costs on loans obtainable from the banks repayable after qualification. The Government argues that this will in the long run, spread public money more widely and will at the same time be a fair method of getting students to invest in their own futures. Opponents of the scheme see this as a

retrograde step in so far as it will deter many students, particularly those from poor families, from going into higher education in the first place. May be a pilot scheme could be placed in operation to investigate if a loan scheme has value, in increasing the number of First Chance students, at Third Level education.

"Second Chance" Education

With proper information, education could be aimed at the large group of people for whom "second chance" education would be truly worthy of consideration. Such groups include people at work, people out of work or people made redundant and people retired or married women who wish to return to work. These people in general will need to be accommodated for courses after 5.00pm on a week day and on Saturdays i.e.. two nights plus one Saturday giving a maximum of 14 hours class contact tuition per week.

Information aimed at this group should specifically mention that preparatory courses in mathematics and/or physics, or whatever subjects are needed to prepare them for the course of study they wish to pursue. These will be provided, at the commencement of the courses. Also under the ACCS mode of study they may take one subject or any group of subjects they wish, at their own pace. They can obtain validation under ACCS for effort/study, qualifications/courses already completed so that they avoid repetition of the first year course subjects.

This idea of validation for past efforts may give them the boost to attempt further qualifications through study at one of the Out Centres and select from any of the topics on offer. ACCS is a new procedure launched by the NCEA in September 1989 and implemented by many of the Colleges from September 1990. It enables the identification, assessment and the accreditation of relevant achievement. If we are to get people back to College and afterwards into work at technician level then the courses will have to be attractive. Those already in work who need retraining to cope with new jobs and new technology and those who have left the labour market e.g. to raise a family, all will need to be encouraged to return to college. It is important to give those who are returning to work a stake in their future by enabling them to gain a qualification. Traditionally this has been achieved by obtaining a qualification as a "First Chance" student. The mature student or "Second Chance" student must now be provided with a route to a qualification.

Learning takes place all the time in what has being termed the "The University of Life" and ACCS now provides a system that recognises the achievements that result from some of this learning and allows for its contribution towards their qualifications. This helps to avoid repetition in learning and provides an incentive and motivation for further study. Therefore it is most important for mature students to receive a form of counselling, so that the students understand what the course procedures are and also gain confidence in their own ability allowing them to make an informed choice about which educational topics to proceed with. There is no doubt that Ireland

has a large reserve of highly competent but unqualified workers. The development of ACCS in the Colleges offers a significant opportunity to meet the challenge of 1992 and beyond. The effects of the creation of a single European Market are not confined to industry and commerce alone. Education is affected in a number of ways, for example it will be much easier for other Europeans to come to work in Ireland and to seek employment as Engineers, Technicians or Trades People. Colleges will have to acknowledge that the students of today are the European Business People of tomorrow.

As educators we are used to being criticised for being behind the rest of Europe. One example is that most Europeans speak at least three languages from a very early age. One of the aims of 1992 is to enable qualifications to become international recognised within Europe. The NCEA through ACCS and their "Credit" requirements already have in operation a system which is compatible with the credit scheme proposed in the European Community Course Credit Transfer Scheme (ECTS). ACCS is therefore making a positive contribution towards achieving one of the major elements of 1992, namely that vocational qualifications should become trans-national.

Conclusions.

An examination of methods used to improve the national expansion of promoting alternative programmes of study may result in the following conclusions.

1. Outcentres: there were ten different types of out centres discussed and fully documented in Chapter 4.

(A) Out centres for the unemployed.
(B) Out centres for Pre-Third level education.
(C) Out centres using the full-time courses for part-time participation.
(D) Out centres for year one of the NCEA National Certificate.
(E) Out centres within the Prison Service.
(F) Out centres for the Armed Services.
(G) Out centres on the factory floor.
(H) Out centres to cater for the retired.
(I) The RTC as an out centre.
(J) The FAS centre as an out centre.

These are all aimed at providing third level education to different groups of people who for various reason, missed the opportunity to partake of this particular module the first time around. They may now wish to partake of this opportunity now, which might not have been available to them, if the RTC's had not moved out to the region and to the people with special needs, or if the NCEA had not provided the ACCS mode of Accumulation of Credits and Certification of subjects.

2. National Certificate by ACCS - This system offers an opportunity to people from different educational and work backgrounds to pursue a course of studies, subject by subject, if desired or a group of subjects which may

improve their job skills such as multi-skilling abilities, their job prospects promotional prospects, or their intellects. The awards so achieved will reflect the subject matter and the level of award achieved is also reflected in the title.

The National Certificate in Engineering can be achieved with a speciality in brackets, or in technology, or in combined studies where subjects from two areas are combined. This could be the basis for multi-skilling or the title could be as broad as Interdisciplinary Studies, where the course of studies undertaken, ranges over more than two disciplines.

This will allow all students from all backgrounds to undertake topics of their choice and proceed along the academic road at a pace suitable to their needs and abilities, so long as the students' entry requirements are similar to that of the "Parent Course". But attention is drawn to page 5 of the *N.C.E.A. A.C.C.S.* document where it states that;

'where students do not meet the academic entry requirements they may be admitted on to the course on the grounds of mature years'.

3. ACCS type National Diplomas; this is the most difficult of propositions as there is a need for a large reserve of students, the prerequisites need to be multi-disciplinary and the times of lectures need to be acceptable,by the proposed students. (see Chapter 3.2.1/3.2.2)

4. Bachelor Degrees: These can be achieved using a joint co-operative programme between the RTCs, an industrial partner and the prospective student, to partake of the full-time programme on a part-time basis. This was explained in Chapter 3.3.1 and 3.3.2.

However, the staff and management of other RTCs also need to be informed of the procedure and how it works and again the N.C.E.A. or the H.E.A. should be used to provide a forum for spreading the information on how to operate this mode of study in other third level institutions.

The staff of Sligo RTC, in an endeavour to promote the ideas expressed in chapter 3 i.e. "Developing and Promoting Alternate Programmes of Study," have initiated the following Action Plans, so they could assess the response of students, industries and Semi-state bodies to the ideas expressed in this chapter and have this information available for any other third level institute that may be interested in promoting these ideas.

ACTION PLAN BY SLIGO RTC

Action 1 Out Centers for the Armed Forces

Sligo RTC has written to the Minister for Defence informing him of the opportunity which exists to hold third level courses for his apprentice schemes and for regular soldiers in the armed forces under the N.C.E.A. ACCS mode in his schools. It was requested that he should nominate someone to represent him in discussions, so that the different methods available could be fully explained.

Reaction

Communication from the Minister for Defence, stated that the Military Personnel attended third level institutions, such as Universities and Regional Technical Colleges, when required, that this arrangement had proved satisfactory and that it is not considered appropriate to have such courses conducted in military establishments

Action 2 Out Centers for the N.C.E.A. ACCS mode.

The staff of Sligo RTC. is investigating the use of other out-centres to allow extra National Certificates to operate within our particular scheme of Year 1 under the N.C.E.A. ACCS mode, held at an out-centre and Years 2 &3 at Sligo RTC.

Reaction

This is proceeding as planned. Sligo would hope to use six out-centres eventually to run Year 1 of the National Certificates in Mechanical - Electronic - Construction Studies under the NCEA ACCS mode and then interest the School of Business Studies to commence their National Certificate under the ACCS mode.

Action 3 Out Centers for year 1 of the Certificate.

Sligo RTC. have academic agreement with the NCEA to run Year 1 of the National Certificate in Mechanical and Electronic Engineering at an out-centre under the F.T. mode and ACCS mode and have agreed that Castlebar should be such a centre. Sligo have also investigated Cavan as a centre for a similar venture. A third

centre where this method could operate is Carrick-on-Shannon. Donegal, another listed centre, does not appear viable at this moment.

Reaction

The Department of Education has not as yet agreed to sanction these courses at outside centres. Cavan VEC. is quite interested and already has some third level courses running at present, in a building exclusively used for third level students. The staff of Sligo RTC. would hope to proceed with negotiations with Cavan and to use this location as a centre for the National Certificate in Mechanical Engineering in 1991/2.

Sligo RTC's philosophy would be to decrease numbers in our first year National Certificate at Sligo back to 32 students per year in both Electronics and Mechanical Engineering and to have approximately 16 students coming from each of the out-centre courses, on to the second year of our National Certificates in Mechanical and Electronic Engineering. This would free space at Sligo RTC. for future developments.

Action 4 Women in Engineering

(A) Sligo RTC has sent Chapter 3, sections 3.1.2 and 3.1.3 to the local newspapers to generate interest in "second chance education" and also to generate interest in engineering from prospective women students.

(b) Sligo RTC hosted an Academic Information day at the College, where the different modes of study were explained.

An explanation was given on how to proceed using Single Subject Certification or courses under ACCS. and how to undertake a full-time course by part-time participation by day or by evening study.

Reaction

(A) The local newspaper printed an article on Women in Engineering. There might be a better response to an offer of Single Subject Certification as an introduction to women's participation on a Nat. Certificate Course in Engineering.

(B) 6.4% of students in the School of Engineering at present are women. This seems to be directly in response to the academic information day, plus school visits to second level girls's schools, where female students where encouraged to think about a career in Engineering. Another selling point used by the staff was the fact that a woman has held the position of top Engineering student four times in the last ten years.

Action 5 Out Centers for Pre Third Level education.

The staff of Sligo RTC has contacted the headmasters of the Vocational schools around the RTC and the Adult Education Officers of Sligo - Mayo - Donegal and Leitrim with a view to implementing a Pre-Third level education programme using the new unemployed scheme. This could then lead to the possibility of the students moving on to a National Certificate course, ACCS mode, at an out-centre in the following year. This will allow a course of study to take place at the out-centres each year.

Reaction

All were favourably impressed with the idea but the number of suitable registered unemployed people in the outlying towns is not great and consequently there may not be the student numbers available to run such classes in the out-centre areas.

The Adult Education Officer in Leitrim is of the opinion that such a course could be held in Carrick-on-Shannon V.S. next year, so that there would be a natural follow on, to the National Certificate, in the following year. Ballina V.S. are to hold discussions on the starting of a Pre-Third Level course and as to how they might validate the students efforts with ACCS Merit points.

Action 6 Nat.Cert. in Technology for Industry.

(A) Sligo RTC has forwarded Chapter 3, Section 3.1.4 to the Federation of Irish Employers and to the Irish Congress of Trade Unions to see if they would be interested in promoting the ACCS ideas, the National Certificate in Technology qualifications and the credit for previous experience within their own organisations, all of which are within the N.C.E.A A.C.C.S mode of study.

(B) Sligo RTC has forwarded copies of this section to twenty five companies around Sligo, to encourage them to participate in this type of scheme, or a specially adapted scheme that might suit their requirements.

Reaction

(A) A note from the I.C.T.U. stating that they had referred the matter to there Assistant General Secretary.

(B) There have been a number of enquiries, and the School of Engineering has made three presentations to interested companies.

Action 7 The idea of a Nat. Cert. in Multi-Skilling.

Sligo RTC has actively pursued the NCEA ACCS mode of study concept with one local manufacturing company. Two other companies, one in Kildare and one in Letterkenny, have also shown an interest and Sligo has put on presentation for each showing how the ACCS mode of study and multi-skilling are mutually complimentary to each other.

Reaction

Staff from the Sligo company are proceeding to obtain the National Certificate in Engineering and/or the National Certificate in Technology, within their companies Multi-skilling retraining programme. The Kildare company has started discussions with Carlow RTC with a view to involving Carlow RTC within its own plans of multi-skilling. The Letterkenny company has started discussions with Letterkenny RTC with a similar view. Sligo are also about to do Single Subject Certification with the Letterkenny company in the immediate future, on a subject that Sligo has academic validation and expertise in, in the area of Multi-skilling.

Action 8 Recognition for Apprentice education by NCEA.

Sligo RTC has forwarded Chapter 3, Section 3.1.5 to FAS, so that this section may be discussed when "Apprenticeship" is being reviewed in the near future.

Reaction

A letter was received from FAS stating that they had received the document, but to date no further communication.

Action 9 The FAS Centers with N.C.E.A.Courses.

The staff of Sligo RTC had discussions with the staff of FAS Sligo on how to implement the philosophy expressed in Chapter 3, Section 3.1.6. FAS were to look at their courses and have further discussions with us, in relation to both their day time and night time programmes.

Reaction

No response to date, in spite of several requests to discuss the matter.

Action 10 Out Centers within the Prison Service.

Sligo RTC have written to the Minister for Justice informing him of the opportunities of holding third level courses under the N.C.E.A. ACCS mode in his prisons and if he would nominate, someone to represent him, in discussions, to explain how this could be developed.

Sligo R.T.C. have contacted the Education Officer of the Prison Service, who appeared interested, but has not to date responded. He however indicated that prisoners were, in conjunction with some R.T.C.,s following courses that were not of a third level nature. Also, that a small number of prisoners were undertaking courses within the "OPEN UNIVERSITY" educational programme. He agreed to forward all this information to the college.

Reaction

To date no communication from the Minister for Justice.
To date no communication from the Education Officer.

Action 11 Validation of Craft Teachers' Qualifications.

The staff of Sligo RTC had discussions with the staff of FAS, of RTC Sligo and the VEC, regarding validation of the qualifications of craft teachers within their educational system. Sligo are now about to commence the National Diploma in Industrial Engineering under the ACCS mode (refer to Chapter 3.1.2.)

Reaction

A very favourable response was received by all concerned. There will be some problems with validation of effort, especially in the non-designated trades, where attendance for apprenticeship training was not mandatory. The staff at Sligo RTC has agreed however to look at all cases on an individual basis and advise on what procedure might be acceptable to the N.C.E.A. and to the College. The use of the present National Certificate running in

Engineering, under ACCS, is one possibility, use of Module "0" used as a conversion course for Toolmakers into the National Diploma in Tool Design is another possibility.

The staff of Sligo RTC held the National Diploma in Industrial Automation, under the ACCS mode, since September 1990. The course is of two years duration, with both halves working independent of each other. A conversion course for Mechanical Technicians, to allow them follow the electronic input, is built into the course. This course will provide educational upward mobility as expounded in Chapter 3.1.2. and validate the craft teachers qualifications if they pursue this course.

Action 12 ACCS mode of education to a degree.

Sligo RTC has proposed a B.Sc. in Quality Assurance and this is at present with the Department of Education for their agreement. As the course complies with all the criteria specified in the *Lindsey Report*, the staff of Sligo RTC are confident that this programme will be offered as a Three Year plus Two Year structure in 1991/2. There are work experience modules built into the course under the "thin-sandwich" system. This will allow upward mobility for "Second Chance " students to a Degree programme.

Reaction

N.C.E.A. Academic validation was obtained in early 1990, and the course commenced in September 1991.

Action 13 ACCS courses offered at other RTC's.

Sligo has written to all the Principals of the other RTC's asking for details of any courses that they run within their schools, which could be classified as "Alternate Modes of Study". The staff of Sligo RTC. were endeavouring to obtain a national picture, of what is available in the other RTCs in this particular area.

Reaction

There were replies from a number of the Principals/Head of Schools of Engineering of the other RTC's. The courses they indicated that were available in their establishments are listed hereunder;

Letterkenny - Single Subject Certificate for National Certificate in Electronics using ACCS mode approximately two subjects per year on offer at Letterkenny with a possibility of two subjects on offer in Donegal Town in 1990.

Dundalk - Craft Technician Award full-time mode in Furniture Manufacture.

Galway - Craft Technician Award at an out-centre in County Galway.

Athlone - Some evening courses offered under the ACCS. mode. Specific details not given. The college offers year one of some of it's courses at outside venues.

Nat. Cert. in Technology in Maintenance Technology.

Further to Action 13, the National Maintenance Association which has recently been reconstituted as a more broad function body, as the Maintenance and Environmental Technology Associated (MEETA), was established by Eolas in 1986 with the objective of raising the level and cost effectiveness of maintenance activities in Ireland. This association convened working parties to investigate aspects of the maintenance function in industry, with particular reference to training and education. They undertook two major surveys, one of maintenance managers and one of maintenance craft persons. Both surveys revealed that there was a definite need to provide knowledge, skills and education appropriate to the needs of the maintenance function in the modern Irish industrial setting.

As a result of these findings the Head of Schools of Engineering in the RTCs and DITs established a committee and produced a proposal on courses for the career development of those involved in the maintenance function in industry, which would comprise A National Certificate in Technology in Maintenance Technology. The structure of the National Certificate in Technology would comprise of a number of core course subjects i.e. Mathematics, Maintenance Technology, Management of Maintenance and Computer Studies and there would also be technological optional syllabi provided by individual colleges in such areas as Fluid Power, Refrigeration and Air Conditioning, Industrial Electronics, Electrical Power and Polymer Technology. There therefore would an "Off-the-Shelf" National Certificate in Technology in Maintenance Technology be available to all the RTCs/DITs.

The NCEA draft submission for the *National Certificate in Technology in Maintenance Technology* of the 16th October, 1990 states in its introduction that;

> Irish Industry is investing more and more in advanced manufacturing technologies. The equipment required for the implementation of these technologies requires complex control systems as well as sophisticated management techniques to ensure optimum utilisation.

In addition, the impact of improved production control and scheduling techniques such as Materials Requirement Planning and Just-in-Time means that the dependency on machinery availability is even more critical. Maintenance strategies, knowledge and skills, in line with investment in advanced manufacturing technology must be developed.

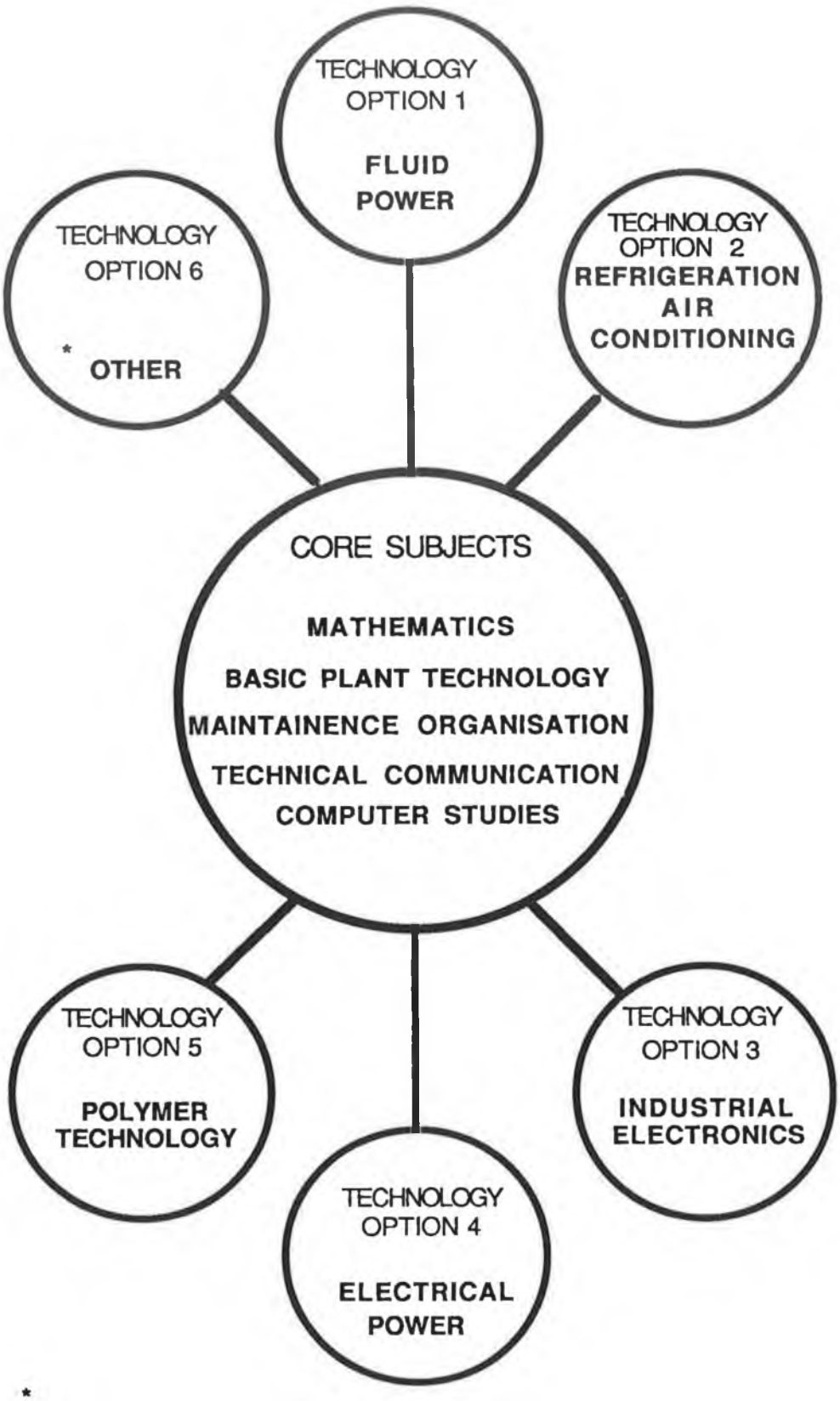
Under Learning Experience and Assessment on page 8, of the same document the course framework is laid out as follows;

> The total course reflects a desire to ensure that the relevant skills and constraints of the modern manufacturing workplace are taken into account. These factors demand flexibility in course content as well as in teaching and learning methods.

The course is to be offered in the NCEA ACCS mode. The flexibility inherent in this mode will allow both students and colleges to participate in individual subjects, group of subjects or the entire course. In order to facilitate this approach a course structure is proposed which consist of a group of technological

options, specially related to the maintenance function as applied to particular technologies. The purpose of the inclusion of core subjects is primarily to meet the requirements of students studying for the National Certificate. However, the successful completion of certain course subjects will also be a necessary prerequisite for the study of particular technological options. (See Fig. 5.1) Credits will be allocated as follows: 40 N.C.E.A. Credits to the Core and 20 N.C.E.A. Credits to each Technology option.

Sligo RTC has included course syllabi for the above National Certificate in Multi-skilling and it is the staff of Sligo RTC's intention to offer this National Certificate in Technology at the earliest opportunity. The college is an integral part of the community it serves and should be in a leadership position, to assist in the areas of economic development, as well as to promote educational, cultural and economic enrichment of the entire community. High value is placed by the college on the people it serves and it is dedicated to maintaining an intellectual community of learning, where each individual can grow and develop to the fullest. This is the ambition of the staff of Sligo RTC. and hopefully this philosophy will spread to the other colleges when the strategies commented on in this chapter are implemented.



* OTHER TECHNOLOGY OPTIONS MAY BE ADDED

Appendix A

Costings of Courses to the College & to the Students.

In considering the viability of Part-Time courses, i.e. courses held outside the normal full-time mode, one area that has to be taken into consideration is the costing of the courses to the College and therefore to the student. There has been little thought or structure devised and implemented that allows the cost of such a course to be calculated. Consequently, the cost to the student is often an educated guess, based on an estimate of what the student could or would pay.

To overcome this problem and to give some structure to the costing a system was devised to ;

(a) Formalise the Costings

(b) Allow a full recovery of funding from European Social Funding. (E.S.F.) e.g. 55% of total course expenditure.

In the light of eight years experience of designing, instigating and running the part-time courses listed below, (now under the ACCS mode), a number of points have arisen which warrant further discussion, particularly in relation to the costing and funding for the courses. For the past two years an endeavour has been made to establish new thinking in this area and to get this concept accepted as a valid method of costing for the part-time certificates (ACCS mode) and the Part-Time Diploma in Automation (ACCS mode). The College should use these new costings for establishing the costs of the different courses.

SUGGESTED PRINCIPLE FOR CALCULATING COSTINGS OF PART-TIME N.C.E.A. QUALIFICATIONS

Include tutorials @ L2 Rate and Weight

Calculations to include	Hours at **Max L2 Rate**
Where appropriate:	Rent of room
	Caretaker
	Technician cover
	(Max. rate &include weighting)
	Class materials
	Project materials
	Depreciation of equipment
	Examinations & Invigilators

TABLE A.1

National Diploma Annual Cost (ACCS Mode)*Basic L2 Rate*

	Setting and Marking of Exam	100
Lecturers:	300 hours @ L2 Salary £19,709	12,000
Tutorials:	18 hours	800
Technician:	240 hours @ £10.00 (O.T. Rate)	2,400
Caretaker:	60 hours @ £5.00	300
Class Materials:	Misc. (e.g. components, computer software, stationery and photocopying)	1,500
Project:	Misc. (det. by particular project)	2,000
Additional Heating/Lighting (or cost of rooms) £60/p.w.		2,000
Depreciation of Equipment:		6,000

EEC Grant @ 55%	£14,921
Student Fees	£ 4,900
Cost per 10 Students	£ 7,308
	£27,129

£27,129

THE COST PER STUDENT IS APPROXIMATELY £700

The Costings using the basic Lecture 2 rate are estimated at a cost per student of approximately £700. The Costings using the top Lecture 2 rate of £35,216 per year, are estimated that the cost per student is now £1,300.

TABLE A.2

PART-TIME DIPLOMA ANNUAL COST **PT Rate*

Lecturers 300 hours @ £20/hour		£6,000.00
Back up staff (nil)		
Class Materials (Computer Paper)		
Caretaker/Administration		£250.00
Travel (nil)		
Tutorials (2 x 6) @ £20/hour		£240.00
EEC Grant @ 55%	3,500.00	
Fees (YR. 1) £350 x 10	3,500.00	
Surplus YR. 1		£350.00
	£7,000.00	£7000.00
Following Years		
EEC Grant @ 55%	*£ 3,500.00	£6,500.00
Fees (YR. 2+) £350 x 18	£ 6,300.00	
Profit		£3,300.00
	£9,800.00	£9,800.00
Profit per Student	3,300 / 18	£ 180.00

If this *£3,300 profit in table A2 using this mode of tuition and taking the lecturing rate as paid on a part-time basis is used for investment in course development each year. It would minimise large injections of capital in the future,

TABLE A.3

ANNUAL COST of FULL-TIME NATIONAL DIPLOMA

Lecturers: 24 hours/PW or 12/16 lecturers		
@L2 Basic Rate		£41,780
Additional Technical (2 days) x 33		£ 2,770
Additional Overheads:	Light, Heat, etc. (£30 x 5 x 35)	
	say £30/day	£ 5,250
Class Materials		£ 3,000
Project:		£ 3,000
Depreciation of Equipment per annum £100,000 @ 10%		£10,000
		£65,800
EEC Grant @ 55%	£36,200	
Student Fee 450 x 18	£ 9,000	
Loss	£20,600	
	£65,800	£65,800

Cost per student would be approximately £1,000.

If this format is applied to the full-time National Certificate, a cost per student of £2,300 is obtained, when the intake is 32 student into Year 1 of the National Certificate. But this is reduced to £1,600 when the student numbers are increased to 48 in year 1 of the National Certificate. The income versus

expenditure for the electronics part-time course for the year 1988/89 estimated that there was a costings to the college of £500 for the 3 years of this course. If a brief summary of the results of Costings of different course and combinations of courses are made, then the conclusion must be, that that the lowest Costings are incurred when the lecturing staff are paid on the part-time rate.

In claiming funding from the E.S.F. all aspects of funding should be included from Top Salaries for Staff to depreciation of buildings and equipment. A return by the E.S.F. of 55% of the total costs incurred makes this type of education very reasonable for both the colleges and the student. Table A4 is based on the proposed costings and is applied to the National Certificate. In year 1 there is a loss of £400 because there are only 12 students in year 1. In year 2 (combined) there could be 20 students and there is nearly a break even situation with a loss of £100 for one year's tuition.

TABLE A.4

Costings for a Part -Time National Certificate. ***Year 1***

Lecturers:	290 hours @ £18.00/hour		£5,220.00
Technician	30 hours @ £12.00/hour		£ 360.00
Invigilator	8 hours @ £6.00/hour		£ 48.00
Invigilator Travel	4 trips		£ 150.00
Lecturer Travel	70 trips		£1,700.00
Set/Mark Exam Paper (12 students)			£ 42.00
Grant:	55% E.C. Grant	£4,140.00	
Fees:	12 Students @ £250 each	£3,000.00	
	Loss	£ 380.00	
		£7,520.00	£7,520.00

Year II

Lecturers:	482 hours @ 18.00/hour	£8,670.00
Technician	180 hours @ £6.00/hour	£1,080.00
Invigilator	10 hours @ £6.00/hour	£ 60.00
Set/mark Exam Paper (20 Students)		£ 50.00
Project/Materials		£1,440.00

Grant:	55% E.C. Grant	£ 6,230.00	
Fees:	20 Students @ £250 each	£ 5,000.00	
	Loss	£100.00	
		£11,30.00	£11,300.00

TABLE A.5.

Summary of Results

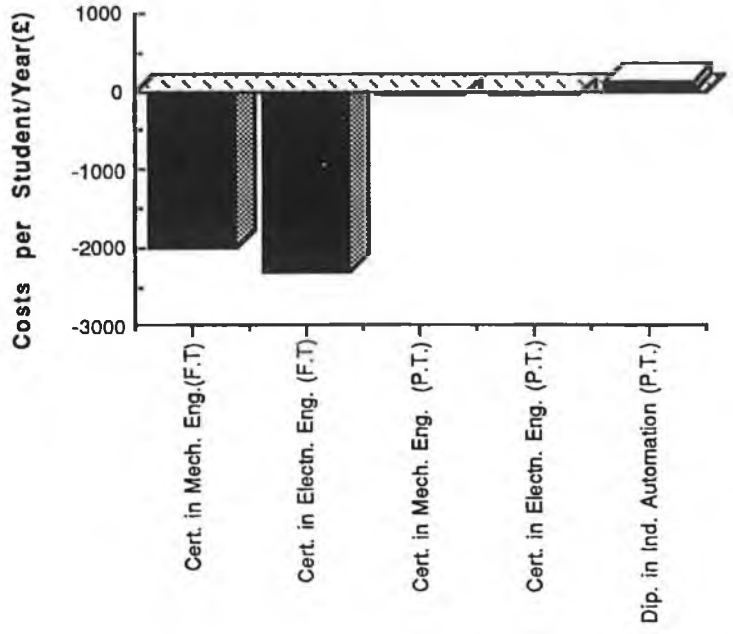
(Dip. PT)	Traditional Method	Profit = £183/student
(Dip. PT)	Full-Time Staff at Top L2 Rate	Loss =£1442/student
(Dip. PT)	Part-Time Staff	Profit = £1423/student
A full-time Diploma would create a		Loss =£1000/student
Average P.T. and F.T. Diploma		Cost = £ 289/student

This was followed by costing the present full-time Certificate

intake of 32 students	Cost = £4539/student
with increased intake to 48	Cost = £3175/student

Finally all four courses (proposed and existing) are grouped together to show that the new average cost of a course per graduate equals £1375/student (Best Case). This is the case where part-time staff are used for part-time courses. However, if the part-time courses are staffed by permanent staff, then the costs rise by approximately £60,000 giving a new average of £2141/student (Worst Case).

Fig.A.1 SLIGO REGIONAL TECHNICAL COLLEGE Costings for Full-time and Part-time Courses in the Engineering Dept.1989/90.



The graph above shows the cost structure of both the full-time and ACCS programmes in the School of Engineering. The cost of educating a student on the full-time programme is between £2,000 and £2,200 depending on the type of course.

It falls short of the national average of £3,000 per student per year and is well below the cost of a student on the Degree in Fashion Design, at another third level institution where the cost of a student, according to the Irish Times, 28th Sept.'90,on this course is estimated at £63,912 per student per year. The ACCS mode of study is provided at Sligo RTC. on the assumption that the courses are self-financing and there is a course fee charged to reflect the actual costs of the course.

FUND RAISING

Because of the special nature of the courses offered at Sligo R.T.C., Mechanical Engineering - Electronic Engineering - Industrial Automation, there is a need for very well equipped laboratories.

Approximately Capital Expenditure in £££ for	
Mechanical	£500,000.
Electronics	£500,000.
Automation	£1,000,000.
Total	£2,000,000.

Therefore sponsorship or fund raising will need to be considered to help pay the depreciation costs as all the above areas have a changing technology that needs replacing every 10-12 years.

The following ideas are expressed so that they may lead to active participation by Industry, Local and National in providing the technology to train, and educate the Technologists of tomorrow.

FUNDING:

(i) College via Department of Education/Department of Finance.

(ii) Private (a) Laboratory Name

(b) Equipment Name Sponsors Plaque .

(c) High profit in literature

(d) Articles in trade magazines

(e) Feature in Technology Ireland and A.M.T.

(iii) Sponsors highlighted or given a high profile in college literature, e.g. on student application forms, of which there are 30,000 issued each year.

(iv) Class prize - this would give an opportunity to publicise sponsors annually in local papers and trade journals and national newspapers with or without photographs.

(v) Name each laboratory after a major sponsor e.g.,

Laboratory 1 (1st. Year Laboratory Certificate)	£8,000
Laboratory 2 (2nd. Year Laboratory Certificate)	£16,000
Laboratory 3 (3rd. Laboratory Diploma)	£25,000

Design Laboratory and Fabrication laboratory in each case the sponsor gives an annual class prize for publicity.

(vi) What is the tax position as an incentive to sponsorship?

SOURCES OF FINANCE

Finance can come from the Department of Education through the Department of Finance. Our experience has been that when the finance comes to update equipment, tools etc it is too little and comes too late. The Colleges have to be at the forefront of technology and their equipment has to be modern and their staff has to receive training in new techniques and technology. This will cost a substantial sum of money.

An example of this was the purchase by the School of Engineering at Sligo RTC of £1.4 million of new equipment in 1989. This will depreciate each year by 10% i.e. £140,000 and will eventually need a repair budget of £10,000 per year increasing by £5,000 each year until replacement of the equipment is desirable.

To address this problem the following ideas are suggested as a forum for discussion.

(i) Colleges to provide some money from their own sources i.e. College Budget which is approximately £3.5 million.

(ii) From College Fees, not very large, due to E.S.F. paying the fees of all students following the National Certificate or National Diploma courses.

(iii) E.S.F. Grants. This is a very large budget due to the fact that 55% of all expenses incurred in running the E.S.F. courses is recoverable from the E.C. The colleges should now be making applications to the Department of Education for extra finance from this budget to fund repair and replacement of high technology equipment.

Industry and private companies benefit from the expertise of our graduates therefore it is only right that they contribute to the high cost of the training and education they require, before their prospective employees comes to work for them. Sligo R.T.C. would promote the idea that the donors be given the opportunity to get advertising exposure for their money within the College literature or College building i.e. laboratories named after the company or plaques in the reception area, or class prizes.

Table B.3. Student Profile P.T. Nat. Certificate in Electronics

	Age	Occupation	Qualification	Distance from College (Kms)
1.	30	Unskilled Lab. Worker	L. C	60
2.	48	Nat. Sch. Teacher		52
3.	36	Nat. Sch. Teacher		48
4.	39	Nat. Sch. Teacher		44
5.	29	Unskilled Lab. Worker	L. C.	56
6.	-	Secondary Teacher	B. Comm.	60
7.	45	Self Employed	R.A.F.	50
8.	31	-	L. C	45
9.	24	Labourer	5 th. Year	12
10.	29	Technician	5 th. Year	20
11.	31	Mech. Cert. Tech.	N.C. Mech.	5
12.	21	Trainee Toolmaker	L. C.	36
13.	33	Unskilled Lab. Worker	L.C. + C&G	22
14.	30	Metal Worker	L. C.	2
15.	36	TV Repairman	L. C.	10
16.	33	FAS Instructor	Inter.+ C&G	15
17.	36	Gen. Mech. Worker	Inter. Cert.	8
18.	33	Technician	L. C.	12
19.	36	Technician	L.C.	6
20.	26	TV Service Man	Inter. Cert.	5
21.	31	Farmer	L. C.	25

Table B.4. Student Profile P.T. Nat. Certificate in Mechanical

	Age	Occupation	Qualification	Distance (Kms)
1.	26	Factory Worker	Nat. Cert. Year 1	100
2.	19	Factory Worker	L.C.	50
3.	23	Factory Worker	LC.	50
4.	30	Farmer	L.C.	30
5.	26	Unemployed	Inter. Cert.	50
6.	23	Factory Worker	L.C.	8
7.	33	Attendant	L.C.	1
8.	31	Mechanic	L.C.	1
9.	23	Machine Operator	L.C.	1
10.	18	Carpentry Apprentice	Inter. Cert.	25
11.	28	Motor Mechanic	L.C.	100

Student Profile : Single Subject (Plastic Technology)

Average Age = 36 years
9 had no Craft Certificate,
2 had no formal 2nd level education,
5 had obtained Group Certificate,
8 had Intermediate Certificate, 13 had Leaving Certificate.

Table B.2. Student Profile National Diploma in Industrial Automation

	Age	Occupation	Qualification	Distance from College (Kms)
1.	47	Teacher	T.T.C.	2
2.	32	Maintenance	N.C. Elect. (Dist..)	22
3.	33	Technician	N.C. Electr. (Cr.)	50
4.	20	Unemployed	N.C.Mech.	30
5.	27	Technician	N.C. Elect.	22
6.	33	Technician	N.C. Elect. (Cr.)	5
7.	28	Second Engineer	Marine Eng. Dip.	2
8.	28	Technician	N.C. Elect.	15
9.	27	Maintenance	N.C. Elect. (Dist..)	50
10.	22	Mechanic	N.C.Mech.	15
11.	33	Maintenance	N.C.Mech.	12
12.	36	FAS	N.C. Elect. (Dist..)	18
13.	28	Teacher	Degree	5
14.	27	Maintenance	N.C.Mech.	23

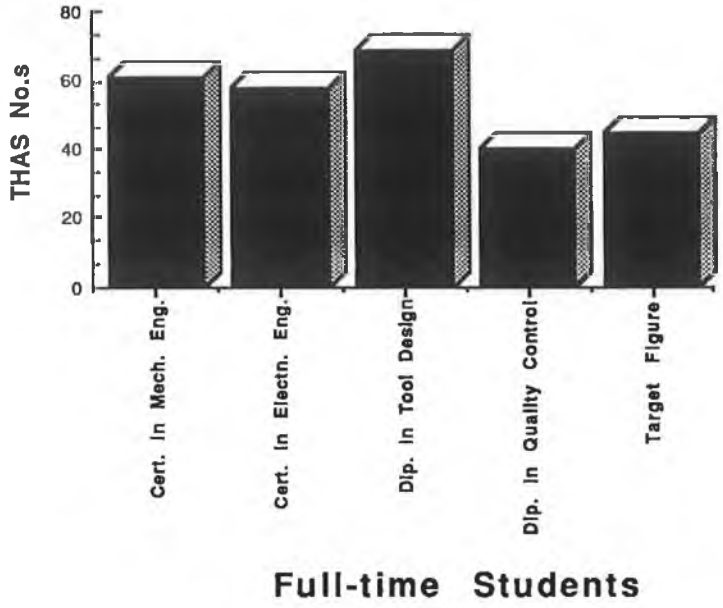
T.T.C. (Teachers' Training Certificate)

Appendix B Student Profiles

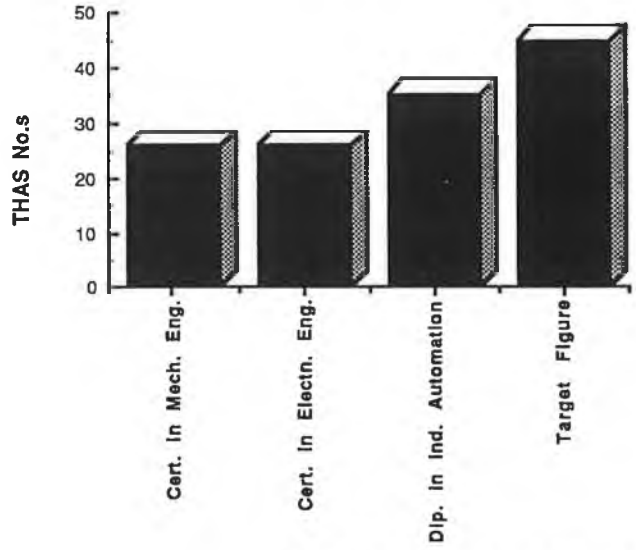
Table B.1 Student Profile
Single Subject (Plastic Technology)

Individual	Age Bracket	Educational Qualification	Trade Certificate
1	45-50	Primary Cert.	No
2	25-30	Leaving Cert.	No
3	35-40	Leaving Cert.	No
4	30-35	Leaving Cert.	No
5	30-35	Inter. Cert.	No
6	25-30	Leaving Cert.	No
7	30-35	Inter. Cert.	No
8	50-55	Primary Cert.	No
9	35-40	Inter. Cert.	Yes
10	40-45	Group Cert.	Yes
11	25-30	National Cert.	Yes
12	50-55	Group Cert.	Yes
13	30-35	Leaving Cert.	Yes
14	35-40	2nd Level (Not in Ireland)	Yes
15	35-40	Inter Cert.	Yes
16	30-35	Inter Cert.	Yes
17	35-49	Leaving Cert.	Yes
18	35-40	Group Cert.	Yes
19	20-25	Leaving Cert.	Yes
20	20-25	Leaving Cert.	Yes
21	30-35	Leaving Cert.	Yes
22	35-40	Leaving Cert.	Yes
23	40-45	Group Cert.	Yes
24	30-35	Inter Cert.	Yes
25	40-45	Group Cert.	Yes
26	25-30	Leaving Cert.	Yes
27	20-25	Leaving Cert.	Yes
28	25-30	Leaving Cert.	Yes
29	45-50	Inter Cert.	No

Fig.C.1. SLIGO REGIONAL TECHNICAL COLLEGE
THAS Figures for Full-time and Part-time Students in Mech. Eng. Dept. 1989/90.



Full-time Students



Part-time Students

From the THAS figures shown it can be seen how effective the ACCS mode of lecturing is, compared to the full-time mode. The basic difference is in the hours allocation per subject, also there is a common night in the National Certificate ACCS mode for year 2A & 2B where both groups i.e. Mechanical & Electronic receive the same instruction. The same policy does not hold for the Diploma in Industrial Automation where the Project hours have to be split to accommodate the students from a mechanical or electronic background, as they both do different type projects.

Table C.3.
Estimated THAS Figures for other Areas at Sligo RTC.

AREA	REGISTERED STUDENTS (W.T.E.)	THAS TARGET	TOTAL HOURS ALLOCATED	ESTIMATED THAS
Business & Humanities				
Art	68	55	3850	56.6
Computing	111	40	2730	24.6
Social Studies	42	35	1330	31.7
Business	524	25	12892	24.6
Total	745		20802	27.9
Engineering				
Technician	351	45	17430	49.7
Science				
All courses	226	45	11567	51.2
Craft				
Engineering	94	-	8564	91.1
Science	12	-	1120	93.3
Total	106	-	9684	91.4

W.T.E. (Whole Time Student Equivalents)

The tables, allow an examination of, the type of courses undertaken at Sligo RTC, the use of outcentres by Sligo RTC and the total number of students participating on the different courses.

The ACCS courses would require the following hours of Lecture time, all of which are outside the "normal" College opening hours. This is the equivalent of 2180/480 or 4 Full-Time Lecturers.

Table C.2. Proposed ACCS courses available for 1993

Sept 93	N.C.Elect.	Year 1	B/Shannon	300 hrs.	
	N.C.Elect.	Year 2A	Sligo	340 hrs.	640 hrs.
	N.C.Mech.	Year 1	Ballina	300 hrs.	
	N.C.Mech.	Year 2A	Sligo	340 hrs.	640 hrs.
	N.C. Mul-Sk.	Year 1	Sligo	300 hrs.	
	N.C.Mul-Sk.	Year 2A	Sligo	300 hrs.	600 hrs.
	N.D.Ind.Aut.	Year 3B	Sligo	300 hrs.	300 hrs.
	B.Sc.Q.A.	Year 4A	Sligo	-	
	B.Sc.Q.A.	Year 4B	Sligo	-	-
				TOTAL Hrs.	**2180**

Fig. C.1 shows the comparison of THAS (Teachers Hours per Student per Annum) for F.T. courses and P.T. courses. This method is now used by the Dept. of Education to determine the efficiency of courses in the RTC's. The expected THAS figure for engineering courses is 45.

Appendix C. Courses & THAS figures at Sligo RTC.

Table C.1. Nat. Certificate In Engineering (Electronic.) ACCS Mode.

DATE	ACADEMIC YEAR	STAGE OF COURSE	LOCATION	NUMBER OF STUDENTS PER CLASS	TOTAL OF STUDENTS ON COURSE
Sept 86	1986/87	Year 1	Ballina	8	
	1986/87	Year 1	Sligo	12	20
Sept 87	1987/88	Year 1	C/Town	15	
	1988/89	Year 2A	Sligo	12	27
Sept 88	1988/89	Year 1	B/Shannon	14	
	1988/89	Year 2B	Sligo	20	34
Sept 89	1989/90	Year 1	Ck-on-Shn.	11	
	1989/90	Year 2A	Sligo	20	31
Sept 90	1990/91	Year 1	Ballina	12	
	1990/91	Year 2B	Sligo	19	31
NATIONAL CERTIFICATE IN ENGINEERING (MECH.) ACCS MODE					
Sept 89	1989/90	Year 1	C/Town	11	11
Sept 90	1990/91	Year 1	B/Shannon	11	
	1990/91	Year 2B	Sligo	10	21
NATIONAL DIPLOMA IN ENGINEERING (INDUSTRIAL AUT.) ACCS MODE					
Sept 90	1990/91	Year 1	Sligo	10	10

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