Chapter 9

Postgraduate Research

The evolving nature of the activities of the colleges of the Dublin Institute of Technology presented them with increasing problems in the 1980s as they sought to operate as effectively as possible as higher level institutions. These problems arose mainly from the restrictions imposed by the Vocational Education Act 1930, which was primarily intended to encompass a second-level education provision. As the Institute began to engage in research and development work, difficulties arose.[1] These restrictions may be seen in bolder relief when one considers the broad academic maturity that had been achieved by the Institute and its colleges at that stage.

Development of Research Activities in the Institute

The International Study Group on technological education, in its report to the Minister for Education in 1987, stated that it "was impressed by the work of the colleges" and recognised "the high standing which the colleges hold in their special fields of study".[2] It went on to state that the "research activities of the DIT are wide ranging, as would be expected in an Institute of such diverse character. Collaboration with other researchers and institutions both nationally and internationally is a common feature of much research carried out by the Institute." This report recommended that statutory provision be made for the Institute to engage in this type of work and that it should be encouraged to make its expertise and facilities more widely available to industry and business as considered appropriate.

Over the years, priority had been given in recruitment in most areas to established professionals in their specialist disciplines. Many of the Institute's permanent academic staff had availed of the opportunities to enhance their qualifications since their recruitment and were involved in

1. *Barriers to Research and Development in the Higher Education Sector, op. cit.*
2. *Technological Education, Report of the International Study Group to the Minister for Education, op. cit.*

research or consultancy work appropriate to their discipline areas.

Statutory provision was made in the DIT Act 1992 for the Institute to engage in research, consultancy and development work, either on its own or with other institutions, and to provide services in relation to such work and enter into arrangements, including participation in limited companies, to exploit the results of this work.

Research within the Institute

The Institute undertook to develop the postgraduate research aspect of its work in a more focussed manner after the DIT Act 1992 was implemented in 1993.

Research work, leading to the advancement of knowledge, is recognized as a necessary element for underpinning education, whether at postgraduate or undergraduate level, and to help ensure a lifelong learning approach to knowledge and skills. It is a key element of the Institute's mission.

Postgraduate research and development projects may be carried out in the wide areas of scholarship in which the Institute has relevant expertise. These involve areas of scientific, commercial, industrial, social, professional and artistic scholarship, as well as educational matters and academic management and administration. Interdisciplinary work and collaborative research projects with other educational, research, industrial, commercial, professional or governmental organizations in Ireland, in the European Union (EU) and further afield, are especially encouraged.

The development of postgraduate research activities in the Institute is encouraged because of their strong role in helping to maintain the standard, quality and relevance of the undergraduate and postgraduate courses offered. Research, development and consultancy work is therefore viewed as essential in underpinning the key teaching functions of the Institute at all levels.

Research activities had been promoted positively by the Institute as part of its mission some considerable time before the DIT legislation was enacted. A Research Committee had been in operation under the aegis of the Academic Council since 1981, developing, promoting and monitoring research and research policies and strategies for the Institute.

Research has been a significant activity in a number of schools across the Institute, particularly in science and engineering,[3] for more than twenty-

3. *Research & Development 1988–1991, A Report and Review, Dublin Institute of Technology, Kevin Street* (Dublin: City of Dublin Vocational Education Committee), 1992.

five years. In 1989 a concerted plan was adopted for its expansion and development in those areas and its extension to all other disciplines of the Institute.

Since then emphasis has been concentrated on developing research in a number of broad strategic areas, based on national priorities that corresponded to academic strengths of the Institute. These included the following areas:

- environment
- construction and property
- engineering, applied sciences and materials
- tourism and hospitality
- information technology
- biotechnology and food
- chemicals and pharmaceuticals
- applied economics, business, finance and marketing
- applied media, design, communications and social science
- music and drama.

Involving and facilitating individual members of staff in research activities has been a core strategy. There have been a number of other key activities as corollaries to this strategy – overcoming the severe problems of limited accommodation and scarcity of requisite equipment, managing each researcher's teaching timetable to facilitate her/his research work, exploiting the research activities to improve courses and generally developing and spreading an intellectually challenging research ethos across the Institute. Staff members are becoming increasingly involved in research. Postgraduate research student numbers grew from less than 150 in 1994/1995 to almost 200 in 1998/1999.

Although the Institute is not allocated specific funding in its budget for research activities, the Department of Education and Science acknowledges that under the legislation it is expected to expend some of its income for this purpose. This is in contrast with the previous situation under the aegis of the provisions of the Vocational Education Act 1930 within the City of Dublin Vocational Education Committee.

Management of research

The Postgraduate Studies and Research Committee of the Academic Council has responsibility for developing and assisting the implementation of

policies in relation to postgraduate research. This committee comprises representatives of all the Faculty (Academic) Boards, the main staff grades and students.

The Postgraduate Studies and Research Committee has formed four subcommittees, each with relevant representation from across the Institute. These are:

- Postgraduate Studies Committee, the work of which is described later in this chapter
- Funding Committee, to manage the distribution of Institute research funds in the different funding schemes
- Ethics Committee, responsible for developing and administering policies relating to ethical and legal issues arising from research projects in the Institute
- Postgraduate Courses Committee, to oversee and monitor all taught postgraduate courses in the Institute.

Postgraduate Studies and Research office

The Postgraduate Studies and Research office was established in 1996 as a central resource for postgraduate research and postgraduate courses across the Institute. It has responsibility for the registration and monitoring of all postgraduate students, the general administration of the Institute's regulations for postgraduate study by research and the implementation of the quality assurance procedures in postgraduate work.

Internal funding schemes

During the past number of years the Institute has developed a number of funding schemes to encourage and facilitate staff members engaging in research, including a seed funding scheme, postgraduate scholarships, postdoctoral fellowships, a strategic research and development programme and a DIT/TCD joint research seed funding scheme.

The seed funding scheme is funded from the Institute's own resources and is aimed especially at assisting staff members to initiate research projects. Since 1986, some £200,000 has been made available in support of about fifty projects annually. In assisting over 500 projects since its inception, this scheme has played a major role in fostering a research ethos across the Institute.

The postgraduate scholarship scheme was initiated in 1994, when awards were made to twenty postgraduate students. A similar number is

now awarded annually. The scheme is funded from Institute resources and is aimed at assisting staff members' research while increasing the number of postgraduate students in the Institute. Allocation of these scholarships is a two-stage process. Calls for applicant projects are made annually. Formatted applications are evaluated by the Funding Committee and the twenty qualifying applications with the highest scores are approved. The second stage consists of a call for applications for scholarships on approved projects.

A scheme to fund up to six post-doctoral fellowships (renewable for up to three years) per annum within the Institute was initiated in 1995, with the aim of further enhancing the standard of research work in key areas in the Institute. These are also funded by Institute resources.

Since 1993, the Strategic Research and Development (SRD) programme has been funded by the European Social Fund through the Department of Education and provides postgraduate students with training in research and development in strategic technological areas. The principal aims are to enhance research and development capabilities in Ireland and to strengthen links between the Institute and industry and commerce in Ireland and generally in Europe. Industry and commerce involvement is a key feature of projects under this programme. Some thirty-two postgraduate students have been recruited annually and there are currently some eighty students involved at various stages in their projects. By 1998, over seventy students had graduated with master's or PhD degrees from the programme and in general it had contributed considerably to research activity in the Institute.

The joint DIT/TCD research seed funding scheme was described in Chapter 4.

External funding

Staff members of the Institute also compete successfully for Enterprise Ireland grants for Basic and Strategic Research and for the Applied Research Programme (ARP), the Higher Education Industry Co-operation Programme, European Union (EU) Framework and other programmes, as well as grants from a range of other public bodies and private agencies. ARP grants are funded by industry and Enterprise Ireland. The industrial contribution (25 per cent of total) to these projects in the DIT in 1996 was £112,000, representing seventeen projects.

The DIT has been the recipient of substantial external research funding for some time. Since the late 1980s such research funding had been running at over £1 million per annum and in more recent years the amounts

received were £2 million in 1994 to 1995, £2.6 million in 1995 to 1996 and close to £4 million in 1996 to 1997. Given the historical development of the DIT as a mainly teaching institution and the relatively restrictive nature of the legislation under which it operated prior to 1993, this has represented a substantial growth in research activity.

Funding under the HEA research scheme 1999–2001

In 1999 the DIT was awarded £8.2 million in the competitive Higher Education Authority programme for research in third-level institutions (1999–2001) for the construction of a 2,500 square metre research building to be associated with the Kevin Street college and the faculty of science. This will be the largest single investment ever in postgraduate research in the DIT. Under the project a facility for optical characterisation and spectroscopy will be developed to support activities spanning the disciplines of science, engineering and food science. It is expected to be completed in 2001.

Productivity of Research in the Institute

Publications, both peer reviewed and others, constitute an important measure of the productivity and quality of research. Table 9.1 summarises the publications and other scholarly output of Institute staff over the period 1993–1997.

Table 9.1: Summary of the Institute's scholarly output 1993–1997

	1993	1994	1995	1996	1997	Total
Peer reviewed publications	123	126	137	124	161	671
Other publications	56	71	80	105	148	460
Consultancies	13	12	11	17	44	97
Exhibitions	47	44	82	55	73	301
External grants	19	18	16	29	59	141

The productivity of the Institute's staff, by faculty, over the same period is shown in Table 9.2, which gives the numbers of publications, other scholarly activities and external research grants obtained.

Table 9.2: Scholarly productivity from 1993–1997 of Institute staff, by faculty

Faculty	Peer reviewed publications	Other publications	External grants
Applied arts	96	96	16
Built environment	19	27	6
Business	69	62	5
Engineering	91	42	14
Science	260	120	59
Tourism and food	69	89	23

Quality Assurance in Postgraduate Research Work

In 1992, the Academic Council organized the Postgraduate Studies Committee as a subcommittee, to manage and oversee the academic quality assurance of the postgraduate research activities throughout the Institute. This committee established the first DIT register of postgraduate students in academic year 1994/1995 and drafted the quality assurance regulations and procedures for postgraduate studies by research. These regulations were submitted in draft form to the Academic Council in February 1994. After discussion within the Academic Council and throughout the Institute, and after receipt of written comments and suggestions, amendments were incorporated. The regulations were approved by the Academic Council in May 1994 and have since been widely promulgated and implemented throughout the Institute.

After two years of application, the regulations were reviewed, modified and reaffirmed by the Academic Council in May 1997.[4]

These regulations set out the terms of reference of the Postgraduate Studies Committee (now a subcommittee of the Postgraduate Studies and Research Committee of the Academic Council), the levels of postgraduate awards offered within the Institute and the range of research activities that might be approved for such postgraduate awards.

The minimum entry qualifications for each register and the application procedures are set down. The regulations describe the process of assessment of an application, the nomination of a research supervisor and advisory supervisor, where required, and the process of registration of a postgraduate student. They also set out the duties of the supervisors, the

4. *Regulations for Postgraduate Study by Research, (2nd ed.)* (Dublin: Dublin Institute of Technology), 1997.

relevant head of school and the postgraduate research student. Training modules in research supervision are provided for supervisors annually. Detailed procedures for the supervisor(s) and postgraduate student to agree on the proposed work, a schedule of meetings, early resolution of problems, reports on progress, application to transfer to a higher register and the submission of the thesis are set down. Furthermore, students are required to attend training modules in areas relevant to their work and present a number of seminars each year on their research.

Bi-annual progress reports are required of all registered postgraduate students and research supervisors, and are reviewed by the Postgraduate Studies Committee. Formal procedures are specified in relation to annual re-registration.

The regulations specify the format and presentation of the thesis and the three months' notice of intention required before submitting it. The examination is normally carried out by an internal examiner with research experience in an area related to the thesis topic and at least one external examiner of standing in the field of the candidate's research work. In addition to examining the master's thesis, the examiners may also test the candidate by oral examination if they consider this to be necessary. In the case of doctoral candidates, the examiners are required to organize an oral examination in which they test the candidate's knowledge of matters relevant to the thesis. Where the thesis needs to be revised and resubmitted, only one resubmission is allowed.

Development Centres

Since 1993, the Institute has formally established a number of specialised development and consultancy centres and other units, principally to engage in desk research, development and consultancy work on contract for industry. These centres have included or now include: National Avionics Ltd., Food Product Development Centre, Industrial Control Centre, Radiation Science Centre, Tourism Research Centre, National Maintenance Centre, Timber Development Centre, Digital Media Centre, Applied Optoelectronics and Optical Communications Centre, Industrial and Engineering Optics Centre, National Logistics Centre, National Satellite Services Centre, Centre for Social and Educational Research, Building Information Centre, Irish Centre for Environmental Health, Media Production Unit and Project Development Centre.

Most of the centres have been assisted in their initial phase by state agencies such as Enterprise Ireland, drawing on EU funds, but they are

encouraged to earn income as soon as possible for the services they provide.

The Institute has used rented premises, often some distance from the college sites, to accommodate most of these development centres. Consequently they have "little (if any) direct relationship with the Institute's teaching" and research within the schools.

Summary

Since the DIT was statutorily established in 1993, it has placed considerable importance on developing its postgraduate research base, producing a notable publication and research grant record over the past six years or so. At this time postgraduate research students constitute about 1.5 per cent of the full-time equivalent student population. It remains a challenge to achieve a more even spread of research throughout the schools and faculties.

The Institute also serves industry in a number of ways, including research, development and consultancy through a range of dedicated development centres. There is an important challenge to integrate this activity more closely with the core teaching and research within the schools.