



NUI MAYNOOTH
Ollscoil na hÉireann Má Nuad

DEPARTMENT OF MATHEMATICS

QUALITY REVIEW 1998

PEER REVIEW REPORT 1998

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1. Introduction

This report constitutes one aspect of the quality review exercise undertaken by the Department of Mathematics, NUI Maynooth, in the academic year 1997-98. It is part of an extensive process that included the preparation of a detailed self-assessment document by the Department of Mathematics reflecting all aspects of its policy and practice, and a peer review visit in which external experts in the discipline were asked to respond to this evaluation.

The review team is supportive of the approach to quality assurance outlined in *Guidelines for a Pilot Quality Review Exercise in National University of Ireland, Maynooth*. The document describes the framework of the quality review exercise in the University and views quality improvement/quality assurance in the following terms:

- Starting from where people are
- Involving the University community in identifying improvement opportunities and minimising factors which detract from quality
- Establishing realisable objectives
- Providing support to achieve and maintain improvement
- Minimising bureaucracy

The reviewers received very full documentation in advance of their visit to the University. They spent two days at the University. During this time they had the opportunity to talk with University officers, with all members of the Mathematics Department staff (both individually and in-group settings) and with a representative group of students.

Based on their reading of the self-assessment and other documentation supplied, and following extensive discussions in the course of the visit to the University, the peer review team has agreed a peer review report, structured to cover the following five topics:

- I. Programmes and courses offered by the Department of Mathematics;
- II. Research activities in the Department;
- III. Administrative procedures in the Department;
- IV. The physical infrastructure of the Department's facilities, .i.e. library and computer space;
- V. Service to the community offered by the Department, e.g. commercial, Olympiad, schools, national committees and IMS.

This report is to be read in conjunction with the Self-Assessment Report, the Student Handbook and the Staff Handbook of the Department of Mathematics.

2. Teaching

Mathematics at NUI, Maynooth is taken by a large range of students with different goals. In addition to service courses, 18 different degree programmes serving almost one quarter of the student population are on offer. The following list is from the departmental quality assessment report:

1. Honours B.A. or B.Sc. in Mathematical Science
2. Single-Honours B.A. in Mathematics
3. Joint-Honours B.A. in Mathematics + X
4. Joint-Honours B.A. in Mathematical Studies + X
5. Single Honours B.Sc. in Mathematics
6. Double-Honours B.Sc. in Mathematics + X
7. B.A. special degrees with minor in Statistics
8. B.Sc. (General) degrees
9. B.A. Honours in Mathematics and statistics (a degree of the Pontifical University)
10. B.A. Honours in Mathematical Studies and Statistics
11. B.A. Honours in Statistics + X
12. B.Sc. Honours in Statistics + X
13. B.Sc. Honours in Mathematics and Statistics
14. B.A. Th. In Theology and Mathematical Studies
15. B.A. (Finance) with minor in Statistics
16. B.A. (Finance) with minor in Mathematics
17. M.A./M.Sc. degrees
18. Ph.D. Degree

(Department of Mathematics Self-Assessment Report 1988: 46)

The academic staff are enthusiastically committed to presenting their programmes and courses to the highest possible standards. It is a task of considerable complexity catering for the specialist academic requirements of the honours students while providing adequate support mechanisms for undergraduates in the general degree programmes. The Department responds to the challenge in a professional and caring manner through a well-structured information system, personal contact sessions, an informative student handbook and an impressive collection of work sheets and assignments.

Dealing with the carefully balanced specific requirements of students taking mathematics as part of a general science programme, and who do not intend to pursue mathematics beyond that level, is an area of particular concern for department members. These students, whose preparation for university mathematics is often less than ideal, are identified by means of a well-designed diagnostic test. The caring departmental response includes the provision of extra support tutorials, practical sessions and complete sets of lecture notes. It is not an easy matter to decide which support mechanisms resolve the difficulties and which may actually increase student dependency and there-by inhibit self-help initiatives. The Mathematics Department is investing considerable effort in trying to achieve an appropriate balance.

In the case of a number of the science subjects mathematics is of critical importance. The extra support in mathematics given to general science students represents an investment that benefits all of these subjects. The question of practical collective support and a re-examination of how the 12-lecture-per-week

norm fits into this particular context should be considered. This is a matter that deserves careful consideration at Faculty level.

The direct route programmes to an honours degree are of a consistently high standard. The courses are well designed to stimulate and challenge the students. At present, relatively small numbers select this option and the Department, by selecting and encouraging suitable candidates emerging from other courses, has managed to increase this number. Staff members are conscious of the inherent difficulties of achieving an effective rate of development in order that these students attain the same final standard over a range of courses as their direct route counterparts. Students interviewed during the visit spoke highly of the experience but expressed the view that a slight acceleration of the process in second year would decrease the impact when confronting the change of emphasis and objectives between the 'concrete' and 'abstract' nature of the courses. The presence of visiting students contributes significantly to the range of experiences available to students and staff.

In order to increase the intake of high quality students, an active campaign is in progress to raise the profile of activities and programmes undertaken by the Department. The peer review team supports the view that a CAO listing of courses with a specific mathematical identity in some form of denominated NUI degree status is an essential first step. The recent provision and tactical distribution of attractive and informative literature together with an intensive school visitation programme is another worthwhile measure. The attractions and history of the splendid campus, its quiet location and vibrant student community life are aspects of this University worthy of serious national and international promotion.

On campus, a clearly identifiable building carrying a large Mathematics Department sign would reflect the importance attached to the subject by the university community. The innovative introduction of the Higher Diploma in Mathematics, which now carries professional recognition from the Institute of Mathematics, has been a major contribution to mathematics education in Irish schools. Other institutions have followed this lead. The peer review team would encourage the Department to capitalise on its established forefront position in the development of this niche-market.

The overall impression of the review team is that the teaching programmes are well designed, well taught and well supported by tutorial and practical classes. The graduate programmes (as is the case in many other institutions) do not at present enjoy student uptake in proportion to overall numbers. The students in this Department are in the caring hands of a highly qualified staff anxious to provide an enjoyable and successful mathematical experience. Individual students speaking to the review team were most appreciative and commented favourably on the relaxed and informal atmosphere between staff and student.

3. Research

The team was greatly impressed by the active participation of all departmental members in high-level research. The publications cover a broad area of modern mathematics, especially in analysis, and many staff members collaborate with colleagues from other institutions and countries. As evidenced Appendix 5 of the self-assessment document, Department members have had considerable success in attracting funding from external agencies. A firm commitment to continue and expand these research activities was clearly evident.

As a means of providing a recognised international identity for mathematics at Maynooth the development of a specialist research interest and a Centre of Excellence should be considered. Staff numbers and research output currently within the Department are such that a policy decision in this direction is timely. The peer review team strongly encourages departmental members to organise non-local research events, such as international conferences similar to the one planned for 1999, Irish analysis seminars and short lecture courses on specialised topics. Likewise, the Department is encouraged to continue expanding its use of modern electronic communication and publication media.

The research programmes would benefit greatly from an increase in the number of visiting specialists for longer periods. Such visits are frequently the result of contacts made by staff members on leave of absence or on sabbatical. This two-way flow of researchers enhances the post-graduate school identity and attracts new graduate participation.

4. Administrative Procedures

The peer review team found administrative procedures efficient and flexible. Staff members expressed uniform satisfaction and readily contribute to sharing part of the load. The system is founded on motivation, open participation, informality and the dynamic leadership qualities and long experience of the Head of Department. Given the growth in staff numbers and the availability of highly competent senior staff there is considerable potential for the distribution of the administrative load. The peer review team commends the developments that have taken place in the Department in this respect. It recognises the importance of the Head of Department's leadership role in research and would encourage the Department to adopt further measures to allow this aspect of the role to be developed, within the resources available.

The Department is well served by having a dedicated Software Support Officer and excellent secretarial support. The peer review team considered that they make a very significant contribution to the overall smooth running of the Department. It is also apparent that this contribution is highly valued by all their colleagues.

5. Physical Infrastructure

Many of the existing courses have a substantial computing component and the Department is well aware that changing methods in mathematical instruction and modern research techniques will require an increase in this activity. The peer review team supports the Department's request for additional laboratory space and equipment. This access is particularly necessary not only for on-time completion of work assignments but as an essential feature of graduate recognition in the employment sector.

The peer review team commends the level of provision of computing equipment available in each staff office. Striking a balance between staff and student computing within the constraints of available resources can prove extremely difficult.

The physical location of the Department on the third floor of Logic House could render it rather remote for all but the most enthusiastic students. The open and welcoming approach to students, which characterises staff in Mathematics, has ensured that this has not emerged as a problem.

6. Service to the Community

The Department has an excellent record in its off-campus promotion of mathematics. This ranges from membership of various national committees for mathematics, providing public lectures and training school teams for the international Olympiad competition. It is presently considering a range of specialised short-term courses for adult audiences. It has close contact with all mathematics teachers associations and fosters and maintains links with its graduates. Within the university community it has developed successful co-operative ventures with other departments and encourages regular consultative reviews of its services to other disciplines.

7. Concluding Remarks

The introduction to this report indicated the support of the peer review team for the guidelines set out in *Guidelines for a Pilot Quality Review Exercise in the National University of Ireland, Maynooth* and it commends the principles and practices which the University has established. While it was deemed appropriate for the self-assessment of the Mathematics Department to depart from the format set out in the guidelines, in future reviews the task of the peer review team would be achieved more easily within the constraints of time which apply if guidelines were adhered to more closely.

During the visit every individual member of staff was consulted. The peer review team formed the definite view that the Department is a cohesive unit, working extremely well and has a clear ambition to achieve more. The provision, and regular up-dating, of the student and staff handbooks is a practice that could usefully be adopted by all departments. They are comprehensive, professionally produced and extremely informative, and are of great benefit especially to new staff.

On the general question of international student exchange programmes, we wish to support and encourage active participation by the University. There exists a world-wide ever-increasing demand for places at English speaking universities. By competing in this lucrative market the University could simultaneously attract quality graduates from abroad and promote real opportunity to exhibit the quality of its courses in a foreign environment. To this end all students should be made aware early in their university careers of the opportunities and benefits of acquiring another language.

8. Recommendations

Based on their reading of the self-assessment and other documentation supplied, and following extensive discussions in the course of the visit to the University, the peer review team recommends that:

- I. The development of a specialist research interest and a Centre of Excellence should be considered as a means of providing a recognised international identity for mathematics at the University;
- II. The Department make greater use of leave-of-absence arrangements and sabbaticals to broaden the range of experience of staff. This could be supplemented by exchanges between NUI Universities for a term or part of a year;
- III. The Department continue and extend its commendable efforts to increase its intake of high quality research students;
- IV. The Department consider how it might enhance its record keeping on graduates in order that greater insight into the career choices of mathematics students could inform curriculum development;
- V. The University continues to extend its participation in international student exchange programmes;
- VI. The University support the Department's request for additional laboratory space and equipment subject to budgetary constraints;
- VII. The excellent practice of the Department of Mathematics in the provision and regular updating of student and staff handbooks be widely disseminated.

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Quality Review

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Dates of Peer Review Visit

The peer review visit to the Department of Mathematics took place on 25 May
– 27 May, 1998