

Quality Implementation Plan for the Department of Mathematics and Statistics

8 March 2011

This plan was approved following a meeting between the President and the Head of Department on 28 January 2011. Section and page numbers in the Peer Review Report are listed at the end of each individual recommendation below.

1. Recommendations which the Department could implement unaided

Recommendation 1.1: We would like to encourage the Department to be bolder and more assertive as a research unit. This could be done through a number of symbolic actions aiming at more visibility within and outside the University (such as occasionally inviting a prestigious mathematician on the campus).

[5.b, p.8]

Response of Department: Prestigious mathematicians have in the past frequently given talks in colloquia or at conferences organised by the Mathematics Department. However, since receipt of the Peer Review Report, the Department has responded to this recommendation by inviting a larger than usual number of prestigious mathematicians to give talks on campus.

Some of those invited declined to come, usually because of competing demands on their time, but the majority accepted. Notable examples of recent visitors are H. Aikawa (Hokkaido U.), P. Koskela (U. Jyvaskyla), A. Nicolau (U. Illinois Urbana-Champaign), Z. Balogh (U. Bern), A. Vasiliev (U. Bergen), M. Kreck (Hausdorff Institute, Bonn), P. Rippon (Open U.). Some of these individuals spoke at the conferences held by the Department in 2009 or 2010, while others spoke in departmental colloquia during this period. Colloquia continue to be held at least once a week during term.

The Department intends to continue to invite such prestigious speakers in the future, assuming that the combination of departmental funds and external grants allow this.

On the theme of visibility, the Department's name was changed from the *Department of Mathematics* (as it was at the time of the Quality Review) to the *Department of Mathematics and Statistics* to recognise the reality that the Department does research, and offers undergraduate and postgraduate degree programmes, in both Mathematics and Statistics.

Action: The response of the Department was approved.

The President suggested the idea of a public Philosophy/Mathematics lecture and promised €3k from President's discretionary fund as seed funding for this. The Department has agreed with the Philosophy Department to institute such a public lecture, which is intended to be an annual event.

Recommendation 1.2: Although the Department and the Hamilton Institute pursue different goals, it would be good to have more cooperation between them. A concrete starting point could be to set a common colloquium once or twice each semester.

[Appendix, p.11]

Response of Department: Joint colloquia/seminars with the Hamilton Institute have begun since receipt of the Peer Review Report. There were two such colloquia in 2009-10 and one so far in 2010-11. Additionally, three members of the Hamilton Institute have given talks to the Mathematics Department during the same period.

Action: The response of the Department was approved.

Recommendation 1.3: The Department's website should mention that one of the aims of the department is to offer a number of internal and external services and give a few examples. A complete and regularly updated list of what is being done by the Department should be made available somewhere.

Response of Department: A list of services is currently being compiled. It is anticipated that this recommendation will be implemented during the 2010-11 academic year.

Action: The response of the Department was approved.

Recommendation 1.4: Demands on the lecturers are high. These could be partially reduced if the curricula were more stable. [Appendix, p.11]

Response of Department: The Quality Review was conducted shortly after a major reorganisation of the Departmental undergraduate curriculum. That curriculum has since remained fairly stable, and no major upheavals are anticipated between now and the next Quality Review.

However a Masters in Mathematics for Education programme was introduced beginning in the 2009-10 academic year. This programme involves all new modules delivered over a two-year period, so there has been much development work involved, and this has been, and continues to be, carried out enthusiastically by members of the Department. The programme has been a big success, although its continuation in future years depends on adequate lecturing resources being provided to the Department.

The Department recently voted to increase from three years to four years the time that a lecturer can teach a module before it normally switches to another lecturer. Increasing this length reduces the preparation demands on lecturers, although there are advantages in keeping some limit. For instance, it ensures that more than one lecturer is familiar with almost every module (which is important in case of a planned or unplanned absence of a lecturer), and it helps to prevent staleness of lecture delivery.

Action: The response of the Department was approved.

Recommendation 1.5: The students could be given more opportunities to express their views and concerns to the Department. We encourage the Department to organise some form of discussions between a group of students and a group of lecturers to discuss issues such as the curricula, the demands on the students and the students' perceptions of the lectures. [Appendix, p.11]

Response of Department: In the past, the Department has experimented with such means of feedback in addition to the feedback obtained through normal channels such as student evaluation forms at the end of each module, but our experience was not very positive, and we believe that informal feedback works better than such formal meetings.

There are several avenues for informal feedback: in-class or after-class questions, office hours of the lecturer and course coordinator, moodle forums, and feedback channeled via tutors or via the Mathematics Support Centre. The Department has agreed to remind students more frequently of avenues for feedback and to hold meetings at the end of each semester between each course coordinator and the relevant lecturers and tutors for that course to facilitate discussion of feedback.

Furthermore, the Department trains tutors at the beginning of each academic year, reminding them of the duties of the job. One of those duties is to solicit from students, and pass on to lecturers, feedback regarding courses.

Action: The response of the Department was approved.

It was further agreed that the Department would explore the possibility of giving students some sort of representation at one or more departmental meetings annually.

Recommendation 1.6: We suggest that a mathematical students' club or association be created. [Appendix, p.11]

Response of Department: A Mathematics Society is now alive and active. The Society has approached some members of the Department asking for volunteers to give suitable talks, and a number of individuals have agreed to do so.

Action: The response of the Department was approved.

2. Recommendations which the Department could implement only with assistance from other bodies within the University and without added cost implications

Recommendation 2.1: A better dialogue and mutual understanding between the central administration and the academic staff should be promoted. [Appendix, p.11]

Response of Department: We feel that the key here is to have a good flow of information from central administration to members of the department, and a good flow of feedback in the opposite direction. In the last year or two, there would seem to have been an improvement in the flow of information from central administration to Heads of Department and in the opportunities for Heads of Department to give feedback to central administration. This is a step in the right direction.

From the beginning of the 2008-09 academic year, the Department began scheduling meetings monthly. Having more frequent meetings allows greater opportunity for information received by the Head from central administration to be passed on to members of the Department and for feedback to be received from members of the Department.

More work remains to be done. For instance, we would welcome the opportunity to be more involved at design stage in initiatives by central administration, such as when central computer packages are being designed or upgraded (Course Finder, the online timetable, etc.).

Action: The response of the Department was approved.

Recommendation 2.2: Logic House and its facilities should be properly and safely maintained. The budget for the computer labs and other high tech equipments should be sufficient and stable. [Appendix, p.11]

Response of Department: The major renovation of late Summer 2008 has significantly improved Logic House but there are still areas that need to be addressed, as have been identified by the Department. A constant concern since before the major renovation is the roof, and indeed there have been some significant leaks since the renovation, and some of these leaks have damaged some of the renovated rooms.

In the last couple of years, the Department has been provided with the funds to purchase replacement computers for our labs as planned, and to upgrade and replace data projectors. Thus the high tech equipment situation is currently satisfactory, but in the current difficult economic times, we are naturally concerned about the future.

Action: The Department remains concerned about problems arising from leaks in the roof of Logic House, and will continue to request that the roofing problems be addressed.

The Department will review its requirements on an ongoing basis and liaise with the University.

Recommendation 2.3: Promote mathematics graduates in the professional world (perhaps in coordination with the University Career Centre). Mathematicians can be successful in many careers, but they may need some help at the beginning to learn how to get in touch with the right people, to write a CV and to confront the job market. [7.b, p.9]

Response of Department: The Department has added material to the careers section of its own webpage (<http://www.maths.nuim.ie/careers>) to help students understand some of the options available to them. The website is still being revamped, and we anticipate further improvements to this webpage during the remainder of the 2010-11 academic year.

We have also included a module MT805 (Career and Research Advancement Portfolio) in our Structured Research programmes. This module trains students to develop CVs and application letters appropriate to job search and grant applications.

We are also eager to cooperate with worthwhile initiatives from the Career Development Centre.

Action: The Department has assigned responsibility for providing information on careers to a senior member of the academic staff, who will liaise with the Career Development Centre whenever the need arises.

3. Recommendations which the Department could implement only if additional resources are provided by the University

Recommendation 3.1: If the full potential of the department as a research centre is to be attained, the teaching and administrative load on the academic staff should be maintained at its present level or lowered. [Appendix, p.11]

Response of Department: Since the Quality Review was done, the Department has lost two permanent members of staff through retirement (Drs Walsh and Watson) and has also lost its Stokes Lecturer (Dr Vernicos). No replacement permanent or contract staff have been provided by the University since then, although the Department did get a single early replacement position before the beginning of the Quality Review process. Meanwhile in 2009-10 the Department began teaching a new Masters in Maths for Education in association with the University of Cambridge, requiring the Department to put on a completely new set of modules specially designed for this course.

The combination of these factors has put much pressure on the Department and teaching loads have increased. This increase has been partially alleviated by the hiring of occasional lecturers, a practice that is new to the Department. In the current difficult economic circumstances, it has been possible to get excellent occasional lecturers, but in future years it is certain that these individuals will either get better positions elsewhere (if the economic environment improves) or will get discouraged and leave academia (if it does not). In either case, the use of occasional lecturers can be nothing more than a stop-gap solution.

Additionally, there is the point that students need a lot of support to understand Mathematics. Occasional lecturers cannot be expected to be in their offices to provide that support in the same way as full-time lecturers, so the overall quality of the learning experience suffers when we employ occasional lecturers to any significant degree, as has been necessary during both 2009-10 and 2010-11. This problem is all the more dangerous because of the key role that Mathematics plays in Science and Technology courses and in building Ireland's Smart Economy.

To date, the Department has done its best to meet this recommendation subject to maintaining existing programmes and the quality of the services that we offer students and the wider community. 15 ECTS of undergraduate modules were eliminated for the 2009-10 academic year which slightly affected the quality of our offerings in the Pure Mathematics programme, but the efficiency gain was judged to be worth the minor reduction in quality.

However there are now no remaining low-hanging fruit. If further resources are not provided and good occasional lecturers become difficult to find, then the Department will have no option but to cut programmes. The easiest one to cut in order to reduce teaching loads would be the Masters in Maths for Education, since it is a two-year programme with all its own modules. It would however be a shame to cut this, since it has been a big success for the Department and the University, and it meets an important need in Irish society.

Action: These matters are to be referred to the Academic Staffing Committee.

Recommendation 3.2:

The replacements of retiring academic staff should be guaranteed and the ratio professors/lecturers should be improved. [Appendix, p.11]

Response of Department: Replacement staff have not been provided, as discussed in 3.1 above, and the professor/lecturer ratio has been improved only by the retirement and non-replacement of two lecturers (which we suspect is not what the Peer Reviewers had in mind in making this recommendation!).

Action: These matters are to be referred to the Academic Staffing Committee.

Recommendation 3.3:

In the (hopefully near) future, the Department should move in to a modern, fully equipped building located near the Hamilton Institute. [Appendix, p.11]

Response of Department: The Department would be happy to occupy a building that more completely meets its needs. Plans to build a PPP building to house both the Department and the Hamilton Institute have been advancing.

Action: The Department awaits developments with interest.

Recommendation 3.4:

We strongly recommend that the tutorial system be maintained, at least, as it is today. If possible, more tutoring sessions should be offered to the students and smaller groups should be organised. [Appendix, p.11]

Response of Department: The tutorial system has been maintained despite a shrinking departmental budget. There will likely need to be some cutbacks in this area if there is any further significant shrinking in this budget.

To offer more tutorials and/or organise smaller groups would require significant extra funding. It is likely that suitable tutors would be available if such funding were provided.

Action: During this economic downturn, the University will do everything in its power to maintain occasional staff funding at current levels, and the Department will strive to maintain quality of tutorial service.

Recommendation 3.5:

The Mathematics Support Centre is a recognised success and its budget should as soon as possible be set on a sustainable basis. Its head should be offered a long-term contract and dedicated space and equipment should be granted to the MSC. [Appendix, p.11]

Response of Department: There has been progress in this area. The University has acknowledged the importance of the MSC and has committed to providing a suitable dedicated space when this is feasible. The Manager of the MSC has recently been offered a three-year extension to his contract (2011-14).

Action: The President has undertaken to have a discussion with the Senior Officers with a view to giving Hall E in the Arts Building to the MSC as a dedicated space in 2011-12. The MSC Manager has accepted a three-year extension to his contract.

Recommendation 3.6:

We recommend that the University provides good blackboards and adequate lighting in the lecture halls used by the Department. [Appendix, p.11]

Response of Department: There has been some progress here. John Hume Lecture Theatre 1, an important venue for 1st Year Science lectures, now has adequate lighting for its good quality blackboard system, and the new lecture theatre in the Iontas building has good quality well-lit blackboards.

However much remains to be done. There are a significant number of lecture rooms in the University that are not suited to the teaching of Mathematics because they do not have chalkboards, or because their chalkboards are far too small (e.g. JH5). There are some blackboards that have been damaged for several years (for instance the boards in Hall H and Theatre 1) and the boards in Logic Hall were damaged this summer when they were used by an outside group. It is hoped that the Logic Hall boards will be replaced in the near future, but there is as yet no date for this work.

Action: The Logic Hall boards have been replaced. Improvements in the remaining classrooms are eagerly awaited.

Recommendation 3.7: The Department should also try and attract more PhD students. [Appendix, p.11]

Response of Department: The Department is constantly striving to improve its ability to attract postgraduate students, and indeed there has been a large increase in the numbers of postgraduates in the Department in the past two years: from 15 in 2008-09 to 49 in 2010-11 (according to figures provided by the Graduate Studies Office to the October 2010 meeting of Academic Council).

Attracting PhD students in Mathematics, and to a lesser extent Statistics, has always been difficult compared with the Sciences because of a lesser availability of funding. The economic cutbacks in Ireland have exacerbated this problem. Because of this, the Department is more reliant on Hume Scholarships than many other departments. However the fact that these scholarships are considerably smaller in value than other awards for PhD students puts us at a competitive disadvantage.

For example, we had an excellent student who graduated in Summer 2010 and who wanted to pursue a PhD in Mathematics beginning in 2010-11. This student succeeded in winning a Hume Scholarship, but withdrew her interest in October 2010 when she was offered considerably more money to pursue a PhD in a different subject. A significant increase in the value of the Hume awards would help to avoid a repeat of this type of event.

Action: The University is considering new funding initiatives to address the above problems.

Recommendation 3.8:

The project of introducing a Masters in Financial Mathematics is valuable and should not be abandoned. However the actual financial crisis impose a lot of considerations and caution and it would be wise to think about such a programme in broader terms. Such a new programme could include a strong component in statistics (which is a strong point of the

department) and/or actuarial sciences (in coordination with the department of Economics, Finance and Accounting). [Appendix, p.11]

Response of Department: The Department is interested in putting on such a programme in the future should there be a demand and a need for it. Putting on a programme of this nature would require that we hire specialists in the field and so would require a substantial investment by the University. We look forward to the day that there is a realistic possibility of obtaining significant additional resources for this or other new programmes.

Even with extra resources, putting on new programmes requires extra effort by existing staff to help plan the introduction of such programmes. Since the Department is currently stretched due to the non-replacement of recently departed staff, it would seem reasonable to expect that extra staff be provided to the Department to compensate for departed staff and for the extra teaching load associated with putting on the Masters in Mathematics for Education before detailed planning is done for the introduction of any financial mathematics programmes.

Action: The Department is deferring a decision on this matter pending the replacement of the full staff complement (as discussed in 3.1 above).

Appendix: General departmental response to the Peer Review Report (optional)

We welcome the Peer Review Report which we note gives a very positive review of the Department's performance in all major areas, including research, teaching, administration and management, and engagement with society.

The recommendations in the Peer Review Report generally seem wise and insightful, and we are eager to implement them in almost all instances. Quite a number of the recommendations have resource implications for the University so we are aware of the difficulties in implementing them all fully in the current difficult economic climate.

Professor Tom Collins
President

Professor Stephen Buckley
Head of Department