

Follow-up Report

University of Iceland
(Former) Faculty of Science

Expert Committee Report

June 2010

Ministry of Education, Science and Culture in Iceland
June 2010

Publisher: Ministry of Education, Science and Culture
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Layout: Ministry of Education, Science and Culture

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ISBN 978-9979-777-87-8

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Executive Summary

In December 2006 the External Peer Review Group (EPRG) appointed by the Minister of Education, Science & Culture presented a report on the academic health of the Faculty of Science. Since the time of the review the University of Iceland has restructured its academic units and the new School of Engineering and Natural Sciences has produced a mid-term response to the conclusions and recommendations contained in the 2006 final report. This current review looks at the progress made by the School since 2006. The review does not provide additional recommendations but makes supportive statements on the nature of progress.

The School of Engineering and Natural Sciences

Overall there has been reasonable to good progress in addressing the recommendations arising from the EPRG review. Understandably important development work has been slowed or postponed because of the financial crisis arising in 2008.

Some of the positive developments outlined in response to recommendations of the EPRG include:

- Restructuring into five Schools to provide better leadership through the new Dean of School and also better use of administrative, teaching and counselling support for staff and students.
- Review of the course portfolio with growth of graduate courses.
- Adoption of a balanced scorecard to measure key performance indicators.
- Improved staff and student working environment through the building of Háskólatorg.
- Improved advice and counselling for students.
- A campaign to increase student numbers.
- Improved potential for monitoring of student progress and withdrawal through setting up of the University 'data warehouse'.
- More thorough approach to annual staff appraisal (annual interview).
- Strengthening of the research profile and income for the School.

For other recommendations progress has been slower and examples include:

- Reviewing permanent staff teaching loads and use of sessional staff.
- Better briefing and preparation of sessional staff for teaching.

- Peer review of teaching.
- Making transferable skills more apparent to students.
- Making international comparisons.
- Creating an advisory board of employers.
- Modification of point-based system for research publications
- Incentive point system for teaching.

With regard to the latter list in some cases progress has been severely affected by the financial crisis though with some progress has not been crucially dependent on additional resourcing.

The University of Iceland and the Ministry of Education, Science and Culture

Items identified by the review team which affect the School of Engineering & Natural Sciences but which require ‘external’ consideration and potential action include:

- The funding of service teaching within the University and the potential for Schools to use budgets more flexibly.
- The development of improved student records and statistics.
- Strengthening of the status of teaching within the University.
- Development of a culture that regards leadership at Faculty and Departmental level as a privilege and mark of achievement.
- The scope for reconsideration of funding to institutes within the School.
- The Government’s approach to rationalising and maintaining the importance of teaching and research in Science across the higher education sector.

The review team considers that since 2006 the School of Engineering & Natural Sciences (and the former Faculty of Science) has made steady progress. The recommendations made by the EPRG in 2006 have been addressed and up to mid-2008 progress was good for many of the recommendations. Since 2008 the School has maintained its level of achievement in teaching and despite the difficult financial climate has continued to increase its research profile. Nevertheless owing to the financial cutbacks the new School remains in a fragile state and will need imaginative, and perhaps bold, support from the University and Government if it is to continue to enhance teaching and research in higher education in Iceland.

1. Introduction

In 2006 the Faculty of Science was assessed by an external peer review group (EPRG) appointed by the Minister of Education, Science & Culture and a final report was presented in December 2006. Since the time of the review the University of Iceland has restructured its academic units and the School of Engineering and Natural Sciences has produced the mid-term response to the conclusions and recommendations contained in the 2006 final report. The response provided is a self-evaluation document which sets out the progress made since 2006 on the recommendations of the EPRG. The response forms the principal piece of evidence for gauging progress and, amongst other detail, it includes tables and diagrams showing growth in student numbers, changes in the number of taught courses, progression of students, research income, changes in teaching hours and a balanced scorecard of performance indicators for the School.

To conduct the mid-term review the Minister of Education, Science & Culture appointed two members of the original EPRG:

Dr. Sigríður Valgeirsdóttir, General Manager of Roche Nimblegen Iceland LLC
Professor Howard Colley, Senior Associate, Higher Education Academy, UK.

Magnús Lyngdal Magnússon, Head of Research and Deputy Director at RANNIS, acted as a secretary for the group.

In carrying out the assessment of the response the reviewers have: studied the December 2006 final report of the EPRG; studied the 2010 response to that report by the School of Engineering & Natural Sciences; reviewed web-based material of the School; held a conference call with the Dean of School, Professor Kristín Vala Ragnarsdóttir; held interviews to obtain student views studying in the School; and received responses on the draft report from the self-assessment team within the School.

Given that this is a review of ‘work in progress’ the following report will not seek to make firm additional recommendations but will provide supportive statements where appropriate.

The final version of the report was sent to University of Iceland for a check of factual errors and misinterpretations on 1 June 2010. The university replied on 9 June making

some specific comments, some of which have been taken into account and corrections have been made accordingly.

2. School policy, objectives and financial position

The restructuring of the former Faculty into the School of Engineering and Natural Sciences addresses, in part, the EPRG concern about strengthening leadership and administrative support. Combining Engineering with Natural Science also appears logical given that a substantial amount of ‘service’ teaching was provided by Natural Sciences staff for Engineering students. One strongly positive aspect of the new School is the adoption of a balanced scorecard to measure progress in the meeting of key objectives. The Appendix to the School self-evaluation report shows a number of appropriate performance indicators, however, it is difficult to judge progress owing to the newness of the balanced scorecard approach and also because the indicators refer to Faculties but actual performance results in the self-evaluation report are aggregations presented for the School of Engineering & Natural Sciences as a whole. However, the review team has been informed that each Faculty within the School will work to its own balanced scorecard so future progress will be demonstrated for both the School and its constituent Faculties.

One of the performance targets referred to during the 2006 review was to increase student numbers by an ambitious 50%. Student numbers presented in Table 1 indicate an increase from 2006 to 2009 of 15% which is similar to the 23% in student numbers between 2000 and 2005. These are good growth figures but they do suggest that financial modeling of income from student recruitment needs to be realistic. In conversation with the Dean of School it was apparent that in order to address the financial deficit the School had a vigorous campaign for increasing student recruitment. This includes running physics and chemistry events in schools, providing a mathematics course for prospective students and running online ‘practice’ courses. This presents an example of how the School is working to address the difficult financial position and the review team sees this as evidence of good practice. In achieving growth in student numbers the review team would advise the School to continue to consider carefully its capacity to teach increased numbers and to maintain the quality of student recruitment.

Initially there was good progress on acting upon an EPRG recommendation for increased funding with the Ministry providing additional income (900 million ISK to the University in 2007-08) to support graduate study, research, hiring of new staff positions and funding for PhD students. This resulted in the appointment of two academic staff for Natural Sciences and PhD student numbers more than doubled before the economic crisis of late 2008 curtailed further funding increases. With a budget cut of 7% for 2010 and inflation running at 10% the current outlook for funding in the School is bleak and the lack of funding, for example, to take on more administrative and technical staff, could hamper the progress of the new School .

Nevertheless, putting aside the economic crisis, it is clear that up to 2008 the Ministry and University were increasing resourcing to Natural Sciences in line with the EPRG recommendation.

The School identifies a problem with the funding of service teaching, particularly in the Faculty of Physical Sciences (mathematics, physics and chemistry) with a drastic reduction in funding. The review team was informed that currently within the University a department providing service teaching receives 80% of the student's funding for the course with 20% going to the student's 'home' department. If there is a drop in recruitment of chemistry students then there are considerable financial difficulties if the department is heavily reliant on service teaching. The EPRG was informed that much of the service teaching of the old Faculty of Science was for Engineering students but it does not appear that the amalgamation of Natural Sciences and Engineering has improved the situation for the Faculty of Physical Sciences. The reason for this is that budget allocations are made directly to departments which limits the School's ability to make internal financial adjustments to meet fluctuating financial conditions. If progress towards a more stable financial situation is to be achieved the University and School will need to consider ways in which to improve firstly the funding of service teaching and secondly flexibility in the way that the School can allocate budgets.

On a more general note the School has suggested further ways of addressing the financial difficulties which include decreasing staff contact hours, reducing the number of elective courses, more cross-disciplinary teaching and more independent learning opportunities for students. This work is being taken forward by the School's teaching

committee and Directors of Study. Some of these measures were recommended by the EPRG prior to the financial crisis. The current reviewers would support this approach but perhaps in the context of keeping the School's entire portfolio of courses under regular review.

In conversation with the Dean of School the review team were provided with helpful advice on how the School is adjusting overall policy and objectives in light of the financial difficulties with a view to better matching of funding with strategy and the development of realistic targets, through the balanced scorecard, to monitor progress of strategic objectives.

3. Internal quality assurance of the Faculty

There is no indication in the School response as to whether the University has improved its guidance for Schools and Faculties on the preparation of self-evaluation documents for external review. This was a minor, though important, recommendation by the EPRG to improve the review process particularly with regard to Schools and Faculties providing a fuller picture of their achievements.

There has been some progress in making better use of student evaluation with a revised pro forma, however, the Dean of School felt that the process remained rather cumbersome. The review team would support the School in continuing to seek to improve and diversify approaches to evaluation. Discussion of student evaluations at staff interviews does provide the staff with feedback but the School response does not refer to feedback to students on their evaluations. The EPRG identified this as an area of weakness raised by the students and the current reviewers would urge the School to consider how it can make better use of student evaluation. It is acknowledged that students are represented on all the major committees of the new School and the review team was also informed that the School is considering the introduction of a staff-student consultative committee.

The University has taken action to improve the calculation of student drop-out rates but at present it is not possible to comment on the effectiveness of the new approach. The EPRG identified a flawed approach to this calculation. Basically students transferring

between courses may be regarded simply as drop-outs for the course they are leaving or a student may register for a course then decide not to take that course prior to its commencement and again be simply classed as a drop-out. The problem has been discussed by the University and the new 'data warehouse' for student records should address this issue. The current reviewers would support the University's action to improve student records and statistics and in the meantime applaud the current action of the School to calculate accurate drop-put rates for its own students.

It should be noted that the EPRG found no serious issues with quality assurance within the old Faculty and the recommendations made by the EPRG were primarily aimed at enhancing the existing procedures. At this time the current reviewers feel that the School continues to make steady progress in improving internal quality assurance.

4. Structure and content of study programs

The School has followed up the recommendation of the EPRG to review the course portfolio. As a result there has been a significant increase in the number of postgraduate courses as recommended by the EPRG. The worry is that there has been no change in the number of undergraduate courses. Given the financial difficulties and possible loss of some sessional staff the new course portfolio will not reduce the teaching burden on tenured staff. The current reviewers strongly support the School in seeking to increase shared teaching across its Faculties and to keep under annual review the volume of courses it offers to students. The School acknowledges that it still has too few postgraduate courses and the hope is that the establishment of a new Centre for Graduate Studies in the University will give a boost to postgraduate course development.

As yet the School has not considered the EPRG recommendation on strengthening the teaching of generic and transferable skills. This will be reviewed in 2010 and the current reviewers would point out that this need not necessarily mean new teaching but could be achieved by making the skills acquisition more transparent to students. The School response points out that there is skills development in most of its courses. Similarly the EPRG recommendation for students to produce a final advanced piece of independent work will be considered in 2010 and again the current reviewers would point out that

this is an excellent way of making skills, including research skills, transparent to students.

The School has made good progress in expanding its portfolio of courses taught in English, particularly at postgraduate level and, as recommended by the EPRG, working with other universities. The School has recently established a Joint Nordic Master's two-year programme in Marine Ecosystems & Climate which involves Iceland, Bergen, Aarhus and the Faroe Islands. Another positive development by the School is to establish, in partnership with the School of Health Sciences, a postgraduate programme in Molecular Life Sciences. This co-operation reflects the fact that many biology students are seeking postgraduate programmes in the interdisciplinary area of Health Sciences and Biological Sciences.

5. Teaching and teaching methods

The School appears to be making good progress in working with the University Teaching Center to improve teaching methods and the assignment of a Teaching Center advisor for the School will encourage further developments. The current reviewers note that the decision to make teaching training courses mandatory for new teaching staff rests with the University.

6. Student assessment

The School reports that oversight of assessment methods rests with study line Directors and Heads of Faculty and that the School Teaching Committee will review the oversight of assessment in 2010. The Committee is also considering how it can promote diversification of assessment methods. It does appear that the School is now using a wider range of assessment methods as recommended by the EPRG.

7. Students

There are indications that data on students will improve with the establishment of the data warehouse in the Student Registry in 2009. In the meantime the School has made a start on tracking the destinations of students leaving the University and this confirms to some extent the assertion made to the EPRG that students readily find employment or go on to further study. The data does show that there is an urgent need to improve the information for students studying biology, geography and tourism. In conversation with a student representative, the review team was informed that many students prefer to do their postgraduate program (MSc or PhD) at the University and welcome the increased opportunities for such studies. Postgraduate students are in general positive at having the opportunity to teach, as part of getting more experience in the field. There are active student associations within the School, among their task is to arrange visits to companies and institutes in order to increase knowledge of career opportunities within their field of study.

In the past there has been a beneficial exchange of students with Icelandic students studying abroad and foreign students coming to Iceland. The net flow has been for incoming students which is not surprising given the attraction of the natural environment in Iceland. There has been a small downturn in Icelandic students studying abroad owing to the weakness of the ISK but overall student exchange remains an important activity within the School. The EPRG recommendation was to have a more systematic approach to student exchange and to tackle this the School has a member of staff designated to support student exchanges. Since the EPRG visit there has been an increase in the number of PhD students completing joint degrees with foreign universities.

The School has made good progress on providing advice and counseling to students with designated School staff providing advice and guidance on courses and academic progress. The School also has a designated counselor to provide guidance on both personal and academic problems.

8. Staff and human resources management

Good progress has been made in bringing together the staff of the new School through two away days. The EPRG identified strong support from staff for away days. Also there has been very good progress in re-invigorating the annual staff review interviews. The very substantial involvement of the Dean in the last round of interviews has shown staff that the annual review is a key element of staff development. There are sound plans to further develop staff review in 2010 with the greater involvement of Heads of Faculty and the Human Resources Manager. Also building on the enhancement of staff review the School will identify training needs and develop a teaching development plan that will involve the Faculties, the University Teaching Center, the Human Resources Department and other appropriate departments across the University. The current reviewers, whilst noting that initial progress was slow, applaud this systematic approach to staff development. The intention to re-introduce peer review of teaching in 2010 is to be welcomed particularly at a time when the School is considering increasing the amount of shared and cross-disciplinary teaching. In order to demonstrate the value of peer review the current review team would urge the School to consult widely with staff and the University Teaching Center on approaches to peer review of teaching. The School is also making slow but steady progress in addressing the gender imbalance (male dominated) in staff appointed by the School.

The School response refers to the problem of tenured staff providing substantial amounts of overtime teaching. The EPRG learnt that this was often the simplest way for staff to increase their income. From the response there seems to have been a very strong reliance on the Ministry providing additional funds to take on more tenured staff. In addition there has been further action and on average overtime teaching has dropped from around 240 hours a year to 140 hours. However, the School response indicates that contracted teaching loads, in terms of staff time, have only fallen from 51% to 48%. The review team considers that the teaching loads may not reflect 'hidden' hours as payment for hours of PhD supervision are only allocated on completion of the PhD. Compared to most overseas universities this is a very heavy teaching load. Elsewhere in the response the School suggests that the current financial crisis make provide the impetus for reducing hours of teaching. There is no doubt that the School is working hard to reduce

contact hours but there is some way to go to achieve comparability with universities overseas.

The number of sessional teachers increased by 64% between 2000-2005, unfortunately the School response does not indicate trends in recruitment of sessional teachers since that time though Table 5 indicates that hours of sessional teaching have dropped by 10% between 2006 and 2009. Of course there can be a strong case for using sessional staff. They can provide additional expertise (e.g. by using staff from the Science Institute) without the added expense of providing accommodation and research facilities. It also gives flexibility to the workforce that can accommodate major budget fluctuations. In accepting the need for some sessional staff the EPRG recommended that the briefing and preparation of such staff for teaching being strengthened but there is no indication in the School response that the training and preparation of sessional staff has been reviewed other than the expectation that they may attend training courses at the Teaching Center. The only measure of performance in place appears to be student evaluation of courses with poor sessional teachers not being re-appointed.

So far the University does not appear to have considered the recommendation from the EPRG about developing a points system for teaching that offers similar incentives to staff as the research points scheme. The EPRG saw this as one way of helping to reduce the substantial amount of overtime teaching undertaken by tenured staff. A points system could offer greater financial reward for teaching and reduce the incentive to do overtime teaching. The School response notes that the University will introduce a Teacher's Portfolio and points system for teaching in 2011. The current reviewers support the University in these measures to strengthen the status of teaching and also strongly endorse the School proposal for a Teacher of the Year award or a similar scheme of rewarding excellence in teaching. Given that the financial difficulties are unlikely to improve in the short term, it is the opinion of the current reviewers that the School should continue to address as a priority the role and use of all staff in teaching.

9. Facilities

The School response indicates that an ambitious building programme was planned with a new Science Park providing accommodation for a substantial part of the new School of

Engineering & Natural Sciences. Unfortunately this work has not progressed because of the financial crisis, however, there was a clear intention to address the EPRG recommendation concerning poor accommodation and the unhelpful dispersal of staff and facilities in the old Faculty. The building plan included the remodeling of VRI with refurbishment of chemistry and physics laboratories. It is of some concern that earlier action was not planned and taken with the laboratories given that the EPRG identified a potential safety hazard with fume cupboards. Nevertheless it is reassuring to read in the School response, and to have confirmed by the Dean of School, that this refurbishment is now under way and scheduled to finish before the start of the next academic year in September 2010. Also it is apparent that the School is taking other contingency measures (e.g. moving the Marine Invertebrate Laboratory from Askja). It would have been helpful in the response to learn a little more on how the School is responding to the postponement of building plans.

Progress has been made in addressing the EPRG recommendation for creating a flexible learning environment. The new University building, Háskólatorg, has improved study facilities and the School is also planning to create flexible learning space in existing buildings VRI-III though these plans have yet to gain University approval.

10. Administration

The establishment of Schools with the appointment of Deans for 5 years does address a key EPRG recommendation on providing stronger leadership and there are good indications that this is having an effect (e.g. more consistent and regular approach to annual staff interviews). It is a little disappointing that the University did not take the opportunity to extend and strengthen the appointment of Heads of Faculty (e.g. longer terms of office, greater remission from teaching, better remuneration) though the review team understands that an act of parliament may be necessary to change the duration of the term (now two years) for Heads of Faculty. Without the opportunity to foster stronger leadership at this level there is the danger of overburdening the Deans of Schools. The current reviewers would support the Dean's plan to work with the Head of Human Resources to establish further leadership courses and echo the School's concern that the new Head of Faculty posts are only a marginal improvement on the former Head

of Department posts. It seems clear to the current reviewers that the University needs to continue to address the need for strong and stable leadership at Head of Faculty level and also to develop a culture that regards leadership at Faculty and Departmental level as a privilege and mark of achievement.

The School response indicates very good progress on improving the administrative support as recommended by the EPRG. The new School, although a bigger unit, does have a dedicated core of staff to provide strong administrative support for both staff and students. The establishment of the web information wiki *Alfinnur* is another positive step in improving administration within the School. The response indicates there is further work needed to meet the remaining concerns of Heads of Faculty over administrative support at their level. There is mention of further 'streamlining' in 2010 but it is not clear if this will address the concerns of Heads of Faculties, particularly their worries of limited support on financial matters. Given the very difficult financial situation the current reviewers would suggest that financial advice and support for Heads is vitally important.

In terms of benchmarking its development and performance with foreign universities the School has, as yet, not been able to progress this EPRG recommendation. The current reviewers would suggest that the School may be able to identify foreign 'reference' universities willing to undertake 'virtual' comparison.

11. Research and development work

Since the visit of the EPRG the School has significantly increased its research income and the School maintains a strong research profile. In particular the School is taking steps to improve the chance of greater funding from European initiatives with the appointment of an administrator to assist staff in making bids for EU funding. A further wish of the School is for a review of Government-funded Institutes within the School so that benefit to the broadest possible spectrum of science is achieved. The current review team would support this move as, for example, the exclusion of biosciences does seem anomalous given the international importance of this area of science and that the School has created a new Centre for Systems Biology partially funded through a European Science Foundation Senior Research Fellowship. The University has also modified its point

based system for funding researchers but it appears that it still may not fairly reflect the output of Science researchers in internationally prestigious ISI journals and through multiauthored papers. The current reviewers would support the University's continuing development of the points system using advice from overseas experts.

12. External relations

The School has strengthened its links with external bodies in particular energy companies in Iceland. Funding from companies supports Master and Doctoral students and research programmes. In addition staff members are involved with a range of spin-off companies. Overall the School is in a strong position to encourage and develop funding from external courses.

The School has also maintained good progress in visiting schools and collaborating with the School of Education on the training of science teachers.

One area where progress has been slow is in systematically strengthening links with local employers though the current reviewers note that the School has secured funding to support postgraduate students. The current reviewers would suggest that the School consider setting up an advisory board of employers. Such a board would contribute to thinking on the employability of students and career development.

To support external links in research the School has appointed a Research Director and the University has a contractor who is experienced in bidding for EU funding, At present the School's income and links with EU sources is relatively modest but with the new appointments there will be a better opportunity to bid for income from EU sources.

One final area for consideration is the Government's approach to higher education. Whilst the review team acknowledge that this is at the limit of scope for the review it does impact on the future development of the School of Engineering & Natural Sciences. Only so much can be achieved through 'internal rationalisation' of science teaching and research in the University of Iceland. If the Government is to achieve comprehensive value for its investment in science and technology in higher education then the rationalisation needs to extend beyond the University of Iceland. Given the vital importance of Engineering and Science to the economy the Government may also wish

to consider ways in which it can protect, and indeed nurture, these discipline areas in higher education during these difficult times.

13. Conclusion

The review team considers that since 2006 the School of Engineering & Natural Sciences (and the former Faculty of Science) has made steady progress. The recommendations made by the EPRG in 2006 have been addressed and up to mid-2008 progress was good for many of the recommendations. Since 2008 the School has maintained its level of achievement in teaching and despite the difficult financial climate has continued to increase its research profile. Nevertheless owing to the financial cutbacks the new School remains in a fragile state and will need imaginative, and perhaps bold, support from the University and Government if it is to continue to enhance teaching and research in higher education in Iceland.

Appendix: List of documents received

Response to External Peer Review Group’s Final Report of Faculty of Science, University of Iceland, 2006. The Faculty is now part of School of Engineering and Natural Sciences. Reykjavík, February 2010.

External Peer Review Group: Final Report. Faculty of Science, University of Iceland. Reykjavik, December, 2006.