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Faculty of Natural Resource Sciences Subject-Level Review Abstract With Dean's Reflection and Action Plan

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Based on the Subject-Level Review by Jóhann Örylgsson, Hreiðar Þór Valtýsson, Oddur Vilhelmsson, Steingrímur Jónsson, Kristinn P. Magnússon, Eva María Ingvadóttir, Almar Knörr Hjaltason, and Berglind Harpa Soffiudóttir

Introduction

This report comprises an abstract of the Subject-Level Review of the Faculty of Natural Resource Sciences, as well as the Dean's reflections and an Action Plan. It is intended for publication on the website of The University of Akureyri.

In accordance with the Icelandic Quality Enhancement Framework at the University Level in Iceland and the University of Akureyri's guidelines for the organization, as well as the schedule and process of institution-led review of faculties and interdisciplinary programmes, the Faculty of Natural Resource Sciences (henceforth the faculty), School of Business and Science (the School), University of Akureyri (the University), carried out self-evaluation during the 2019-2020 academic year, with some work extending into the 2020-2021 academic year due to delays caused in part by the COVID-19 pandemic. The results are presented in the Subject-Level Review and are summarized herein. A self-evaluation steering group was formed in September 2019 and comprised the following members:

1. Jóhann Örlygsson, Professor and Head of Faculty. Chair.
2. Hreiðar Þór Valtýsson, Assistant Professor and Head of the Department of Fisheries Science.
3. Steingrímur Jónsson, Professor. Academic staff representative.
4. Kristinn P. Magnússon, Professor and Head of the Department of Biotechnology (to 31 December 2019).
5. Guðný J. Jóhannsdóttir. Data retrieval and management.
6. Eva María Ingvadóttir, MS student. Student representative.
7. Almar Knörr Hjaltason, Fisheries science student representative.
8. Berglind Harpa Soffiudóttir, Biotechnology student representative.
9. (from 1 January 2020) Oddur Þ. Vilhelmsson, Professor and Head of the Department of Biotechnology.

In addition, a panel of 10 students was consulted during the writing process. The steering group used data collected from the University databases, website and internal web, student satisfaction survey results, notes from a student focus group discussion session, and staff feedback as well as its own discussion and ideas to develop actions for improvement.

The self-review was externally reviewed by Professor Mark John Costello, Nord Universitet, in December 2020. His feedback was used for further refinement of the Subject-Level Review and was taken into consideration in developing the recommendations and Action Plan presented in this abstract.

Faculty characteristics

The Faculty of Natural Resource Sciences (FNRS) is one of two faculties within the School of Business and Science at the University of Akureyri. On the undergraduate level, it offers two Cycle 1.2 BS study lines: Biotechnology and Fisheries Science. The Biotechnology study line is subdivided into two minor-level specializations; Health Science related Biotechnology (taught with the School of Health Sciences) and Natural Resource Biotechnology (with the Faculty of Business Administration). At the postgraduate level, a Cycle 2.2 research-based 120-ECTS MS study line in Natural Resource Sciences is offered. The MS study line comprises a 60 or 90 ECTS research project, with the remaining credits filled by an individually designed curriculum of courses selected from the course catalogues of the University and collaborating institutes. Finally, the faculty offers with the Centre for Doctoral Studies, Cycle 3 PhD programmes in Biotechnology and Fisheries Science (Appendix 1, Table 1). The first PhD student in Biotechnology was admitted to the programme in August 2020.

The administration of the faculty is as outlined in the Regulations for the University of Akureyri, no. 387/2009. In brief, the faculty is governed by monthly faculty meetings, but daily administration is in the hands of the Faculty Head and heads of department.

Among the 14 faculty members, 1 (the Dean of School, not included in Table 2, Appendix 1) is in administration, the remaining 13 being in 12.5 academic positions. The gender distribution is somewhat imbalanced, although the balance among academic staff has improved from that presented in Table 2, Appendix 1, as the previous Dean has returned to her Associate Professor's position, whereas one of the male Professors has taken over as Dean. Five academic staff will reach retirement age within the next five years.

The faculty is, in terms of student numbers, one of the smaller faculties within the University, with 138 enrolled undergraduate students in 2019 (Table 3, Appendix 1). However, enrolments have been steadily increasing in recent years, while at the same time the dropout rate has been decreasing. The faculty has thus reached capacity and has imposed restrictions on new undergraduate enrolments. Postgraduate studies at the faculty, while listed as research-based MS studies in the University's catalogue and thus officially on offer, have effectively been on self-imposed hiatus in recent years while the programme is undergoing restructuring in response to research-based education being shifted to the PhD level with the faculty's recent accreditation to offer PhD studies. A revamped MS programme in Natural Resource Sciences with an expanded course catalogue is on offer from Fall 2021.

The research output of the faculty has remained more or less steady in recent years (Table 4, Appendix 1). When measured only in peer-reviewed publications it is above the School average, but slightly below average when other measures of research output are included.

Summary of the Subject-Level Review

The Subject-Level Review presents a detailed and self-critical look at the present status of the faculty and makes numerous suggestions for improvements, backed by careful analysis of the various data gathered. The review is structured in nine chapters and seven appendices, with **Chapter 1** comprising an introductory preamble.

Chapter 2 focuses on the academic lines of study offered within FNRS, teaching practices, and academic assessment. It also offers historical context for the development of the faculty and a discussion on flexible education as it is practiced within FNRS. The chapter's main findings are summarized as follows:

Two BS study lines are offered at FNRS (Biotechnology and Fisheries science) as well as a MS study line with emphasis on either Biotechnology or Fisheries Science, and a PhD program. The main emphasis for further developing and enriching the FNRS should be on environmental studies which will enhance synergy between the present study lines.

The faculty has worked closely with industry partners to add value to its study lines. This has been done by scrutinizing both lines and led to enrichment of the present study lines.

The standard and guidelines for quality assurance for European higher education have been incorporated into learning outcomes and course descriptions within the faculty. Both teachers and students are satisfied with the format of the annual review of the curriculum and students feel that information regarding the curriculum is easily accessible, even though some pathways are complicated, and that the information is accurate.

A variety of teaching methods is used in the faculty. Distance students are generally pleased with the study phases, which primarily consist of laboratory work. Local students feel that it would not be good to move all laboratory sessions to the practicals week.

There seems to be little formal documentation on student engagement and interest in their studies, but

Box 1. SLR Main Conclusions

- The faculty provides student centred learning and follows best international practices in university education.
- Future development should be within environmental science, which will enhance synergy between the present study lines.
- Close cooperation with industry partners adds value the Faculty's study lines.
- European standards for quality assurance have been incorporated into learning outcomes and course descriptions.
- Students are generally pleased with current teaching practices, although some concerns are raised.
- Documentation on student engagement should be improved.
- While dropout rates have declined from the last SLR, they are still a matter of concern within the Faculty.
- The lack of an established course catalogue for MS students is a concern.
- The Faculty is understaffed and its human resource policy needs to be updated.
- There are several perceived threats to continued cooperation with key institutes. A renewed focus on forming and strengthening these ties is recommended.
- More focus should be put on PhD studies in the future since this will increase the research output.

teachers feel that this is due to a lack of time as most students work or have other obligations alongside their studies. This matter needs to be examined more closely, followed by suggestions for reactions, if necessary.

Many teachers express worries about the current system of flexible studies. They feel that the quality of student-teacher personal contact may be lessened by the present mode of studies. There is a perception that development of flexible studies may not be carried out with pedagogical interests in mind, but rather from a technological standpoint.

Little or no hard data exists on the exact division of assessment methods used within the faculty, but teachers claim to use a combination of assessment methods, with nobody relying solely on written examinations. Students generally feel that information regarding assessment is clear in course descriptions and that the assessment is fair. A majority of students also feels that the assessment is formative in the sense that they receive detailed feedback on their assignments.

The faculty has been accredited to offer doctoral studies. Although teachers have already had several Ph.D. students they have been enrolled at other universities, although being supervised and performing research projects at UNAK. More positively, two professors got grants for two Ph.D. students, one enrolling in the autumn of 2020, the other in 2021.

Chapter 3 presents and analyses a wealth of data on students, their recruitment, progress, retention, graduation, and post-graduate fate and experience. In general, the chapter concludes that the FNRS study lines are reasonably effective and well run from the student perspective, with graduates generally expressing happiness with their respective programs. However, it does present a number of issues for improvement and resolution. The major issues raised within this chapter are:

- Dropout rate, while it has lowered in recent years, is still of concern and may in some years have contributed to low recruitment levels.
- Students with high levels of extraneous obligations (e.g., employment, family) should be encouraged to enrol on a part-time basis.
- Workload for students in individual courses must be monitored carefully.
- Lack of sea-going capabilities for the fisheries students is of great concern.
- Student engagement should be monitored.
- Lack of courses available for MS students within the faculty is of concern.
- Students could be more actively engaged in the administration of the faculty.
- Lack of elective courses for fisheries students is of concern.
- More foreign exchange students should be attracted to Fisheries Science.
- Conversely, in Biotechnology, more students should be encouraged to go abroad as exchange students.
- To review and amend the study lines, current industry and alumni feedback should be used to make proposals for changes.
- Consider teaching courses every second year if student numbers are low. Intensive block teaching might be another solution.
- Consider synchronization of laboratory courses for local and distance students to develop collegiality and encourage social networking among students.
- Integration of research and teaching could be improved.

- Involvement of students in extracurricular activities, such as in societies and sports, should be actively encouraged.
- Formalizing internships with selected industry partners would be advantageous to students.
- A wider selection of courses taught in English could be offered in the undergraduate lines.

Chapter 4 is on issues regarding staff and human resources. It reviews issues such as faculty staffing, the human resource strategy, professional and career development support, and reception of new staff. The main conclusions are as follows:

- The human resource policy needs to be updated.
- To maintain quality of teaching and research the faculty needs new hires in academic positions.
- Reception of new staff members needs to be implemented in a formal and clear way.
- Staff interviews need to be improved according to the standards set by the faculty.
- The service provided by the University Library and the School Office are satisfactory according to teachers, but issues were raised regarding UGLA and The Centre for Teaching.
- The oncoming new PhD students should be offered teaching assistantships as it would give them teaching experience and relieve some staff workload.
- Sabbaticals may be more easily viable if some courses would be taught every second year.

Chapter 5 discusses outreach-related issues, such as cooperation with educational and research institutes in Iceland and abroad, private companies, and other community links. It concludes that there are several perceived threats to continued cooperation with key institutes, which it identifies as a cause for grave concern. A renewed focus on forming and strengthening these ties, as well as seeking new collaboration opportunities with institutes and private enterprises, is recommended. Another weakness identified is that, while collaboration with overseas universities and institutes has been on the increase, it is to some extent hampered by the lack of resources for running courses in English within FNRS.

Chapter 6 is on issues pertaining to research within the faculty. Among issues reviewed are the faculty's research strategy, research activity of faculty members, and research support, including sabbaticals. The main findings are as follows:

- The research activity at FNRS has reached many of the goals set out in the strategy of FNRS for the years 2016-2022 such as the number of research points.
- More focus should be put on PhD studies in the future since this will increase the research output.
- Financial support for sabbatical leaves should be increased.
- The fact that teachers are obliged themselves to find part time lecturers to teach for them while they are on sabbatical, hampers their opportunities to go on sabbaticals. This should be changed, so that the faculty is responsible for finding replacement-teaching solutions.
- A fund for PhD students' salaries should be installed.
- Majority of overheads from grants should be allocated to the relevant faculty.
- Research cooperation among staff within FNRS and the School should be encouraged.
- Remind staff members to update their research outreach at the home page of UNAK.
- Administrators should make it clear that outreach to society is a part of staff duties. Such activities need to be paid for accordingly.

Chapters 7 and 8 review issues of administration, leadership, quality control and development. An organisational chart of the faculty within the University is presented and discussed, as are several quality-control issues. Among the main conclusions of these chapters are that the roles of administrators (Dean, Office Manager, Heads of Faculty and Departments) could be more clearly defined, that while quality monitoring systems are in place and in regular use by the faculty as regards study programmes and teaching issues, quality monitoring for research activities is considerably less developed and may require some analysis. Also of concern was that consultation with students revealed that many of them were not aware that they have representatives in faculty meetings. This needs to be remedied, such as by reiterating to student representatives their obligation to pass on information to their fellow students and by clarifying which agenda items are discussed in confidence and which are not. Finally, it was pointed out that the system for course assessment was recently revised. To what extent the new format will require changes in how faculty responds to the assessments is not entirely clear.

Dean's reflections and action plan

The Subject-Level Review, while overall giving an encouraging view of a sound, competent and forward-thinking faculty, reveals a large number of issues that staff, students and other stakeholders feel are in need of attention. Many of the issues raised can be addressed with relatively minor adjustments in focus, organization or budget, but others require careful analysis and/or committed budgetary planning to implement.

One of the major foreseeable tasks needed to secure the robustness and longevity of the faculty is the need for new academic hires. This is pointed out in a few places in the Review, especially in Chapter 4, but not really developed beyond pointing out that new hires are needed. A back-of-the-envelope calculation considering the number of ECTS credits taught at the faculty, accounting for joint courses with other Faculties and assuming an average teaching load of 12 ECTS per full-time equivalent (FTE) academic staff member yields an expected number of 18 FTE, indicating a **current deficiency of six FTE staff members**. Currently, this excess teaching requirement is met in part by overtime teaching and in part by non-staff session teachers, a policy not tenable in the long term, although continued collaboration with partner institutes ameliorates the staffing need to some extent. The staffing issue is further confounded by the fact that five staff members are expected to reach retirement age in the next five years. It is therefore clear that **five to eleven FTE academic staff new hires are required in the next five to eight years**. Identifying and prioritizing positions at the subject level is therefore a high-priority task, as is inclusion of anticipated new hires in upcoming budget plans. The gender balance within the faculty is a matter of concern even though with the previous Dean returning to her Associate Professor position in January 2021, it is currently slightly less alarming than indicated by Table 2 in Appendix 1. Nevertheless, the situation is worrisome, and women will be especially encouraged to apply for any advertised positions.

Among many noteworthy suggestions by the External Reviewer was finding a way to formally recognise student's extracurricular leadership, engagement, and achievements. As the reviewer points out, students' social activities are instrumental in developing their inter-personal and organisational skills not taught in formal university education. This may be doubly important in

distance learning-oriented institutions such as the University of Akureyri, where a campus environment is more difficult to establish and maintain. It is not clear in the SLR or in the reviewer's report how this goal is to be accomplished. I will therefore place emphasis on soft skill development and support for extracurricular activities, see e.g., item 2.7 in the Action Plan (Appendix 2).

Also pointed out by the ER is the fact that despite severe budgetary restrictions and very high workload, the faculty does offer its students very high teaching contact hours. While this speaks to the admirable levels of dedication of faculty members to their students, the effects on staff health and well-being are of concern. The reviewer makes good suggestions, some of which are discussed in the SLR, such as postponing low-enrolment classes, lowering contact hours in individual courses, and introducing intensive block courses. Another ameliorative action, currently (2021) being explored throughout the University, is the introduction of teaching assistantships, which leads me to propose that the faculty establish a permanent TA-fund (Action 3.7 in Appendix 2).

Reviewing the previous (2015) SLR, it is encouraging to see that several of the recommendations presented therein have been acted upon, although full resolution of the underlying issues has not in all cases been attained. For example, much work has been conducted within the faculty analysing student workload with the goal of reassessing and restructuring the curricula. However, while much data has been gathered and the content of several courses has been adjusted to better reflect the ECTS credits awarded, the restructuring of the course catalogue has still not occurred and is thus still an action point (point 1.2 in the Action Plan). Similarly, reviewing the Biotechnology study line in light of industry needs (point 1.3), increasing the number of courses taught in English (point 2.6), and improving the postgraduate course catalogue (point 1.4) are still on the agenda.

The Strategic Vision of the faculty, and indeed the School as a whole, needs revision, as both external and internal conditions have changed since it was last revised in 2017. The Subject-Level Review will form a very helpful and welcome input into the revision process. Indeed, an Action Plan has been drafted based on the review and is presented in Appendix 2. It will be a standing item on faculty Meetings, School Board Meetings, and Strategic Planning Events in the months to come.

Appendix 1. Key figures

Table 1. Overview of present study programmes within the faculty

Name of study Program	Cycle	Degree	Credits (ECTS)
Fisheries Science	1.2	BS	180
Biotechnology	1.2	BS	180
Natural Resource Sciences	2.2	MS	120
Biotechnology	3	PhD	180-240
Fisheries Science	3	PhD	180-240

Table 2. Faculty members as of December 1st, 2020 and sessional teachers in 2020, number (No.) and full-time equivalent (FTE).

	Male No.	FTE	Female No.	FTE	Total No.	FTE
Professors	5	4.5	0	0.0	5	4.5
Associate Professors	0	0.0	0	0.0	0	0.0
Assistant Professors	4	4.0	1	1.0	5	5.0
Adjunct Lecturers	1	1.0	2	2.0	3	3.0
Total	10	9.5	3	3.0	13	12.5
Sessional teachers	16	1.16	12	1.06	28	2.2

Table 3. Total number of students, number of entrants, retention rate for first year, and completion rate (2019).

Programme	No. of students			No. of entrants	Retention rate %*	No. of graduates	Completion rate (semesters)**
	Total no.	Full time	Part time				
Fisheries Science	82	68	14	26	56	13	7
Biotechnology	56	44	12	27	52	9	7
Natural Resource Sciences (MS)	2	0	2	1	-	0	-

*Percentage of students still enrolled 1 year after initial enrolment.

**Average number of semesters required to complete.

Table 4. Research output of faculty members, based on the Evaluation System for the Public Universities in Iceland, expressed by mean total research points (A) and mean research points from peer-reviewed publications only (B) per FTE.

	2016		2017		2018		2019		Mean	
	A	B	A	B	A	B	A	B	A	B
Faculty	29.2	19.9	26.9	16.5	28.9	17.5	35.7	20.1	30.2	18.5
School	31.7	18.0	30.1	16.0	27.8	14.1	39.3	23.3	32.2	17.9
University	27.4	12.8	24.5	13.2	29.0	16.3	33.6	18.0	28.6	15.1

Appendix 2. Action Plan

1. Study programmes*

	Action	Deliverable	Deadline	Responsible party
1.1	Enhance synergy between the study lines by placing emphasis on environmental science.	Revised Strategic Vision of the faculty, with Action Plan.	2022	Dean and Faculty Meeting
1.2	Reassess ECTS credits for course modules in light of student workload.	Survey, followed by restructuring of the course catalogues.	2022	Curriculum Committee
1.3	Review and amend the Biotechnology study lines in light of industry needs.	Meeting with industry leaders followed by proposed changes the study lines.	2022	Head of Biotechnology
1.4	Improve postgraduate course catalogue.	Additional MS-level courses described and budgeted for.	2022	Curriculum Committee
1.5	Restructure laboratory coursework re local/distant students.	Revised practicals schedules and/or restructured curricula.	2023	Curriculum Committee

*This Action Plan is based on points raised in Chapters 1, 2 and 3 in the Subject-Level Review.

2. The Student experience and community*

	Action	Deliverable	Deadline	Responsible party
2.1	Reasons for low perceived student engagement scrutinized.	Student survey.	2022	Head of Faculty (HoF)
2.2	Encourage part-time studies when appropriate.	Part-time curricula.	2022	HoF
2.3	Assess student workload.	Report on student workload per ECTS.	2022	HoF
2.4	Secure seafaring capabilities for students.	Contract with operator.	2023	Dean and HoF
2.5	Increase student involvement in faculty administration.	Increase no. of student representatives to 2.	2021	Dean and HoF
2.6	Support foreign exchange students.	Increased no. of courses in English.	2023	Curriculum Committee
2.7	Find ways to support student soft skill development and extracurricular activities.	Report on student extracurricular support and soft skill development.	2022	Dean-appointed WG
2.8	Formalize internships with industry.	Internship contracts with selected partners.	2023	Dean and HoF

*This Action Plan is based on points raised in Chapters 1 and 3 in the Subject-Level Review.

3. Human resources*

	Action	Deliverable	Deadline	Responsible party
3.1	Update the human resource policy.	Updated policy and vision.	2022	Dean and HoF
3.2	Identify staffing requirements at subject level.	Prioritized hiring plan	2021	Faculty Meeting
3.3	Hire new academic staff.	A minimum of 5 new FTE hires based on Action 3.2.	2025	Dean
3.4	Correct gender imbalance in the faculty.	Majority of new hires female.	2025	Dean and HR
3.5	Formalize reception of new staff.	Checklist.	2021	Dean and Quality Manager (QM)
3.6	Revise structure of staff interviews.	Revised instructions.	2021	Dean and QM
3.7	Establish TA-duties for PhD students.	TA-fund and rules for awarding TA-ships.	2021	Dean and Management Board
3.8	Offer more development opportunities	Survey among staff on what opportunities are lacking.	2022	HoF

*This Action Plan is based on points raised in Chapters 1 and 4 in the Subject-Level Review.

4. Research management, cooperation, community and outreach*

	Action	Deliverable	Deadline	Responsible party
4.1	Obtain funding for research, including PhD studies.	A minimum of 5 proposals per year as PI to the IRF or other national/international funds.	2021	Faculty staff
4.2	Enhance financial support for sabbaticals.	Revised rules for sabbaticals.	2022	Dean and Management Board (MB)
4.3	Establish of a fund for PhD students.	Contract(s) with industry partners funding a PhD fund.	2024	Dean and HoF
4.4	Encourage research cooperation among faculty.	Joint proposals to national/international funds.	2022	HoF and faculty staff
4.5	Encourage outreach activities.	Revised rules for 'D points' and their allocation.	2023	Dean and MB
4.6	Strengthen formal collaboration with other educational institutes.	Revised contracts.	2023	Dean and HoF

*This Action Plan is based on points raised in Chapters 1, 5 and 6 in the Subject-Level Review.

5. Administration, leadership, development and quality control*

	Action	Deliverable	Deadline	Responsible party
5.1	Better define roles of managers (Dean, Heads, Office Manager).	Revised job descriptions.	2021	Dean and QM
5.2	Development of quality monitoring criteria and practices for faculty research activities.	White paper on quality in research.	2022	Dean and QM
5.3	Quality monitoring of study programmes updated in light of current University rules and practices.	Revised guidelines for informing students of course evaluation results and actions	2021	HoF
5.4	Clarification of the role and responsibilities of student representatives.	Guidelines for student representatives.	2021	HoF and QM
5.5	The policy and strategic vision of the FNRS should be made visible to students and other stakeholders.	Policy and vision placed on the unak.is website.	2022	Dean

*This Action Plan is based on points raised in Chapters 1, 7 and 8 in the Subject-Level Review.