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Systematic quality assurance and enhancement within research at the Faculty of Science and Technology

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Background

The Faculty's quality assurance and enhancement are based on the well-established quality assurance that is similar at all Swedish high education institutions. Quality assurance occurs in many areas, including through internal or external peer reviews of publications, research grant applications, teaching appointments, acquisition of qualifications to become a docent and through teacher promotions, defence of doctoral theses and regular evaluations conducted by centres, infrastructures, research programmes and subject areas. Many of the latter evaluations are conducted by external parties, including national research funding bodies (e.g. the Swedish Research Council) and the Science for Life Laboratories. The University's *Policy for quality enhancement and quality assurance of research* also defines this as the basis for quality assurance and enhancement of research[1]. In this policy, the University works systematically to allocate research funding strategically and in such a way as to raise the level of quality.

Reviews and decisions

The Faculty's quality assurance and quality enhancement within research takes the form of reviews and decisions by the Faculty Board, the dean, the Research Committee, the Committee for Doctoral Studies, the Faculty Office and the Appointment Committee. Decisions are made as per applicable delegations of authority. The Faculty's management group consists of the dean, the deputy dean, the associate dean for education, the associate dean for research, the head of the Faculty Office, the chair of the Appointment Committee and the chair of the Committee for Doctoral Studies. The Faculty's organisation and work are described in its rules of procedure.

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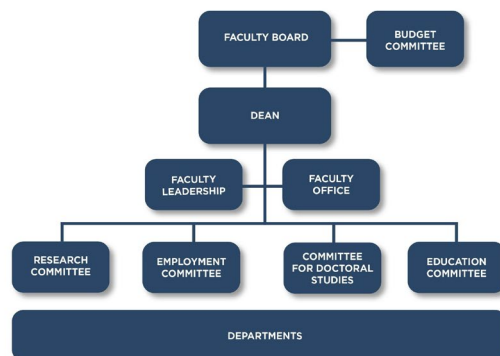
[1] Policy for quality enhancement and quality assurance of research at Umeå University (FS 1.1-1121-23).

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The Appointment Committee is responsible for the hiring process and produces supporting documentation for the dean and the Vice-Chancellor for appointment procedures for full professors (Vice-Chancellor), associate professors, assistant professors and researchers. The committee also works with quality and enhancement concerning the Faculty's appointment processes for teachers.

The dean is chair of the Faculty Board and reviews the departmental requests to hire full professors, associate professors, assistant professors and researchers and hires associate professors, assistant professors and researchers. The dean also decides on whether to award the title of docent.

The Faculty's management group consists of the dean, deputy dean, the head of the Faculty Office, the chair of the Research Committee (associate dean), the chair of the Education Committee (associate dean), the chair of the Committee for Doctoral Studies and the chair of the Appointment Committee.

The Faculty Office prepares supporting material on research- and budget-related cases for the Faculty Board and for the dean's decision-making meetings, conducts follow-up and produces parts of the Faculty's annual report.

The Faculty Board makes decisions on such issues as the budget and the allocation of funding within the Faculty's internal calls for research grants proposals.

The Research Committee prepares documentation to support the Faculty Board when making decisions on the research grants annually announced by the committee. The committee also prepares supporting documentation for the dean in preparation for awarding the title of docent and conducts qualification follow-ups when assistant professors have completed half of their employment period.

The Committee for Doctoral Studies prepares supporting material for the Faculty Board on issues related to general syllabuses, descriptions of degrees and other questions it is tasked to prepare. Within doctoral education, the committee supervises and develops the Faculty's quality assurance and enhancement.

Background and limitations

The Faculty's work is governed overall by the University's vision statement and operational plan and the operational plan adopted by the Faculty Board for the Faculty. The departments are responsible for their internal quality assurance and enhancement and formulate these using trust-based governance. The Faculty follows up departmental research activities through department consultations and in annual reports that include qualitative assessments and key ratios that follow such aspects as

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publications and awarded external research funding. Each year, the Faculty Board allocates funding to the departments and can implement support measures as required. Support measures are normally based on evaluations and information in the annual report and are prepared by the Research Committee and the Faculty's management group.

Research activities at departments differ because of the unique nature of each subject. Some departments need infrastructure, which can somethings require the research be conducted in large groups, while it is more natural at other departments to work in smaller and more loosely composed groups. This also means that quality assurance and enhancement will differ in practice between different departments. As such, it is rational and effective to use trust-based governance with its high degree of decentralised responsibility for working with the quality in research. This division of responsibilities is supported in the above noted policy for quality assurance of research at Umeå University, which also states that quality assurance is to be effective, trust-based and systematic.

Some systematic quality assurance and enhancement at Umeå University occurs through a model where internal organisations are regularly assessed at three levels: departmental or subject level, faculty level, and centrally at the University-wide level. The Faculty must also account for this model in its quality assurance and enhancement procedures so that the core activities are not burdened with parallel evaluations with the same purpose.

The Faculty's quality assurance and enhancement are largely in done in the allocation of resources to the departments. The primary examples are the allocation of time for research, salary funding for doctoral students, support for infrastructures, targeted support for research environments and centres, overall recruitment efforts, the dean's strategic resources and a separate resource with strategic funding allocated by the heads of department. The majority of this allocation is based on merits and performance but can also consist of support measures taken after follow-ups and discussions with the departments. The Faculty constantly works to improve administrative routines to support research, such as to clarify recruitment processes and shorten the time from a decision by the Faculty's Appointment Committee to when a person can begin their employment.

Here, we describe the Faculty's quality assurance procedures based on resource allocations, recruitments, follow-up, consultations with core activities and the link to education.

Resource allocation

An important part of the Faculty's quality assurance and enhancement is a model for allocating grant funding in the form of work hours for research. Annually, the Faculty allocates funding in a call for proposals aimed at full professors and associate professors called Faculty-Funded Research Time

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(FFT). FFT is a major budget item making up just over 20 per cent of the Faculty's costs for research covered by grant funding.

Full professors and associate professors who have had a permanent position for at least three years can apply for FFT in competition across departmental lines. Awarded funding is allocated in the form of research time covering 25, 50 or 75 per cent of full-time employment in periods of 3 to 5 years. Full professors are guaranteed at least 25 per cent FFT regardless of whether they have applied for these funds or not.

After the end of each call, the Research Committee reviews the submitted applications together with assistants co-opted to the committee to provide specific subject expertise. The committee submits a proposal to the Faculty Board for prioritising the applications. The board then determines the allocation of resources within the existing budget framework.

Peer review is used to assess applications that is similar to how large national research funding bodies conduct their calls. This review is based on the applicant's scientific achievements in the form of publications, scientific leadership and the ability to receive external research funding in competition among peers. Scientific leadership refers to work with building up a research group, such as through supervision of doctoral students or by leading research projects that include other research or technical staff. In most cases, required qualifications should be reported for the last seven years so that they more closely reflect current research activity rather than accumulated activity over an entire career. Even if bibliometrics are used as one criterion, the overall decision is based on a total assessment of the applicant's qualifications using peer review by expert evaluators in the different scientific fields. The allocation model is assessed annually and adapted in line with the intentions of CoARA[2], which the University has joined.

When applying for FFT, the applicant submits a list of their qualifications and comments on them in a narrative CV based on the noted qualification areas. This can include choice of journals for publications, descriptions of how they have built up a research group and what external grants they have chosen to apply for at different points in their career. Awarded FFT grants are thus not linked to conducting a specific project. Instead, the applicant is to demonstrate with their qualifications and associated narrative that they have the ability to conduct high-quality research given resources in the form of research time. An applicant who sufficiently demonstrates their competitiveness to be awarded a grant is entirely free to use the funding to conduct successful research and hopefully is as deserving an applicant in the next round when the period for the FFT grant nears its conclusion. Individuals awarded FFT grants are also expected to actively contribute to

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[2] Coalition for Advancing Research Assessment.

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the Faculty's work by taking part in ad hoc committees and preparatory bodies and in other ways.

A new FFT grant may only be applied for the year before a granted period ends, but each year recipients may apply for an increase in the FFT for the remaining part of their current period. This is important since FFT is often awarded for five-year periods, and during this time the applicant may manage to improve their qualification significantly. There are no fixed criteria for being awarded a grant through the call. Applicants in a given year compete for available funding within the budget frameworks adopted by the Faculty Board.

The annual review process gives the Faculty a good understanding of the research that the departments conduct and enables the allocation of resources based on the applicant's reported ability to conduct successful research.

After each FFT grant decision, the Faculty follows up how the funding has been awarded across the departments and the gender balance of awarded grants and reports this to the Faculty Board and the heads of department.[3]. See [4] for a more detailed description of FFT.

The Faculty also distributes grants in the form of salary funding for doctoral students to the departments. This allocation is determined by the size of awarded funding for FFT and other criteria. The idea is to have a certain link between grant funding of research time for potential supervisors and grant funding of doctoral students.

The dean's strategic resource is an important tool for special initiatives in connection with high-level recruitments, pilot projects and counter offers to retain distinguished researchers.

Resource allocation also includes the heads of department's strategic resource that have a fixed part and an amount that is in proportion to the percentage of the Faculty's use of external funding provided by the departments. This provides an incentive to apply for external funding and an automatic additional amount that can be used when a research funding body does not provide full cost reimbursement for auxiliary operations. The additional amount can currently cover just over 10 per cent of costs for auxiliary operations not covered by the research funding body, assuming that the department management makes this prioritisation.

Another important part of the Faculty's quality assurance and enhancement is the support given to research infrastructure, including co-funding of national infrastructures where the Faculty is the host or included as a node. Each year, the Faculty offers a grant for medium expensive research

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[3] See Section 3.2.1 in the 2023 annual report for the Faculty of Science and Technology.

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equipment. The purpose is to provide funding for acquisition of research equipment that is not as easy to fund within a department and that thus may need co-funding to more easily gain funding from external funding organisations. The call is open for permanently employed staff and assistant professors as the lead applicant.

The University's researching staff are often linked to centres, which are commonly Faculty-wide or include external stakeholders. The Faculty contributes funds and evaluations are conducted as per each centre's instructions.

Recruitment

Most of the Faculty's recruitments are initiated by the departments. It is important to note that recruitments largely occur using trust-based governance, since the departments are most familiar with their work and thus know where the greatest need for staff exists.

The dean makes decisions to employ teachers when it comes to associate professors and assistant professors while the Vice-Chancellor makes decisions for full professors. The dean reviews all hiring proposals early in the process when the departments explain the need to hire new staff and how they plan to finance the request. The Faculty's Appointment Committee handles the entire recruitment process. This guarantees a quality-assured process for all departments with a quality job announcement, appointment of external reviewers, interviews of applicants and so on.

As a complement to recruitments initiated entirely by departments, however, the Faculty works with departments at different times to fund recruitment of assistant professors with generous resources in the form of guaranteed research time, start grants and, in some cases, postdoctoral appointments, doctoral studentships and infrastructure. [5]. These recruitments have not been linked to specific research subjects or specific departments at the Faculty. The purpose has been to achieve a strong and broad range of applicants by not narrowly stipulating focus areas and generally having few conditions in the appointment profile. Overall, these recruitments have been well received and have renew and strengthen research at several of the departments (see the Faculty's annual report). The Faculty also actively utilises the option of direct appointment of full professors, which has also strengthened research environments.

Follow-up and measures

The Research Committee conducts a follow-up of all assistant professors around the midpoint of their employment period. The purpose is to compare qualifications and future plans with the evaluation criteria for promotion to associate professor. The evaluations are designed in the form

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of a meeting with the assistant professor and the Research Committee. In the meeting, the assistant professor presents an overview of their research with a particular focus on their autonomy. The overview includes publications, external research funding, collaborations with other researchers, teaching qualifications, review of higher education teaching training, administrative assignments and any periods of leave that can be significant for assessing the achieved qualification level in relation to the employment period. The Research Committee's task is to provide support and make suggestions for the remaining period before the evaluation that could lead to promotion. The committee also provides feedback to the head of department as needed.

Newly appointed assistant professors can also attend a mentorship programme with aspects intended to help in their academic careers. As part of the programme, an experience scientist is appointed for each participant. Early-career researchers can also participate in a leadership programme offered by the University.

Statistics on research operations are tracked by department, for example the number of applications for external grants and the number of external grants awarded. Allocation of grant funding for research by department and by gender is also followed up. Bibliometric analyses of the number of publications, number of citations and the percentage of publications in highly ranked journals are also conducted and reported in the Faculty's annual report[4].

Follow-ups of the departments' operations and activities over time are important to allow the Faculty to see whether quality assurance and enhancement at individual departments is working in practice or if support measures should be discussed with the department.

It is important, however, to supplement these internal follow-ups with a comparison of the Faculty's operations with research conducted at other higher education institutions, both nationally and internationally. Otherwise, there is a risk that an internal development may be seen as positive over time but that it is still worse than other higher education institutions. It can be difficult to do good comparisons with faculties at other high education institutions, since research specialisations and organisation can vary greatly. Another problem is that there can be limited access to relevant data on the activities at other high education institutions. One way of following up activities is to look at awarded research grants from larger funding organisations, such as the Swedish Research Council and the European Union's research programme, where there is good access to date and review panels that partly reflect the Faculty's research specialisations (see the Faculty's annual report).

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[4] See Section 3.1 in the 2023 annual report for the Faculty of Science and Technology.

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Parts of resource allocation are also followed up, such as the award of grants for FFT and medium expensive research equipment. The Research Committee follows up processes in both cases, and the heads of department are consulted on how FFTs are awarded after the Faculty Board's decision. Other parts, such as the use of the strategic resource available to heads of department, are not directly evaluated by the Faculty, since the decision on the use of these resources is taken at the department level.

Consultation with core activities

Each year, Faculty Management consults with department management on overall operations and activities, and about three times a year PI meetings are held with heads of department and staff with formal management responsibility for research activities at the departments. A relevant theme is presented at these meetings, such as the results of applications for external funding, proposals for reforms related to research operations and bibliometric follow-ups. PI meetings provide an opportunity to build support, test drafts for reforms and share ideas for improvements. Annually, several seminars for heads of department are held that focus on specific areas, multiple with relevance to quality assurance and enhancement within research, for example strategies for successful recruitment of teachers.

Research and education

Umeå University's policy for quality assurance and enhancement of research specifies that the University is to work systematically to promote the close link between research and teaching. Research is important for providing the scientific basis and expertise needed for the University's courses and programmes. Education, in turn, can contribute to strengthening research and increasing its relevance to society. Doctoral education and degree projects have important intersections between research and education, where collaborative projects are also created with the surrounding community. This particularly applies to degree projects but also in doctoral education, where the University accepts doctoral students within an industrial doctoral school. Another important intersection is with teaching assistants, who can ease the load for the programme so that researching staff can work with more qualifying teaching assignments while some teaching assistants gain experience that can help them in future doctoral studies.

An important component in this context is that employed teachers are encouraged to participate in the programme and that they gain professional development within the disciplinary domain. Successful educational activities are thus an important part of the acquisition of qualifications available at the Faculty. To be appointed as a docent, an individual must have completed higher education teaching training, including a course specifically focused on supervision within doctoral studies. [1]. In addition

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to research activities, the application is to include a presentation of teaching qualifications in the form of teaching experience, teaching awards, statements from department leadership, course evaluations, and the production of instructional material. Since the designation of docent is a criterion for promotion to full professor, successful educational activities are indirectly included in this case [2]. The promotion from assistant professor to associate professor also requires extensive experience of teaching, course development, development of course material and completion of training in teaching and learning in higher education [3].

Policy documents and sources

[1] Guidelines for appointment of docent at the Faculty of Science and Technology (FS 1.1-1356-20)

[2] Guidelines to applicants and external reviewers for assessment of applications for promotion to full professor (FS 1.1-1062-18)

[3] Procedures when applying for promotion from assistant professor to associate professor (FS 1.1-1524-21)

[4] Description of Faculty-funded research time (link to website)

[5] Appointment profile for up to five positions as associate professor (AN 2.2.1-1879-21)