Academic organizational structure

ASSESSMENT OF NEW FACULTY STRUCTURE AT NTNU

FUSJONSPROSJEKTET

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Chapter 2 describes the Government's decision on the merger of the Norwegian University of Science and Technology (NTNU), Gjøvik University College (HiG), Sør-Trøndelag University College (HiST) and Aalesund University College (HiÅ), which forms the background for the work on the academic organizational structure.

Chapter 3 outlines the working group's mandate and composition, as well as the process the group has pursued since it was appointed in March 2015 to prepare this recommendation – group meetings, information gathering, a consultation round and analysis of models.

Chapter 4 addresses principles and practice in the organization of universities, nationally and internationally. The working paper from the Nordic Institute for Studies in Innovation, Research and Education (NIFU) is discussed, as well as the group's assessments of the experience. The main principles that form the foundation for the group's proposed models are also described in this chapter, with a discussion of some dilemmas surrounding the choice of model. The relationship between the organization model and quality is discussed, and the group maintains that the significance of the faculty structure should not be overstated. Finally, an attempt is made to define the responsibilities and tasks of a faculty.

Chapter 5 describes the group's working paper on concepts for academic organizational structure that provided the basis for a broad-based consultation round. The comments from the organization are summarized.

Chapter 6 discusses the group's assessment of the consultation round and how it has influenced the work with models. Based on the comments, the group has chosen to go ahead with two main models within the range between K1 and K3 of the concept report, that is, a narrow and a broad faculty structure. These main models are different in principle, primarily because of the number of faculties (4 and 7 respectively), but also in their approach to the academic organizational structure. A narrow structure inevitably results in large faculties that are relatively broad from an academic perspective, while a broad structure allows for more specialized faculties of different sizes. To illustrate several possible solutions, the group has chosen to present an alternative variant of each of the two main models, with 5 and 8 faculties respectively. The group has then carried out an approximate allocation of existing basic units at the four institutions to faculties in the different models, based on a main principle of academic proximity and cohesion.

Chapter 7 provides a consequence analysis of the four models based on historical (2014) key data about the units. As an introduction to the analysis, the group discusses guidelines inherent in the merger platform and how these can be translated into expectations for faculties. The group also explains the four sets of criteria that form the basis for the analysis, collected under the headings *Academic identity; Academic synergy; Leadership, participation and co-determination*; *Strategic capability and financial room for manoeuvre*. The rest of the chapter includes a number of figures and tables that illustrate the consequences of the various faculty constellations. Finally, the group's combined assessment is presented, with the conclusion that all four models are relevant and realistic.

Chapter 8 provides a summary. The group's proposals for models as a basis for the hearing are recapitulated here:[1]

Narrow structure – main model M1	**Variant M1a**
1. Health sciences, social work, nursing, medicine 2. Natural sciences, mathematics, computer and information science, electrical engineering 3. Engineering, architecture 4. Humanities, art, social sciences, science of education, economics, psychology, management	1. Health sciences, social work, nursing, medicine 2. Natural sciences, mathematics, computer and information science, electrical engineering 3. Engineering, architecture 4. Social sciences, the science of education, economics, psychology, management 5. Humanities, art
Broad structure – main model M2	**Variant M2a**
1. Health sciences, medicine, nursing 2. Natural sciences 3. Mathematics, computer and information science, electrical engineering 4. Engineering, architecture 5. Humanities and art 6. Social sciences, social work, economics and management 7. Psychology, science of education	1. Health sciences, medicine, nursing 2. Natural sciences 3. Mathematics, computer and information science, electrical engineering 4. Engineering 5. Humanities and art 6. Social sciences, psychology, social work, science of education 7. Economics and management 8. Architecture, visual art

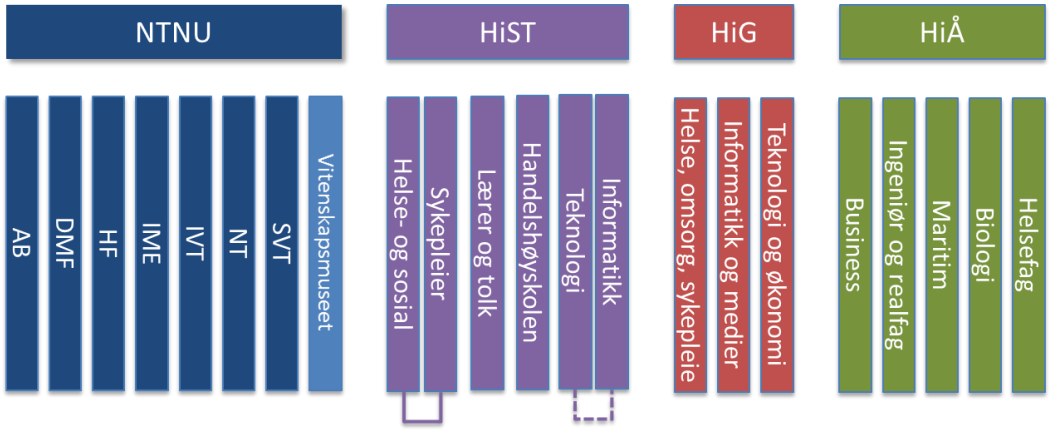
Chapter 9 provides the underlying data for some of the figures in Chapter 7, as well as an overview of the units included in the faculties in the four models.

[1] For the record – the terms in the models indicate the faculties' general subject areas, not suggestions for faculty names. Some subject areas are mentioned in more specific terms than others in the model. This applies especially to areas where there are questions about faculty affiliation.

2. Introduction

The Government has decided that the Norwegian University of Science and Technology, Gjøvik University College, Sør-Trøndelag University College and Aalesund University College are to be organized as one university under the name of the Norwegian University of Science and Technology (NTNU) from 1 January 2016. The royal decree states that the basis for the institutions is that after the merger NTNU will be an internationally outstanding university with active campuses in Trondheim, Gjøvik and Ålesund. NTNU's main profile will be in science and technology, with great academic breadth that includes the humanities, social sciences, medicine, health sciences, the science of education, architecture and activities in the arts. The aim of the institutions is that NTNU will be a national hub in programmes of professional study.[2]

NTNU must establish a new academic structure that reflects the merger of four institutions with a range of academic environments. We are working on the basis that there should be at least three formal organizational levels – 1: central management/Rectorate, 2: faculty/division and 3: department/academic unit. At the outset (2015), the four institutions have 22 entities (faculties/departments) at level 2. In August 2015, HiST reorganized from six departments to five faculties, after which there are 21 units at level 2.[3]



The high number of departments creates a complex structure at level 2. Apart from this, there are many parallel academic groups that must be coordinated in a new organization. In addition, the new NTNU will have several separate campuses from the start, spread over three different cities. This, together with expectations for synergy effects from the merger, creates the background for the task of proposing a new academic organizational structure.

[2] See the Royal Decree of 19 June 2015: https://www.regjeringen.no/no/dokumenter/sammenslaing-av-ntnu-hogskolen-i-sor-trondelag-hogskolen-i-gjovik-og-hogskolen-i-alesund/id2423958/

[3] The reorganization of HiST provided for a merger of the faculties of technology and informatics, but this has not been implemented in the autumn of 2015.

3. Mandate, group and work process

3.1. Mandate

The mandate was adopted at the steering committee's meeting on 18 March 2015 (excerpt).[4]

> […]
>
> The steering committee for the merger establishes a group to prepare proposals for the organization of the university. The work is to be divided into two phases. Before 15 June 2015, the group is to create a foundation for discussion that charts various relevant models and principles for the organization of the academic activities at the future NTNU, and to assess the advantages and disadvantages of these. The term "models" refers to organization in the form of entities such as faculties, schools, or research centres. One prerequisite is that the future NTNU will continue to have a unitary and appointed management.
>
> The group must consider how the academic activities can best be developed from the perspective that, in many subject areas, they will take place in three cities. The foundation for discussion is to be debated in the steering group.
>
> Based on the foundation for discussion and consideration by the steering committee, the group is to present specific alternatives for the future academic organization of NTNU by 1 November at the latest. This proposal is to be distributed for broad consultation in the organizations with a deadline of 15 December 2015. The proposal will be revised in the light of the comments before it is submitted to the new Board. […]

The steering committee also decided to establish various academic working groups within delimited thematic and technical areas that would provide input to the work with the academic organizational structure (see 3.3 below). It was also assumed that the merger platform would form the basis for the work (see below).

Interpretation of the mandate

The group discussed the mandate at its first meeting on 28 April 2015. The mandate entails 1) exploring models and principles for academic organization and assessing their advantages and disadvantages, and 2) on this basis, developing at least two specific alternatives for the organizational model. We have interpreted the assignment as requiring us to examine various proposals for the faculty structure of the new NTNU, that is, primarily the division into units or divisions at level 2 in the organization. Naturally, this will also involve an assessment of where the units at level 3 (departments, sections) should be placed in the structure. However, in our interpretation the group does *not* have a mandate to prepare a complete or final proposal for the structure at level 3 and level 4. According to the way that the merger process has been organized, the decision on the departmental structure will be made after the new Board has decided on the faculty structure. This means that the point of departure for the group must be the academic units existing in 2015 and the group must use its judgement to distribute them between the various models.

[4] Minutes of the steering committee's meeting on 18 March 2015, Item 4.

The group is working on the basis that the merger platform establishes certain guiding principles for the academic organization. These guiding principles are discussed in Chapter 0 below.

3.2. Composition of the group

At its meeting on 18 March, the steering committee decided that the group for the academic organizational structure should consist of 3 from NTNU, 2 from HiST, 1 from HiÅ, 1 from HiG, 1 employee representative (with two alternates) and 2 student representatives. In line with this, the group comprises the following members:

- Berit Kjeldstad, Pro-Rector, NTNU (chair)
- Marit Reitan, Dean, NTNU
- Ingvald Strømmen, Dean, NTNU
- Solrun Valen, Dean, HiST
- Camilla Nereid, Dean, HiST
- Hans Petter Hildre, Dean, HiÅ
- Nils Kalstad Svendsen, Dean, HiG
- Maria Honerød, Student, NTNU
- Student Kaja Meling Holmesland, HiÅ (replaced Hans Marius Martinsen)
- Kristian Steinnes, employee representative, Forskerforbundet (the Norwegian Association of Researchers) – NTNU

The deputies for the employee representatives have been Terje Tvedt, Tekna (the Norwegian Society of Graduate Technical and Scientific Professionals) (HiÅ) and Ronny Kjelsberg, NTL (Norsk Tjenestemannslag – the Norwegian Civil Service Union) (HiST).

The secretariat has consisted of Thor Bjørn Arlov, Per Eivind Kjøl, Ken Richard Stebergløkken and Morten Størseth from the Rector staff, NTNU.

3.3. Work process

The group has had seven half-day and full-day meetings in Trondheim in 2015 before the recommendation was delivered, i.e. 28 April, 28 May, 19 June, 20 August, 18 September, 8 October and 30 October. Between meetings, the group communicated by telephone and email.

As part of the assessment activities, NIFU was engaged to prepare a working paper on various university models and principles for organizational structure, especially with regard to institutions with several campuses.[5] The findings were presented to the group and discussed at the meeting held on 28 May, and were also presented to the working groups in different subject areas in connection with their *workshop on* 16 June. Based on NIFU's work and internal discussions, the group prepared an initial working paper on various concepts for the academic organizational structure. [6] This working paper was distributed in a wide-ranging consultation round at NTNU, HiST, HiG and HiÅ – to

[5] Elken, Mari and Stensaker, Bjørn: Organisering av flercampusuniversitet - en diskusjon av prinsipper og etablert praksis, NIFU Working Paper 10/2015.

[6] *On the academic organization of the new NTNU: four concepts*, Working paper, Trondheim 26 June 2015 (see www.ntnu.no/web/fusjon/arbeidsgrupper).

the line organization, the working groups in different subject areas, the unions and the student organizations. A specific request was made for comments on the criteria that should form the basis for the choice of the organizational model, and which of the four concepts should be developed further. In addition, comments were requested on proposals for the organization at level 3 with various types of basic unit – department, centre and school.

By the deadline of 15.09, more than fifty comments had been received, which the group discussed at its meetings on 18 September and 08 October. (See Chapter 5 below). Based on this discussion, the group chose to assess some main models for the organizational structure, in the range between a narrow and a broad faculty structure (see Chapter 6).

The group has gathered key data from the merging institutions to make it possible to evaluate consequences of the various models in terms of aspects such as finance, staff, teaching and research. Open access to the data has been provided on the merger project's website and is also attached to this recommendation.

4. About the organization of universities

4.1. Introduction

The tradition of a university as a concept and cultural institution is centuries old, but both form and content have changed greatly over time. Specialization of the sciences, the education revolution and the development of society in general have been important factors in the thinking about how universities can and should be organized. It is beyond the scope of this recommendation both to describe the development and to exemplify it (however, see 4.2 below). We must content ourselves with noting that a rich variety of organizational models exists internationally, and even at the national level we will find many different ways of organizing universities.

A common feature of all large organizations, such as universities, is that some form of divisional structure is needed in order to govern and direct the organization's activities, allocate resources and tasks, establish a sense of community, ensure participation and co-determination, etc. The larger the organization, the greater the need tends to be for further subdivision. In one sense or another, the vast majority of universities are hierarchical institutions with at least three formalized levels. Norwegian universities have a main structure of this type, with a Rector level, a faculty level and a department level. The institutions may well operate with a fourth level as well, whether the components are termed sections, centres or academic groups. The extent to which units at level 4 are in fact or are perceived as part of the line of governance and management may vary. In terms of this narrower meaning, NTNU does not currently have a formal level 4 at all of its faculties, but some of them have implemented it, with accompanying delegation of authority and representation in the faculty leadership. In practice, much of the academic activity is organized at level 4, especially research.

The pure hierarchical model is supplemented by various units and mechanisms that exist between or across the levels. Examples include interdisciplinary centres, educational and research initiatives, infrastructures of various kinds or coordinating bodies. They may have delegated authority in limited areas. Such mechanisms are essential to the academic activities, and it could well be argued that more will be needed in relation to increasing interdisciplinary cooperation. However, it is a challenge to place such units and bodies in the traditional hierarchical organization chart, which is a greatly simplified representation of reality. The solution is often to exclude them from the organization charts, but the challenge still consists of defining the role and place of these mechanisms in the overall organizational structure.

In this context, the point is that a structure that is cogent per se, with three (or four) levels, is far from covering all aspects of the university's organization of its academic activities. Our mandate and our recommendation are primarily concerned with Level 2, the faculty structure, and the immediate consequences this has for level 3. It is important to bear this limitation in mind.

In Norway, the Act relating to Universities and University Colleges specifies some general boundary conditions for organization of the institution's academic activities, but the Act deals mainly with the responsibility and duties of the Board and Rector as well as with what we could collectively term the university's mission in society. The administrative structure, including the faculty and departmental structure, is left to the institution itself to determine.

4.2. Key principles for academic organization

Merger processes are complex, in terms of both the process itself and which principles should form the basis for the organizational structure and governance. The new NTNU will be a multi-campus university represented in three cities. This creates particular challenges, and the group has been asked to explore different arguments for the organizational structure and governance of such a university. In this work, we found it necessary to draw on the experiences of other, preferably similar, institutions, and to highlight examples of organization of universities in an international context.

NIFU's working paper

The group asked the Nordic Institute for Studies in Innovation, Research and Education (NIFU) to chart various ways of organizing universities. [7] The working paper from NIFU emphasizes some key development characteristics that seem to influence thinking about university organization in a more general context. The working paper also provides some empirical examples of how some leading universities – with a technological profile – have chosen to organize their activities.

The working paper addresses two main perspectives for the organizational structure: academic/thematic and geographical. Historically, the proximity of the disciplines has been an important organizational principle, and variants of organizational structures based on disciplines can be regarded as the most common organizational model at Norwegian universities. The development of knowledge has contributed to changes in the traditional concept of disciplines. For example, research projects and the establishment of centres with external funding create new organizational structures. An alternative form of traditional discipline-based organization has been the "schools" approach. The working paper from NIFU shows that the concept of schools is not at all clear, and needs to be explained with specific examples. The second principle – geography – relates to how closely different campuses should be linked to each other and whether organizational integration across geography is practical or whether different campuses should have "parallel" academic organizational structures.

NIFU's review of universities, regardless of whether they are located on one or more campuses, shows great diversity in organizational structures. Both schools and traditional faculties are used. Multi-campus universities do not appear to be organized in ways that are essentially different from universities with only one campus. A second point is that one could maintain that in the universities NIFU has looked at more closely, hybrid rather than "pure" models tend to dominate. Many universities operate with departments as a substructure below both schools and faculties, and traditional discipline-based organization structures seem to thrive alongside more thematic organizational structures. A third interesting point is that "world-leading" universities do not seem to show a clear tendency in terms of their academic organizational structure. Although many of the universities that NIFU has looked at are indisputably excellent institutions, it is difficult to see a strong association between excellence and organizational structure. Instead, the common characteristic of these universities is the diversity of their structures.

[7] Elken M. & Stensaker B. (2015) Organisering av flercampusuniversitet. En diskusjon av prinsipper og etablert praksis ved noen utenlandske læresteder [Organization of multi-campus universities – a discussion of principles and established practice] . Working paper 10/2015. Oslo. NIFU

The group's assessments

It is both instructive and inspiring to see how other institutions, including leading universities, have organized their academic activities. However, it is clear that no one model will guarantee success; many solutions are possible, and their diversity is in itself an important lesson here. Another lesson is not only that hybrid models can work, but also that they are often preferred because they provide greater flexibility. A third experience is that institutions that carry out radical organizational initiatives in connection with mergers either take an extremely long time to get their operations to work well or need to reorganize after a few years.[8]

The group has discussed various university structures, both real-life examples and more idealized models. A key distinction at level 2 appears to differentiate between a traditional organizational structure based on disciplines on one hand, and a more thematic and often interdisciplinary structure on the other. The first type often uses the term *faculty* as the name of the unit at level 2. The names of faculties normally reflect knowledge areas or disciplines, but the academic structure varies internationally to some extent.

Thematically organized institutions operate with various terms at level 2 – *faculty*, *school* or *division*. There is no uniform terminology internationally. The names of units may reflect various interdisciplinary combinations, thematic areas of focus or a specific purpose as a professional programme of study – for example *School of Engineering*.

A large number of universities have hybrid organizational models. They may have academic units at levels 2 and 3 that are either discipline-based or thematic based on the nature of the activities, and/or they may have divergent organizational structures, for example for education and research. They may also have cross-cutting or overarching structures for academic activities across faculty boundaries. The formal structure rarely tells the whole story of the academic organizational structure in real life, or of governance and management in practice.

Our general assessment is that it is not viable to lay down rigid principles of academic organization; instead, a pragmatic approach is needed. Some flexibility – or hybridity – should probably be included in the model. One of the reasons for this is to meet the needs arising from NTNU's situation as a multi-campus university spread over three cities. Merging three university colleges with one university means that many parallel academic environments with different cultures for education and research need to be united, which also implies that one must find practical solutions.

However, the group has agreed on several main principles that form the basis for the models we present in this recommendation. We mention them briefly, without further detail on the line of argument here (see discussion in 4.3 below):

- The divisions at level 2 are called faculties and headed by a dean, in line with Norwegian university tradition.
- The NTNU University Museum is kept as an independent unit, headed by a director who reports to the Rector.

[8] Studies of experience from mergers in the Danish higher education sector indicate this.

- The faculty must represent an academic community based on cohesion between scientific disciplines or subject areas, whether there are few or many faculties.
- There is no requirement for the faculties to be approximately the same size.
- The various models are based on the existing units or academic environments of the institutions as at 2015, and they do not assume segmentation of departments. A decision on the organization of level 3 must be made after the Board has decided on the faculty structure.
- The models that are proposed should all be relevant and feasible in terms of the overarching framework conditions that currently apply to the higher education sector.

Based on these principles, the models will result in an NTNU with faculties of different sizes, primarily structured in terms of subjects or disciplinary domains and with different levels of specialization. The current academic environments at level 3 and 4 will largely stay together, but in some cases they will be organized under a new faculty.

4.3. Some dilemmas in the choice of an organization model

When it is problematic to establish clear and unequivocal principles for the organization of academic activities, this is naturally related to the variety of dilemmas inherent in the field, as well as directly conflicting goals in some cases. The final assessment of the model that is most fit for purpose entails finding a balance between several dilemmas, as the group has discussed in several contexts.

Integration versus autonomy

The merger means that four independent institutions become one from 1 January 2016. A university culture and a university college culture as well as four unique profiles must be reconciled. In addition, the academic activities in three different cities must be coordinated. An organization model must be found between the two ends of the spectrum: full integration of all academic activities regardless of geography and formal profiles on the one hand, and greater diversity on the other. To what extent should the autonomy that the parties have today continue in a new organization? The way that the management of research and education is organized will play a key role. The dilemma is perhaps most acute for HiG and HiÅ; based on purely practical factors related to geography and logistics, there is reason to believe that it will be easier to integrate the academic management of the academic environments at HiST and NTNU. Parallel and overlapping academic environments are also part of this dilemma; For example, to what extent should NTNU allow several similar programmes of study side by side?

Research versus education

Research and education at a university are activities of equal value, but they differ with respect to their organizational structure. In general terms, education is controlled to a greater extent than research is by frameworks and regulations, formalized procedures for cooperation, resource planning, external requirements, recruitment and so on. The degree of freedom is greater in research, both for the academic environments and for the individual academic staff members. For example, it is probably easier to establish and conduct research cooperation across the organization or with external academic environments than it is to collaborate on education. There are undoubtedly divided opinions about the degree to which research activities can and should be organized, but it is hardly controversial to maintain that the need is greater in the context of education. An academic organization optimized for providing effective education of high quality is

not necessarily as suitable if the objective is to achieve research of high quality. A good organization model must balance these considerations and include suitable mechanisms for the academic activities, such as centres and strategic areas across the organization, or coordinating bodies.

Disciplines versus interdisciplinarity

From the long-term perspective, the discipline-based structuring of the university has dictated the organization. Historically, disciplines were inextricably linked with professions. The specialization of the sciences, the development of new fields of knowledge, the emergence of the mass university and not least the growing interaction with society and the business community have all contributed to challenging and changing the traditional concept of the discipline. As the NIFU report also shows, some institutions have gone a long way towards organizing themselves in terms of social relevance in one sense or another (thematic and interdisciplinary, such as KTH Royal Institute of Technology and ETH Zurich), while many others have made adaptations to varying extents (hybrid models with schools, faculties and centres). Although the link with the discipline is often preserved in the name of the faculties/divisions, the academic content has changed. The point in this context is that even if one chooses a discipline-based organizational structure in principle, the structure of the subjects is not automatically given. One factor is that many subject areas have roots in several disciplines, such as biotechnology or ICT. Another is that a narrow faculty structure will inevitably need to include more disciplines in fewer faculties, and in that sense it will become more multidisciplinary and interdisciplinary. Depending on whether one wishes to give priority to disciplinary consistency or to multidisciplinary, interdisciplinary and thematic cooperation, and on whether one wishes to highlight the subject areas internally and externally, this may be relevant to the choice of organizational model.

Similar versus dissimilar units

From the point of view of governance and management, not least in terms of administrative and financial efficiency, faculties with a similar structure may be desirable. For example, if the faculties have fairly similar capacity and competence, it will be easier for them to interact with each other and with the management. Cross-cutting procedures and uniform systems will presumably be easier to implement, and there will be fewer obvious disparities in power at the departmental level. On the other hand, placing academic environments at levels 3 and 4 in the faculty structure based purely on size considerations could easily make it necessary to break up established environments and collaborative relationships. It could well be argued that diversity in the form of both large and small faculties takes care of academic identity in a better way, and that the problems created by an asymmetrical structure must be solved using other mechanisms.

Ratio of employees to managers

The size of the management group at the various levels and the distance between management and the academic environments (and the individual employee) are relevant to strategic capability as well as to participation and co-determination. As a general term, we can refer to this as the span of control, and it will take different forms in the different models. A narrow faculty structure will give the rector a more compact management group with pro-rectors and deans, which could theoretically strengthen strategic capability in the sense of the power to make decisions. On the other hand, the deans would need to represent a variety of subject areas, some of which would be dissimilar. At the same time, the management group at level 2 would become correspondingly larger, unless the number of units at level 3 is reduced in parallel. A small number of large units at

level 3 might trigger the need to formalize a level 4. A broader faculty structure would result in a larger extended management group for the Rector. The university's academic activities would thus have broader representation in the management, but the management group might also be perceived as less effective in certain contexts. Through the merger the university will become about 50% larger, which might also entail an increase in the span of control. The choice of organizational model also involves an assessment of where one wishes to strengthen strategic capability in the organization and how wide the span of control may be between the levels.

Change versus continuity

A merger creates the opportunity for innovative thinking about the academic organization and the potential for better positioning of the university in national and international competition – to the extent this is desirable. The authorities' rationale for the "SAKS" process is primarily to strengthen the quality of research and education in the sector. [The Norwegian acronym SAKS stands for Cooperation, Division of Work, Concentration, Merger.] Quality enhancement is also an overarching goal in the merger platform. Below (see 4.4), we discuss possible relationships between organizational structure and quality, but here we want to highlight the dilemma between achieving academic gains in the future and ensuring that today's good academic activities are not harmed. It is obvious that the merger will demand organizational changes, probably mainly for the academic environments of the university colleges, which in any case will lose their institutional level, and potentially also their departmental affiliation. It is not equally obvious that the academic activities will need to change significantly in a new faculty structure – this depends on the extent of the reshuffling demanded by the chosen model. If a new faculty structure involves extensive changes in terms of splitting, combining or moving academic environments, establishing new employer relationships and cooperative relationships, the introduction of new funding models and so on, there is reason to believe that this will curb academic activities for a period – both because it creates extra organizational work and greater uncertainty for a longer period, and because it will demand a great deal of management attention.

4.4. About organizational structure and quality

The expectation of improved quality is the most important driver in the merger process. The concept of quality may be perceived as somewhat abstract, but it is possible to operationalize it by linking it to indicators used in the sector. For example, in the field of education, it is common to refer to indicators such as the number of applicants with the institution as their first choice and the quality of admitted students, the time required for completion and the completion rate, the demand for graduates and so on. Indicators of research quality typically include academic publishing, impact, number of doctoral degrees produced, academic evaluations, international collaboration, competitive project funding and the like. Both the authorities' and the merger partners' own goals – expressed for example through the merger platform – entail expectations about quality enhancement in many or all of these areas, if not immediately, then in the longer term. A logical consequence of this is that one must organize the academic activities so that quality will be improved.

As we have said above, supported by NIFU's report among other things, it is difficult to find empirical evidence for a correlation between the organizational model and academic quality. Quality depends primarily on the people – students and staff – at the institution and the infrastructure available for maintaining and refining knowledge and expertise. In this context, infrastructure includes financial resources, administrative systems, culture, physical infrastructure – and organization. A

dysfunctional organization will clearly reduce quality. Conversely, one must assume that an appropriate academic organizational structure will promote quality.

The group believes that one should not exaggerate the significance of the faculty structure itself as far as creating a basis for increased quality is concerned. There are probably many models that can and will work well in this respect. At the same time, the way that one assembles academic units in a structure is not immaterial. In part, it is a question of creating robust academic environments with sufficient weight and breadth to conduct academic development at a high level and over time. In part, it concerns ensuring a consistent culture for quality in research and education. All this has implications for the choice of model.

Regardless of which model is chosen, it is a question of establishing a functional organization and infrastructure that underpins the academic core activities, i.e. quality of leadership, administration and support services. The group for the administrative organizational structure has identified some important requirements for administrative solutions, i.e. that they

- result in *qualitatively* good services to students and academic staff
- are *close to the disciplines* in the sense that they are focused on students, the educational tasks and the needs of the research communities
- create a basis for *close collaboration* with the academic activities
- improve management's ability and potential to make informed *strategic* decisions
- are *effective* through standardization, simplification, common procedures and processes
- take advantage of the opportunities inherent in *digitization* and the use of modern technology
- are *flexible* so that they are adapted to the operation and facilitate mobility among students and staff.[9]

We believe that a new faculty structure will yield significant quality gains only if it is accompanied by good, appropriate administrative systems and solutions.

4.5. What is a faculty?

In general usage, the faculty is often identified with the dean and administration, but it is important to remember that a faculty represents the sum of the students, academic and technical-administrative staff and the activities that they perform.

The group assumes that NTNU's divisions at level 2 (except for the NTNU University Museum) will continue to be termed faculties and be headed by a dean. Without anticipating the structure and the question of the future organization, we would like to point out the role and responsibilities of the faculty and the dean in today's NTNU. What follows is not an exhaustive list, and we emphasize that there are certain differences between the faculties.

The faculty is primarily a strategic and administrative superstructure over related academic environments that are usually organized as departments, in some cases as centres. The faculty, i.e. the management group in practical terms, develops integrated strategies for the subject areas. It is

[9] Comments from the Merger Secretariat on 27 October 2015 on the basis of discussion in the group for the administrative organizational structure.

responsible for programmes of study, and is the degree-conferring authority. In some cases, the administration of courses and entire programmes is delegated to the departments. The faculty also has overarching responsibility for doctoral education within its subject areas and confers doctoral degrees itself.

The faculty is headed by an appointed dean in a full-time position (fixed term of employment) who sits in the Rector's management group and takes part in shaping the institution's plans and strategies. The dean appoints vice-deans for research and education, who are normally appointed in part-time positions. The dean has personal responsibility for the heads of departments and represents NTNU and the faculty with respect to the outside world. The faculty requests reports from subordinate units and reports further to rector level.

The faculty receives allocations from the board and distributes funds to the departments on the basis of its own budget. It is not bound by the institution's model for income allocation in the further distribution to departments and any other units. An important task is to contribute to and establish the basis for the faculty to obtain extra resources through collaborative and commissioned activity ("BOA"). The faculty is the appointments authority for academic and administrative staff.

The faculty may host activities and initiatives across the institution, for example an interdisciplinary strategic area of research (TSO), programmes of study, centres or research infrastructure. The faculty may also have a coordinating role on behalf of the institution within specific academic or thematic areas or with regard to cooperation with other institutions. The dean or vice-dean may also represent a group of faculties or the institution as a whole in various national and international forums.

About the NTNU University Museum

Today, the NTNU University Museum (VM) is a unit on an equal footing with the faculties, and is headed by a director who participates in the Rector's extended management group (the council of deans). The museum has four sections. The museum curates large cultural and natural history collections and uses these in research, outreach, dissemination and teaching, but it is not a degree-conferring authority as the faculties are.

Science museums are found in most countries with which Norway can compare itself. In Norway, science museums are organized as part of the universities. According to the *Act relating to Universities and University Colleges,* these universities have a special national responsibility for building up, managing and maintaining museums with scientific collections and public exhibitions.[10] Like the other university environments, the museums have research as a primary responsibility, but the museums also have a variety of other tasks compared with the faculties. Among other functions, the NTNU University Museum has a role in heritage management through the *Act concerning the Cultural Heritage* and has a responsibility according to the regulations to the Act[11]. The museums have a broad responsibility for dissemination and outreach, with dissemination to the public including exhibitions and the like, as well as user-oriented dissemination including work with the

[10] Act relating to Universities and University Colleges (Universities and Colleges Act), Section 1.4, 2nd subsection.

[11] Regulations for allocation of professional responsibility, etc. for the Cultural Heritage Act

conservation of nature and culture. The work also includes their own management tasks and cooperation with other management authorities. VM works in partnership with the country's other university museums in research, documentation and management.

The other university museums report to the rector, and the group believes it would be appropriate for the NTNU University Museum's director to do the same. We have not taken a position on whether the director should continue to attend the rector's extended management group on a regular basis.

4.6. What is level 3?

At the university, level 3 primarily comprises the faculties' basic academic units, normally departments. At the university colleges, these basic units are either called departments or sections, and they are subordinate to faculties (HiST) or "*avdelinger*" (divisions) [which are also termed faculties in English] (HiG, HiÅ).[12] The departments and sections usually have a complex mission consisting of research, teaching, innovation and dissemination in their subject areas.

At both NTNU and the university colleges today, there are different centre formations. Some are organized at level 3 in the line of control and authority, alongside the departments, while others are organized under a department (level 4). Centres may have various tasks, but the majority are geared toward research and development. Some are initiated and funded by the institutions themselves, while others are established as a result of national programmes and funding schemes – for example centres of the type Centre of Excellence in Higher Education (SFU), Centre of Excellence in research (SFF), Centre for Research-based Innovation (SFI) and Centre for Environment-friendly Energy Research (FME). By definition, such centres are time-limited initiatives, but with a relatively long-term perspective – typically 8-10 years.

When we talk about the organization of level 3, we are thus referring to different units and types of units subordinate to the faculties' areas of responsibility. Of these, the departments are undoubtedly the most lasting, more or less permanent structures. Naturally, faculties or divisions sometimes change their departmental structure for various reasons. A new faculty structure provides an opportunity to look at the composition of departments at the individual faculties as well as to assess the need for a level 4 at large departments.

In the assessment of various models, the group has undertaken an approximate allocation of existing basic units as a basis for assessing consequences. We have neither a mandate nor the competence to assess the future departmental structure. However, we assume that NTNU will continue to have departments as the primary academic basic unit at level 3. As at present, the departments will have a combined mission in conducting teaching, research and dissemination – in their own subject areas and in interdisciplinary cooperation with other units. Permanent academic as well as technical and administrative staff will normally be associated with a department with employer responsibility. We regard it as self-evident that the head of department will be included in the dean's extended management group.

[12] At HiST, the Trondheim Business School is a division on an equal footing with the faculties. HiST also has a department of informatics and e-learning which is not associated with a faculty, but reports to the rector.

In the future, there will continue to be a range of temporary and perhaps some more permanent centres at NTNU. Many of these are most likely to find their natural organizational position at level 3. Overarching guidelines for management and leadership, delegation, finance and so on should then be in place. It will be important to clarify the responsibility and role of the centres in relation to the departments, not least in terms of employer responsibility – employees at the centres often have temporary or shared positions.

In their working paper on concepts for academic organization, the group launched the school as a relevant basic unit type at level 3 for certain types of activity, preferably related to professionally oriented programmes of study. We will not evaluate this further, but suggest keeping this option open.

5. Concepts for the academic organizational structure – comments

In line with its mandate, the group has divided the assessment work into two main phases. In the first phase, until the middle of June 2015, the group worked primarily with principles and criteria for the academic organizational structure, as well as gathering information about university models nationally and internationally. Against this background, the group prepared a working paper on various concepts for faculty structure and organization. This paper was then distributed in the organization in June for discussion and comments. [13]

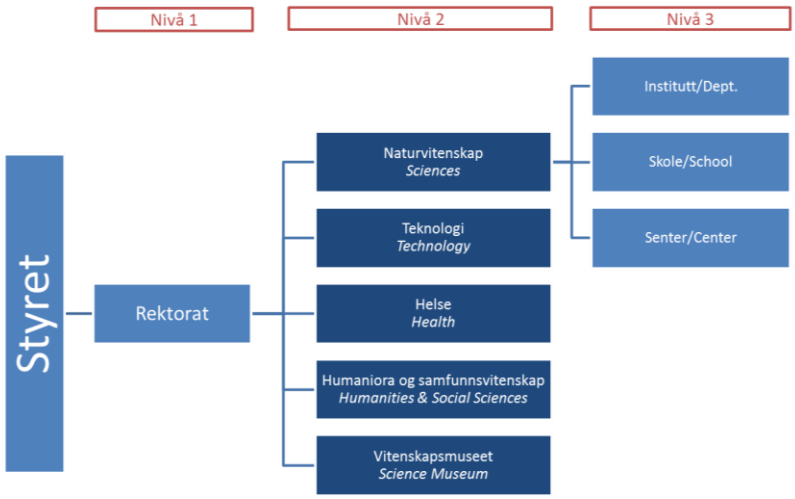
5.1. Working paper on four concepts

In the working paper, the group presents for different concepts for faculty organization. They reflect approaches that differ in terms of the breadth at level 2, thematic versus discipline-based structures and autonomy for satellite campuses. They are also positioned at different places in the range between "pure" models (thematic or discipline-based) on the one hand and hybrid models on the other. In all the concepts, the group proposes that the NTNU University Museum remains a division at level 2, headed by a director. The reason is primarily the special status of the university museums in the Act relating to Universities and University Colleges (cf. 4.5 above).[14]

Below, we outline the main features of the four concepts that were presented.

K1: Narrow faculty structure

This concept assumes a small number of faculties – four in number, plus the NTNU University Museum. The faculties will have varying sizes, but will generally be large entities. The academic structure reflects broad disciplinary domains as they are often defined internationally. In this concept, humanities and social sciences, technology and engineering are gathered in two large faculties.

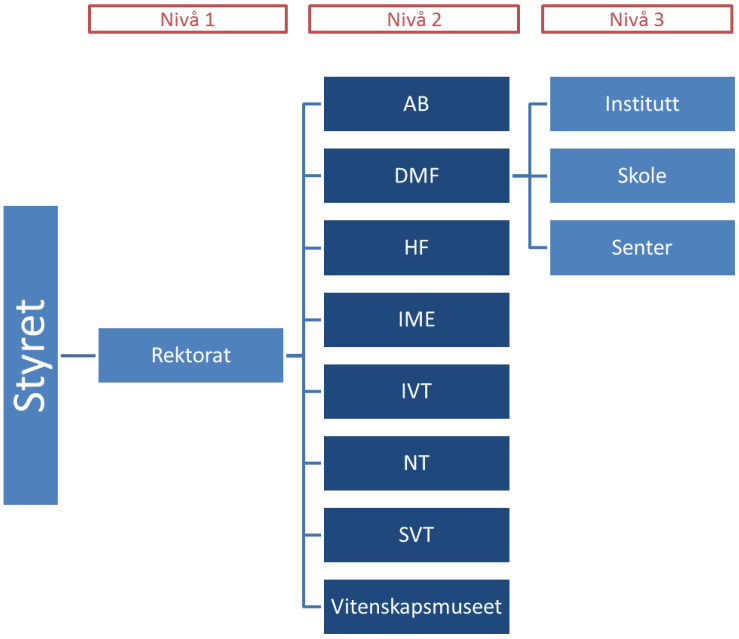


[13] *On the academic organization of the new NTNU: four concepts*, Working paper, Trondheim 26 June 2015 (see www.ntnu.no/web/fusjon/arbeidsgrupper).

[14] Cf. Section1.4, No. 2 of the Act relating to universities and university colleges (UHL)

K2: The current NTNU structure

This concept operates with seven faculties plus the NTNU University Museum, that is, the same basic structure as in today's NTNU. The academic structure also reflects the NTNU structure. A model based on this concept thus requires incorporation of the academic activities at the three university colleges into the existing faculty structure at NTNU, and the major changes will primarily take place at level 3.



Nivå = Level
Styret = Board
Rektorat = Rectorate
AB = Faculty of Architecture and Fine Art

DMF = Faculty of Medicine

HF = Faculty of Humanities

IME = Faculty of Information Technology, Mathematics and Electrical Engineering
IVT = Faculty of Engineering Science and Technology

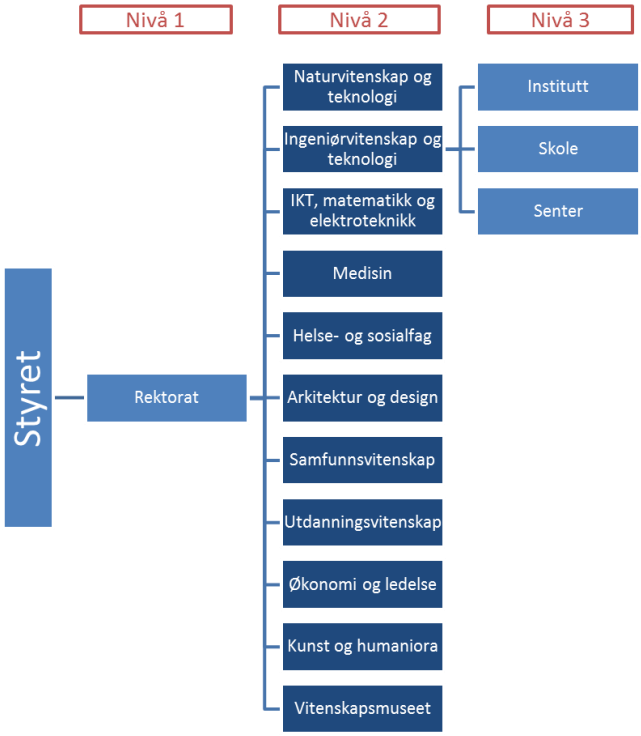
NT = Faculty of Science and Technology

SVT = Faculty of Social Sciences and Technology Management

Vitenskapsmuseet - NTNU University Museum
Institutt = Department
Skole = School
Senter = Centre

K3: Broad faculty structure

Concept 3 is based on K2, but with a larger number of faculties, i.e. ten plus the NTNU University Museum. Here, the proposal is to create new faculties for health and social care disciplines, education science, and economics and technology management respectively, but other structural variants could be envisaged. The faculties will have varying sizes as well as different profiles with regard to disciplines and professions. Compared with the current situation at NTNU, the Faculty of Social Sciences and Technology Management (SVT) will be greatly reduced even with the incorporation of social science environments at the university colleges. Engineering education, teacher education and health-related subjects will be distributed among at least three faculties.



Nivå 1 = Level 1 Nivå 2 = Level 2 Nivå 3 = Level 3

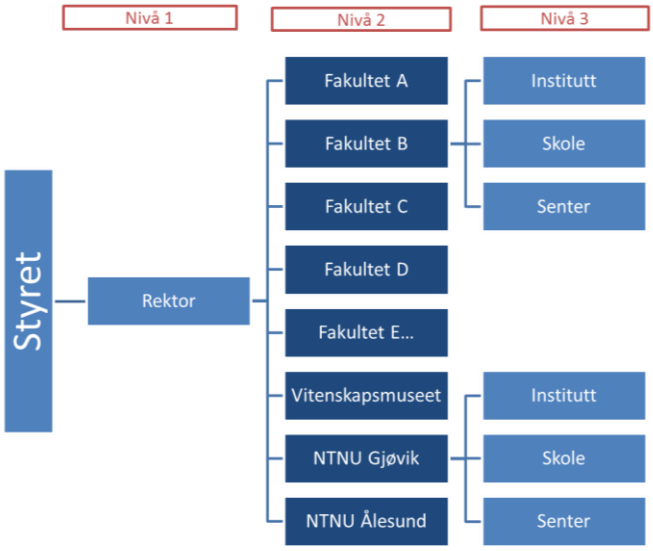
Styret = The Board
Rektorat = Rectorate

Naturvitenskap og teknologi = Natural Sciences and Technology
Ingeniørvitenskap og teknologi = Engineering Science and Technology
IKT, matematikk og elektroteknikk = ICT, Mathematics and Electrical Engineering
Medisin = Medicine
Helse- og sosialfag = Health and Social Care
Arkitektur og design = Architecture and Design
Samfunnsvitenskap = Social Sciences
Utdanningsvitenskap = Science of Education
Økonomi og ledelse = Economics and Management
Kunst og humaniora = Arts and Humanities
Vitenskapsmuseet = NTNU University Museum

Institutt = Department
Skole = School
Senter = Centre

K4: Campus-based faculty structure

This concept differs in principle from the other three in several ways. First, it means that the university colleges in Gjøvik and Ålesund are included as faculties in the structure, whereas HiST is fully integrated in the Trondheim faculties. Second, with regard to how many and which faculties the campus in Trondheim will consist of, the concept is open; both a narrow and a broad faculty structure are conceivable. While the faculties in Trondheim will be structured more or less by discipline, the Gjøvik and Ålesund faculties will be interdisciplinary. The concept primarily emphasizes geography, and a consequence may be the duplication of academic communities within NTNU.



Nivå 1 = Level 1 Nivå 2 = Level 2 Nivå 3 = Level 3
Styret = Board
Rektorat = Rectorate

Vitenskapsmuseet = NTNU University Museum

Institutt = Department
Skole = School
Senter = Centre

The group proposes using four building blocks in all the models to be developed: *faculty* to designate the division at level 2, and *department*, *school* and *centre* as the names of the units at level 3. Of these units, *school* is a new term in the Norwegian university context. The group tentatively defined the unit as follows:

> Unit at level 3, led by a head of school. The school is generally responsible for career-oriented education (programmes of professional study), development of subjects and research focused on practice. Courses of study may bridge faculty boundaries, and the overarching faculty is then the host faculty.

The working paper also includes proposals for criteria that can be used to evaluate the concepts up against each other. In keyword form, these are:

- Distinctive character and recognizability
- Academic identity
- Academic synergy, interdisciplinarity and mobility
- Flexibility
- Expenses
- Long-term basic research
- Leadership and co-determination
- Social relevance
- Strategic capability

In the letter that accompanied the working paper, input was requested on the choice of concept for the faculty structure, organizational units at level 3 and criteria for evaluating models.

5.2. Comments from the organization

By the deadline of 15 September, about 50 comments had been received from the institutions, the unions and the student democracy, the working groups and some academic environments. The comments have been published on the merger project's website. A brief summary of the consultation round appears below, as it was conducted in connection with the group's meeting on 18 September.

Criteria

In the report on the comments, a request was made for assessment of which criteria should be given priority in an assessment of the academic organization at level 2. Based on a purely quantitative overview of the comments, not weighted according to the size of the entity invited to comment, these criteria were given the highest priority:

1. Academic synergy, interdisciplinarity and mobility
2. Academic identity
3. Leadership and co-determination
4. Social relevance
5. Strategic capability
6. Distinctive character and recognizability
7. Long-term basic research
8. Flexibility
9. Expenses

Many of the entities invited to comment defined the criteria as problem formulations and explored them in more depth. Some comments point out that several of the examples of criteria represent terms of the merger platform and that several are difficult to use in a real assessment of the concepts for the academic organization. Several entities also provide proposals for definitions, juxtaposition or splitting of the criteria as well as proposals for other criteria. The comments provide a good foundation for further definition of criteria for assessing the various models.

Concepts

Common to most of the comments is that they provide a balanced discussion of strengths and weaknesses of the four concepts, but many refrain from giving clear recommendations. Some comments also launch alternative concepts, often in the form of hybrids between two or more of the concepts. Based on an interpretation of the comments – not weighted with regard to the size of the entities invited to comment – some clear tendencies nevertheless take shape:

- A clear majority wants a model based on K2 or K3 or a hybrid of these
- A minority wants a model based on K1, possibly modified
- All the comments reject (or do not discuss) K4

The same main picture emerges if we look only at the comments from the line organization, that is, the three university colleges and NTNU's seven faculties as well as the NTNU University Museum:

- 4 of 11 want further analysis of K1
- 6 of 11 want further analysis of K2
- 9 of 11 want further analysis of K3
- None of the comments expresses a wish for further analysis of K4
- Several propose hybrid models and/or variants in the range between K1 and K4
- Many express reservations about the organizational structure of level 1 and level 3 (and 4); opinions differ about the units at level 3

The unions also reject K4 as a basis for further analysis. The trade unions at the university colleges, except for the Norwegian Confederation of Trade Unions (LO) at HiST, believe that K2 is not a suitable alternative. In contrast, Forskerforbundet (the Norwegian Association of Researchers) and Tekna (the Norwegian Society of Graduate Technical and Scientific Professionals) at NTNU want further development of K2. Five of six organizations believe that K3 is relevant for analysis.

The Student Parliament (Studenttinget) at NTNU gives priority to K2 and K3 for further analysis, while the Student Parliament (Studentparlamentet) at HiST finds K3 most relevant.

About levels 3 and 1

In the invitation for comments, the entities were asked to comment on proposals for the basic unit types at level 3. There seems to be a widespread opinion that the department is and should be the most common organizational unit for academic activities at level 3. The majority believes that centres may be a suitable unit for organization of interdisciplinary or inter-faculty research at level 3, as at present. There is greater scepticism about introducing a new type of basic unit such as "schools"). Some entities directly advise against this, while others are open to the possibility – for reasons that differ to some extent.

Several of the responses pointed out that the organization of level 2 could or should influence the structure of level 1's management. For example, some suggested a thematic/discipline-based structure on the lines of the Uppsala model, with pro-rectors for disciplinary domains or faculty clusters. The question of academic leadership at the campuses of Gjøvik and Ålesund is also highlighted. The organization at level 2 will also be relevant to co-determination and participation both vertically and horizontally – a situation that the multi-campus structure makes more complicated.

6. From concepts to models

The main purpose of the working paper was to create a basis for discussion, as the mandate requires. Based on the active participation in the consultation round, we can confirm that both broad and in-depth discussion has taken place in the organization. Another important objective was to determine which concepts are most relevant for further development as real models for the faculty structure, and to identify the criteria that should form the basis for evaluating the models.

6.1. The group's assessment of the consultation round

The group's general impression is that the consultation round has been useful and productive, partly because it has led to in-depth discussions in the academic environments and partly because it has raised several points and views. From this perspective, the group has gained a far better foundation for preparing proposals for a new faculty structure. At the same time, the comments reveal that there are both differing opinions and sometimes conflicting interests in the organization. It is therefore difficult to draw unambiguous advice from the consultation round. We have tried to achieve a balanced interpretation of the comments received and used this as a basis for further work on the organizational models.

Criteria for the choice of model

Many comments and assessments of different criteria emerged in the consultation round. As many point out, several of the criteria are covered by terms and objectives laid down in the merger platform. We are working on the basis that the merger platform provides guidelines for what a new faculty structure must achieve, whichever model is used. For example, high quality in research and education must be ensured regardless of the structure, and relevance to society is a prerequisite for all the models. In section 0 below, we describe the guidelines that we believe the merger platform establishes.

Several of the criteria that were proposed in the working paper or that emerged in the consultation round overlap to some extent or have indicators that coincide. We perceive some of the proposed criteria as more relevant to the organization of level 3. After the consultation round, the group has emphasized identifying the criteria best suited to describe the consequences of the various models and to differentiate them from each other. We have identified four key fields of criteria or evaluation themes, to which we will link indicators in the next stage (see 7.4 below):

- Academic identity
- Academic synergy
- Leadership, participation and co-determination
- Strategic capability and financial room for manoeuvre

Preferred concepts

Unsurprisingly, the entities invited to comment have diverging views on preferred concepts. In part, there is a dividing line between NTNU on the one hand and the university colleges on the other with regard to concept 2 (the existing faculty structure). While many of the groups at NTNU who were invited to comment believe that further development of K2 may be relevant, this alternative is largely rejected by the university colleges. To some extent, there are dividing lines across faculties

and departments with regard both to what represents "natural" grouping of subject areas and to whether a narrow or a broad structure is an advantage. In part, several of the academic working groups and unions have preferences that differ from those of the line organization. We refer to 5.2 above with regard to the main tendency in the comments.

Based on the consultation round, the group has chosen to assess two main models within the range between K1 and K3, that is, a narrow and a broad faculty structure. We believe this provides an adequate foundation for the hearing process and decision. Our point of departure is that both models should be relevant and realistic in terms of implementation in 2016. As far as possible, we attempt to assess the consequences of placing *existing* basic units/academic environments in the two models. This means that we do not assume splitting of units at level 3 at this stage. This does not prevent assessment of variants of the two main models.

Organization of level 3

The group for the academic organizational structure has noted the comments and in the further assessment of models we will not assume the establishment of basic units that do not exist today. On the other hand, we believe that it may be reasonable to avoid ruling out the option of establishing *schools* when the academic activities at level 3 are to organized later (cf. Chapter 4.6 above and 0 below).

6.2. Proposal for main models for the faculty structure

No universal formula exists for determining which disciplines and subject areas "naturally" form faculties; there are many combinations and variants nationally and internationally.[15] Many modern universities, especially young institutions, have a structure that represents a compromise between traditional disciplines and more thematic and/or interdisciplinary fields of knowledge. Today, NTNU has an organizational structure that could be perceived as fairly traditional in the sense that the faculties have parallels with sister institutions nationally and internationally. At the same time, technology is an example of an education area spread over four faculties. The university colleges have an organization that traditionally reflects the areas of education. Through the merger, the university gains new subject areas and programmes of study, as well as different disciplinary traditions. The question is how this integration should be expressed through a new faculty structure. The group emphasizes that a new structure *will* involve changes whichever model is chosen.

Given that a faculty structure based on geography is out of the question, the group believes that the most important distinction in principle is between few or many faculties, or what we call a narrow or broad faculty structure. Another differentiating principle is the distinction between a predominantly discipline-oriented organizational structure and a thematic or interdisciplinary organizational structure. A third dimension which is important, but in our opinion subordinate, is the distinction between small and large faculties, which is relevant in both a narrow and a broad structure. Our proposal for the main models reflects a balancing of these dimensions.

The group has assumed that the new faculties – whether there are few or many – should include disciplines and subject areas that are regarded as belonging together in one way or another. For

[15] Cf. NIFU Working Paper 10/2015.

example, the cohesion could reflect shared academic theory and/or practice, thematic orientation, international recognizability or established collaborative relationships. Taking both practicality and principle into account, we believe that only for very good reasons should academic environments that have developed cohesion be fragmented and split up. However, the degree to which an existing faculty or division can and should be regarded as a unified academic community in this sense is subject to discussion. In our proposals for the main models, we have allowed for both consolidation and splitting of the current units at level 2.

The group has had a wide-ranging discussion of potential subject groupings in order to arrive at the models in question, and in this work we have considered the comments on the choice of concept and criteria. A detailed reference to this discussion would be too lengthy, but we would like to highlight some of the points that illustrate our choice of main models and variants.

- A narrow faculty structure would depend on merging, and it results in academically broad units at level 2 that are more or less heterogeneous. In the main model (M1) humanities and social sciences are combined in one faculty, for example, as a continuation of concept 1 (K1) in the working paper of 26 June. The group believes that a relevant alternative may be to divide these two disciplinary domains into separate faculties (model M1a).
- A broad faculty structure creates some potential for keeping existing faculties/divisions together, and some for creating new combinations. Several of the proposals that emerged during the consultation round entail segmentation of the area that in the broad sense comprises the social sciences. The group has provided for this in the main model (M2) and in the variant (M2a), but has assumed that in the future NTNU should continue to have a strong and sufficiently broad social science faculty, possibly in combination with the humanities (M1). For this reason, we do not regard it as relevant to establish *both* a faculty for economics and management subjects *and* a faculty for the science of education and psychology as well as a faculty for "other" social sciences.
- The group does not attach decisive importance to the size of the new faculties, relatively or individually. The main argument has been that there will be differences in any case, and that these must be handled through leadership, administrative organization and a financial model. However, there is probably a limit to how small a faculty can be while meeting the requirements and expectations set for resources and expertise. Architecture and fine art represent an example of a small and specialized area that the group believes should not be a part of the main models, but we allow for a separate faculty corresponding to the current Faculty of Architecture and Fine Art (AB) in the broadest variant (M2a).
- As far as possible, the group has chosen to avoid changing the affiliation of the basic units (department, section) to the existing faculty structure where this will be continued, possibly as part of a combination. For this reason, the proposed new faculties consist largely of combinations of undivided existing faculties. This principle must however be waived in models containing fundamentally new faculty formations (M2 and M2a).

In the light of the consultation round, the group find it correct to focus the assessment on two main models based on different principles, one narrow (4 faculties, M1) and one broad (7 faculties, M2) structure. Several variants of the two models are conceivable. The group has found it appropriate to

propose only one relevant variation of each of the two main models, but we expect that the hearing may produce other proposals for combinations of subjects.

We emphasize that the terms we use below and in the rest of the text do *not* imply proposals for faculty names, but only indicate the disciplines and subject areas that the various faculties represent. To streamline the process we have used general terms for subject areas such as "health sciences", " management " and so on. In Chapter 9.2 there is a complete list of the basic units allocated to the various faculties in the models.

M1: Narrow faculty structure

Main model 1 (M1) is a structure with four faculties. We also describe a variant of this model (M1a) that entails five faculties.

Model M1	**Model M1a**
1. Health sciences, social work, nursing, medicine 2. Natural sciences, mathematics, computer and information science, electrical engineering 3. Engineering, architecture 4. Humanities, art, social sciences, science of education, economics, psychology, management	1. Health sciences, social work, nursing, medicine 2. Natural sciences, mathematics, computer and information science, electrical engineering 3. Engineering, architecture 4. Social sciences, the science of education, economics, psychology, management 5. Humanities, art

M2: Broad faculty structure

Main model 2 (M2) is a structure with seven faculties. The variant 2a includes eight faculties.

Model M2	**Model M2a**
1. Health sciences, medicine, nursing 2. Natural sciences 3. Mathematics, computer and information science, electrical engineering 4. Engineering, architecture 5. Humanities and art 6. Social sciences, social work, economics and management 7. Psychology, science of education	1. Health sciences, medicine, nursing 2. Natural sciences 3. Mathematics, computer and information science, electrical engineering 4. Engineering 5. Humanities and art 6. Social sciences, psychology, social work, science of education 7. Economics and management 8. Architecture, visual art

6.3. Distribution of subject areas and units

In the current structure of the university colleges and NTNU, several subject areas cross faculty boundaries and are organized in different ways in the different institutions. For example, this applies to subjects at the intersection of technology and science, or of health sciences and social work. This may also be necessary in a new faculty structure. To be able to analyse the various models, it is necessary to assign basic units to the faculties. We have made an approximate distribution of subject areas, represented by existing academic units at the four institutions. It concerns both whole

faculties and individual departments. In some cases, the allocation is self-evident, in the sense that departments keep their current faculty association based on a perception of the "natural" or traditional academic affiliation. In other cases, departments will change their faculty affiliation — either because the model assumes that an existing faculty is dissolved or because new faculties are created. With regard to faculties at the university colleges, only in exceptional cases have we proposed division into two faculties at NTNU (M2 and M2a); the main principle is that existing units are placed in their entirety in the new structure.

This distribution forms the basis for the presentation of quantitative factors in diagrams and tables. In the column *Units* in the summaries below, departments are shown in italics, while entire faculties are shown in a regular font style. A summary of all the units at level 2 and 3 at the four institutions appears in Chapter 9.2. We briefly describe some characteristics of the individual models.

M1: Narrow faculty structure

A narrow faculty structure with four or five faculties will inevitably mean that *all* of the current departments at the university colleges and many of those at NTNU will change their affiliation in relation to the current structure. With regard to the university colleges, however, the faculties and their departments/sections will remain together. With regard to NTNU, the model requires a merging of the current Faculty of Information Technology, Mathematics and Electrical Engineering (IME) and the Faculty of Natural Sciences and Technology (NT), and it requires the Faculty of Engineering Science and Technology (IVT) to be combined with the architecture part of the Faculty of Architecture and Fine Art (AB). The main model (M1) also implies merging of the Faculty of Humanities (HF) and the Faculty of Social Sciences and Technology Management (SVT).

Model 1 – four faculties

M1		
Faculty	**Subject areas**	**Units**
1	Health sciences, social work, nursing, medicine	HiÅ Faculty of Health Sciences HiST Faculty of Health and Social Science, NTNU Faculty of Medicine NTNU Faculty of Social Sciences and Technology Management – *Department of Social Work and Health Science* HiG Faculty of Health, Care and Nursing
2	Natural sciences, mathematics, computer and information science, electrical engineering	HiÅ Faculty of Life Sciences HiST *Faculty of Informatics and e-Learning* NTNU Faculty of Information Technology, Mathematics and Electrical Engineering NTNU Faculty of Natural Sciences and Technology HiG Faculty of Computer Science and Media Technology
3	Engineering, architecture	HiÅ Faculty of Maritime Technology and Operations HiÅ Faculty of Engineering and Natural Sciences HiST Faculty of Technology NTNU Faculty of Engineering Science and Technology NTNU – Faculty of Architecture and Fine Arts -*except visual arts* HiG Faculty of Technology, Economics and Management

4	Humanities, art, social sciences, science of education, economics, psychology, management	HiÅ Faculty of International Business HiST Faculty of Teacher and Interpreter Education HiST Trondheim Business School NTNU Faculty of Social Sciences and Technology Management NTNU Faculty of Humanities NTNU Faculty of Architecture and Fine Art – *Department of Fine Art*

M1 is a pure-bred narrow faculty structure that thus entails several mergers of existing faculties at NTNU and at the university colleges. With two exceptions, these are complete mergers; the exceptions are the Department of Fine Art, to be moved to Faculty 4, and Department of Social Work and Health Science, moved to Faculty 1. As the analysis shows (see Chapter 7), this results in four faculties of about the same size with regard to staff and resources. Faculty 4 would clearly have the most students. The composition of all the faculties would inevitably also become fairly multidisciplinary and interdisciplinary. Until level 3 is reorganized, if applicable, there will also be parallel academic environments in several faculties – for example, academic environments in economics and management in both faculty 3 and 4. M1 corresponds to concept 1 from the consultation round, that is, a faculty structure based on large disciplinary domains.

Model 1a – five faculties

M1a		
Faculty	**Subject areas**	**Units**
1	Health sciences, social work, nursing, medicine	HiÅ Faculty of Health Sciences HiST Faculty of Health and Social Science, NTNU Faculty of Medicine NTNU Faculty of Social Sciences and Technology Management – *Department of Social Work and Health Science* HiG Faculty of Health, Care and Nursing
2	Natural sciences, mathematics, computer and information science, electrical engineering	HiÅ Faculty of Life Sciences HiST *Faculty of Informatics and e-Learning* NTNU Faculty of Information Technology, Mathematics and Electrical Engineering NTNU Faculty of Natural Sciences and Technology HiG Faculty of Computer Science and Media Technology
3	Engineering, architecture	HiÅ Faculty of Maritime Technology and Operations HiÅ Faculty of Engineering and Natural Sciences HiST Faculty of Technology NTNU Faculty of Engineering Science and Technology NTNU Faculty of Architecture and Fine Art – *except Department of Fine Art* HiG Faculty of Technology, Economics and Management
4	Social sciences, the science of education, psychology, economics, management	HiÅ Faculty of International Business HiST Faculty of Teacher and Interpreter Education HiST Trondheim Business School NTNU Faculty of Social Sciences and Technology Management

5	Humanities, art	NTNU Faculty of Humanities NTNU Faculty of Architecture and Fine Art – *Department of Fine Art*

The variant M1a differs from the main model in that the humanities and social sciences each form their own faculties and they will thus thus be more clearly identified as separate disciplinary domains. Both nationally and internationally, most large universities have chosen a similar division. One clear consequence is that the five faculties are very different in size, as shown in the assessment (Chapter 7). The group however believes that the faculties will be robust enough with regard to the resource and recruitment base, so that the model is both realistic and relevant.

M2: Broad faculty structure

A broad faculty structure with seven or eight faculties will entail fewer changes for NTNU in relation to the current structure, except for the Faculty of Social Sciences and Technology Management (SVT) and the Faculty of Architecture and Fine Art (AB) (M2), while the faculties of the university colleges would inevitably have a new affiliation. With regard to the current departments/sections at the university colleges, we still assume that they accompany their current faculties into the new faculty structure, with one exception – the Faculty of Health and Social Science at HiST will be divided. Both main model M2 and the variant M2a require the formation of new faculties, primarily through different combinations of subject areas in the social sciences.

Model 2 – seven faculties

M2		
Faculty	**Subject areas**	**Units**
1	Health sciences, medicine, nursing	HiÅ Faculty of Health Sciences HiST Faculty of Health and Social Science, – *Department of Health Science, Department of Nursing Science* NTNU Faculty of Medicine HiG Faculty of Health, Care and Nursing
2	Natural sciences	HiÅ Faculty of Life Sciences NTNU Faculty of Natural Sciences and Technology
3	Mathematics, computer and information science, electrical engineering	HiST *Faculty of Informatics and e-Learning* NTNU Faculty of Information Technology, Mathematics and Electrical Engineering HiG Faculty of Computer Science and Media Technology
4	Engineering, architecture	HiÅ Faculty of Maritime Technology and Operations HiÅ Faculty of Engineering and Natural Sciences HiST Faculty of Technology NTNU Faculty of Engineering Science and Technology NTNU Faculty of Architecture and Fine Arts – *except visual arts* HiG Faculty of Technology, Economics and Management
5	Humanities, art	NTNU Faculty of Humanities NTNU Faculty of Architecture and Fine Art – *Department of Fine Art*
6	Social sciences, applied social science economics,	HiÅ Faculty of International Business HiST Trondheim Business School

	management	HiST Faculty of Health and Social Science, – *Department of Applied Social Science* *NTNU Faculty of Social Sciences and Technology Management – Department of Industrial Economics and Technology Management, Department of Economics, Department of Sociology and Political Science, Department of Geography, Department of Social Anthropology, Norwegian Centre for Child Research, Department of Social Work and Health Science*
7	Science of education, psychology	HiST Faculty of Teacher and Interpreter Education NTNU Faculty of Social Sciences and Technology Management – *Department of Adult Learning and Counselling, Department of Education, Programme for Teacher Education, Department of Psychology*

Main model 2 results in a faculty structure characterized by greater academic specialization than model 1 and with hybrid features. Disciplinary domains are still relatively large, but more subject areas and disciplines are made visible in the structure – specifically ICT and mathematical sciences, the science of education and psychology. The model means that NTNU gets two faculties within what is traditionally regarded as social science (faculty 6 and 7). Technology as a discipline will be included in three faculties (2, 3 and 4) – or four, if one defines technology as a field of education (*siv.ing.* degree). Faculty 1 becomes smaller than it is in model 1, because the social sciences are assigned to faculty 6. As the analysis shows (see Chapter 7), the differences between the faculties are relatively large, but they would all be relatively robust on the basis of the current framework conditions.

Model 2a – eight faculties

M2a		
Faculty	**Subject areas**	**Units**
1	Health sciences, medicine, nursing	HiÅ Faculty of Health Sciences HiST Faculty of Health and Social Science, – *Department of Health Science, Department of Nursing Science* NTNU Faculty of Medicine HiG Faculty of Health, Care and Nursing
2	Natural sciences	HiÅ Faculty of Life Sciences NTNU Faculty of Natural Sciences and Technology
3	Mathematics, information technology, electrical engineering	HiST Faculty of Informatics and e-Learning NTNU Faculty of Information Technology, Mathematics and Electrical Engineering HiG Faculty of Computer Science and Media Technology
4	Engineering	HiÅ Faculty of Maritime Technology and Operations HiÅ Faculty of Engineering and Natural Sciences HiST Faculty of Technology NTNU Faculty of Engineering Science and Technology HiG Faculty of Technology, Economics and Management
5	Humanities	NTNU Faculty of Humanities
6	Social sciences, applied	HiST Faculty of Health and Social Science, – *Department of*

	social science, psychology, economics, technology management, the science of education	*Applied Social Science* HiST Faculty of Teacher and Interpreter Education NTNU Faculty of Social Sciences and Technology Management – *Department of Adult Learning and Counselling, Department of Education, Programme for Teacher Education, Department of Psychology, Department of Sociology and Political Science, Department of Geography, Department of Social Anthropology, Norwegian Centre for Child Research, Department of Social Work and Health Science*
7	Economics, management	HiÅ Faculty of International Business HiST Trondheim Business School NTNU Faculty of Social Sciences and Technology Management – *Department of Industrial Economics and Technology Management, Department of Economics*
8	Architecture, visual art	NTNU – The Faculty of Architecture and Fine Art

The variant M2a differs from M2 in the division of the social science area, as well as in that the Faculty of Architecture and Fine Art is maintained as a separate faculty. This is the only model in which the Department of Fine Art remains together with architecture. Instead of the science of education and psychology (faculty 7 in M2), economics and management subjects are combined in a separate faculty. With eight faculties, in terms of the structure NTNU emerges as an academically broad and diverse university without a particular main profile. However, there are great differences between the faculties, with regard to both size and degree of specialization. In an international context, it is natural to regard this as a hybrid model, in which faculty 7 and 8 in particular would typically would be termed “schools” at many institutions outside Norway.

7. Consequence analysis of the models

In this chapter, the group analyses the consequences of choosing a narrow or broad faculty structure. We do this partly by presenting relevant data related to finances, staff, research and education, and partly by evaluating qualitative aspects. Our point of departure is that the two main models – including the variants – are of equal value in the sense that they are relevant alternatives. Opinions in the group differ with respect to the preferred model for the faculty structure, but there is agreement that both main models with their variants are relevant and feasible for the new NTNU.

7.1. Method and assumptions

The group has assumed that existing basic units (departments) will not be divided in the design of the models, even though existing departments may be associated with a different faculty in a new structure. We have also avoided splitting the faculties of the university colleges, with a few exceptions.

In the assessment, we have tried to compare the different models systematically on the basis of given criteria with corresponding quantitative and qualitative indicators (see 7.4 below). We have gathered key data from the institutions themselves and from open sources. To some extent, quantitative data have played a role in the group's discussion of relevant models, but they have not been decisive for our choice of alternatives. Instead, these data help to shed light on the consequences of different combinations of faculties along various dimensions.

The group has placed the greatest emphasis on qualitative aspects, that is, which organizational structure can yield academically good results. Here, views within the group naturally diverge regarding what would be optimal, but our point of departure is what we perceive as guiding principles in the merger platform and the consultative round, and we have used these as the basis for the discussion in the group.

7.2. Guiding principles in the merger platform

The merger platform sets goals for the new NTNU's organization and activities, but provides few – if any – direct principles for the faculty structure. The group however believes that key terms and guidelines in the merger platform must apply to *all* models for the faculty structure, and in equal measure.

The platform establishes that NTNU must be characterized by high quality throughout the operation, both the academic and the administrative aspects. The university must have up-to-date infrastructure and good support systems. The organization must be characterized by flexibility and diversity, and efforts must be made to achieve academic synergy through interdisciplinary cooperation. The culture must be open and focused on cooperation. NTNU must show strategic capability and willingness. The new university must stand out as attractive to students and staff.

The platform defines some key premises as the basis for the activities: academic freedom, research and research-based education of high quality, relevance to society, academic synergy and interdisciplinarity.

The merger platform discusses the academic activities in part 3. Here, the subject areas are grouped into six separate sections, plus a section on the NTNU University Museum. [16] The group does *not* interpret this as guiding principles for the choice of faculty structure, but as a way to illustrate the benefits of the merger and the new NTNU's academic profile. Even if the platform does not include specific instructions for the faculty structure, we can still draw on general guiding principles which are relevant to the organizational structure and which provide a basis for assessing the suitability of the various organizational models. The group will highlight some of these.

- *Profile and distinctive character*
  NTNU must be and have a profile as a broad-spectrum university with a clear main profile in science and technology, and must represent a national hub in programmes of professional study.
- *Coherent and comprehensive programmes of study*
  NTNU must coordinate its programmes of study. A basis must be created for completing educational pathways within cycle 1 (bachelor's degree), cycle 2 (master's degree) and cycle 3 (PhD) within the areas of education. The merger must lead to increased quality in the programmes of study.
- *Link between profession and discipline*
  All education must be research-based. Both discipline- and practice-based programmes of study must have a solid foundation in research and academic development.
- *Strong research communities*
  NTNU must have consistently high quality, and there are expectations that leading academic environments exist or will be developed throughout the breadth of the university. The doctoral programmes have high priority.
- *Innovation*
  All parts of the university must contribute to activities that encourage innovation and creativity.
- *Internationalization*
  NTNU must have an international focus in its activities. All academic environments should pay attention to EU-funded cooperation in research and education.
- *Good administrative and technical services*
  NTNU must have a competent and adequate administration at all levels, which provides good support to the core activities.
- *Multi-campus university*
  NTNU must be one university with campuses in three cities. This requires academic integration, division of tasks and exploitation of complementary strengths and advantages.
- *Flexibility and diversity*
  The form of organization at NTNU will provide scope for subjects, people and cultures to develop their distinctive character, and for the realization of diversity and creativity. At the same time, the new organization will pave the way for creating a sense of shared identity regardless of academic and geographical affiliation.

[16] The merger platform, part 3.

- *Academic synergy, interdisciplinarity*
  Interdisciplinarity must be valued and encouraged. Subjects in the programmes of professional study at NTNU will have a solid foundation in disciplinary knowledge and a practice-oriented profile. The links between the professional and discipline-based programmes of study will mutually strengthen quality, and the academic expertise in these environments will be applied across boundaries.
- *Participation and co-determination*
  NTNU must link clear leadership with good processes for participation and co-determination.

These guiding principles primarily apply to NTNU as an institution, but it is reasonable to interpret them as directives for how the university's divisions – as well as the basic units – should be designed. Below (7.3) we try to deduce how these guiding principles could be translated into expectations regarding the faculties.

7.3. Expectations for a faculty

An overarching objective for the structural reform in the higher education sector is increased quality through more solid or robust academic environments. Effective use of resources is also an explicit requirement from the authorities. The academic organizational structure is an instrument for achieving these goals. Virtually all academic activities take place under the direction of the university's faculties, and it should be possible to specify some general expectations for what a faculty at what will become Norway's largest university should be able to handle. The following is not an exhaustive list, but rather a kind of generic "specification of requirements" that partly overlaps, partly complements the description in section 4.5 above, and that can be derived from the guiding principles and goals formulated in the merger platform (cf. 0).

- *Research-based education*
  The faculty conducts and develops research-based education with quality at the international level within the entire range from cycle 1 to 3 (bachelor's degree to PhD.). The faculty has good recruitment to all its programmes of study. Continuing and further education is a natural part of the activities in line with first-degree education.
- *Research and /or artistic activities*
  The faculty conducts both applied and basic, long-term research or artistic activities of consistently high quality. Some academic environments are already in the national or international forefront, or have the potential to achieve this. The faculty conducts collaboratively funded and contract-funded research and has an international focus.
- *Dissemination, outreach and innovation*
  The faculty conducts dissemination of knowledge and research results to society and participates actively in innovative activity. The faculty has good relationships with external stakeholders in society and business within its subject areas.
- *Strategic management*
  The faculty develops and implements strategies for its subject areas, participates in NTNU's overarching strategic work and contributes constructively to interdisciplinary activities. The faculty has human and financial resources to develop all its activities and to make necessary changes in its portfolio of subjects and research focus.
- *Administrative capacity and skills*
  The faculty has adequate technical and administrative capacity and skills both to follow up the internal academic activities and to ensure adequate coordination with other faculties,

the university's leadership, and the university administration. The faculty is to have good management support. For example, this involves being able to allocate resources to joint tasks at NTNU and to national forums and processes in the sector.

7.4. Criteria and indicators for assessment

As mentioned, we believe that some of the assessment criteria from the consultative round are covered by the platform's premises and guiding principles, and are not well suited for differentiating models (cf. 0 above). The criteria, or rather, the topics for evaluation that we are left with therefore comprise

- Academic identity
- Academic synergy
- Leadership, participation and co-determination
- Strategic capability and financial room for manoeuvre

The criteria have both quantitative and qualitative aspects. To operationalize them in the evaluation of the various models, we have linked indicators to each of them.

Criterion	Indicators	Assessment method	Figure/Table
Academic identity	NTNU's profile	Quantitative, qualitative	Fig. 7-1
	Areas of education by faculty	Quantitative	Fig. 7-2 .. 7-5; Tab. 10-1 .. 10-4
	External and internal visibility for subject areas	Qualitative	
Academic synergy	Areas of education/programmes of study across faculties and campuses	Quantitative	Fig. 7-6..7-9; Tab. 10-1.. 10-4
	Co-publication	Quantitative	Fig. 7-10..7-13
	Centres across faculties and campuses	Quantitative	Fig. 7-14..7-17
	Strategic areas of research	Quantitative	
Leadership, participation and co-determination	Ratio of employees to managers: number of managers at level 2 and 3	Quantitative	Tab. 7-1
	Restructuring expenses at merger date	Qualitative	
Strategic capability and financial room for manoeuvre	Finances	Quantitative	Fig. 7-18.. 7-21
	Collaborative and commissioned activity ("BOA")	Quantitative	Fig. 7-18.. 7-21
	Number of employees	Quantitative	Fig. 7-14.. 7-17
	Number of credits	Quantitative	Fig. 7-22..7-24

7.5. Analysis of the models

In this section, we present data that shed light on the main models and the variants based on the criteria above. For practical reasons, numbers and abbreviations for the faculties are used in the presentation below instead of the names of their subject areas (cf. 6.3 above).

Numbers and abbreviations for faculties in figures and tables			
M1	**M1a**	**M2**	**M2a**
1. Health 2. Nat Sci/ICT 3. Eng 4. Hum/Soc	1. Health 2. Nat Sci/ICT 3. Eng 4. Soc 5. Hum	1. Health 2. Nat Sci 3. Math/ICT 4. Eng 5. Hum 6. Soc 7. Edu	1. Health 2. Nat Sci 3. Math/ICT 4. Eng 5. Hum 6. Soc 7. Econ 8. Arch.

References

We have collected key data from the institutions, the national student register (Common Student System, FS), the Database for Statistics on Higher Education (DBH) and the CRIStin national research information system. Unless otherwise indicated, we have used data for 2014 and the organizational structure that the institutions had during that year. Historical figures, not forecasts, thus form the basis for the illustration of the different models.

The dimensions used for programmes of study and education are the numbers of students attending tuition in the second half of 2014 distributed by the field of education. The attendance figures have been retrieved from the DBH database and linked with the areas of education in the FS student register. Each programme of study has only one link to a field of education. There may be programmes of study that also share boundaries with other areas of education, and different registration practices and weighting of the link may vary from institution to institution. For this reason, there may be areas of education within faculties that emerge as relatively small. One example is NTNU's programmes of study for the Master of Science in Engineering (*sivilingeniør*), which are linked with technology, but could also have been linked with information technology or science areas. Programmes of study with two or fewer students have been removed from the material. Courses defined as at upper secondary school level have also been removed. These are programmes of study such as preliminary courses, summer courses and the like.

Chapter 9 provides an overview of the links between programmes of study and areas of education, the basic units in the various faculties, and the definition of what is included in positions in teaching, research and dissemination ("UFF"), teaching and research ("UF") and recruitment.

Academic identity

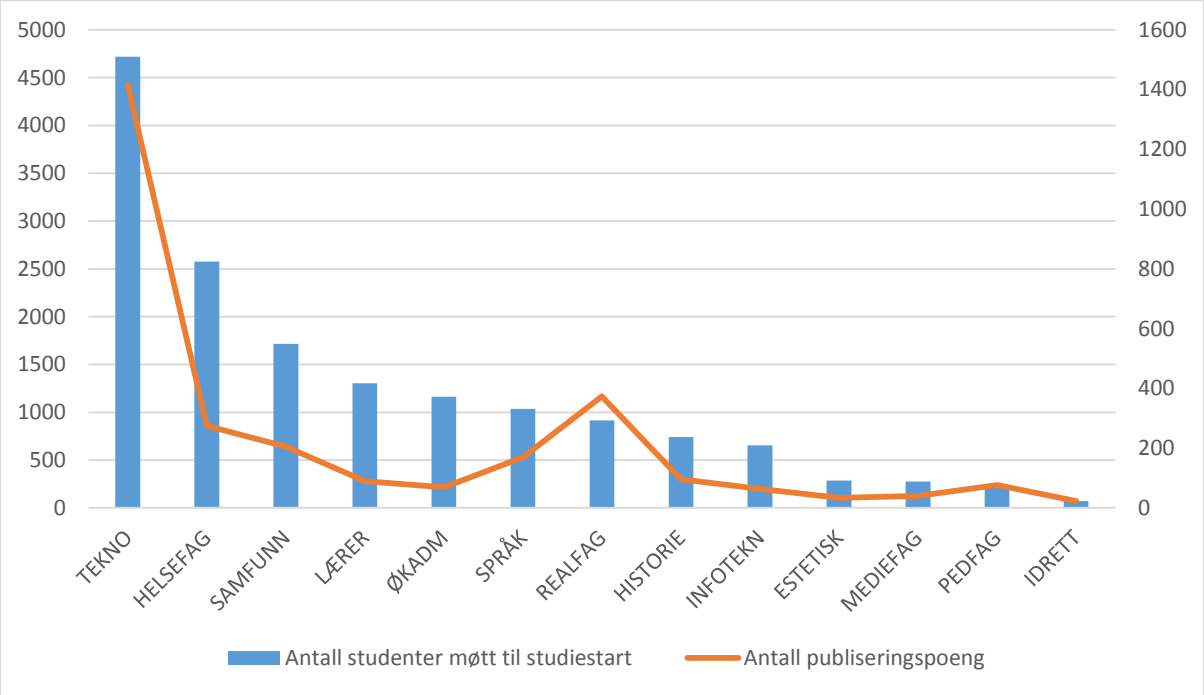
Academic identity can be interpreted in two senses. One dimension is academic identity with respect to the outside world, which can be related to recognizability and the visibility of distinctive characteristics. This may be a key dimension in connection with recruitment of students, reputation management, and establishing cooperative relationships and alliances in both research and education. The second dimension is academic identity inside the institution. It is important for staff to keep, but at the same time to develop their academic identity. This may also be seen in the context of the costs of change; it is important that the academic environments find their academic identity in the organization as quickly as possible to avoid loss of quality in the process.

Academic identification naturally takes place on many levels and from different points of view. In connection with the organization, our hypothesis is that students and academic staff primarily identify with their academic group and their department, and secondarily with the faculty or division

to which they belong. This does not mean that the faculty is unimportant for academic identity. To the extent that the faculty represents and makes visible a field of knowledge, a discipline or a profession, it is probably significant for a sense of academic identity. If this is correct, there is reason to assume that the broader and more interdisciplinary a faculty is, the weaker that academic identity at this level becomes. This is only an assumption, but it is nevertheless relevant to analyse the academic composition of the different models.

Identity is also related to the institution as a whole. It may seem somewhat contrived to talk about the academic identity of an institution, but we believe this is relevant from both an external and an internal perspective. NTNU is and must be a broad-spectrum university with a clear main profile in science and technology, and a national hub in programmes of professional study. The faculty structure provides one signal about the university's profile. How does our self-perception of our role match the student population we have? Figure 7-1 below shows the new NTNU's profile based on the number of students (attending in autumn 2014) distributed by the field of education. To illustrate research capacity, we have also included a graph with publication points (2014) distributed by the same fields of education.

Figure 7-1 Number of students attending in autumn 2014 and publication points by field of education 2014



Antall studenter møtt til studiestart = Number of students attending at the start of studies
Antall publiseringspoeng = Number of publication points

Code in the national student register (FS)	Field of education*
TEKNO	Technology, Master of Science in Engineering (sivilingeniør), engineer and architect
HELSEFAG	Medicine, health and social care disciplines
SAMFUNN	Social sciences and psychology
LÆRER	Teacher education and Programme for Master of Philosophy and Education/Programme for Master of Science and Education
ØKADM	Economics, management and administration
SPRÅK	Languages and literature
REALFAG	Mathematics and natural science
HISTORY	History, religion, culture and ideas
INFOTEKN	Information technology, computer and information science
ESTETISK	Aesthetics, fine art and music studies
MEDIEFAG	Media studies and communication
PEDFAG	Educational sciences
IDRETT	Sport sciences

*Description in NTNU's overview on the Web pages (http://www.ntnu.no/studier/alle)

Technological subjects are prominent, and the health sciences will also be substantial in the new NTNU. Natural sciences are not equally visible in this presentation, but they are included in several fields of education – and are partly included in technology. The same applies to cultural and social studies, which are included in several categories. As a whole, there is unquestionably a basis for stating that NTNU will become a broad-spectrum university with a profile in technology and science.

In figures 7-2 to 7-5 below, we show how the numbers of students in 2014 would have been distributed by faculties in the various models. We see that in a narrow structure the humanities and social sciences field in M1 would be NTNU's largest faculty by far, and that the social sciences faculty would also be the largest of the five in M1a.

Figure 7-2 M1 Number attending in autumn 2014

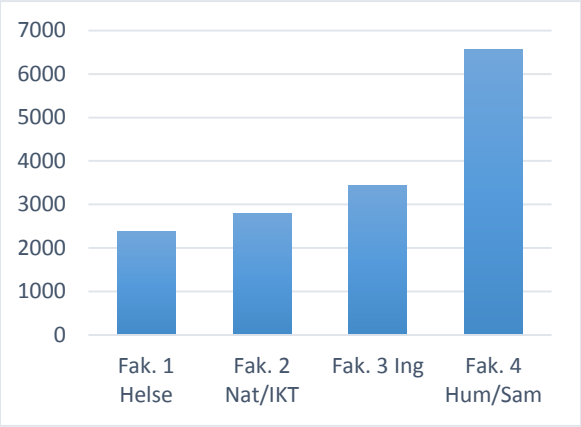


Figure 7-3 M1a Number attending in autumn 2014

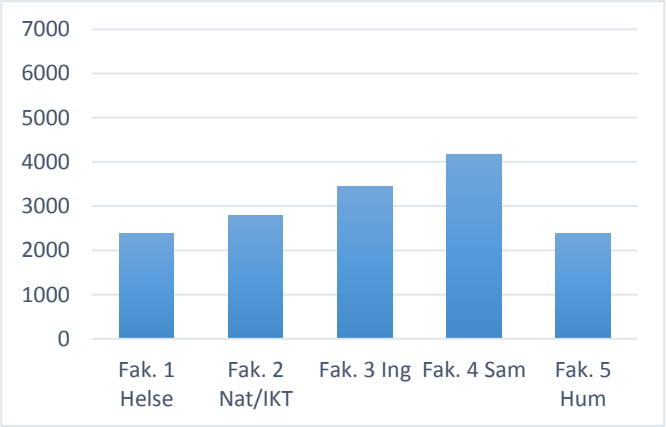


Figure 7-4 M2 Number attending in autumn 2014

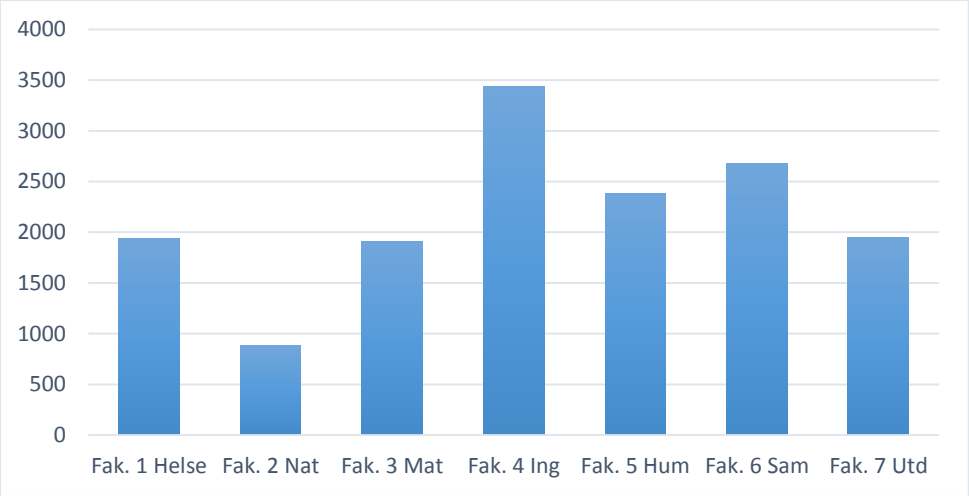
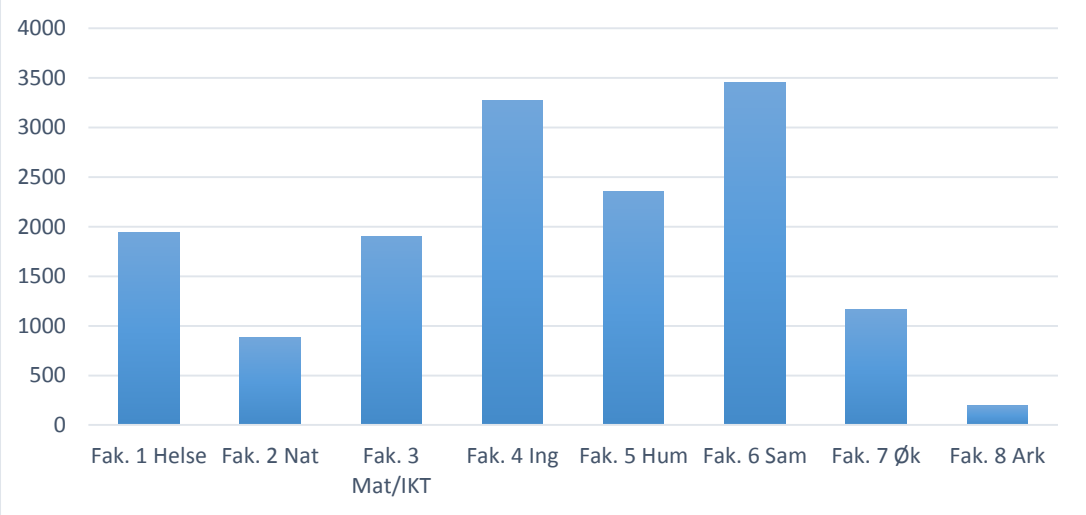


Figure 7-5 M2a Number attending in autumn 2014



Academic synergy

Academic integration and synergies across the campuses are key in the merger platform. Academic synergy also has several dimensions, both internally in the faculties across departmental boundaries and across faculty boundaries. Many people assert that it is important to organize related academic environments together, but at the same time to open the way for interdisciplinary activity. The diversity of different subject areas in a faculty will correlate with the potential for interdisciplinarity at faculty level, given that the academic prerequisites for such interdisciplinarity are present. Much of the interdisciplinary development also takes place across the faculties. Academic synergy, interdisciplinarity and mobility may thus be prerequisites for both inter-faculty and cross-faculty cooperation. This is therefore included as a criterion in the report.

Figure 7-6M1 Number attending in autumn 2014 per field of education and faculty

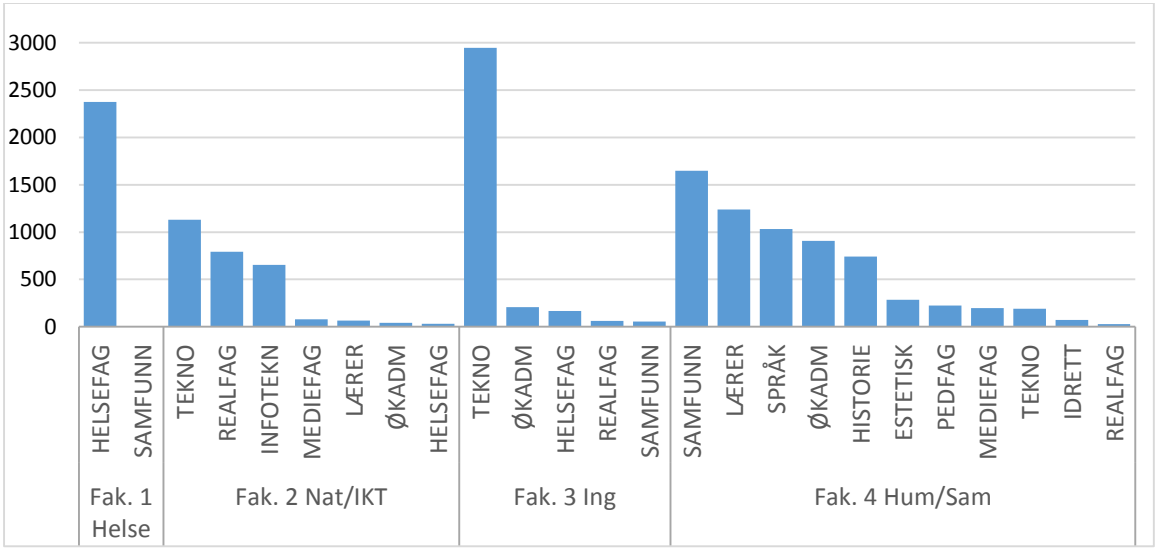
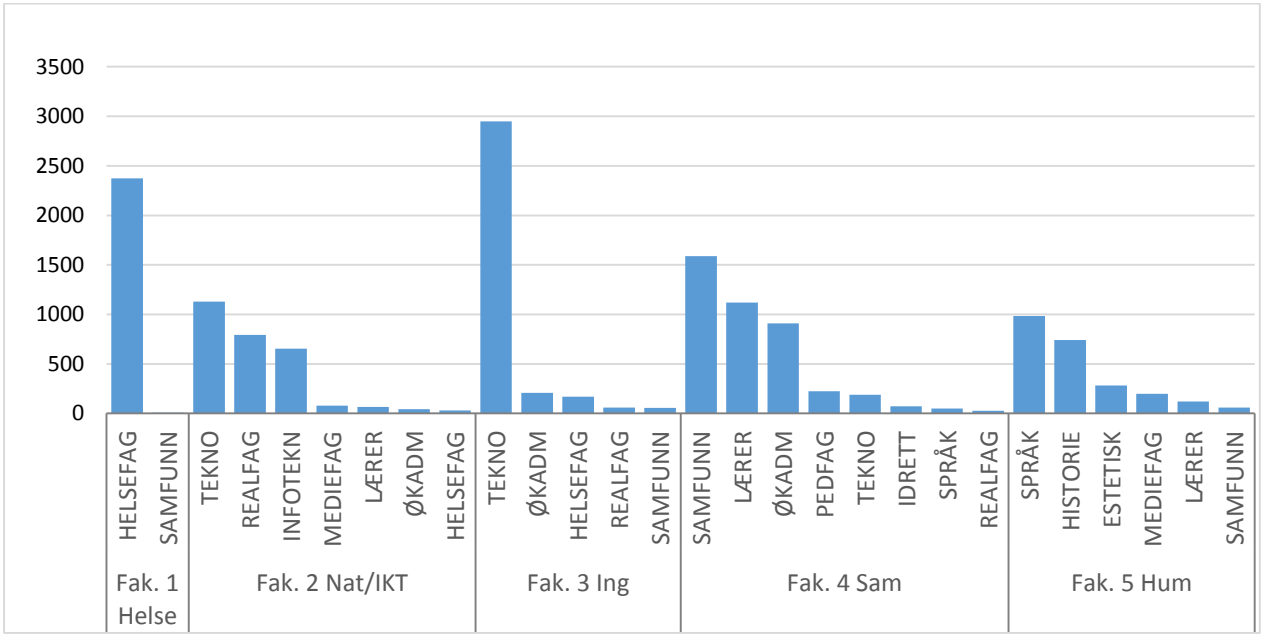


Figure 7-7M1a Number attending in autumn 2014 per field of education and faculty



The fields of education represented by the different faculties are an indication of the profile, interdisciplinarity and potential for synergy. Figure 7-6 and 7-7 above show the number of students by field of education distributed by the four (M1) or five (M1a) faculties. The figures show that the students in one field of education are primarily linked to one faculty. Faculty 1 Health and faculty 3 Eng have the clearest discipline profiles. But even in the narrow model, three faculties would offer education in technology, two would offer teacher education and three would offer economics and management education, with the allocation of existing basic units that we have used. The distribution in the broad faculty structure is shown in figures 7-8 and 7-9 below.

Figure 7-8M2 Number attending in autumn 2014 per field of education and faculty

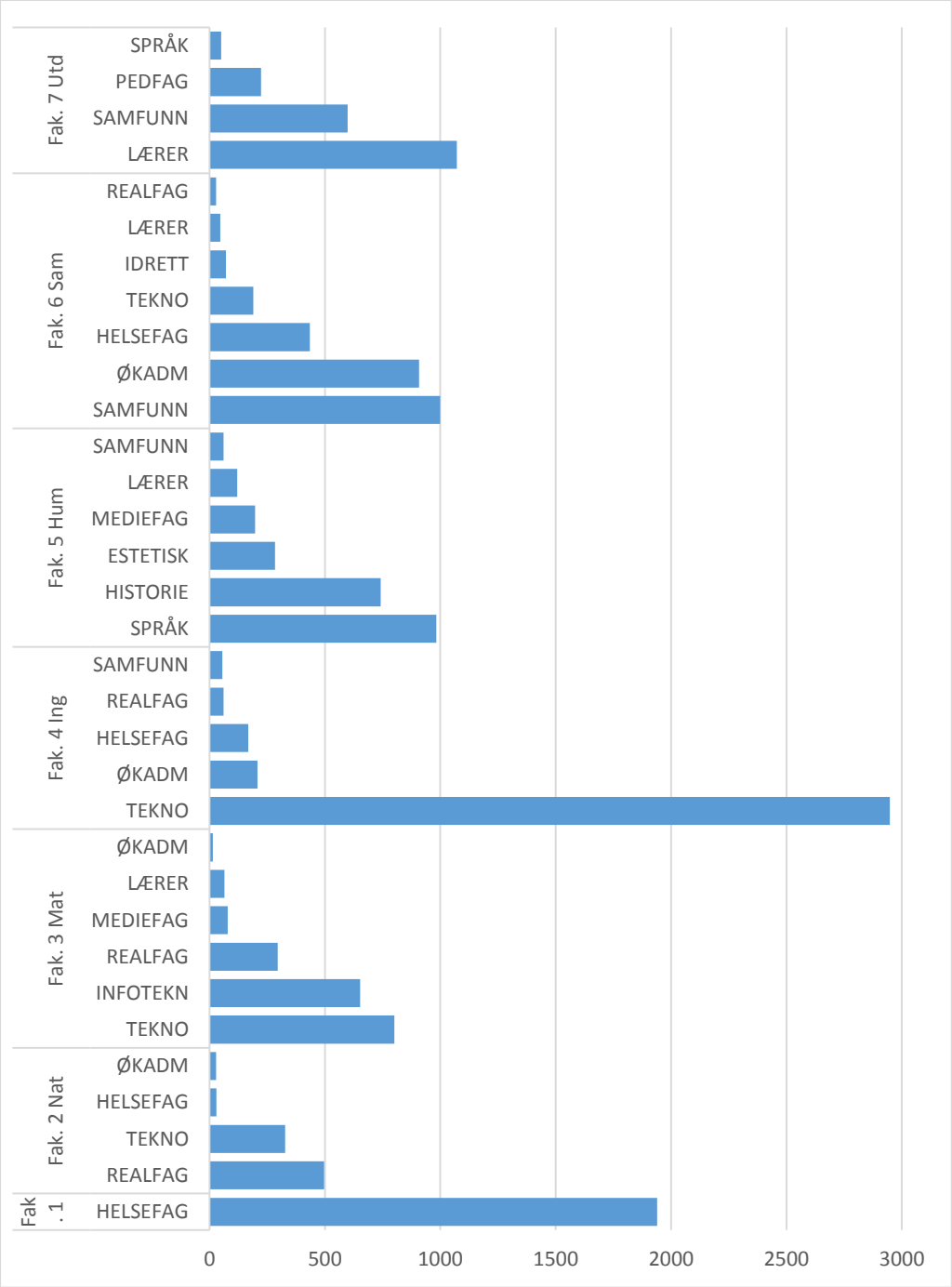
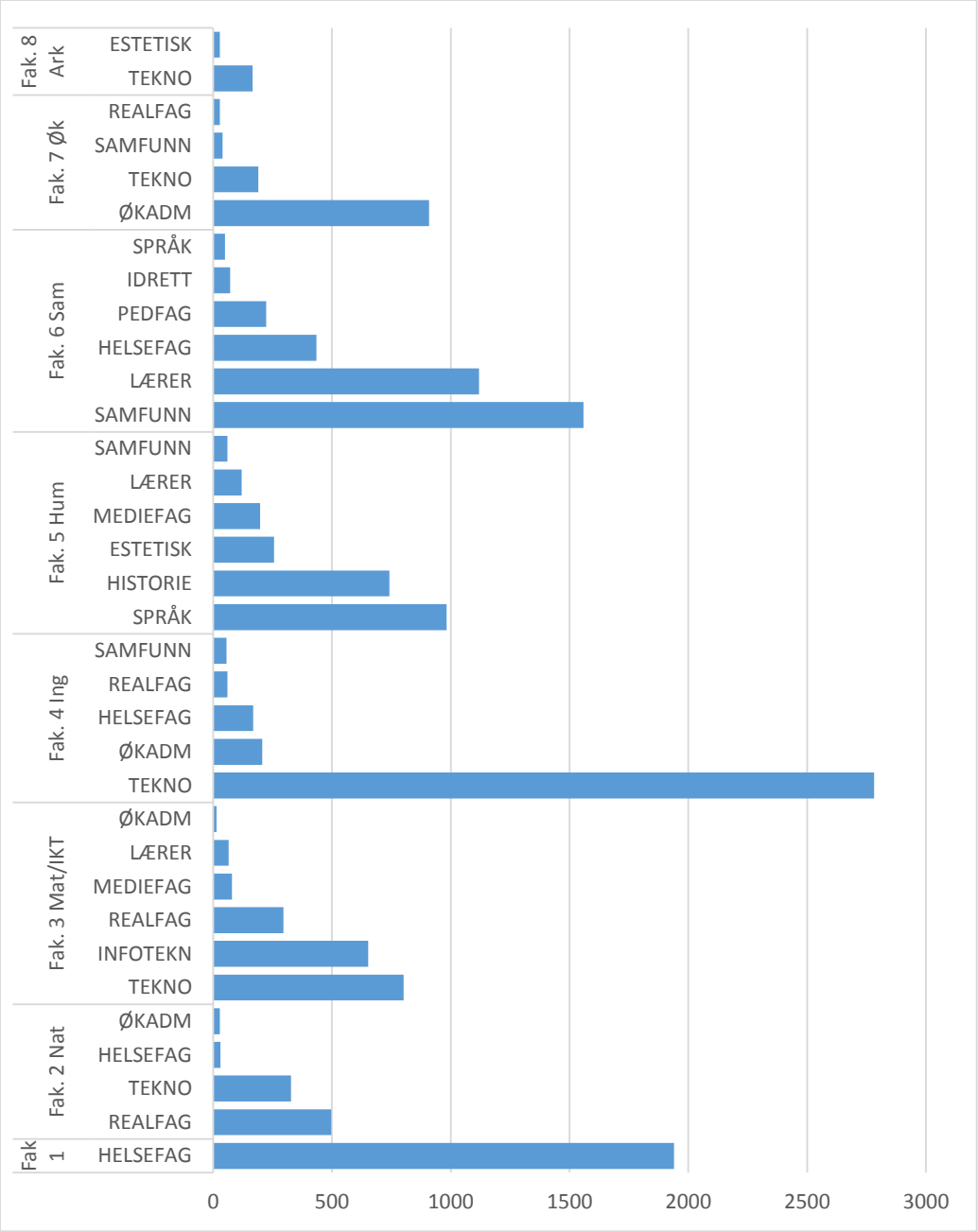


Figure 7-9M2 Number attending in autumn 2014 per field of education and faculty



In a broad faculty structure, too, several faculties would offer programmes of study in the same field of education, but as in model 1 and 1a the faculties would have a clear profile. It would still be the health and engineering faculties that have the most "mono-disciplinary" profile.

Tables 9-1 – 9-4 (Chapter 9 Supporting data) provide a more detailed breakdown between the faculties of students attending programmes in different fields of education and in the four merging institutions.

NTNU's faculties are expected to be visible in the international research arena (cf. 7.3 over). One dimension of this is international co-publication. In figure 7-10 – 7-13 below, we show the number of

approved co-publications registered in CRIStin/NVI (common database of Norwegian academic publications) in 2014 distributed by faculty in the various models.

Figure 7-10 M1 International co-publication

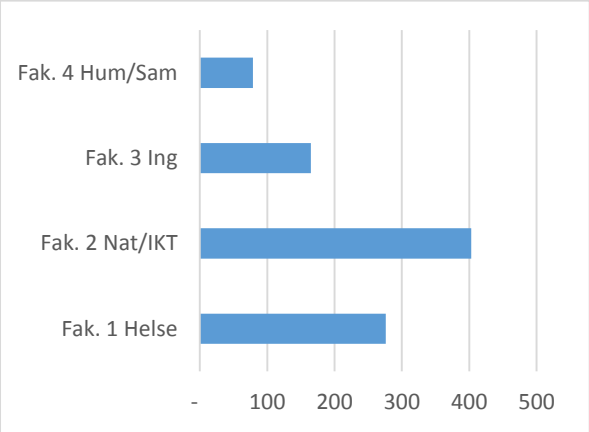


Figure 7-11 M1a International co-publication

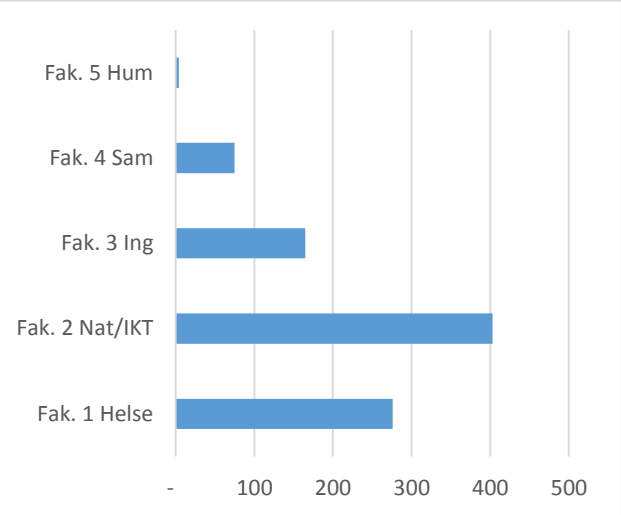


Figure 7-12 M2 International co-publication

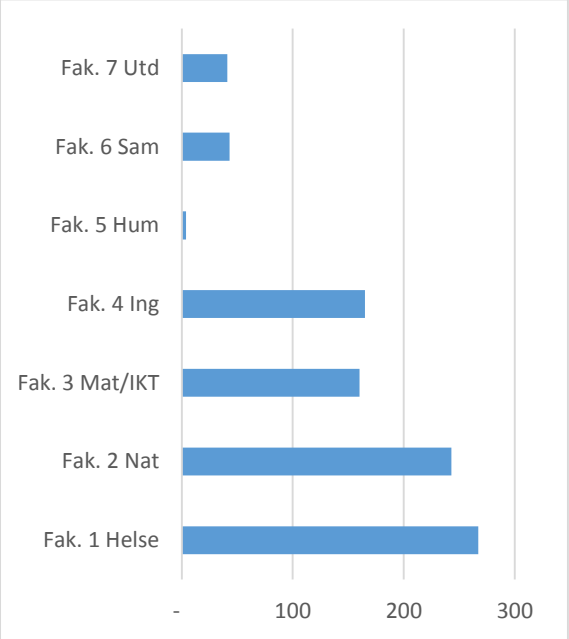
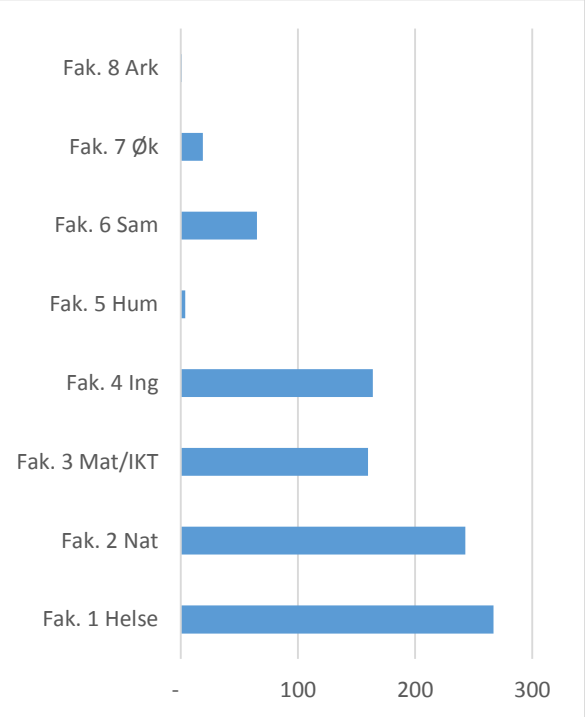


Figure 7-13 M2a International co-publication



We see that there are large differences between the faculties, which may partly be due to differences in academic tradition and culture, and partly to the extent and orientation of the research activity.

Strategic research areas (TSOs) are an instrument used at NTNU to realize synergy in addressing major societal challenges. In figures 7-10 – 7-13, we have tried to illustrate how the faculties in the various models can be assumed to relate to the four strategic research areas given today's activity.

As the figures show, the interdisciplinary strategic areas cross the boundaries of many faculties regardless of the organizational form.

Figure 7-14 M1 Faculties and strategic research areas (TSOs): Energy; Ocean Science and Technology; Health, Welfare and Technology; Sustainable Societal Development

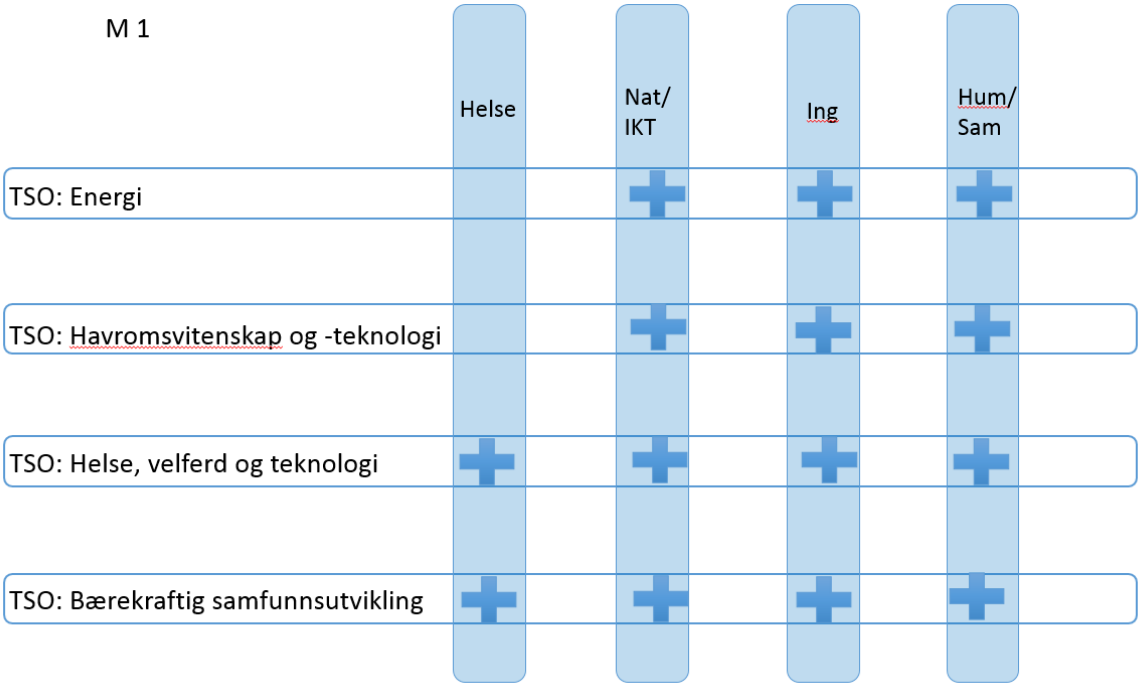


Figure 7-15 M1a Faculties and strategic research areas

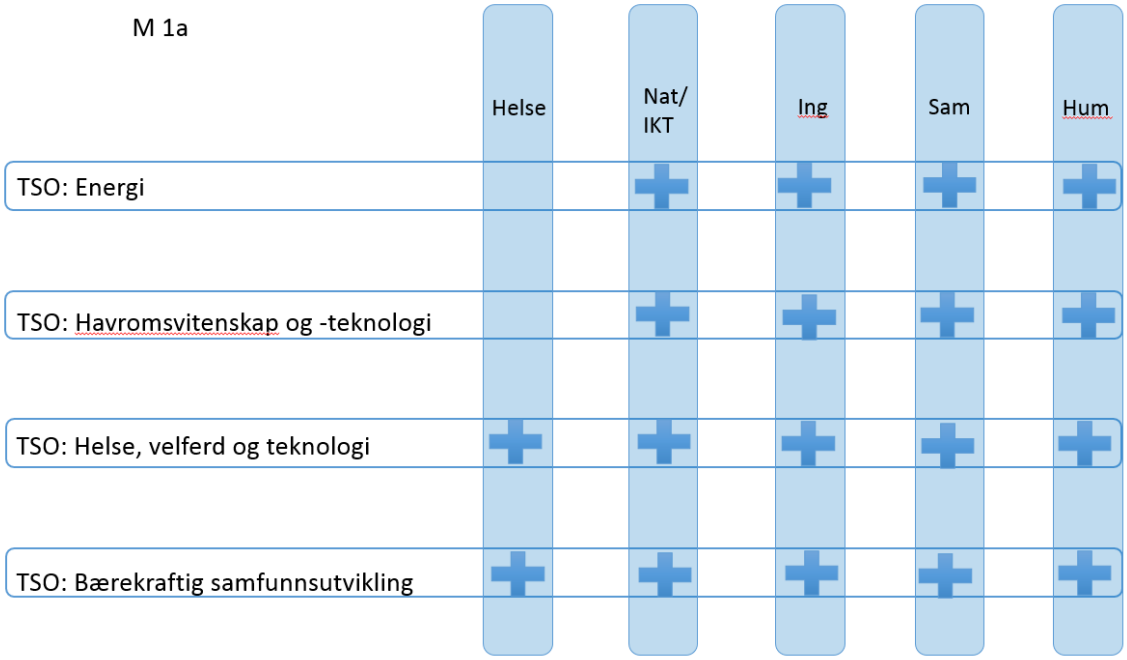


Figure 7-16 M2 Faculties and strategic research areas

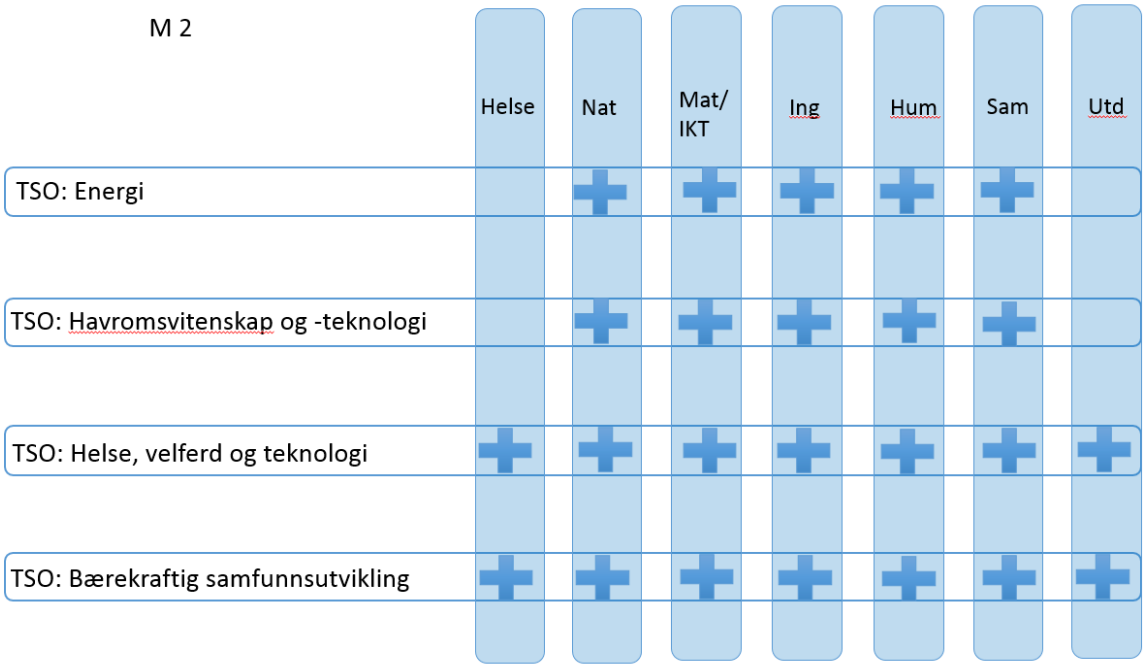
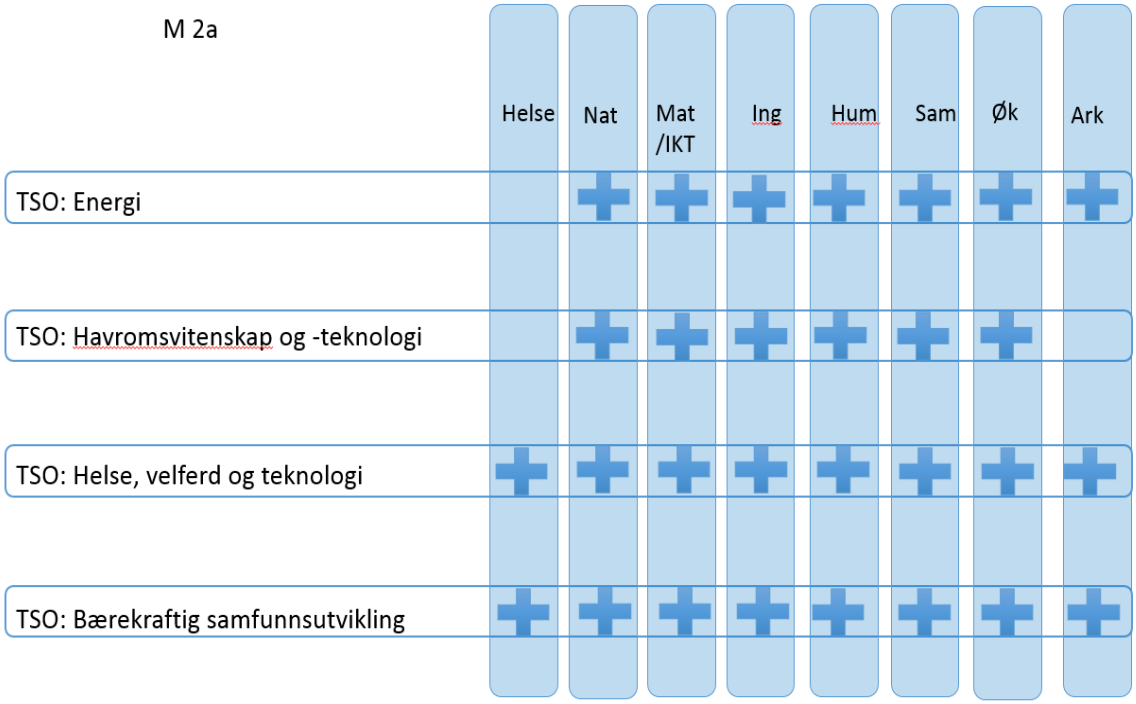


Figure 7-17 M2a Faculties and strategic research areas



Leadership, participation and co-determination

The academic organizational structure must ensure good leadership, participation and co-determination. It is assumed that NTNU aims to conduct good educational and research management. The distance to managers with the right to make decisions will influence how participation and co-determination take place for the individual employee. The group's mandate focuses on level 2, but the organization of this level will provide guiding principles for the size of the management groups at both level 1 and level 3.

Table 7-1 Number of managers with geographical location in the current organization at level 3

Model	Number of deans	Faculty	Managers level 3	Trondheim	Gjøvik	Ålesund
M1	4	Fac. 1 Health	**15**	11	3	1
		Fac. 2 Nat Sci/ICT	**16**	13	2	1
		Fac. 3 Eng	**26**	21	3	2
		Fac. 4 Hum/Soc	**21**	20		1
M1a	5	Fac. 1 Health	**15**	11	3	1
		Fac. 2 Nat Sci/ICT	**16**	13	2	1
		Fac. 3 Eng	**26**	21	3	2
		Fac. 4 Soc	**14**	13		1
		Fac. 5 Hum	**7**	7		
M2	7	Fac. 1 Health	**13**	9	3	1
		Fac. 2 Nat Sci	**7**	6		1
		Fac. 3 Math/ICT	**9**	7	2	
		Fac. 4 Eng	**26**	21	3	2
		Fac. 5 Hum	**7**	7		
		Fac. 6 Soc	**10**	9		1
		Fac. 7 Edu	**6**	6		
M2a	8	Fac. 1 Health	**13**	9	3	1
		Fac. 2 Nat Sci	**7**	6		1
		Fac. 3 Math/ICT	**9**	7	2	
		Fac. 4 Eng	**22**	17	3	2
		Fac. 5 Hum	**6**	6		
		Fac. 6 Soc	**12**	12		
		Fac. 7 Econ	**4**	3		1
		Fac. 8 Arch	**5**	5		

The figures are based on the positioning of level 3 as in the tables in Chapter 9.2: Overview of basic units in the faculties in the models. Where there is an organizational level 3 in the faculties at HiST and HiG, this is included in the figures. In the table, the sections of the NTNU University Museum are omitted. In all models, some faculties will have large management groups at level 2 with the current departmental structure, especially the faculty of engineering.

Strategic capability and financial room for manoeuvre

The faculties must be able to develop good leadership, have a suitable administrative support infrastructure and have financial sustainability to carry out strategic initiatives. Strategic capability is also linked with flexibility in terms of the faculty's ability to respond to existing and emerging needs, and is thus a determining factor for the adaptability of the entire organization.

The measurable indicators that we use to illustrate this criterion are related to resources in the broad sense – finances, staff and results of academic activities (output). It could be argued that there is a positive relationship between strategic capability and faculty size measured by these indicators. At the same time, it could be argued that the prerequisites for size to be a resource in reality are related to the degree of breadth or homogeneity in the faculty's academic profile which must be assumed to influence the ability to exercise strategic leadership. As we also see from the figures below, the categorization of which faculties are large or small will be conditional on whether the indicators are linked, on the one hand, to results related to education or, on the other hand, total budget, staff and results of research.

Figures 7-14 – 7-17 show academic positions distributed by category and faculty in the various models and provide an indication of both capacity and staff profile.

Figure 7-18 M1 Teaching, research and recruitment positions

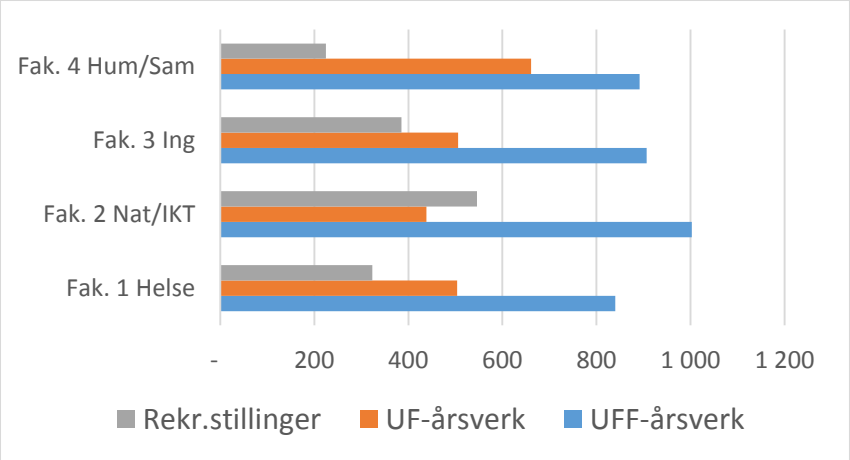
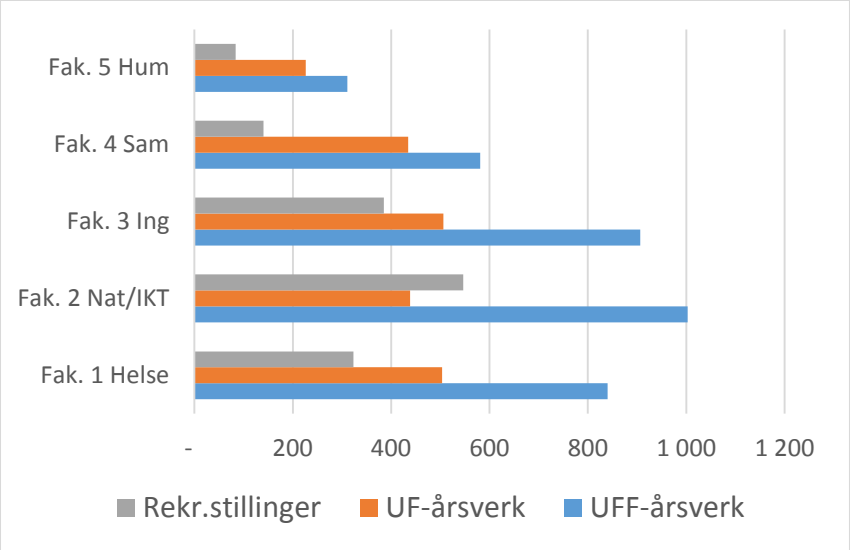


Figure 7-19 M1a Teaching, research and recruitment positions



In main model M1, the resources for staff positions are reasonably evenly distributed. The greatest variation is in the number of recruitment full-time equivalents where Fac. 4 Hum/Soc has the fewest, while Fac. 2 Nat Sci/ICT has the most. In the variant M1a, Fac. 5 Hum has far fewer full-time equivalents than the other faculties.

Figure 7-20 M2 Teaching, research and recruitment positions

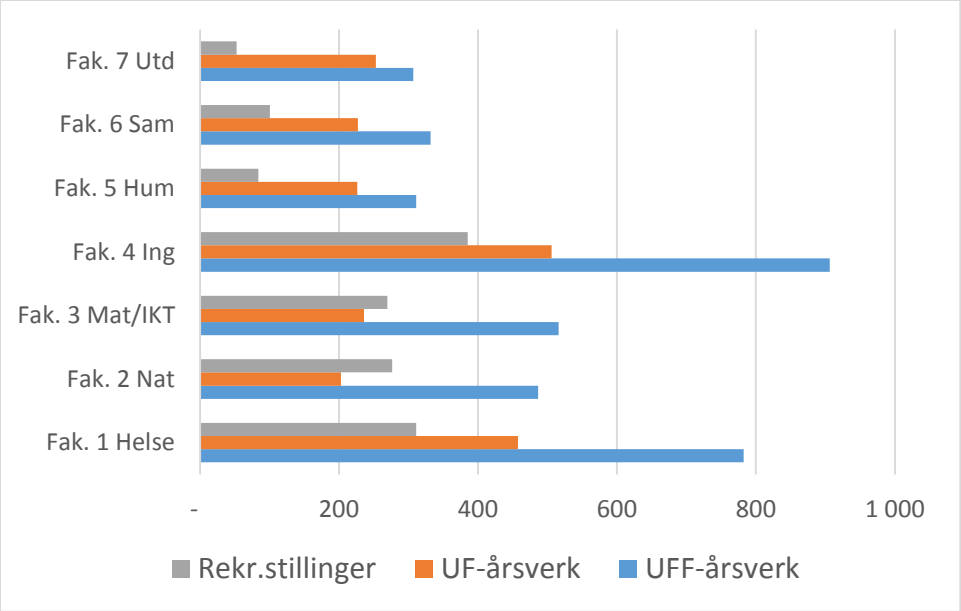
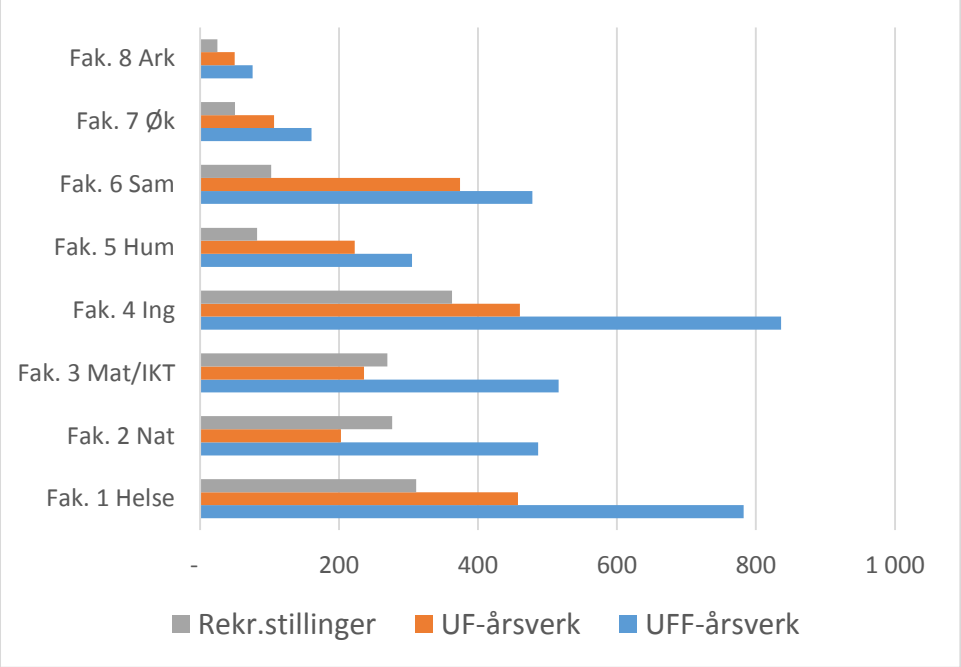


Figure 7-21 M2a Teaching, research and recruitment positions



In the broad structure, we see that an outline emerges of three groups of faculties that are each about the same size as each other in terms of full-time equivalents. In this model, the health faculty (1) and the engineering faculty (2) have by far the highest number of full-time equivalents. Faculty 3 and 2 will be about the same size. The same applies to faculty number 5, 6 and 7. The education faculty (7) will have the lowest number of recruitment full-time equivalents. In the variant M2a, we see that the spread between the faculties becomes even greater in terms of the number of full-time equivalents. Architecture (8) will be the smallest and economics (7) the next smallest – clearly

smaller than the others. The total finances in the models, based on budgets and organizational structure in 2014, largely reflect the number of positions, but also show other factors. In figures 7-18 – 7-21 we have entered the funding from appropriations as well as from collaborative and commissioned activity (BOA), and calculated the proportion of payroll expenses (Y2 axis).

Figure 7-22 M1 Total expenses, proportion of payroll expenses (NOK million)

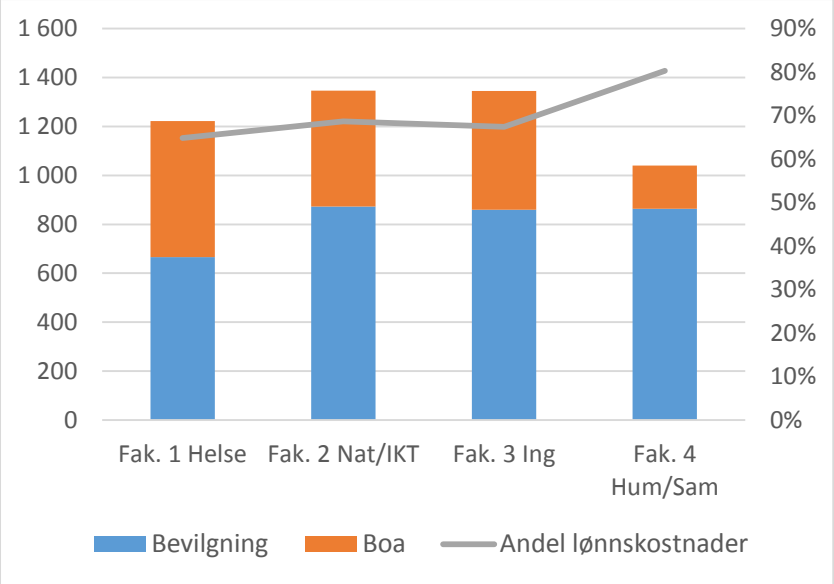
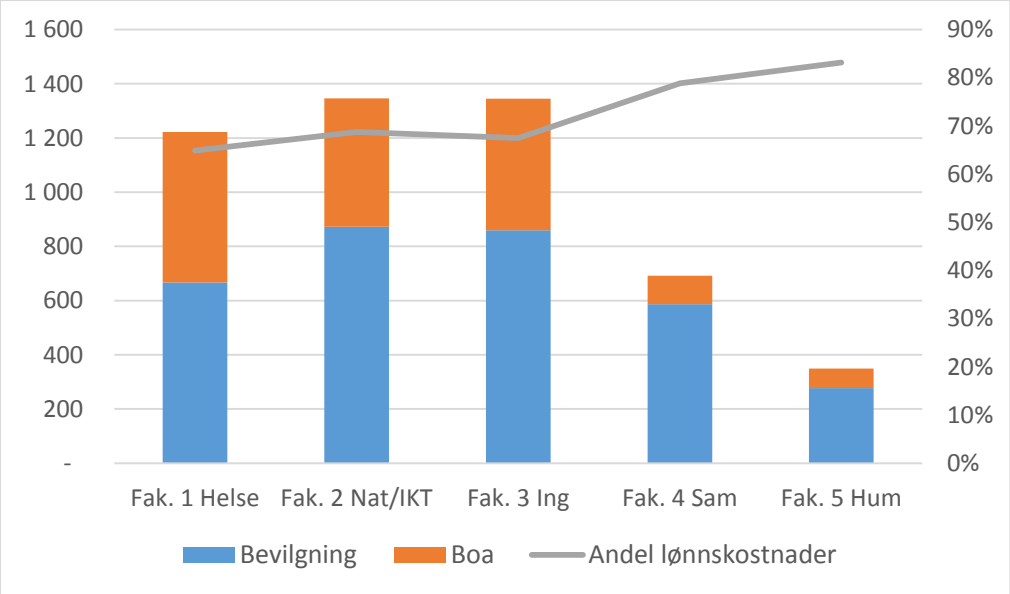


Figure 7-23 M1a Total expenses, proportion of payroll expenses (NOK million)



In the narrow main model M1, the four faculties of fairly similar in terms of the total finances. We see that Fac. 4 Hum/Soc will have the lowest finances and that this is primarily due to less funding from collaborative and commissioned activity. We can also see that the proportion of payroll expenses will be higher for this faculty than for the three others, which have higher operating expenses related to laboratory operations and scientific equipment among other things. The variant

M2a and will inevitably lead to greater differences in that the humanities and social sciences are divided into two faculties.

In a broad structure, the differences between the faculties become substantial. As was the case with full-time equivalents, a picture of three groups of faculties emerges. In the main model M2 we see that Fac. 4 and Fac. 1 have by far the highest finances. Fac. 2 and Fac. 3 are about the same size, but the distribution between appropriation funding and funding from collaborative and commissioned activity is somewhat uneven. Fac 5, 6, and 7 are also of roughly equal size with little external income. Fac 5 has the highest proportion of payroll expenses in relation to total expenses. In the variant M2a, we see that Fac. 8 is clearly the smallest in terms of finances and Fac. 7 is next smallest. Fac. 8 also has the highest proportion of payroll expenses in relation to total expenses.

Figure 7-24 M2 Total expenses, proportion of payroll expenses (NOK million)

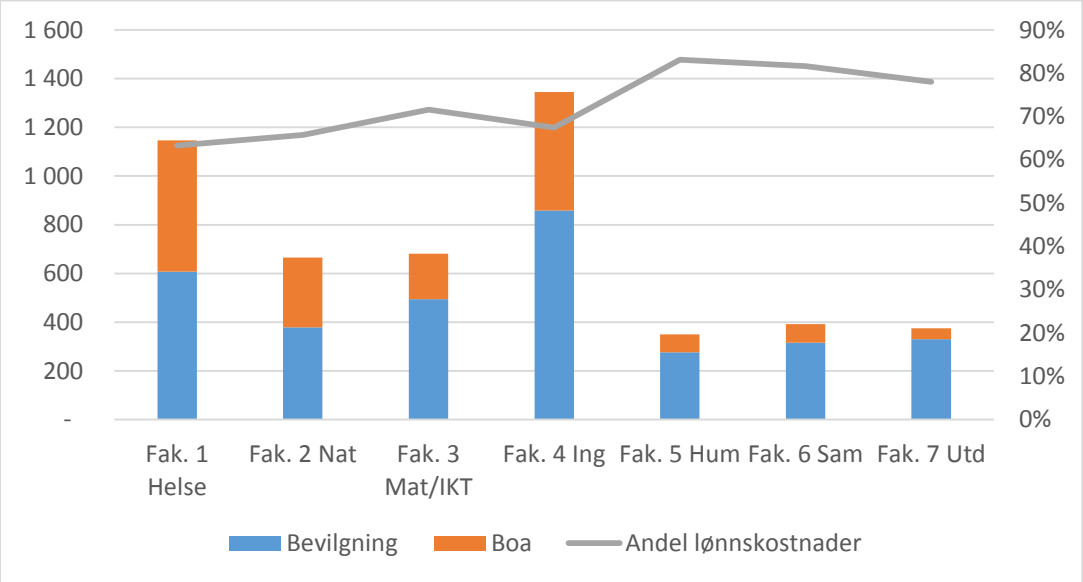
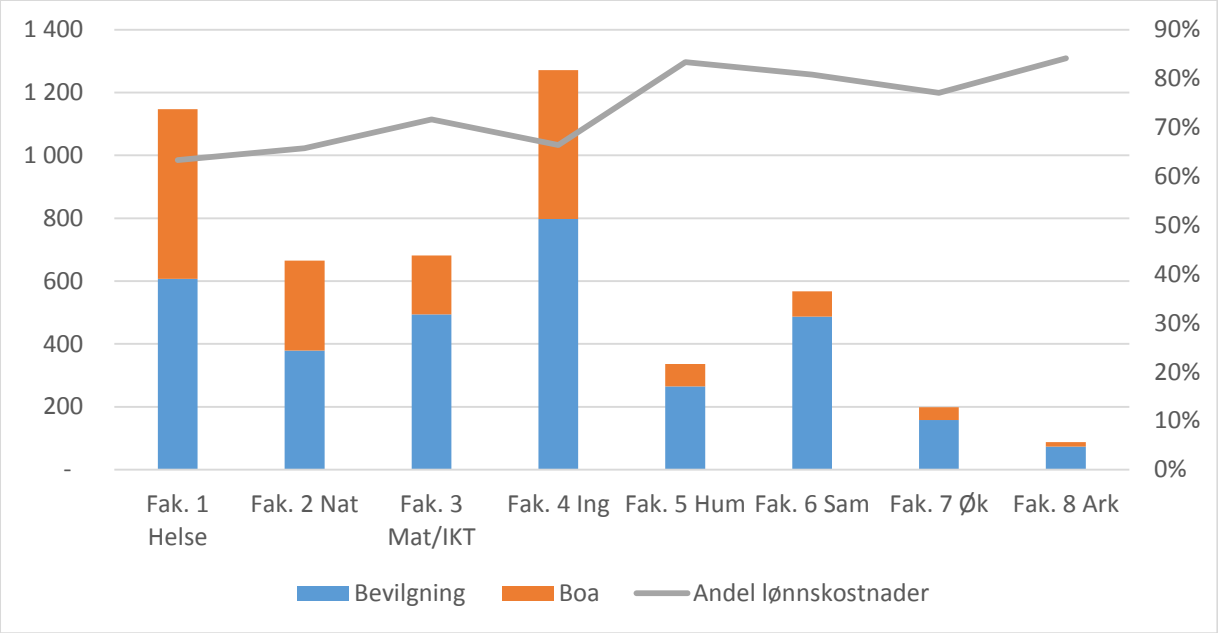


Figure 7-25 M2a Total expenses, proportion of payroll expenses (NOK million)



The results of academic activities are easiest to measure through credits and publication points. Figures 7-22 – 7-25 below show credits converted to annual units (2014) distributed by faculty in the individual models.

Figure 7-26 M1 Credits, annual units

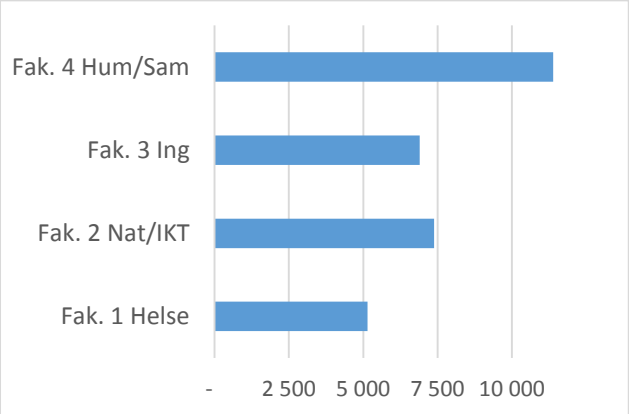


Figure 7-27 M1a Credits, annual units

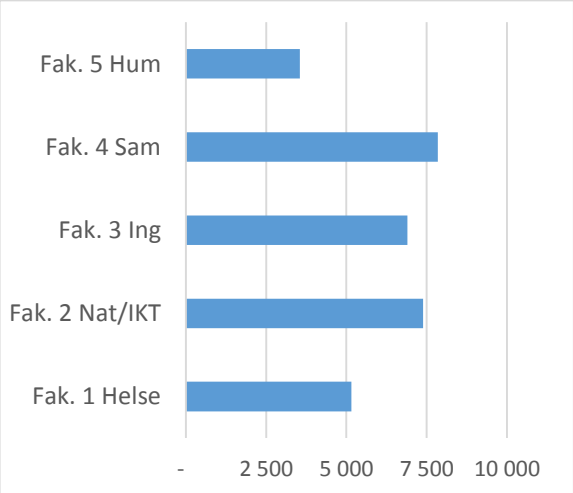


Figure 7-28 M2 Credits, annual units

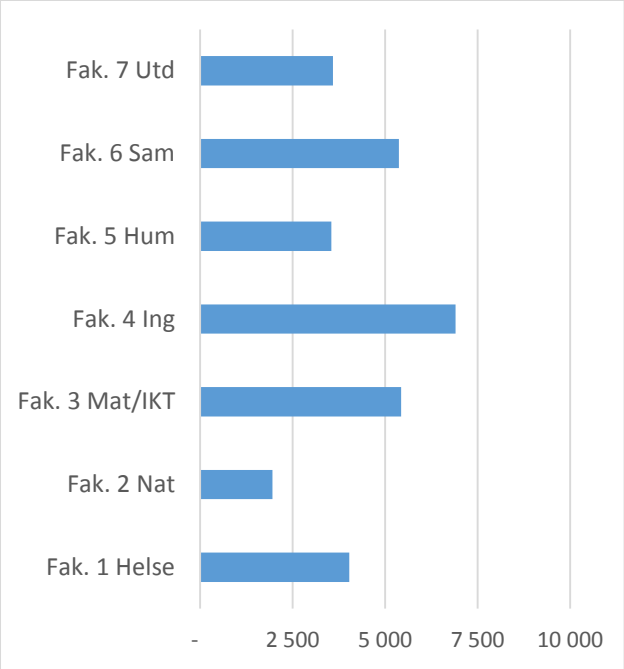
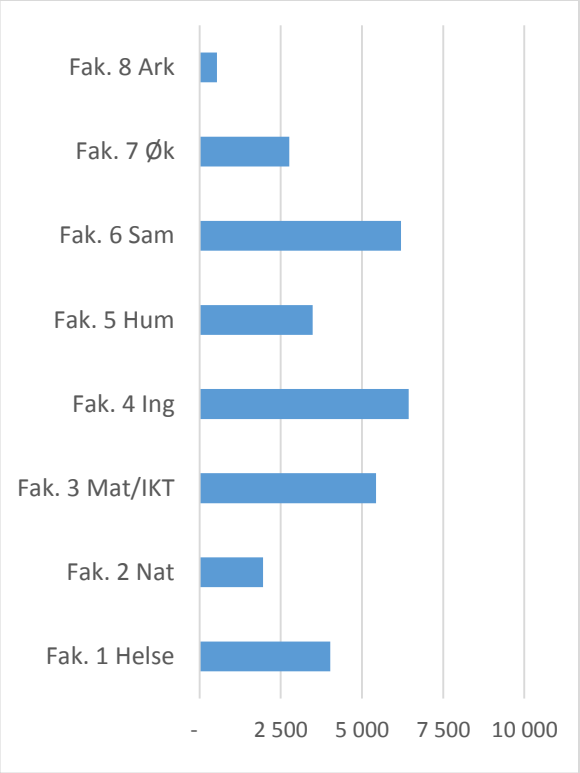


Figure 7-29 M2a Credits, annual units



In a narrow structure (M1 and M1a), the social sciences faculty will have the greatest production of credits, either on its own or merged with the humanities. This would also be large in a broad faculty structure, where the variations are larger. Natural sciences have a relatively small output in a broad structure (M2 and M2a).

For academic publishing, the picture is different, cf. figure 7-26 – 7-29. The natural sciences, whether merged with Mathematics/ICT or alone, stand out as a major producer of publication points together with the engineering faculty.

Figure 7-30 M1 Publication points

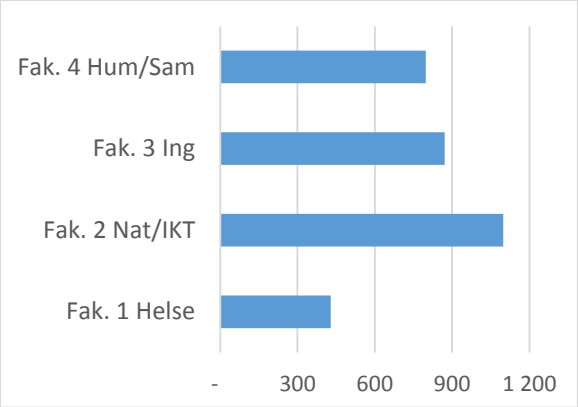


Figure 7-31 M1a Publication points

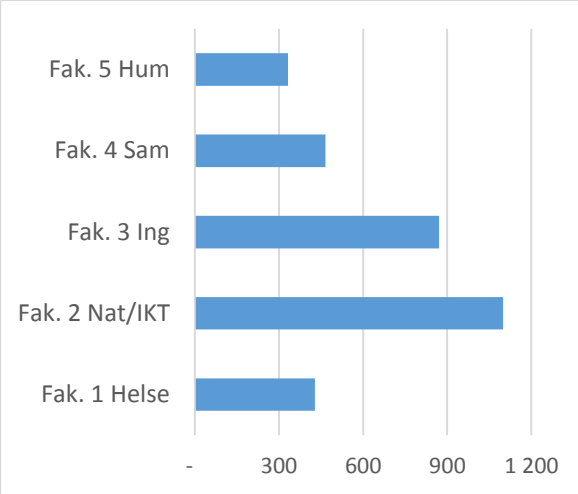


Figure 7-32 M2 Publication points

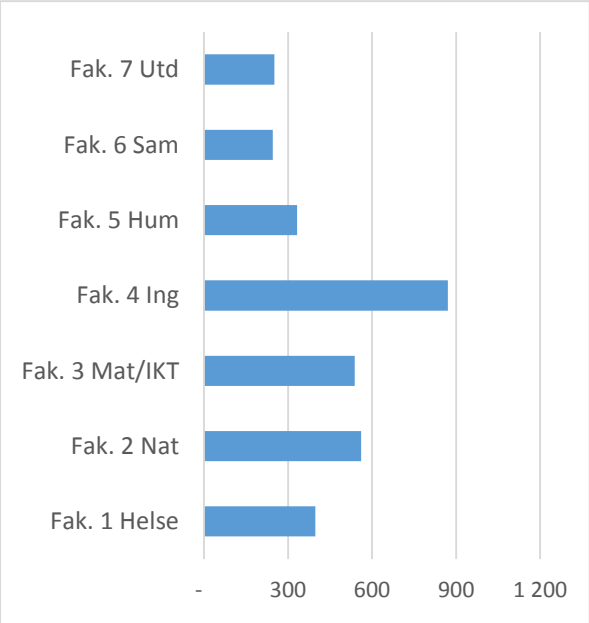
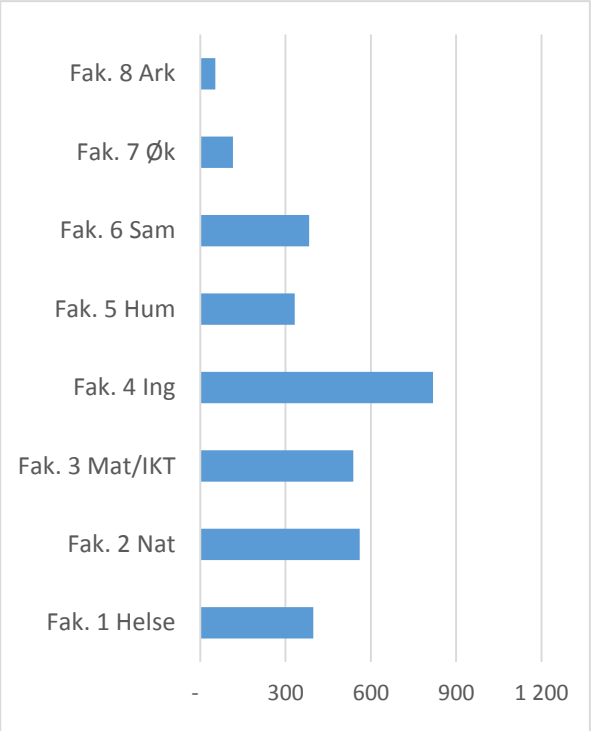


Figure 7-33 2a Publication points



Regardless of the model, there are great variations between the faculties, but the range of the variation is naturally largest in model M2a. The extent of academic publishing also reflects different profiles in the faculties' subject areas and differences between university and university college environments. Varying emphasis on teaching and research emerges clearly if we distribute the production of points by the number of teaching and research positions (DBH category UF positions). This is presented in figures 7-30 – 7-33.

The number of credits is drawn on the Y1 axis, the publication points on the Y2 axis.

Figure 7-34 M1 Credits and publication points per teaching and research position

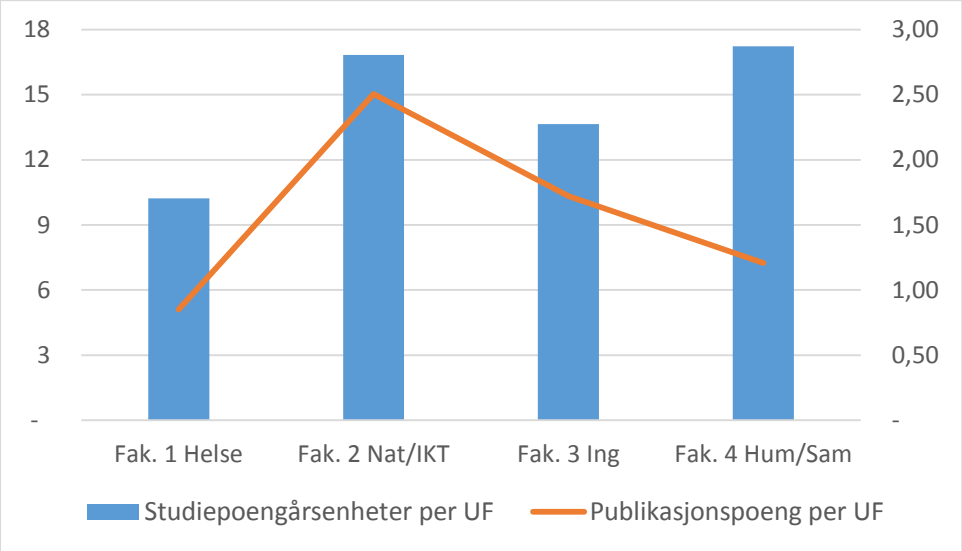
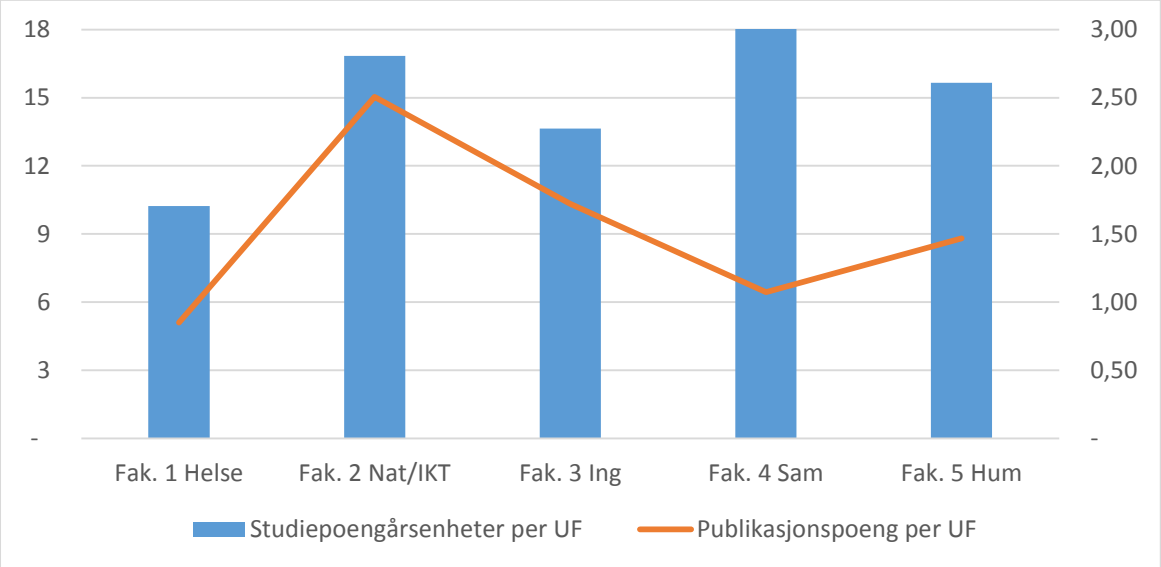


Figure 7-35 M1a Credits and publication points per teaching and research position



In a narrow structure – both M1 and M1a – faculty 1 Health will have the lowest number of both credits and publication points per teaching and research (UF) position. Faculty 2 and 4 have the highest production of credits per UF position, while faculty 2 Nat/ICT will have by far the highest number of publication points per UF position. Variant M1a shows that faculty 4 Soc and faculty 5 Hum considered separately also have a high production of credits. The social sciences have more credits per teaching and research position than the humanities, while the opposite applies to publication points.

Figure 7-36 M2 Credits and publication points per teaching and research position

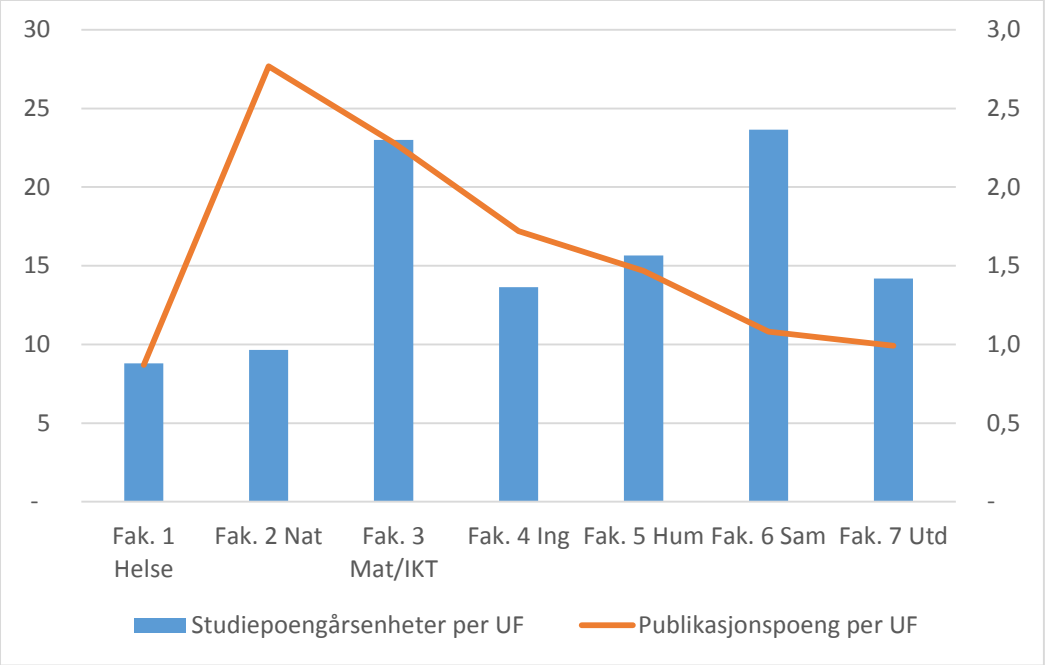
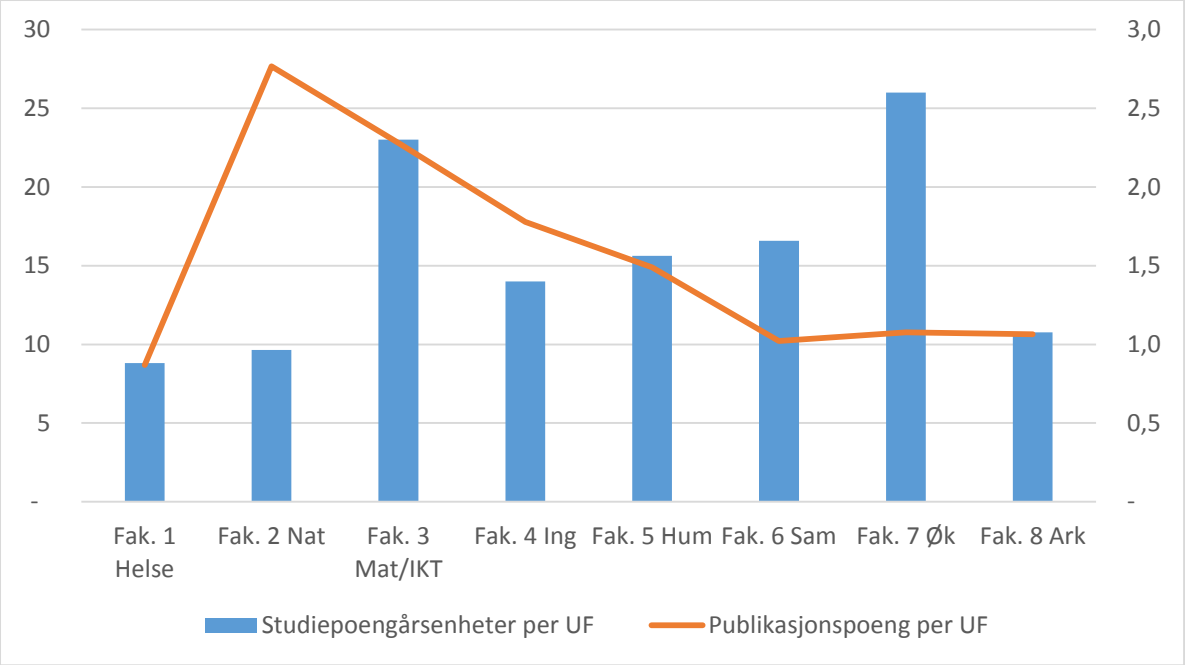


Figure 7-37 M2a Credits and publication points per teaching and research position



In a broad faculty structure, the range is naturally greater. As in a narrow structure, the natural sciences and mathematics/ICT stand out with a high number of publication points per employee. Both in the main model M2 and in the variant M2a, faculty 3 Math/ICT has high productivity in the sense of many credits and publication points per teaching and research position. The social sciences in various constellations in M2 and M2a have a high production of credits per employee, but a relatively low number of publication points.

7.6. Organization at level 3

Both main models and their variants require an allocation of existing basic units to a number of faculties (cf. 6.3 and overview 9.2). This allocation has been made on the basis of judgement by the group and does not include a substantiated proposal for a future departmental structure (level 3). However, we believe that it provides a reasonably good basis for evaluating the academic organizational structure at level 2, which is the mandate for the group's work and the topic of the upcoming hearing. We are open to the possibility that the hearing in the organization and the Rector's preparation of a submission to the Board may identify other combinations of basic units, and other models than those that the group has proposed.

Given that the Board adopts one of the models proposed here, a proposal for the departmental structure will be available at the same time in the sense that all of the basic units of the university colleges and NTNU will be allocated to a faculty that (in principle) is new. These faculties will be operative from the date determined by the Board Consideration of how NTNU and the faculties should organize the departments in the next stage is outside the group's mandate. The same applies to organization of the activities at level 3 in the period between the Board's decision and the appointment of deans.

We do not rule out the possibility that in the shorter or longer term it may be relevant to assess both the departmental structure internally in the faculties and any transfers of academic environments between the faculties; reorganization of level 3 is something that takes place from time to time in any event. However, the group has neither the competence nor a mandate to assess this in this context.

The group would nevertheless like to emphasize a general point based on the original concept report and the consultation round. We launched the "school" as a possible unit for academic activities at level 3, as a supplement to departments and centres. The idea received a mixed and hesitant reception from the entities invited to comment. Above all, a clearer definition of the role of such a unit was requested. One function that a school may have is to promote and focus on a subject area, for example a programme of study or a group of related programmes. In a new faculty structure, we believe there will be subject areas that experience a loss of visibility and identity almost regardless of the model chosen. For some of these, it could be relevant to consider organizing all or parts of their activities as a school (at level 3) to strengthen the profile and visibility internally and externally. Our point is only that this possibility should be left open in the further discussion on the organization at level 3.

7.7. Consequences for administrative organization

The group's general opinion is that both the size of the faculties and the number as well as differences between them have implications for the administrative organizational structure. It is reasonable to believe that many faculties with differences between them would require different and more varied or flexible administrative solutions than would be the case if a narrow model with large faculties were chosen. It is outside our mandate and our competence to evaluate the administrative consequences. Our "sister group", the group for the administrative organizational structure, is however in the process of evaluating consequences of the merger, and will continue its work when the Board has decided on the faculty structure. At this stage in the process, we have received a comment with general points of view from them. Here, it is pointed out that the academic organizational structure is an important condition for the administrative organization, but

only one of several. In its comment on this paper, the group for the administrative organizational structure states[17]:

> "In general, the size of the faculty administration will depend on factors such as the size of the faculty, the academic profile, and whether the faculty extends across campus boundaries. The faculty administration will also be influenced by the powers, tasks and functions that are assigned to the faculties.
>
> In principle, one must consider that the total administration at NTNU has adequate competence and capacity. The organization of the faculty level should therefore not result in a larger administration as a whole. A future academic reorganization of level 2 and a different administrative distribution of tasks may have implications for the size of the faculty administrations. However, this must take place through redeployment of administrative staff.
>
> The group for the academic organizational structure has put forward two alternative models for distribution of the activities at level 2: a narrow faculty model with 4–5 units and a broad model with 7–8 units. Regardless of the structure at level 2, the result across the board will be relatively large organizational units. A number of general principles therefore apply to the administrative organization, which are independent of the "narrow" and "broad" model.

- *Allocation of administrative tasks*: Administrations that cover all functions at all levels would not be very practical. To simplify the workflow as well as to avoid duplication of effort and overlap between organizational units, it must be possible to implement administrative processes across the levels. They may be placed at the institution and faculty level or the faculty and departmental level, and in some cases at the institution and departmental level. Where the task and the powers are placed will vary according to the functional area and the type of task.
- *Customized organizational solutions:* Based on productivity and quality considerations, one should allow for different organizational solutions, including asymmetrical solutions. An example is that a large faculty takes care of certain administrative functions on behalf of a smaller sister faculty. The fact that NTNU will have campuses in Gjøvik and Ålesund in itself implies asymmetrical solutions.
- *Local responsibility for human resources:* Administrative staff who perform and carry out functions at a faculty or department should generally report to the line manager for the unit in question. This implies that remote management should be avoided as far as possible.
- *Process ownership*: As a large organization, NTNU will have a number of complicated administrative work processes with many work tasks that may well involve units at several levels and divisions across boundaries. To simplify and coordinate cross-cutting work processes, one should determine who will have process ownership for specific administrative functions.

[17] The following is based on comments and suggestions from the group for administrative organization, received on 27 October2015.

- *Digitization and standardization*: Where it makes sense based on an all-round assessment, NTNU must standardize and digitize its services. Standardization and digitization must have usability in focus.
- *Mobility:* To build culture as well as to improve skills and increase insight into different functions and tasks, arrangements should be made to encourage mobility between levels, divisions and campuses, for example, in the form of secondments, career plans."

7.8. Overall assessment

The group has emphasized presentation of information and data that shed light on the consequences of various compositions of faculties. The material can and must be subjected to interpretation. We make no secret of the fact that there are differing opinions in the group about the implications of the information for assessment of the strengths and weaknesses of the individual models. It is also true that the different variables we have used for measuring activity pull in different directions – for example, some combinations of academic environments have education as a strength, while others are strong on research. In general we have been reticent in interpretation of the material; our goal has been to present a balanced foundation for the hearing in the organization, the Rector's recommendation and the Board's decision.

We must also include a reminder that the underlying data here are figures from 2014, with the framework conditions and the organizational structure in effect at that time. The funding system in the sector is changing, and a merger will require a new model for income allocation. An analysis based on historical assumptions thus has significant limitations, but nevertheless has predictive power at least as good as forecasts with many unknown factors.

With these reservations, the group will nevertheless try to make an overall assessment on the basis of the study. We maintain that there are two main models – a narrow (M1) and a broad (M2) faculty structure. We comment on these below, and we draw in the variants (M1a and M2a) where they are relevant. We relate the assessment to the sets of criteria we defined in 7.4 above.

The group has arrived at some general characteristics of the main models:

Criterion	Model 1	Model 2
Academic identity	• NTNU's main profile is well reflected in the faculty structure; easily recognizable by the outside world • 4 faculties (M1) will result in relatively lower visibility for the humanities and social sciences externally and great thematic breadth that may weaken academic identity internally • 5 faculties (M1a) will result in a balance – main profile/broad-spectrum university	• More specialized faculties create internal identification with discipline/subject area • Some faculties will be more specialized than others – a hybrid organizational structure • It is possible to profile several subject areas in particular – for example economics, the science of education and architecture
Academic synergy	• A small number of large faculties can create good internal synergy between the academic environments • There is a certain risk of the faculties becoming academic "silos" that give priority to "in-house" skills	• Synergy is related to identity; it is easier to realize synergy between closely related academic environments • Many faculties mean larger transaction costs in connection with inter-faculty cooperation
Leadership, co-	• A smaller number of faculties will probably require substantial	• The span of control is narrower with more units at level 2, which supports wider

determination	reorganization at level 3 and involve higher restructuring costs • Large departments create a basis for developing professional management at level 3 and a clear formal level 4	involvement in NTNU's leadership • Many faculties may create space for departments with few employees, and a short distance between the individual employee and management
Strategic capability	• Large faculties will more easily generate financial room for manoeuvre (collaborative and commissioned activity, "BOA") and the potential for setting internal priorities • Large faculties are more robust with respect to variations in recruitment	• Academic uniformity/specialization may result in academic strategic capability through a clear academic identity and potential for profiling • M2a in particular, is demanding because some faculties will not have many "strings to their bow" and potential weak finances; may require compensatory measures

There are strengths and weaknesses in both narrow and broad faculty structures. The criteria that the group has used, and that have been the subject of a number of comments from the organization, help to identify differences, but are not suitable for ranking the models (including the variants). In the group's opinion, the assessment shows that both main models (including the variants) are feasible, but will require adaptations of various types – of administrative organization, income allocation models, cooperative mechanisms, and so on. All this can be solved, but the time perspective will vary. In general, it is probably true that the more a faculty structure diverges from the current organization, the higher the costs of restructuring or change will be in the short term. In this sense, the narrow model (M1) is more radical than the broad one (M2). However, we would like to emphasize that *all* models entail major changes, simply because the university colleges and the university are merging and many basic units will get a new organizational affiliation.

Restructuring expenses in the short term are only one factor in the evaluation. Another factor is the challenges and needs of the future – it is a question of finding a model that is well suited to NTNU in the longer term. The group has no uniform recommendation in this connection beyond emphasizing that a great effort must be made to get the organization to function optimally – whatever the model. For example, it is both necessary and desirable that arrangements are made to encourage cooperation on research and education across faculty boundaries, and that this cooperation takes place. This is the case today, and the same will apply to all the models that the committee has investigated.

8. Summary

Before the summer, the group prepared a working paper on various concepts for the academic organizational structure. The working paper was the subject of thorough consideration and an extensive hearing process in the organization. On the basis of the comments, we chose to continue our work with the assessment of two main models – one narrow and one broad faculty structure within the range of the concepts termed K1 and K3 in the working paper.

The group has focused on ensuring that the faculties comprise academic environments that have a "natural" cohesion. However, there are many possible approaches to this as well as a question about the aggregation level. Many combinations of subject areas are conceivable, each of which could represent a logical combination. We have chosen to assess one variant of each of the main models, with the same assumptions that they should be relevant and realistic.

The models with variants are discussed in Chapter 6.2above and further analysed in Chapter 7. We summarize them here:

Narrow structure – main model M1	**Variant M1a**
1. Health sciences, social work, nursing, medicine 2. Natural sciences, mathematics, computer and information science, electrical engineering 3. Engineering, architecture 4. Humanities, art, social sciences, science of education, economics, psychology, management	1. Health sciences, social work, nursing, medicine 2. Natural sciences, mathematics, computer and information science, electrical engineering 3. Engineering, architecture 4. Social sciences, the science of education, economics, psychology, management 5. Humanities, art
Broad structure – main model M2	**Variant M2a**
1. Health sciences, medicine, nursing 2. Natural sciences 3. Mathematics, computer and information science, electrical engineering 4. Engineering, architecture 5. Humanities and art 6. Social sciences, social work, economics and management 7. Psychology, science of education	1. Health sciences, medicine, nursing 2. Natural sciences 3. Mathematics, computer and information science, electrical engineering 4. Engineering 5. Humanities and art 6. Social sciences, psychology, social work, science of education 7. Economics and management 8. Architecture, visual art

The group has not evaluated the future departmental structure (level 3), but has undertaken an approximate distribution of existing academic basic units (as at 2015) in the individual models to make it possible to measure effects and consequences of a new faculty structure. A summary of which basic units are included in which faculties in the models appears in the supporting data, Chapter 9.2.

The group will not rank these models in relation to each other, but assesses them all as relevant. We recommend that this be used as a basis for the hearing process.

9. Faktagrunnlag

9.1. Tallgrunnlag for figurer

Tabell 9-1 M1 Utdanningsområder, møtt H2014

Fakultet/Utd.omr.	HiG	HiST	HiÅ	NTNU	Totalsum
Fak. 1 Helse	**411**	**1206**	**253**	**513**	**2383**
HELSEFAG	411	1206	253	504	2374
SAMFUNN				9	9
Fak. 2 Nat/IKT	**388**	**283**	**82**	**2037**	**2790**
TEKNO	51	86		992	1129
REALFAG			24	768	792
INFOTEKN	244	197		212	653
MEDIEFAG	79				79
LÆRER				65	65
ØKADM	14		28		42
HELSEFAG			30		30
Fak. 3 Ing	**686**	**794**	**358**	**1601**	**3439**
TEKNO	521	613	260	1554	2948
ØKADM	155		52		207
HELSEFAG		168			168
REALFAG		13		47	60
SAMFUNN	10		46		56
Fak. 4 Hum/Sam		**1083**	**197**	**5284**	**6564**
SAMFUNN				1649	1649
LÆRER		502		737	1239
SPRÅK		50		983	1033
ØKADM		531	197	180	908
HISTORIE				742	742
ESTETISK				284	284
PEDFAG				223	223
MEDIEFAG				197	197
TEKNO				190	190
IDRETT				71	71
REALFAG				28	28
Totalsum	**1485**	**3366**	**890**	**9435**	**15176**

Tabell 9-2 M1a Utdanningsområder, møtt H2014

Fakultet/Utd.omr.	HiG	HiST	HiÅ	NTNU	Totalsum
Fak. 1 Helse	**411**	**1206**	**253**	**513**	**2383**
HELSEFAG	411	1206	253	504	2374
SAMFUNN				9	9
Fak. 2 Nat/IKT	**388**	**283**	**82**	**2037**	**2790**
TEKNO	51	86		992	1129
REALFAG			24	768	792
INFOTEKN	244	197		212	653
MEDIEFAG	79				79
LÆRER				65	65
ØKADM	14		28		42
HELSEFAG			30		30
Fak. 3 Ing	**686**	**794**	**358**	**1601**	**3439**
TEKNO	521	613	260	1554	2948
ØKADM	155		52		207
HELSEFAG		168			168
REALFAG		13		47	60
SAMFUNN	10		46		56
Fak. 4 Sam		**1083**	**197**	**2898**	**4178**
SAMFUNN				1589	1589
LÆRER		502		617	1119
ØKADM		531	197	180	908
PEDFAG				223	223
TEKNO				190	190
IDRETT				71	71
SPRÅK		50			50
REALFAG				28	28
Fak. 5 Hum				**2386**	**2386**
SPRÅK				983	983
HISTORIE				742	742
ESTETISK				284	284
MEDIEFAG				197	197
LÆRER				120	120
SAMFUNN				60	60
Totalsum	**1485**	**3366**	**890**	**9435**	**15176**

Tabell 9-3 M2 Utdanningsområder, møtt H2014

Fakultet/Utd.omr.	HiG	HiST	HiÅ	NTNU	Totalsum
Fak. 1 Helse	**411**	**804**	**253**	**472**	**1940**
HELSEFAG	411	804	253	472	1940
Fak. 3 Mat	**388**	**283**		**1236**	**1907**
TEKNO	51	86		664	801
INFOTEKN	244	197		212	653
REALFAG				295	295
MEDIEFAG	79				79
LÆRER				65	65
ØKADM	14				14
Fak. 4 Ing	**686**	**794**	**358**	**1601**	**3439**
TEKNO	521	613	260	1554	2948
ØKADM	155		52		207
HELSEFAG		168			168
REALFAG		13		47	60
SAMFUNN	10		46		56
Fak. 6 Sam		**933**	**197**	**1547**	**2677**
SAMFUNN				999	999
ØKADM		531	197	180	908
HELSEFAG		402		32	434
TEKNO				190	190
IDRETT				71	71
LÆRER				47	47
REALFAG				28	28
Fak. 7 Utd		**552**		**1392**	**1944**
LÆRER		502		570	1072
SAMFUNN				599	599
PEDFAG				223	223
SPRÅK		50			50
Fak. 2 Nat			**82**	**801**	**883**
REALFAG			24	473	497
TEKNO				328	328
HELSEFAG			30		30
ØKADM			28		28
Fak. 5 Hum				**2386**	**2386**
SPRÅK				983	983
HISTORIE				742	742
ESTETISK				284	284
MEDIEFAG				197	197
LÆRER				120	120
SAMFUNN				60	60
Totalsum	**1485**	**3366**	**890**	**9435**	**15176**

Tabell 9-4 M2a Utdanningsområder, møtt H2014

Fakultet/Utd.omr.	HiG	HiST	HiÅ	NTNU	Totalsum
Fak. 1 Helse	**411**	**804**	**253**	**472**	**1940**
HELSEFAG	411	804	253	472	1940
Fak. 2 Nat			**82**	**801**	**883**
REALFAG			24	473	497
TEKNO				328	328
HELSEFAG			30		30
ØKADM			28		28
Fak. 3 Mat/IKT	**388**	**283**		**1236**	**1907**
TEKNO	51	86		664	801
INFOTEKN	244	197		212	653
REALFAG				295	295
MEDIEFAG	79				79
LÆRER				65	65
ØKADM	14				14
Fak. 4 Ing	**686**	**794**	**358**	**1435**	**3273**
TEKNO	521	613	260	1388	2782
ØKADM	155		52		207
HELSEFAG		168			168
REALFAG		13		47	60
SAMFUNN	10		46		56
Fak. 5 Hum				**2358**	**2358**
SPRÅK				983	983
HISTORIE				742	742
ESTETISK				256	256
MEDIEFAG				197	197
LÆRER				120	120
SAMFUNN				60	60
Fak. 6 Sam		**954**		**2502**	**3456**
SAMFUNN				1559	1559
LÆRER		502		617	1119
HELSEFAG		402		32	434
PEDFAG				223	223
IDRETT				71	71
SPRÅK		50			50
Fak. 7 Øk		**531**	**197**	**437**	**1165**
ØKADM		531	197	180	908
TEKNO				190	190
SAMFUNN				39	39
REALFAG				28	28
Fak. 8 Ark				**194**	**194**
TEKNO				166	166
ESTETISK				28	28
Totalsum	**1485**	**3366**	**890**	**9435**	**15176**

9.2. Oversikt over grunnenheter i modellenes fakulteter

Modell M1

Helse
DMF Institutt for kreftforskning og molekylær medisin
DMF Institutt for laboratoriemedisin, barne- og kvinnesykdommer
DMF Institutt for nevromedisin
DMF Institutt for samfunnsmedisin
DMF Institutt for sirkulasjon og bildediagnostikk
DMF Kavliinstituttet/CNC
DMF Regionalt kunnskapssenter for barn og unge
HiST Helse- og sosialfag Institutt for anvendt sosialvitenskap
HiSTHelse- og sosialfag Institutt for helsevitenskap
HiST Helse- og sosialfag Institutt for sykepleievitenskap
HiG helse, omsorg sykepleie
HiÅ Helsefag
SVT Institutt for sosialt arbeid og helsevitenskap
Nat/IKT
HiG Informatikk og medieteknikk
HiST Informatikk og e-læring
HiÅ biologiske fag
IME ELKRAFT
IME Institutt for datateknikk og informasjonsvitenskap
IME Institutt for elektronikk og telekommunikasjon
IME Institutt for matematiske fag
IME Institutt for teknisk kybernetikk
IME Institutt for telematikk
NT Institutt for biologi
NT Institutt for bioteknologi
NT Institutt for fysikk
NT Institutt for kjemi
NT Institutt for kjemisk prosessteknologi
NT Institutt for materialteknologi
Ing
AB Institutt for byforming og planlegging
AB institutt for byggekunst form og farge
AB institutt for byggekunst, historie og teknologi
AB institutt for byggekunst, prosjektering og forvaltning
HiG Teknologi, økonomi, ledelse
HiST Teknologi
HiÅ Ingeniør og realfag
HiÅ Maritim teknologi og operasjoner

IVT Institutt for bygg, anlegg og transport
IVT Institutt for energi- og prosessteknikk
IVT Institutt for geologi og bergteknikk
IVT Institutt for konstruksjonsteknikk
IVT Institutt for marin teknikk
IVT Institutt for petroleumsteknologi og anv. geofysikk
IVT Institutt for produksjons- og kvalitetsteknikk
IVT Institutt for produktdesign
IVT Institutt for produktutvikling og materialer
IVT Institutt for vann- og miljøteknikk

Hum/Sam

AB Institutt for billedkunst
HF Institutt for filosofi og religionsvitenskap
HF Institutt for historiske studier
HF Institutt for kunst- og medievitenskap
HF Institutt for musikk
HF Institutt for språk og litteratur
HF Institutt for tverrfaglige kulturstudier
HiST Handelshøyskolen
HiST Lærer- og tolkeutdanning
HiÅ Internasjonal business
SVT Geografisk institutt
SVT Institutt for industriell økonomi og teknologiledelse
SVT Institutt for samfunnsøkonomi
SVT Institutt for sosiologi og statsvitenskap
SVT Institutt for voksnes læring og rådgivningsvitenskap
SVT Norsk senter for barneforskning
SVT Pedagogisk institutt
SVT Program for lærerutdanning
SVT Psykologisk institutt
SVT Sosialantropologisk institutt

Modell M1a

Helse
DMF Institutt for kreftforskning og molekylær medisin
DMF Institutt for laboratoriemedisin, barne- og kvinnesykdommer
DMF Institutt for nevromedisin
DMF Institutt for samfunnsmedisin
DMF Institutt for sirkulasjon og bildediagnostikk
DMF Kavliinstituttet/CNC
DMF Regionalt kunnskapssenter for barn og unge
HiST Helse- og sosialfag Institutt for anvendt sosialvitenskap
HiST Helse- og sosialfag Institutt for helsevitenskap
HiST Helse- og sosialfag Institutt for sykepleievitenskap
HiG helse, omsorg sykepleie
HiÅ Helsefag
SVT Institutt for sosialt arbeid og helsevitenskap
Nat/IKT
HiG Informatikk og medieteknikk
HiST Informatikk og e-læring
HiÅ biologiske fag
IME ELKRAFT
IME Institutt for datateknikk og informasjonsvitenskap
IME Institutt for elektronikk og telekommunikasjon
IME Institutt for matematiske fag
IME Institutt for teknisk kybernetikk
IME Institutt for telematikk
NT Institutt for biologi
NT Institutt for bioteknologi
NT Institutt for fysikk
NT Institutt for kjemi
NT Institutt for kjemisk prosessteknologi
NT Institutt for materialteknologi
Ing
AB Institutt for byforming og planlegging
AB institutt for byggekunst form og farge
AB institutt for byggekunst, historie og teknologi
AB institutt for byggekunst, prosjektering og forvaltning
HiG Teknologi, økonomi, ledelse
HiST Teknologi
HiÅ Ingeniør og realfag
HiÅ Maritim teknologi og operasjoner
IVT Institutt for bygg, anlegg og transport
IVT Institutt for energi- og prosessteknikk
IVT Institutt for geologi og bergteknikk
IVT Institutt for konstruksjonsteknikk
IVT Institutt for marin teknikk

IVT Institutt for petroleumsteknologi og anv. geofysikk
IVT Institutt for produksjons- og kvalitetsteknikk
IVT Institutt for produktdesign
IVT Institutt for produktutvikling og materialer
IVT Institutt for vann- og miljøteknikk

Sam

HiST Handelshøyskolen
HiST Lærer- og tolkeutdanning
HiÅ Internasjonal business
SVT Geografisk institutt
SVT Institutt for industriell økonomi og teknologiledelse
SVT Institutt for samfunnsøkonomi
SVT Institutt for sosiologi og statsvitenskap
SVT Institutt for voksnes læring og rådgivningsvitenskap
SVT Norsk senter for barneforskning
SVT Pedagogisk institutt
SVT Program for lærerutdanning
SVT Psykologisk institutt
SVT Sosialantropologisk institutt

Hum

AB Institutt for billedkunst
HF Institutt for filosofi og religionsvitenskap
HF Institutt for historiske studier
HF Institutt for kunst- og medievitenskap
HF Institutt for musikk
HF Institutt for språk og litteratur
HF Institutt for tverrfaglige kulturstudier

Modell M2

Helse
DMF Institutt for kreftforskning og molekylær medisin
DMF Institutt for laboratoriemedisin, barne- og kvinnesykdommer
DMF Institutt for nevromedisin
DMF Institutt for samfunnsmedisin
DMF Institutt for sirkulasjon og bildediagnostikk
DMF Kavliinstituttet/CNC
DMF Regionalt kunnskapssenter for barn og unge
HiST Helse- og sosialfag Institutt for helsevitenskap
HiST Helse- og sosialfag Institutt for sykepleievitenskap
HiG helse, omsorg sykepleie
HiÅ Helsefag
Nat
HiÅ biologiske fag
NT Institutt for biologi
NT Institutt for bioteknologi
NT Institutt for fysikk
NT Institutt for kjemi
NT Institutt for kjemisk prosessteknologi
NT Institutt for materialteknologi
Mat/IKT
HiG Informatikk og medieteknikk
HiST Informatikk og e-læring
IME ELKRAFT
IME Institutt for datateknikk og informasjonsvitenskap
IME Institutt for elektronikk og telekommunikasjon
IME Institutt for matematiske fag
IME Institutt for teknisk kybernetikk
IME Institutt for telematikk
Ing
AB Institutt for byforming og planlegging
AB institutt for byggekunst form og farge
AB institutt for byggekunst, historie og teknologi
AB institutt for byggekunst, prosjektering og forvaltning
HiG Teknologi, økonomi, ledelse
HiST Teknologi
HiÅ Ingeniør og realfag
HiÅ Maritim teknologi og operasjoner
IVT Institutt for bygg, anlegg og transport
IVT Institutt for energi- og prosessteknikk
IVT Institutt for geologi og bergteknikk
IVT Institutt for konstruksjonsteknikk
IVT Institutt for marin teknikk

IVT Institutt for petroleumsteknologi og anv. geofysikk
IVT Institutt for produksjons- og kvalitetsteknikk
IVT Institutt for produktdesign
IVT Institutt for produktutvikling og materialer
IVT Institutt for vann- og miljøteknikk

Hum

AB Institutt for billedkunst
HF Institutt for filosofi og religionsvitenskap
HF Institutt for historiske studier
HF Institutt for kunst- og medievitenskap
HF Institutt for musikk
HF Institutt for språk og litteratur
HF Institutt for tverrfaglige kulturstudier

Sam

HiST Helse- og sosialfag Institutt for anvendt sosialvitenskap
HiST Handelshøyskolen
HiÅ Internasjonal business
SVT Geografisk institutt
SVT Institutt for industriell økonomi og teknologiledelse
SVT Institutt for samfunnsøkonomi
SVT Institutt for sosialt arbeid og helsevitenskap
SVT Institutt for sosiologi og statsvitenskap
SVT Norsk senter for barneforskning
SVT Sosialantropologisk institutt

Utd

HiST Lærer- og tolkeutdanning
SVT Institutt for voksnes læring og rådgivningsvitenskap
SVT Pedagogisk institutt
SVT Program for lærerutdanning
SVT Psykologisk institutt

Modell M2a

Helse
DMF Institutt for kreftforskning og molekylær medisin
DMF Institutt for laboratoriemedisin, barne- og kvinnesykdommer
DMF Institutt for nevromedisin
DMF Institutt for samfunnsmedisin
DMF Institutt for sirkulasjon og bildediagnostikk
DMF Kavliinstituttet/CNC
DMF Regionalt kunnskapssenter for barn og unge
HiST Helse- og sosialfag Institutt for helsevitenskap
HiST Helse- og sosialfag Institutt for sykepleievitenskap
HiG helse, omsorg sykepleie
HiÅ Helsefag
Nat
HiÅ biologiske fag
NT Institutt for biologi
NT Institutt for bioteknologi
NT Institutt for fysikk
NT Institutt for kjemi
NT Institutt for kjemisk prosessteknologi
NT Institutt for materialteknologi
Mat/IKT
HiG Informatikk og medieteknikk
HiST Informatikk og e-læring
IME ELKRAFT
IME Institutt for datateknikk og informasjonsvitenskap
IME Institutt for elektronikk og telekommunikasjon
IME Institutt for matematiske fag
IME Institutt for teknisk kybernetikk
IME Institutt for telematikk
Ing
HiG Teknologi, økonomi, ledelse
HiST Teknologi
HiÅ Ingeniør og realfag
HiÅ Maritim teknologi og operasjoner
IVT Institutt for bygg, anlegg og transport
IVT Institutt for energi- og prosessteknikk
IVT Institutt for geologi og bergteknikk
IVT Institutt for konstruksjonsteknikk
IVT Institutt for marin teknikk
IVT Institutt for petroleumsteknologi og anv. geofysikk
IVT Institutt for produksjons- og kvalitetsteknikk
IVT Institutt for produktdesign
IVT Institutt for produktutvikling og materialer
IVT Institutt for vann- og miljøteknikk

Hum
HF Institutt for filosofi og religionsvitenskap
HF Institutt for historiske studier
HF Institutt for kunst- og medievitenskap
HF Institutt for musikk
HF Institutt for språk og litteratur
HF Institutt for tverrfaglige kulturstudier
Sam
HiST Helse- og sosialfag Institutt for anvendt sosialvitenskap
HiST Lærer- og tolkeutdanning
SVT Geografisk institutt
SVT Institutt for sosialt arbeid og helsevitenskap
SVT Institutt for sosiologi og statsvitenskap
SVT Institutt for voksnes læring og rådgivningsvitenskap
SVT Norsk senter for barneforskning
SVT Pedagogisk institutt
SVT Program for lærerutdanning
SVT Psykologisk institutt
SVT Sosialantropologisk institutt
Øk
HiST Handelshøyskolen
HiÅ Internasjonal business
SVT Institutt for industriell økonomi og teknologiledelse
SVT Institutt for samfunnsøkonomi
Ark
AB Institutt for billedkunst
AB Institutt for byforming og planlegging
AB institutt for byggekunst form og farge
AB institutt for byggekunst, historie og teknologi
AB institutt for byggekunst, prosjektering og forvaltning

Tabell 9-5 Modell M1 Tall brukt i figurer i kap. 7

Fakultet	UFF-årsverk	UF-årsverk	Rekrutt-erings-stillinger	Publi-seringspoeng	Studie poeng, års-enheter	Studie poeng års-enheter per UF	Publika-sjons poeng per UF	Inter-nasjonal sam-publisering	Bevilgning	Boa	Andel lønns-kostnader
Fak. 1 Helse	840	504	323	429	5 150	10	0,85	276	666 438	555 232	0,65
Fak. 2 Nat/IKT	1 003	439	546	1 099	7 386	17	2,51	403	872 459	473 968	0,69
Fak. 3 Ing	906	506	385	871	6 905	14	1,72	165	859 168	486 379	0,67
Fak. 4 Hum/sam	892	661	224	798	11 393	17	1,21	79	863 387	177 393	0,80
Totalsum	**3 641**	**2 109**	**1 480**	**3 197**	**30 834**	**15**	**1,52**	923	**3 261 451**	**1 692 972**	**0,70**

Tabell 9-6 Modell M1a Tall brukt i figurer i kap. 7

Fakultet	UFF-årsverk	UF-årsverk	Rekrutt-erings-stillinger	Publisering spoeng	Studie-poeng, årsenheter	Studie-poeng-årsenheter per UF	Publikasjonspoeng per UF	Inter-nasjonal sam-publisering	Bevilgning	Boa	Andel lønns-kostnader
Fak. 1 Helse	840	504	323	429	5 150	10	0,85	276	666 438	555 232	0,65
Fak. 2 Nat/IKT	1 003	439	546	1 099	7 386	17	2,51	403	872 459	473 968	0,69
Fak. 3 Ing	906	506	385	871	6 905	14	1,72	165	859 168	486 379	0,67
Fak. 4 Sam	581	434	141	466	7 846	18	1,07	75	586 598	104 645	0,79
Fak. 5 Hum	311	227	84	332	3 547	16	1,47	4	276 789	72 748	0,83
Totalsum	**3 641**	**2 109**	**1 480**	**3 197**	**30 834**	**15**	**1,52**	**923**	**3 261 451**	**1 692 972**	**0,70**

Tabell 9-7 Modell 2 Tall brukt i figurer i kap.7

Fakultet	UFF-årsverk	UF-årsverk	Rekrutt-erings-stillinger	Publi-serings-poeng	Studie-poeng, årsenheter	Studie-poeng årsenheter per UF	Publika-sjons-poeng per UF	Inter-nasjonal sam-publisering	Bevilgning	Boa	Andel lønns-kostnader
Fak. 1 Helse	782	458	311	397	4 028	9	0,9	267	607 556	539 144	0,63
Fak. 2 Nat	487	203	277	561	1 955	10	2,8	243	378 481	286 563	0,66
Fak. 3 Mat/IKT	516	236	270	539	5 430	23	2,3	160	493 978	187 405	0,72
Fak. 4 Ing	906	506	385	871	6 905	14	1,7	165	859 168	486 379	0,67
Fak. 5 Hum	311	227	84	332	3 547	16	1,5	4	276 789	72 748	0,83
Fak. 6 Sam	332	227	101	246	5 374	24	1,1	43	315 650	76 175	0,82
Fak. 7 Utd	307	253	53	251	3 593	14	1,0	41	329 829	44 558	0,78
Totalsum	**3 641**	**2 109**	**1 480**	**3 197**	**30 834**	**15**	**1,5**	**923**	**3 261 451**	**1 692 972**	**0,70**

Tabell 9-8 Modell 2a Tall brukt i figurer i kap. 7

	UFF-årsverk	UF-årsverk	Rekrutt-erings-stillinger	Publi-serings-poeng	Studie-poeng, årsenheter	Studiepoe ngårsenhet er per UF	Publikasjo nspoeng per UF	Internasjo nal sampublise ring	Bevilgning	Boa	Andel lønns-kostnader
Fak. 1 Helse	782	458	311	397	4 028	9	0,9	267	607 556	539 144	0,63
Fak. 2 Nat	487	203	277	561	1 955	10	2,8	243	378 481	286 563	0,66
Fak. 3 Mat/IKT	516	236	270	539	5 430	23	2,3	160	493 978	187 405	0,72
Fak. 4 Ing	836	460	362	819	6 438	14	1,8	164	797 474	474 168	0,66
Fak. 5 Hum	305	223	82	332	3 479	16	1,5	4	265 000	71 312	0,83
Fak. 6 Sam	478	374	103	382	6 202	17	1,0	65	487 190	80 440	0,81
Fak. 7 Øk	161	106	50	114	2 766	26	1,1	19	158 289	40 293	0,77
Fak. 8 Ark	76	50	25	53	535	11	1,1	1	73 483	13 647	0,84
Totalsum	**3 641**	**2 109**	**1 480**	**3 197**	**30 834**	**15**	**1,5**	**923**	**3 261 451**	**1 692 972**	**0,70**

Tabell 9-9 UFF-stillinger

Stillingskode	Stillingsbenevnelse
1007	Høgskolelærer
1008	Høgskolelektor
1009	Universitetslektor
1010	Amanuensis
1011	Førsteamanuensis
1012	Høgskoledosent
1013	Professor
1017	Stipendiat
1108	Forsker
1109	Forsker
1110	Forsker
1183	Forsker
1198	Førstelektor
1352	Postdoktor
1378	Stipendiat
1404	Professor
1483	Undervisningsdosent
1532	Dosent
8013	Professor II
8028	Førsteamanuensis
8029	Universitetslektor
9301	Professor II

Tabell 9-10 UF-stillinger

Stillingskode	Stillingsbenevnelse
1007	Høgskolelærer
1008	Høgskolelektor
1009	Universitetslektor
1010	Amanuensis
1011	Førsteamanuensis (førstestilling)
1012	Høgskoledosent (førstestilling)
1013	Professor (førstestilling)
1108	Forsker
1109	Forsker (førstestilling)
1110	Forsker (førstestilling)
1111	Forskningssjef
1183	Forsker (førstestilling)
1198	Førstelektor (førstestilling)
1404	Professor (førstestilling)
1483	Undervisningsdosent (førstestilling)
1532	Dosent (førstestilling)
8028	Førsteamanuensis (førstestilling)
8029	Universitetslektor

Tabell 9-11 Rekrutteringsstillinger

Stillingskode	Stillingsbenevnelse
1017	Stipendiat
1352	Postdoktor (førstestilling)
1378	Stipendiat
1476	Spesialistkandidat

Kilde: DBH