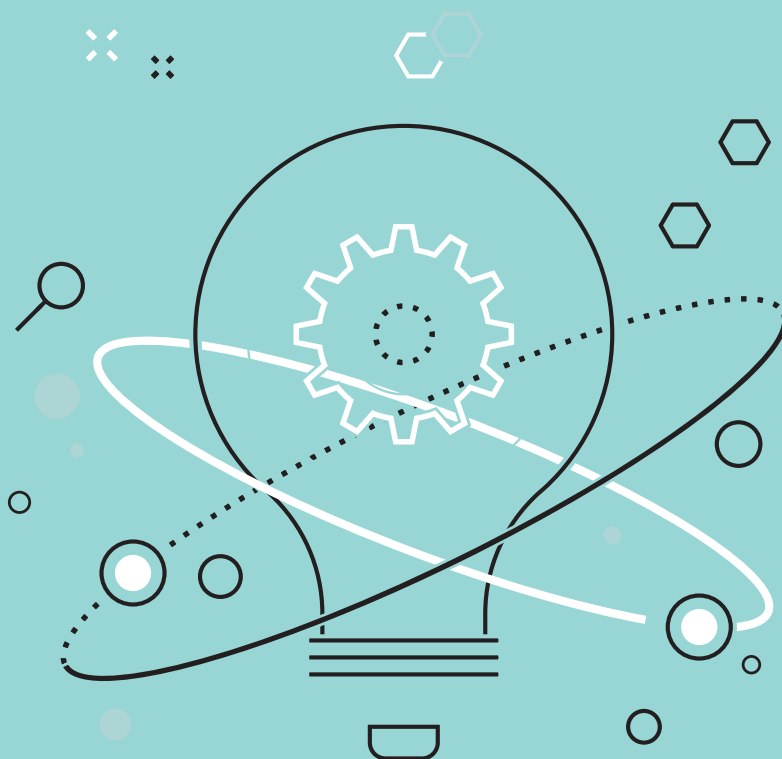


Comprehensive Plan for Innovation Competence at NTNU

Report from the working committee appointed
by the Pro-Rector for Innovation



Report from the working committee
for “Development of a Comprehensive Plan
for Innovation Competence at the NTNU”
appointed by the Pro-Rector for Innovation

NTNU, June 2023

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FOREWORD

Strengthened competence in innovation can increase value creation from research

For many years, NTNU has been an important contributor to sustainable value creation, transition processes, and increased competitiveness. A high level of innovation activity is a hallmark of NTNU. However, there is great potential for increased value creation through wider application of research results for the benefit of both the public and the private sector.

Through our employees and our infrastructure, NTNU is Norway's largest research resource. There are increased expectations that research must contribute to innovation and benefit society. In NTNU's strategy for the period 2018–2025 'Knowledge for a Better World', innovation was specifically defined as one of the core tasks at NTNU with clear development goals. In NTNU's performance agreement with the Ministry of Education and Research for 2023-2026, we have pledged to be a driving force and partner for sustainable societal development. This entails major commitments to and expectations from both the private and the public sectors regarding the contribution that knowledge from NTNU will make to creating value for our partners. It will therefore be more important than ever before to contribute to applying knowledge in practice and creating value. This aligns with expectations in the Long-Term Plan for Research, in strategic national and international documents, and in the letter of allocation from the Ministry of Education and Research.

It is important that NTNU's academic groups have the capacity and competence to realize NTNU's ambitions within all the core areas. This also applies to the field of innovation. But there has been a lack of clarity about what competence employees actually need to enable them to deliver on the core task of innovation. The Pro-Rector for Innovation has therefore appointed a working committee to investigate this specific issue. The working committee highlights several key factors for successfully translating research into innovation. Strengthening and development of innovation competence among employees must be prioritized at all levels of leadership. Additionally, contributions to innovation, as well as active participation in networks and collaboration should be recognised, and valued also in recruitment, career assessments and promotions (see CoARA, the Coalition for Advancing Research Assessment, and NOR-CAM, the Norwegian Career Assessment Matrix).

The Pro-Rector thanks the working committee for its important work. The report and recommendations provide a sound basis for taking steps to increase innovation capacity by further developing competence in the field of innovation at NTNU in the time ahead.

By boosting NTNU's contribution to value creation from research, we contribute to realizing NTNU's vision 'Knowledge for a Better World'.



Trondheim, June 2023

Toril Nagelhus Hernes
Pro-Rector for Innovation
NTNU

1. SUMMARY

Innovation is strategically anchored as one of the core tasks in NTNU's strategy 2018–2025. According to the performance agreement with the Ministry of Education and Research for the period 2023-2026, NTNU will develop its 'role as a driving force and partner for sustainable societal development' and 'create innovation, development and transformation by using research-based knowledge and new technology'.

The working committee for the *Comprehensive Plan for Innovation Competence at NTNU* has been given a wide-ranging mandate. It has therefore been necessary to describe the plan in concrete terms at a relatively general level. The plan sets the direction for how NTNU should work with innovation competence in the time ahead. The proposals are important starting points in relation to various change processes that are now under way nationally and internationally, such as changes in the assessment of research applications and changes in how academic activity is assessed in academic careers (CoARA)¹. There is a need to recognize and increase competence in the area of innovation. Employees must be both motivated and equipped to handle the growing expectations that the institution will be an active driver for societal transition.

Strategic leaders are key recipients of the working committee's report. At the same time, the report can provide inspiration for anyone who works with or wants to work with innovation.

For NTNU to achieve its goals for innovation, the work and expertise of its

employees are vital. As there are no procedures for documenting innovation activities and making them visible, we *do not have an overview of specific needs* for competence in the organization. As innovation is becoming a key factor in successful applications for research funding and documenting innovation activities is important for strategically developing competence within academic communities, the working committee recommends that NTNU establish procedures for documenting these contributions and enhancing their visibility in the form of an 'innovation profile'. The profile should be flexible and adaptable to different academic environments and positions. The working committee wants more competences to be recognized as worthy of merit, without expecting everybody to do everything – a principle consistent with the Norwegian Career Assessment Matrix (NOR-CAM)², which is based on a broader assessment of academic careers.

To fulfil society's expectations that NTNU will be an active contributor in solving societal challenges, strengthening competitiveness and innovation capacity, the working committee's assessment is that there is a need to strengthen competence in innovation at NTNU.

Key factors for success require:

- leaders at every level to treat innovation competence as a priority
- recognition of and emphasis on active participation in networks and collaboration

¹ CoARA - Coalition for Advancing Research Assessment

² Veileder for vurdering i akademiske karriereløp NOR-CAM – En verktøykasse [NOR-CAM – A toolbox for recognition and rewards in academic careers] Universities Norway (uhr.no)

- strengthening the development of competence in innovation as a discipline among employees and academic groups

Basic competence in intellectual property (IP) has been highlighted as a necessary foundation of knowledge that everyone should be familiar with. Training in innovation competence must be developed. Course offerings must meet real needs, and must be perceived as useful. Increased demand for customized training in innovation competence is expected in the future, and a system must be developed that is able to respond to the needs reported. We recommend offering basic introductory training and developing a module-based course offering in specific (and sought-after) areas. Development of an 'innovation profile' at the individual and academic group level will be a useful tool for identifying the needs for competence. As experience-based knowledge is important in innovation work, the working committee proposes establishing forums where experience-based expertise can be shared.

The working committee believes it is necessary to strengthen incentives for choosing innovation as part of the career path. Over time, a gap has developed between the results and activities by which academic staff have traditionally been measured, and the expectations for contributions to innovation and benefit to society in their research. In the longer term, political signals, stronger emphasis

on how research-based knowledge is translated into benefits to society in externally funded research, and implementation of CoARA and NOR-CAM will drive incentives for work on innovation. Today, however, specific incentives are needed at NTNU so that more time can be set aside for innovation work, and so that innovation activities and collaboration with working life can be implemented in practice. This will promote motivation and interest in innovation competence and innovation work.

Recommendations from the working committee for the development of innovation competence:

- **Introduce a system for documenting innovation competence among employees by establishing an 'innovation profile' - which also provides an overview of the collective competence of academic groups/units**
- **Set expectations for fundamental skills in IP for all employees (basic competence)**
- **Develop training programmes in innovation competence**
- **Establish forums for exchange of experience-based competence/ sharing of experience**
- **Strengthen incentives to work with innovation and to recognize innovation as part of the career path**

2. INTRODUCTION

For NTNU, innovation is an important core task, and a hallmark of the university. There is a need to increase competence in the area of innovation so that NTNU can deliver on its innovation mission.

Mandate and composition

The working committee for the 'Development of a Comprehensive Plan for Innovation Competence at NTNU' was appointed by the Pro-Rector and was discussed at a meeting of the Innovation Committee on 22 April 2022.

The description of the background for the appointment of the committee states:

'Innovation is one of NTNU's core tasks. The letter of allocation from the Ministry for 2022 specifically emphasizes that "Knowledge, competence and a culture of innovation and commercialization activities in the higher education sector are essential to success in creating value from research. This must be given attention in all subjects and disciplines". The Pro-Rector's dialogue meetings with the faculties as well as several discussions in the Innovation Committee have revealed a need to increase competence in innovation among academic, technical and administrative employees at NTNU. The Pro-Rector for Innovation will therefore appoint a working committee to make recommendations in this area.'

According to its mandate, the working committee is to:

- Develop an overview of challenges regarding the needs for competence to realize NTNU's objectives within the core task of innovation
- Define what innovation competence is needed within the various target groups at NTNU in order to fulfil the innovation mission in accordance with NTNU's strategy within the core task of innovation

- Develop a comprehensive plan for the development and implementation of innovation competence, incentives and support schemes for the various target groups at NTNU
- Propose an assessment framework that includes innovation competence in recruitment processes and career development

The full mandate for the working committee is included in the appendix.

The working committee has consisted of:

Chair of the committee:

Catherine Taylor Nordgård, Vice-Dean of Innovation, Faculty of Natural Sciences (NV)

Members:

Alenka Temeljotov-Salaj, Vice-Dean for innovation, Faculty of Engineering (IV)

Rolee Aranya, Professor and Head of Programme, Department of Architecture and Planning, Faculty of Architecture and Design (AD)

Ståle Johansen, Professor, Department of Geosciences and Petroleum, Faculty of Engineering (IV)

Robert Næss, Associate Professor, Department of Interdisciplinary Studies of Culture, Faculty of Humanities (HF)

Hans Solli Sæther, Head of the Department of International Business, Faculty of Economics and Management (ØK)

Anne Berit Emstad, Innovation Manager, Professor, Faculty of Social and Educational Sciences (SU)

Tormod Njølstad, Innovation Manager, Department of Electronic Systems, Faculty of Information Technology and Electrical Engineering (IE)

Christin H Berndtsson, Research and Innovation Adviser, Faculty Administration, Faculty of Medicine and Health Sciences (MH)

Secretariat:

Ragnhild Nisja and Hilde Kyrkjebø, senior advisers, Rector's staff – innovation

Kristin Wergeland Brekke, Senior Advisor HR

Scope, organization and approach to work

The working committee's mandate is wide-ranging. The plan presented here is therefore at an overarching level and indicates the direction for how NTNU should work with competence development in the time ahead.

However, the plan includes specific details for some points that call for urgent action. The proposed measures are important starting points in relation to various changes that are now under way, such as changes in how academic activities are assessed in academic careers (CoARA), and changes in the assessment of research applications, as well as internal changes at NTNU such as IP management in connection with commercialization processes.

Leaders are key recipients of the working committee's report (primarily line leaders). At the same time, the report may provide inspiration for anyone who works with or wants to work with innovation.

The working committee has had 7 meetings.

3. BACKGROUND

3.1 NTNU's mission related to innovation

'Strengthened competitiveness and innovative capacity' is one of the three overarching objectives in the Government's long-term plan for research and higher education 2023–2032³, and higher education institutions are expected to follow up the objectives in the long-term plan in alignment with the distinctive character of their own academic profile. NTNU's mission is described in the annual letter of allocation and in the performance agreement with the Ministry of Education and Research 2023–2026⁴. During this agreement period, NTNU must develop its 'role as a driving force and partner for sustainable societal development' and 'create innovation, development and transformation by enabling the use of research-based knowledge and new technology'.

Innovation work is strategically anchored as one of the core tasks in NTNU's strategy 2018–2025 'Knowledge for a Better World'. The development goals for innovation are to:

- strengthen long-term collaboration with established business and the public sector to improve innovation capability,
- increase the number of innovations, commercialization projects and start-ups from staff and students, and
- include training in innovation in our students' education.

Through the long-term plan mentioned above, the government will 'continue to strengthen work-related relevance in the programmes of study based on regional and national needs by creating a basis

for more systematic dialogue and collaboration'. NTNU's strategy describes this mission as follows: 'During their studies, students gain skills in innovation and address issues relevant to business and the public sector. In this way, our graduates become attractive employees, contributing to change processes and development in existing and new workplaces.'

Under Section 1–3 letter f) of the Universities and University Colleges Act, higher education institutions must contribute to innovation and value creation based on the results of research as well as academic and artistic development work, while letter g) states that they must work together with relevant actors at international, national, regional and local level to strengthen the quality and relevance of the institution's activities.

For NTNU to achieve its goals for innovation, the work and expertise of its employees are vital. The development of employees' competence is therefore also a question of institution building and quality development.

3.2 Trends in national and international development

Social relevance and innovation are steadily growing in importance in the assessment of applications for research funding. This trend is reflected in the EU framework programmes, which have moved towards an ever stronger inclusion of innovation across the entire spectrum of the programme. The Research Council of Norway (NFR) is also increasingly demanding documentation of the benefits to society

³ Report No. 5 to the Storting (2022–2023) Meld. St. 5 ENG (2022–2023) ([regjeringen.no](https://www.regjeringen.no))

⁴ [tildelingsbrev-2023-norges-teknisk-naturvitenskapelige-universitet-.pdf](https://www.regjeringen.no) ([regjeringen.no](https://www.regjeringen.no))

that the research will generate. Because innovation is becoming an increasingly important element in successful research applications, NTNU's academic environments must develop procedures to document how research can be translated into actual benefit in society and make this impact visible.

When subject areas or research projects are evaluated, researchers and academic communities often need to document what, how and who has used the new knowledge that has been developed, and what significance this has had.

Over time, a gap has developed between the results and activities by which academic staff have traditionally been measured and the expectations for contributions to innovation and benefit to society in their research. Many people have therefore argued that greater recognition must be given for different types of roles and professional contributions from academic staff. The activities referred to in this context include work on peer reviews, social networking, supervision, leadership, dissemination and outreach, entrepreneurship and collaboration with working life (the private- and public-sector as well as the non-profit sector). There is a demand for recognition of a wider range of results from research beyond scientific publications, including development of methods, software, algorithms, experiments or workflows, contributions to policymaking, and exhibitions. There are higher expectations for a culture of sharing in line with the goal of open science practice. There is also growing criticism of the frequent misuse of, or over reliance on, publication-based indicators and rankings of institutions as a measure of quality in the assessment of researchers and research. The sector's shift towards broader and more qualitative

assessment of research is reflected in the format requirements for CVs at the European Research Council (ERC) and the Research Council of Norway. Both have introduced a more comprehensive evaluation of research results and researchers by using CV templates that include presentation of a track record and a narrative of the researcher's background and work beyond publications alone.

Since the San Francisco Declaration on Research Assessment (DORA)⁵ in 2012, new international recommendations and reports have contributed to the development of principles and guidelines for evaluating researchers and research, most recently in the European Agreement on Reforming Research Assessment. The purpose of the reform is to promote research quality and impact. NTNU joined CoARA⁶, the Coalition for Advancing Research Assessment, on 17 November 2022. NTNU has thus committed itself to recognizing a greater diversity of careers and contributions to research that respect the distinctive nature of each discipline and match the needs of society. Evaluation of researchers and research must mainly be based on qualitative peer assessment, supported by responsible use of quantitative indicators.

Internationally, there are examples of initiatives taken both nationally and at individual universities to assess researchers on a broader basis of competence and skills. For example, extensive revision of research evaluation methods is taking place at a number of institutions in the Netherlands, based on a memorandum from the Dutch sister organization to Universities Norway (UHR). Their researcher evaluation recognizes different types of contributions such as collaboration and teamwork. Universities Norway (UHR) has developed the toolbox 'Norwegian Career Assessment Matrix

⁵ Home | DORA ([sfdora.org](https://www.sfdora.org))

⁶ COARA – Coalition for Advancing Research Assessment

(NOR-CAM)⁷ for assessment of academic results, competence and experience. In Norway, institutions will be able to follow up the CoARA commitments through the implementation of NOR-CAM. UHR-Innovasjon, a national coordination arena in innovation for the member institutions of Universities Norway, has appointed a working group to assess merit and competence development in the field of innovation, which will be completed in June 2023. This initiative is a further concretization of NOR-CAM.

3.3 Overview of Challenges at NTNU

A strengthening of innovation competence is necessary to solve challenges in society and address NTNU's social mission. It is a goal that all employees contribute to realizing the practical application of research-based knowledge to benefit society through the education of our students, and through research and innovation activities. Knowledge and competence in innovation should be included as a natural part of research, innovation and educational activities.

For NTNU to contribute to innovation, the work and expertise of its employees are vital. There must be a connection between how NTNU is evaluated and how employees are assessed, so that ambitions in the field can be achieved. While procedures have been established for documentation and visibility of education and research at NTNU, there are no corresponding procedures for documentation of the university's innovation and collaboration with the private and public sectors. At present, NTNU does not have systems or procedures that pave the way for recognizing and rewarding competence in innovation for academic staff.

NTNU's Staff Regulations include competence and results related to innovation as well as collaboration with industry and the working world as a relevant area of competence in connection with recruitment. This aligns with the CoARA principle of recognizing a wider range of academic contributions. The NOR-CAM toolbox provides examples in greater detail, but there is a need to develop evaluation criteria, tools and processes for documentation of competence in the area of innovation.

As mentioned earlier, competence assessment of researchers has mainly been based on research publications, and the university sector lacks schemes for recognition of merit in the area of innovation. In 2019, education received a boost with new regulatory requirements for competence in teaching in connection with recruitment and promotion. There are now hopes that the revised regulations in 2023 will also provide a boost to the third mission related to dissemination, innovation, and external relations.

Nationally and internationally, a number of initiatives have been launched to change the way that academic activity is assessed in academic careers and in competition for research funding. A question for NTNU is whether it wants to take an influential role at the forefront of such a development, or whether it wants to take a less prominent position.

The working committee summarizes the overview of challenges as follows:

To fulfil society's expectations that NTNU will be an active contributor in solving societal challenges, strengthening competitiveness and innovation capacity, the working committee's assessment is that

⁷ Veileder for vurdering i akademiske karriereløp NOR-CAM – En verktøykasse [NOR-CAM – A toolbox for recognition and rewards in academic careers] Universities Norway (uhr.no)

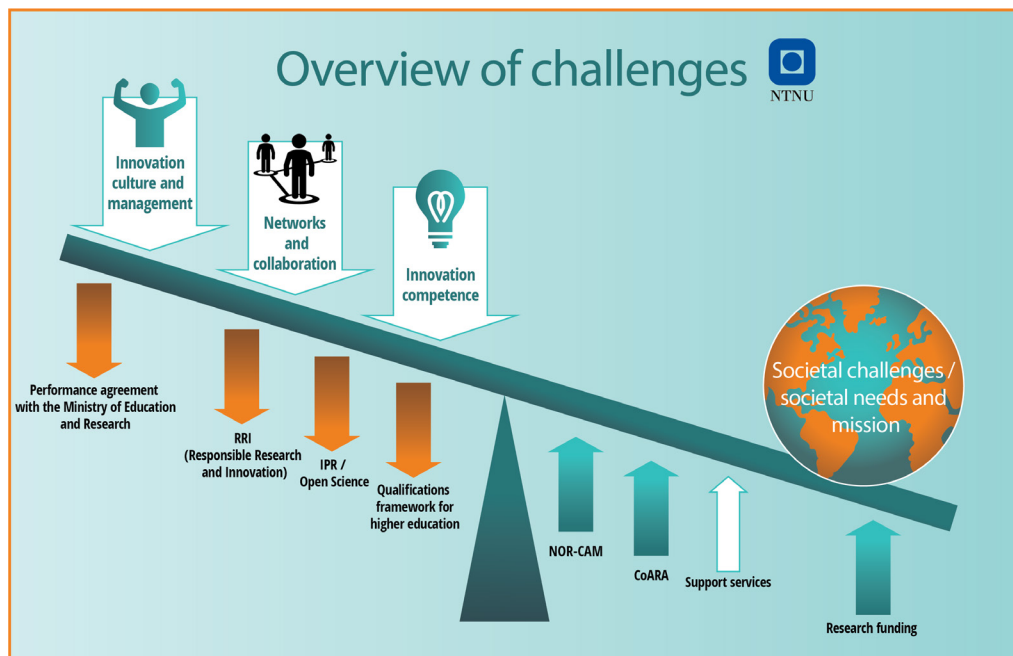


Figure 1: Elements that are important to enable NTNU to deliver on its mission.

there is a need to strengthen competence in innovation at NTNU.

Taking action is a prerequisite for delivering on our mission. Key factors for success require:

- leaders at every level to treat competence in innovation as a priority
- recognition and emphasis on active participation in networks and collaboration
- strengthening the development of competence in innovation as a discipline among employees and academic groups

In Figure 1, the arrows illustrate these three factors that can boost our ability to deliver on our mission and contribute to solving societal challenges and needs.

The figure also includes other factors pushing in the same direction, illustrated by orange and green arrows. The expectations for innovation in the performance agreement with the Ministry of Education and Research, the intentions behind the framework for responsible research and

innovation (RRI) in which the fundamental idea is to ensure that science and technology are developed in alignment with the values and needs of society, stimulation to make research and innovation more open through the intentions in open science, [Policy for Open Science – NTNU](#) as well as requirements for content about innovation in the programmes of study are factors pushing in the same direction. In research funding, societal benefits and innovation are increasingly important, and NTNU's endorsement of CoARA, as well as the development of tools for assessing academic career paths (see NOR-CAM), will pull in the direction of a greater diversity of career paths that can strengthen the ability to deliver on our mission.

NTNU's internal support system for innovation activities is illustrated by a white arrow. Expectations and needs regarding the way that a support system should be organized will change over time, and it is important that it is developed in parallel to meet real challenges and needs in the organization.

4. THE WORKING COMMITTEE'S APPROACH AND SCOPE FOR THE DEVELOPMENT OF A COMPREHENSIVE PLAN FOR INNOVATION COMPETENCE

The working committee has a wide-ranging mandate. It has therefore been necessary to report at a relatively general level.

The working group has based its work on a broad understanding of innovation and competence in innovation. For example, as defined by the Research Council of Norway: *Innovations are new or significantly improved goods, services, processes, organisational and governing forms or concepts that are implemented to promote value creation and/or yield benefits to society*⁸. A more detailed discussion of the broad approach to innovation can be found in the NTNU report from 2019⁹.

Different faculties and departments may have different approaches to and understanding of innovation, and they have different disciplinary and experience-related traditions related to innovation ventures.

Innovation can be described as an active process in which one seeks to find applications for knowledge – either established or new knowledge. An innovation process may involve finding solutions to defined problems (applied research), or it may be an active process for applying the knowledge generated through, for example, basic research.

NTNU's research is the basis for innovation, and basic research is important for innovation. The link between research and innovation takes place through gradual

transitions/interactive cycles, as illustrated in Figure 2. It is important to keep the possible application of research in mind

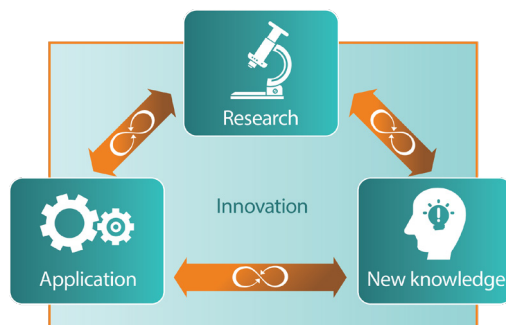


Figure 2: Relationship between research and innovation

early in the research process, and to have the expertise and room for manoeuvre (management support) to explore it further in specific projects. Innovation competence should be included as an integrated and natural part of research work to help ensure that research-based knowledge is applied in practice.

Universities contribute to innovation and knowledge transfer in many ways. The report 'How Universities Contribute to Innovation'¹⁰, shows that the most important channels for knowledge transfer are long-term collaboration between universities and stakeholders in society as well as the education of university students. Figure 3 from the OECD¹¹, which is referred

⁸ Innovasjon i offentlig sektor. NFR strategi 2018–2023 [1254032549913.pdf](https://www.forskingsradet.no/1254032549913.pdf) ([forskingsradet.no](https://www.forskingsradet.no)) (Summary in English: Innovation in the public sector. NFR strategy 2018-2023) <https://www.forskingsradet.no/siteassets/publikasjoner/strategy-for-innovation-in-the-public-sector.pdf>

⁹ Mot et bredere målesystem for UoH-sektorens bidrag til innovasjon [Towards a broader measurement system for the higher education sector] [jae2f5507-07c7-439a-a7fb-8a92fa7fd666](https://www.ntnu.no/jae2f5507-07c7-439a-a7fb-8a92fa7fd666) ([ntnu.no](https://www.ntnu.no))

¹⁰ [2233414b-d9cd-85ad-6bc8-58b9bc0c9d78](https://www.ntnu.no/2233414b-d9cd-85ad-6bc8-58b9bc0c9d78) ([ntnu.no](https://www.ntnu.no))

¹¹ [University-Industry Collaboration: New Evidence and Policy Options](https://www.oecd.org/en/publications/2019/04/university-industry-collaboration-new-evidence-and-policy-options) | en | OECD 2019en | OECD 2019

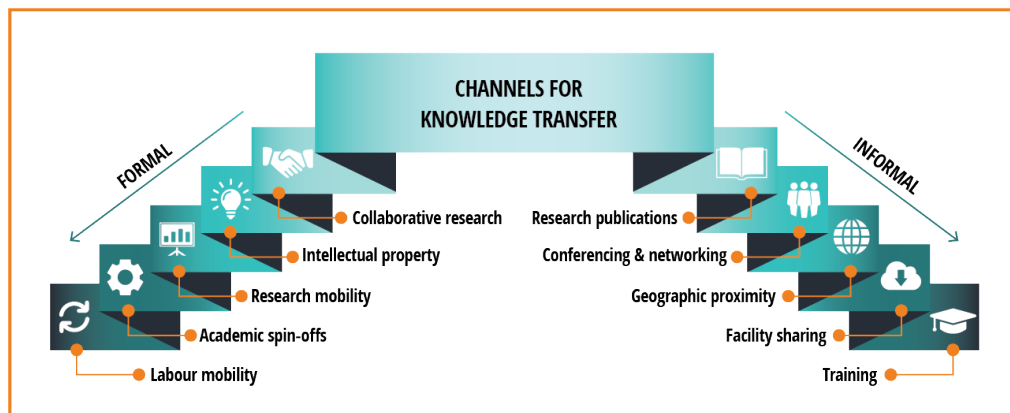


Figure 3: Channels for knowledge transfer (OECD, 2019, p. 31)

to in this report, illustrates that knowledge transfer can take place through formal and informal channels. Knowledge transfer through formal channels takes place through collaborative research, exploitation of intellectual property rights, researcher mobility, start-up companies and recent graduates in the workforce. More informal channels for knowledge transfer include research publications, conferences and networks, geographical proximity/co-location, shared infrastructure, as well as courses and continuing education.

As there are no procedures for documenting innovation activities and making them visible, we do not have an overview of specific needs for competence in the organization. For instance, we do not know whether it is time or competence that is a limiting factor. The report *'Documentation and visibility of innovation at NTNU'*¹² points out that for academic staff at NTNU, finding the time and space for work on innovation is regarded as a challenge.

We know that there is considerable experience-based innovation competence

as well as research competence at NTNU. It is important to make this competence visible as well as to recognize it, keep it, and develop it further. Over the past 20 years, financial incentives and research assessment practices have led to a stronger emphasis on international publishing, and this may have reduced the attention given to innovation.

An important part of a comprehensive plan for innovation competence is to gain an overview of existing competence so that knowledge and experience sharing and exchange can be extended beyond those who already work in 'the field'.

'Everybody should not do everything', is one of the recommendations from NOR-CAM. Several different types of competence should be recognized and rewarded, and the institution should create the conditions for employees to immerse themselves in different areas (research, education, innovation, external relations, management) throughout their career path, based both on their own interests and on the needs of the institution.

¹² Dokumentasjon og synliggjøring av innovasjon og nyskaping ved NTNU. Fokus på samfunnseffekt og samarbeid med arbeidsliv. (English version: Documentation and visibility of innovation at NTNU. Focus on societal impact and collaboration with working life. https://www.ntnu.edu/documents/1272711283/1276140112/2020_nov_Documentation+and+visibility+of+innovation+at+NTNU.pdf/36bee14f-f68b-9b95-e779-a10abd610b23?t=1636538286055)

A profile focus in one area does not exclude the need for competence in other areas.

Knowledge of intellectual property rights (IPR) and open science are examples of basic competence that everyone should have. The working committee considers it very important that employees have sufficient knowledge to be 'aware of a lack of knowledge' and to seek support when needed to ensure that NTNU fulfils its mission in an effective manner (see Figure 7).

The working committee believes it is important to look at the incentive structure and to stimulate opportunities for including innovation in an academic career path, and that this will contribute to a

desire to acquire innovation competence. Here, an important factor will be recognizing and considering different types of contributions and competences in connection with recruitment and promotion.

The working committee has discussed various elements that will be key to promoting innovation, and believes NTNU must focus on the following factors when promoting innovation:

- **Knowledge about society and societal challenges**
- **Strategic leadership**
- **Collaborative competence**
- **Knowledge in the discipline of innovation**
- **Personal characteristics and competence**

Key elements that promote innovation are illustrated in Figure 4 below.

Knowledge about society and societal challenges

When NTNU is to develop its 'role as a driving force and partner for sustainable societal development' and 'create innovation, development and transformation by enabling the use of research-based knowledge and new technology', it is necessary to have good insight and

knowledge of society and societal challenges to ensure relevance to society in its work.

Strategic leadership

Management must support both each person's individual needs and the need of the academic groups for innovation competence in order to fulfil their mission. Recognition is a key factor here. With support for new requirements for evaluation of research and researchers, which

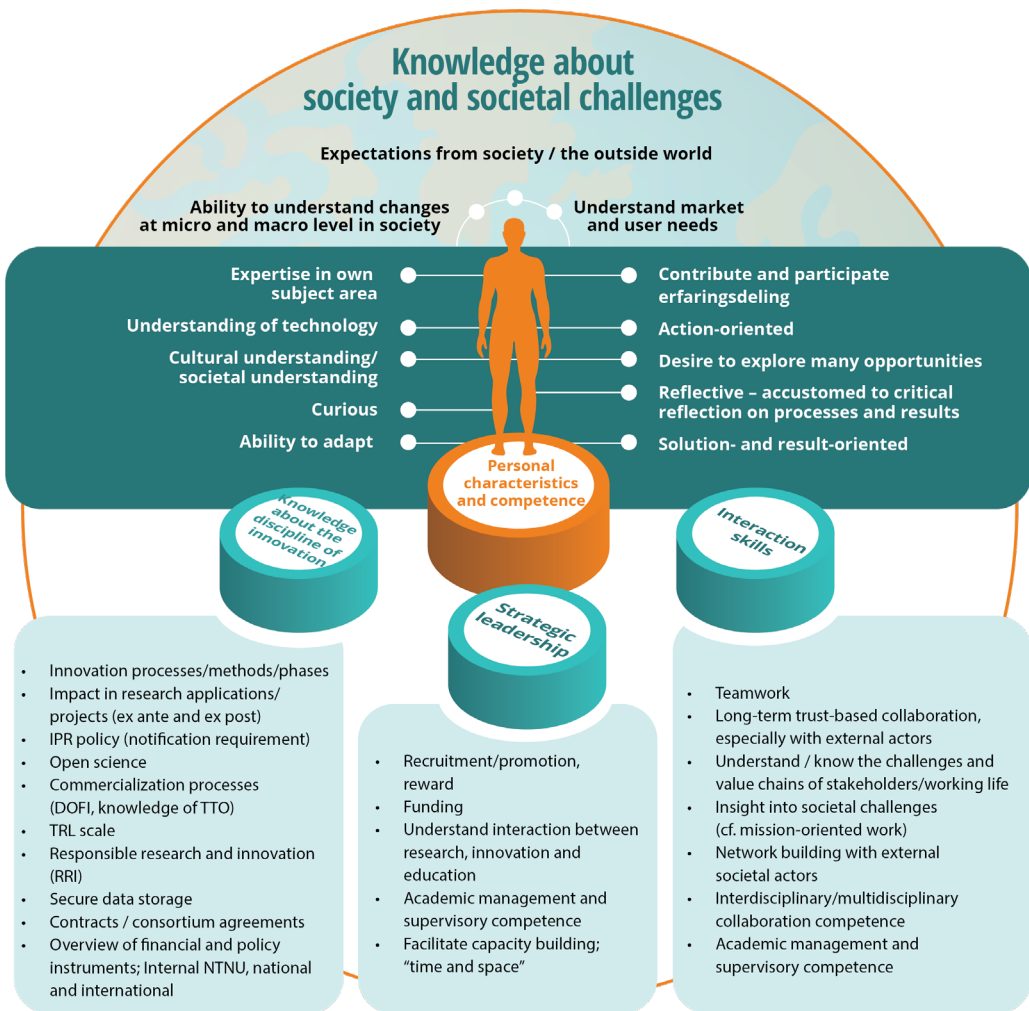


Figure 4: Key elements that promote innovation

place increasing emphasis on interaction with society and value creation (CoARA), facilitation and competence development for the individual academic employee and for the academic groups will be placed on the agenda going forward. More time and space must be carved out, so that it is possible to implement innovation efforts and collaboration with working life in practice.

Collaborative competence

Innovation is often the result of interdisciplinarity and cross-sectoral work that requires collaborative skills. Innovation requires interaction between many actors and takes place at the interface between people and perspectives. Trust is essential for good collaboration and is something that develops over time. Networking skills and the ability to work together with internal and external stakeholders (partners and users in the private and public sectors) are pivotal to innovation. Similarly, competence in teamwork across boundaries (sectors and disciplines) and mission-oriented work is important. 'Mission-oriented work' means goal-oriented missions/pioneering initiatives where the goal is to find solutions to defined technological and/or social problems by a given deadline.

Knowledge in the discipline of innovation

Knowledge in the discipline of innovation involves an understanding of innovation and innovation processes. Innovation takes place in different contexts and there are different forms of innovation, such as product innovation and service innovation. Insight into different methods, theory, techniques and tools that can be used in different innovation processes will be a key success factor. For understanding technological maturity, knowledge of tools such as the Technology Readiness Level (TRL) scale is important.

Knowledge that makes it possible to describe the likely benefit to society (ex ante impact) of the research in applications for funding is becoming increasingly important, combined with the ability to document how the results from research have contributed or will contribute to benefit society (ex post impact).

Some basic skills must form the basis of work with innovation, such as knowledge of intellectual property rights (IPR) – see the Act relating to the right to employees' inventions [*arbeidstakeroppfinnelsesloven*]¹³ and NTNU's Policy for Intellectual Property Rights – IPR¹⁴ with the accompanying guidelines. The Act requires all employees to report potential ideas, that is, they must notify the employer of employee inventions and ideas by submitting a Disclosure of Invention form (DOFI). Employees should also be familiar with NTNU TTO and their responsibilities and services, and have insight into the relationship between open science and IPR. In addition, they need some basic knowledge of contracts for cooperation and consortium agreements.

Knowledge of available financial and policy instruments is also important for promoting innovation efforts.

Personal characteristics

Curiosity, the desire to explore many possibilities, and the ability to adapt are examples of personal qualities that promote innovation. At the same time, it is naturally important to possess expertise in your own discipline.

¹³ Lov om retten til oppfinnelser som er gjort av arbeidstakere [Act relating to the right to employees' inventions]

¹⁴ NTNU's Policy for intellectual property rights – IPR

5. RECOMMENDATIONS FROM THE WORKING COMMITTEE FOR THE DEVELOPMENT OF INNOVATION COMPETENCE

Proposal 1: Introduce a system for documenting innovation competence among employees by establishing an ‘innovation profile’

The committee proposes introducing an ‘**innovation profile**’, using a format such as a simple table to systematically gather and document innovation-related activities and the specific competence of employees, academic communities and groups. This will provide a structured but flexible overview. In the next step, this can form a basis for reflection, mapping of needs and further development at both the individual and the group level.

The individual researcher can use the content of such a profile in documenting their CV in applications for research funding. It can also be used as documentation for job applications or career development.

Such a table can be created based on elements that are important for competence – see Figure 2. Figure 5, below, sets out an initial outline for such a profile that should be further developed.

Establishing such a profile will cover various functions discussed in Action 4 in ‘Utviklingsplan for økt samspill, innovasjon og samfunnseffekt [*Development plan for increased interaction, innovation and societal impact*]¹⁵:

	Topic	Courses/training/education	Experience	Outputs (measurable/countable)	IMPACT (in society)
Networks and collaboration	General participation and contributions				
	Formalized innovation collaboration (through cooperation /consortium agreements)				
	Dissemination and outreach				
	Stakeholders and value chain				
	Multidisciplinary/transdisciplinary collaboration				
	Strategic thematic areas (mission-oriented)				
Specific competence	Innovation projects and processes, methods/phases				
	Service innovation				
	Intellectual property and rights (IP, IPR)				
	Open science				
	Technology and knowledge transfer				
	Intrapreneurship				
	Responsible research and innovation (RRI)				
	Experience from other sectors				

Figure 5: Table structure for the content of an innovation profile

¹⁵ NTNUs Utviklingsplan for økt samspill, innovasjon og samfunnseffekt [NTNU's development plan for increased interaction, innovation and societal impact]

Develop good incentives for increased innovation in academic environments and recognition of merit for employees

- *Develop standards for documentation and visibility of innovation activity, as well as documentation of collaborative projects with working life. This will also be important documentation for:*
 - *career development based on innovation*
 - *innovation, education and development work in collaboration with the working world*
 - *documenting work with regard to assessment criteria for applications for research funding in accordance with the DORA declaration.*

Many areas of competence that are relevant to innovation have broad application and relevance. They may be skills that are also important for research and education, and they can be built up through research, education or innovation projects.

Introducing an innovation profile will help NTNU to pinpoint relevant experience and specific competence acquired by an employee or in the academic community, section or department.

There is considerable diversity among employees at NTNU, so not all topics in the table will be relevant to everyone. Such a table should also be flexible, allowing topics to be added. The table should be regarded as a tool and not as an end in itself.

Creating and maintaining an innovation profile may increase the focus on innovation among employees. This documentation (mapping) of existing competence and results can later provide a basis for reflection on one's own competence. The innovation profile is a tool that can create awareness of different types of competence and skills, and tacit knowledge may be revealed. This provides an opportunity to make existing activities visible. These activities may be important elements in innovation efforts, such as interdisciplinary work, contact with societal stakeholders, etc.

Such documentation (mapping) will give line managers an overview of employees' tacit knowledge and competence and may reveal people with key skills in the academic communities. It is also a tool that can create opportunities for a discussion about the need for competence development and can bring this need to the surface.



Figure 6: Illustration of innovation profile

This applies to both academic and administrative staff.

At the *individual level*, the innovation profile can be included in performance appraisals, where it can serve as documentation of academic contributions and experiences in accordance with the university's mission, and be used in further planning of competence and career paths. NTNU's human resources policy states that NTNU will pave the way for predictable and equitable career paths where, during their careers, employees can emphasize different areas of competence and develop qualifications in them in line with their own interests as well as the needs of the academic communities and society¹⁶.

There will also be potential for using the innovation profile at *academic group level*. An overview of the academic group's combined competence will be available, which may reveal a need for competence development in order to build robust groups and teams. The introduction of an innovation profile can thus be an important tool in the strategic development of competence.

The innovation profile can also be used in connection with recruitment and promotion. The profile will collect information described in point D of NOR-CAM¹⁷: *Interaction with society, dissemination and innovation*. The working committee's proposal to develop an innovation profile will create a tool and a basis for evaluating innovation competence in connection with recruitment and promotion.

Expected effects of introducing an innovation profile:

- **Culture building:** At the unit level, such documentation could strengthen

awareness and reflection on innovation at the unit, and signal the importance of innovation. It can also reveal synergies between innovation, research, education and artistic activity, as well as providing benefits by making innovation competence visible (for example, in applications for funding). It will also raise the visibility of overlap with other ongoing processes such as Open Science, Responsible Research and Innovation (RRI) and Technology Education of the Future (FTS).

- **Competence mapping and needs analysis:** The innovation profile can be used to identify necessary and/or desirable competence development for each employee, so that line managers can facilitate the development of competence for their staff and students. At group level, a **unit profile** can be used to map the innovation competence of the unit, and what needs to be developed further to close gaps at unit level (department/section/centre/programme of study, etc). This will improve our ability to assess what competence development we need to help us achieve our mission. We assume that demand will drive the concrete design of needs for competence development, which will be an important part of the follow-up work and as part of strategic competence development at unit level.
- **Recognition:** An overview like this may contribute to recognition of both individual competence and achievements in groups that have been realized through collaboration. A variety of profiles can be recognized – some people want to build up competence so that they can teach students in innovation, while others want to develop skills in contact with working life to promote innovation, interdisciplinary work, etc. Recognition

¹⁶ NTNU's human resources policy. Section 7

¹⁷ Veileder for vurdering i akademiske karriereløp NOR-CAM – En verkøykasse [NOR-CAM – A toolbox for recognition and rewards in academic careers]

is regarded as an important factor in creating a basis for merit awards.

- **Innovation taxonomy:** The development and application of an innovation profile could contribute to creating a taxonomy for describing innovation competence and, with time, for measuring it. In this way, NTNU could be a pioneering institution in Norway for developing tools that can also be used by others.

Proposal 2: Set expectations for fundamental skills in IP for all employees (basic competence)

All employees should have knowledge about intellectual property (IP) and intellectual property rights (IPR). IP knowledge should be regarded as necessary on an equal footing with knowledge about health, safety and the environment (HSE): not mastering IPR as basic competence could damage NTNU's ability to deliver on its mission, and therefore **everyone** must know the most basic principles. As a rule, for all results and all physical material with potential for commercial exploitation, the employee must notify the university through its technology transfer office, NTNU TTO, with a copy to the head of department at the department where the inventor is employed. NTNU's recently developed website on IPR is an important and easily accessible resource that provides a solid introduction to the key elements ([Innovation and knowledge management – NTNU](#)).

Figure 7 provides a good illustration of the different levels of knowledge that may apply in different contexts. If one does not know that one lacks knowledge of IP, i.e. 'unconscious incompetence' (see the 1st quadrant in the figure), one can do great harm to further research and the application of research results. The consequences may include undermining the prospects of translating the research results into products and services that benefit society. All employees should therefore have a

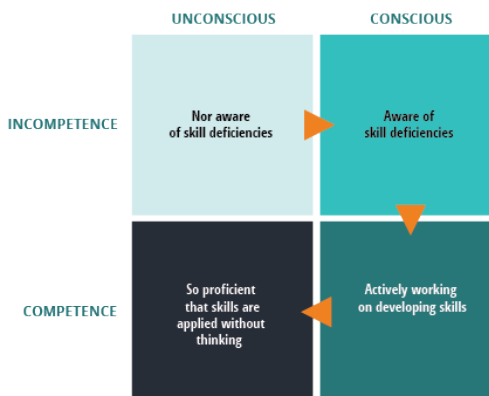


Figure 7: Various levels of knowledge

minimum knowledge of IP and IPR at NTNU.

The working group therefore proposes that all employees should be expected to read the websites about IPR, and to answer a set of questions/pass an online exam afterwards. There should be a requirement to have passed such a test for those who are to supervise both academic staff and students. A requirement to complete such a test would increase competence throughout the organization, and send a strong signal that this is important for NTNU.

IP competence should also be part of NTNU's onboarding programme for new employees.

Proposal 3: Develop training programmes in innovation competence

It is important to encourage more people to gain experience and competence in innovation. The development of various training programmes will be an important part of the work on such competence enhancement. Demand for training in innovation competence is expected to increase in the time ahead for several reasons, because:

- Work on the innovation profile will reveal needs for competence and

a desire for training to 'close any knowledge gaps' in innovation.

- The inclusion of innovation competence as an element worthy of merit in academic careers (see CoARA) and expectations related to externally funded research, will drive demand for documentable formal competence in innovation
- Requirements for content about innovation in the programmes of study will trigger a demand for courses and training to make it possible to meet expectations, for example:
 - Report No. 30¹⁸ to the Storting (2019–2020) states: 'The programmes emphasise how student teachers can contribute to innovation processes relating to the school's activities and facilitate the involvement of representatives of the labour market, society and the cultural sector in teaching. It is a goal that teachers graduating from the programmes are capable of acting innovatively.'
 - The regulations on national guidelines for medical education (2020)¹⁹ state: 'The candidate can contribute to new thinking, innovation processes, innovation in services, systematic work processes and continuous quality improvement.'

It is important that the training offered meets real needs and that the participants thus perceive it as useful for them. The training offered will help to ensure that NTNU is better equipped to deliver on its mission. It is important to keep NTNU's diversity in mind. Different academic environments may have different approaches to what innovation means within their subject area, and there will be varying expectations of innovation competence in

the different study programmes, while the existing competence among employees may vary. Requirements to take part in standard training may thus be perceived as a less relevant activity.

A basic introductory course should therefore be developed for those who do not have experience with innovation, but who wish to develop in this field. This could be supplemented with module-based courses in specific (and sought-after) areas.

It may also be relevant to develop training in social benefit/impact – both *ex ante* (assumed benefit) and *ex post*²⁰ (verified benefit), as this is included as an important element in future research funding.

Development of a web portal for innovation resources should be considered, where standard online courses can be posted, but where it is also possible to report a need for more customized courses/workshops for different topics.

Courses and course certificates will also be useful for formalizing and documenting experience-based innovation competence. Course participants will be able to learn from each other and acquire more systematic and generic competence.

The need for training and competence is closely linked to being able to deliver on expectations from society. It must be easy to get access and an overview of existing support systems for innovation (that is, what one can learn from others, what one can get help for, etc.). As expectations from both society and the support systems change, we must take into account that the need for competence will change, and the range of courses offered must therefore be dynamic. For example, the new

¹⁸ Report.No. 30 to the Storting (2019–2020) An innovative public sector – Culture, leadership and competence <https://www.regjeringen.no/contentassets/14fce122212d46668253087e6301cec9/en-gb/pdfs/stm201920200030000engpdfs.pdf>

¹⁹ Regulations on national guidelines for medical education

²⁰ Work is now in progress on a knowledge base for *ex post* analysis at NTNU

cooperation agreement with NTNU TTO will mean that the responsibility for authorizing TTO to manage NTNU's IP related to specific commercialization processes will be transferred from NTNU centrally to the academic communities represented by deans/heads of departments. This change triggers an immediate need for sharing competence and experience. Work with innovation profiles may also be useful in these cases, by providing a better overview of existing competence in the organization. This will create an opportunity to draw on resources who already possess the required expertise and thus contribute to sharing of knowledge and experience across academic environments.

Proposal 4. Forums for exchange of experience-based competence/sharing of experience

We know that experience-based knowledge is important in innovation work. Experience transfer is important in terms of sharing good practices and working methods that have yielded good results (value creation and benefits to society). This applies especially to those who work with large research and innovation projects (such as Centres for Research-based Innovation (SFIs)/Environment-friendly Energy Research (FMEs)), but also to other innovation projects that have succeeded. It is important to communicate information both from and between those who are working 'in the field'. Both formal forums (for example, networking meetings) and informal forums (for example, innovation cafés) for sharing competence and experience can increase employee engagement and competence. Active participation in such forums provides insight into innovation processes and can be used further to disseminate innovation activities. This will be an important contribution to developing a culture for and ownership of innovation work in the organization, which in turn is an important part of integrating innovation into the university's other core activities.

More formal experience-building pathways can also be established. For example, one could consider developing a management school that could prepare relevant candidates for leadership roles in SFIs and FMEs or other major research and innovation projects. Such programmes will also highlight the interaction between research, innovation and education, and promote an NTNU culture that supports NTNU's main profile – see NTNU's strategy 'Knowledge for a better world'.

Proposal 5: Strengthen incentives to work with innovation and to recognize innovation as part of the career path

There is a need to consider and clarify merit schemes for innovation work, and to ensure adequate incentives and incentive schemes.

The sector lacks schemes for recognition of merit in the area of innovation. Until now, competence assessment has mainly been based on competence in scientific research. In 2019, the area of education received a boost with new regulatory requirements for pedagogical competence in connection with appointment and promotion. There are now hopes that the revised regulations in 2023 will also provide a boost to the third mission related to dissemination, innovation and external relations. However, NTNU's Staff Regulations open the door to inclusion of innovation activities and collaboration with the working world in the overall assessment of competence in the recruitment process. For this reason, NTNU should use the existing room for manoeuvre where this is desirable based on strategic competence assessment.

Implementation of CoARA and NOR-CAM will be an important driver for changes in assessments of academic career paths, where the aim is to include a broader range of competences. NTNU will use the Norwegian NOR-CAM toolbox from UHR in the follow-up of the CoARA commitments. NOR-CAM proposes using a matrix for

assessing academic results, competences and experience for six areas of competence. One of the areas of competence is point D, 'Interaction with society dissemination and innovation'. NOR-CAM can be used as a tool in assessing academic competence in recruitment, promotion and the allocation of funding. It can be used to assess which areas of expertise to target when advertising positions and funding. It is also a tool for people who apply for positions, promotion, and research funding, as well as for competence development and career planning. It will be important to develop a taxonomy for describing innovation competence and, with time, for measuring it. The working committee's proposal for an 'innovation profile' could be used to develop the content in the D area of competence.

The basis of NTNU's pay policy for academic staff (Section 3.1.2.1) is that the emphasis is primarily on academic results achieved, followed by innovation and dissemination efforts. The working committee believes that documented results in the field of innovation (see the innovation profile) should be emphasized in NTNU's pay negotiations on an equal footing with the other core areas of research, education and dissemination.

NTNU's sabbatical scheme can be used for activity in all the core areas, including innovation and collaboration with the working world, but is primarily intended to be used for internationalization. The working group believes that the purpose of the scheme should be expanded and should place the four core areas on an equal footing to create an opportunity for continuous time for innovation activity, regardless of whether the activity takes place in Norway or abroad. The opportunity is there, but recognition and acceptance are

prerequisites for taking advantage of the room for manoeuvre.

NTNU has merit schemes for recognition of excellent teaching practitioners. The working group believes that a similar merit scheme for actors in innovation should be investigated.

In addition, the working group believes that different forms of reward can be considered in more detail. For example, academic groups could be rewarded if they have achieved good results in the field of innovation. An example of a reward might be the grant of a 4-year postdoc position for work in their research area. On the basis of the documentation (mapping) in the innovation profile, academic groups could apply for such a reward.

In conclusion, the working group believes that incentives must be designed in a way that makes it possible to set aside more time for innovation work, enabling practical implementation of innovation activities and collaboration with working life.

Among other things, there should be scope for PhD candidates and postdocs to use required duties for innovation activities or placements in the working world, preferably with external funding from companies/Innovation Norway²¹ or public-sector organizations.

In the performance agreement with the Ministry of Education and Research, there are policy signals regarding innovation activity. The way that incentives are built up is also related to how NTNU follows this up in its own management within the frameworks set for the university. In the longer term – with the hope that indicators and assessment criteria for innovation will be better developed – we recommend looking more closely at how innovation

²¹ NTNU has provided input on this in the work towards the revised Regulations concerning appointment and promotion. [Høring Strategi for forskerrekuttering og karriereutvikling \[Consultation on the Strategy for Researcher Recruitment and Career Development\]](#)

should be included in NTNU's budget allocation model.

6. THE ROAD AHEAD

The plan from the working committee sets the direction for how NTNU should work with innovation competence in the time ahead. The proposals are important starting points in relation to various change processes that are now under way – see the changes in the assessment of research applications and changes in how academic activity is assessed in academic careers (CoARA). There is a need to increase competence in the area of innovation. Employees must be both motivated and equipped to handle the growing expectations that the institution will be an active driver for societal transition.

Strategic leaders are key recipients of the report. At the same time, the report can provide inspiration for anyone who works with or wants to work with innovation.

Cooperation and distribution of work between the academic communities at the departments/faculties and the joint administration will be important in the follow-up of the plan.

In Chapter 5, the working committee has presented five different proposals for how innovation competence can be developed. Specific actions for following up the proposals appear below. They have been sorted according to various points described in the mandate.

Needs for competence in innovation

Active use of an innovation profile will be a useful tool for identifying knowledge gaps and needs for increased competence.

There is a need to develop a system capable of responding effectively to the needs that have been identified for strengthening competence in the field of innovation.

Action: Innovation profile – where innovation competence is documented (mapped).

- In 2023, a separate working group will be appointed to look more closely at the design of the innovation profile. This is then tested in pilots at individual departments/academic groups.
- An assessment is to be made of the benefits for the department/academic group and the benefits in the context of competence evaluation and career development; see the NOR-CAM and CoARA commitments, in 2024.
- Implementation of an innovation profile at department level (possibly as an integrated part of a more comprehensive programme, cf. follow-up of NOR-CAM/CoARA).

Development of competence in innovation

According to the trends described in the report, there is likely to be greater demand for competence in innovation, and an increase in the demand for documentable formal qualifications in innovation is expected. Expectations and needs for support services will change over time, and it is important that they are developed to address real challenges and needs in the organization – a *flexible and responsive support system*. Here, active use of the innovation profile will also be a useful tool in the work on strategic development of competence.

Action: Develop training programmes in innovation competence, primarily demand-driven (in person, web-based, or on-demand)

- Training package in IPR (online course, onboarding course, etc.)
- Basic introductory course on innovation.
- Module-based courses in specific areas (that are in demand).
- Course on impact / societal benefit in research applications (ex ante), and verified impact (ex post). Development project on ex post has started, and can form the basis for courses later.

Action: Establish forums for exchange of experience-based competence/sharing of experience

Assessment framework that includes innovation competence in recruitment processes and in career development

Implementation of CoARA and NOR-CAM will be an important driver for changes in assessments of academic career paths, where the aim is to include a broader range of competencies. NOR-CAM proposes using a matrix for assessing academic results, competencies and experience for six areas of competence. One of the areas of competence is point D, 'Interaction with society dissemination and innovation'. The working committee's proposal to introduce an innovation profile will be an important tool and a basis for evaluating innovation competence in connection with recruitment and promotion. As NTNU's Staff Regulations allow for including innovation activities and collaboration with other sectors in the overall assessment of competence in the recruitment process, this room for manoeuvre should be used where this is desirable based on strategic needs for competence.

Action: Innovation profile – where innovation competence is documented (mapped).

- This action, which is described in more detail under competence needs, will also contribute to further development of the taxonomy for describing and subsequently measuring competence in innovation. Efforts to develop an innovation profile will contribute to further development of an NTNU NOR-CAM so that it can function as a tool for competence assessment and career development.

Incentives and stimulation – for implementing innovation-related activities

Political signals and stronger weighting of benefits to society in externally funded research will be drivers for innovation efforts. In the longer term, implementation of CoARA and NOR-CAM will also drive incentives for work on innovation. Today, however, specific incentives are needed at NTNU so that more time can be set aside for innovation work, and so that innovation activities and collaboration with working life can be implemented in practice. Better operating conditions will promote motivation and interest in innovation activities.

Action: Incentives to choose innovation as part of a career path.

- In 2023, a separate working group will be appointed to investigate various forms of incentives, such as merit schemes, funding schemes, reward systems for academic groups, application of the sabbatical scheme to innovation activities, pay policy, etc. This will be followed by pilots in which this is tested, before possible implementation.

APPENDIXES:

Appointment of the working committee for developing the 'Comprehensive Plan for Innovation Competence at NTNU'

With reference to item no. 3 in the Innovation Committee's meeting on 22.04.2022 regarding Appointment of the working committee for 'Development of a Comprehensive Plan for Innovation Competence at NTNU'.

Based on discussions in the Innovation Committee in 2022, the following working committee is appointed:

Chair of the committee:

Catherine Taylor Nordgård, Vice-Dean of Innovation, Faculty of Natural Sciences (NV)

Members:

Alenka Temeljotov-Salaj, Vice-Dean for innovation, Faculty of Engineering (IV)

Rolee Aranya, Professor and Head of Programme, Department of Architecture and Planning, Faculty of Architecture and Design (AD)

Ståle Johansen, Professor, Department of Geosciences and Petroleum, Faculty of Engineering (IV)

Robert Næss, Associate Professor, Department of Interdisciplinary Studies of Culture, Faculty of Humanities (HF)

Hans Solli Sæther, Head of the Department of International Business, Faculty of Economics and Management (ØK)

Anne Berit Emstad, Innovation Manager, Professor, Faculty of Social and Educational Sciences (SU)

Tormod Njølstad, Innovation Manager, Department of Electronic Systems, Faculty of Information Technology and Electrical Engineering (IE)

Christin H Berndtsson, Research and Innovation Adviser, Faculty Administration, Faculty of Medicine and Health Sciences (MH)

Stine Halle Faugstadmoen, Senior Adviser, HR

Secretariat:

Ragnhild Nisja, Senior Adviser, Innovation Staff

Mandate of the working committee for the 'Development of a Comprehensive Plan for Innovation Competence at NTNU':

- *Develop an overview of challenges in connection with needs for competence to realize NTNU's objectives within the core task of innovation: Relevant factors are:*
 - International experience and trends, national challenges and expectations regarding the higher education sector's contribution to transformation and innovation in working life
 - Develop NTNU's 'tacit knowledge' and 'the NTNU DNA' that have been built up over time with regard to NTNU's contribution to innovation, applied research and collaboration with working life
 - Incentives and stimulation for developing innovation competence and implementation of innovation-related activities
 - Recognition of merit and career development

- *Define what innovation competence is needed within the various target groups at NTNU in order to fulfil the innovation mission in accordance with NTNU's strategy within the core task of innovation*
 - Innovation competence may be relevant for all employee groups at NTNU. Specify innovation competence for the various target groups:
 - academic staff who will conduct education, research, innovation, dissemination; for example, professors, associate professors, assistant professors (universitetslektorer), postdocs, PhDs, researchers
 - Innovation managers
 - Technical and administrative employees who will provide support in innovation activities
 - Managers at various levels in NTNU, including the heads of Centres for Research-based Innovation (SFIs) and Environment-friendly Energy Research (FMEs)
 - and possibly others

- *Develop a comprehensive plan for the development and implementation of innovation competence, incentives and support schemes for the various target groups at NTNU*
 - Setting priorities for actions
 - Schedule for implementation applicable from 2023
 - Resources and budget

- *Propose an assessment framework that includes innovation competence in recruitment processes and career development that*
 - is transparent about including competence and experience in innovation in recruitment processes,
 - highlight and clearly define what aspects of innovation work and innovation competence can be regarded as worthy of merit in a career path for academic staff.

Specification of the work method:

- The work must be seen in the context of the efforts to develop an overall framework for competence development, the 'Comprehensive Plan for Competence Development for NTNU Employees'
- The work must be seen in the context of NTNU's strategy, the letter of allocation from the Ministry of Education and Research and NTNU's performance agreement 2023-2026 with the Ministry (in progress at the time of writing), and NTNU's overall ecosystem and support services for innovation.
- Use work methods that provide insight into the competence needs of various target groups in different employee groups along the way to gain an understanding of challenges and needs
- The Innovation Committee is the reference group and is involved along the way for input/dialogue

Time frame:

17. 06.2022:

Presentation of the working group's work plan to the Innovation Committee (IU), including plan for presentation/discussion in IU

01.12.2022:

The working committee submits its recommendation to the Pro-Rector for Innovation

The secretariat will shortly convene the first meeting of the working committee.

Best regards

Toril Nagelhus Hernes
Pro-Rector for Innovation

Background:

Innovation is one of NTNU's core tasks. The letter of allocation from the Ministry for 2022 specifically emphasizes that 'Knowledge, competence and a culture of innovation and commercialization activities in the higher education sector are essential to success in creating value from research. This must be given attention in all subjects and disciplines. After the Pro-Rector's dialogue meetings with the faculties, as well as several discussions in the Innovation Committee, a need has emerged to increase competence in innovation among academic, technical and administrative employees at NTNU. The Pro-Rector for Innovation will therefore appoint a working committee to make recommendations in this area.

Anchoring in applicable strategies and reports that provide background information

- Letter of Allocation from the Ministry of Education and Research
- NTNU's strategy 2018-2025 Knowledge for a Better World.
- NTNUs Utviklingsplan for økt samspill, innovasjon og samfunnseffekt [NTNU's development plan for increased interactivity, innovation and societal impact].
- The report 'Documentation and visibility of innovation at NTNU – Focus on societal impact and collaboration with working life'. November 2020'
- Performance agreement with the Ministry of Education and Research – see Goal 4: NTNU will develop and increase innovation activity and the contribution to sustainable innovation originating from clusters and centres.

'NTNU will increase innovation activities through further development of internal support functions and incentives to make it easier for NTNU's academic environments to take advantage of national policy instruments and participate in the EU's innovation-oriented programmes. This work also includes clearer anchoring in line management, implementation of new IPR policy and further development of policy instruments to increase the innovation rate and competence level in the academic communities. NTNU will boost student innovation by establishing a dedicated student hub and piloting ways to integrate competence in innovation and entrepreneurship into the study programmes, including PhD education.'

- Revised IPR policy, in effect from 1.1.2021
- Cooperation agreement between NTNU TTO and NTNU, in effect from 1.1.2021

Several analytical studies in progress:

- Separate working committee for the development of a comprehensive ecosystem for student innovation.
- SFU Engage is conducting a project on innovation in the bachelor's, master's and PhD programmes, exploring the development of models for the integration of innovation and entrepreneurship in education.
- Support services for commercialization – Consultation on NTNU TTOs – Strategic plan 2022–2030
- Support functions for service innovation – the Health Pilot – has been launched.
- Indicator project pilot to measure the contributions to innovation from the higher education sector so as to make them visible. Report in the spring of 2022.

- Work on developing a 'Comprehensive plan for competence development for NTNU employees' will start during the spring. This is intended to be an overall plan that applies to all employees and a superstructure for the more specific plans for competence development. The plan will outline a shared vision, set a level of ambition and clarify expectations within career and competence development for NTNU employees from a lifelong perspective. It will also establish a holistic system for career and competence development at NTNU. The work will start in the spring of 2022. The plan is intended as a superstructure for the discipline-specific plans for competence development.
- The 'Plan for Comprehensive Development of Pedagogical Competence at NTNU' has just been circulated for consultation and is expected to be adopted during 2022.

Other documents:

- NOR-CAM – A toolbox for recognition and rewards in academic careers [Veileder for vurdering i akademiske karriereløp – [the NOR-CAM report](#)] discusses the scope that universities have for including innovation activity as a basis for recognition of merit / applications for promotion.
- The San Francisco Declaration on Research Assessment (DORA), which NTNU has signed – see the discussion of the DORA declaration in the report '[Documentation and visibility of innovation at NTNU](#) page 15.

