



Norsk studentorganisasjon

Holbergs gate 1 / 0166

Oslo

T: 22 04 49 70

E: nso@student.no

W: www.student.no

Platform on Research, Development and Innovation (RDI)

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NSO's policy on research, development and innovation (RDI)

1.0 Introduction

This platform covers NSO's requirements and goals in relation to research policy in Norway. NSO's other policy documents supplement and elaborate on the policy in this platform.

Research creates insight, dispute and debate about societal issues. Research contributes to the development of society. A long-term investment in research is essential to solve global, national and local societal challenges.

Research should be closely connected with education. Universities and university colleges are important participants in Norwegian research. Therefore, it is decisive that the conditions are in place to allow Norwegian institutions to carry out high quality research. Research is a joint concern which should contribute in solving large-scale societal challenges. Therefore, a long-term investment is required. Research of high quality is a premise for offering high quality higher education. Research-based education and student participation in research contributes to better research.

The best conditions for good research exist when researchers have a high level of predictability and freedom to carry out their work. This must be ensured through stable financial conditions and less use of temporary positions in academia. At the same time, the Research Council of Norway (RCN) needs competitive arenas in which good academic environments can flourish.

1.1 Main challenges

Four main priorities will be of special importance over the next few years:

1. *Increased co-ordination* – Resources and aids for research should be distributed to correspond with national and international societal challenges. Transparency is required in the distribution of resources and there must be a clear distribution of responsibility.
2. *Long-term approach* – It is important to acknowledge the need for good conditions for basic research, applied research and long-term projects which do not necessarily meet immediate demands for usefulness.
3. *Knowledge triangle* – Innovation and creativity must be closely integrated with higher education, to make it possible to commercialise research results and ideas.
4. *International participation* – Norwegian participation in international research projects needs to increase, with a special focus on creating the right conditions for increased participation in the EU Framework Programme for Research and Innovation (Horizon 2020).

2.0 Research governance

Norway must have an integrated research policy which takes into consideration the ways in which Norwegian research can contribute in solving global challenges. If we are to have good research environments, political management of research must be well-co-ordinated, transparent, consistent and progressive.

There must be a clear distribution of tasks between the different sectors of the Norwegian research system. Universities and university colleges should have a primary focus on carrying out research on their own initiative and doing projects with grants from the Research Council of Norway (RCN) and the EU Framework Programmes, while research institutes should primarily carry out commissioned research.

The Storting (Norwegian Parliament) manages research by deciding the priorities which will bind the government's work on research. This includes the four-yearly White Papers on Research and the Long-term Plan for Research and Higher Education.

Resources and aids for research must be distributed to correspond with national and international societal challenges. It must be transparent where and why resources have been allocated. In the long term, the total expenses of research and development must be increased to 3% of the country's gross domestic product. This goal reflects an investment in research and development (R&D) in both the public and private sectors. A large-scale effort will be required to reach this goal, stimulating R&D activities in general, and business and industry in particular.

The *sector principle* decrees that all departments have a long-term responsibility for research within their sector, and a responsibility for research which meets the department's own knowledge requirements for policy development and management. RCN's individual negotiations with the different departments create an obstacle to the effective co-ordination of thematic research grants, making it difficult to create the right conditions for research across sectoral and departmental borders. RCN and the departments must co-ordinate research and innovation funding in a manner that meets the challenges posed by the sector principle.

Higher education institutions have a responsibility to see their own research activities in relation to their academic profile, the studies they offer and the challenges society faces. Thematic priorities within Norwegian research should pay special attention to the areas in which Norway has extra favourable conditions to succeed.

The government's Research Committee should function as a political research-prioritising body. The Committee should be headed by the Prime Minister, and the top levels of political leadership should be represented. The Research Committee should be active and practical. The Research Council of Norway should have an observer role on the committee.

The pressure on higher education institutions to get external funding for their activities adversely affects the other central tasks of the institutions. Basic funding to institutions must

be increased so that they are able to realise their strategic priorities. This will also reduce the pressure of research applications on RCN.

Every fourth year, the Storting assesses and approves a White Paper on Research. This provides guidance for Norwegian research policies. Other plans should elaborate on, concretise and bind the policies of the White Paper. The Long-term Plan for Research and Higher Education is one example. Plans which affect the higher education sector should see research and education in relation to each other.

2.1 Funding

The Norwegian government must create the conditions for innovative creative, ground-breaking research in Norway. Research funding must provide the basis for quality in research and education, making space for projects with an uncertain outcome.

2.1.1 Higher education funding

NSO is in favour of a funding system which safeguards the main tasks of higher education institutions – that is, teaching, research and knowledge dissemination. Institutions must be guaranteed good basic funding to allow them to develop according to their own strategies. Basic funding must be increased in relation to performance-based funding.

2.1.2 The Research Council of Norway (RCN)

The main tasks of RCN are to fund research and give advice on research policy.. At the same time, RCN should take a distinct position in the research sector as an independent political participant. RCN has a special responsibility to see research in a long-term perspective. Broad participation in the development and implementation of research policies and strategies is conditional on RCN establishing itself as a natural meeting point for the higher education sector. It is important that RCN considers the funding of research infrastructure in relation to the organisation and dimensioning of higher education. This is necessary to ensure a long-term approach to the use and purpose of research infrastructure.

Arrangements must be made to accommodate both programme-based and basic research. Extra support for basic research is necessary, to avoid forcing researchers to adapt research to fit into rigid categories. This means that RCN's FRIPRO Scheme (independent research funding scheme) must be bolstered. More research projects must be funded in full by RCN, because partial funding ties-up the institution's own financial resources, compromising its ability to prioritise internally. The Research Council's support scheme for Open Access (OA), which allows institutions to apply for partial coverage of publication costs incurred in Open Access publication, must be expanded to cover hybrid OA publication.

To reduce the amount of bureaucratic red-tape involved in the application process for RCN grants, there should be a pre-qualification scheme, allowing RCN to sort out the rough outlines of project applications and excluding those which do not fit in with the programme

in question. In this way, researchers will save time preparing applications, and it will also reduce the growth of research administration. To strengthen the link between research and education, it should be a requirement for the allocation of project grants from RCN to explain how the research will supplement education. RCN should give a programme-funding bonus for linking up master's or bachelor's degree students to the research project.

NSO supports schemes which offer long-term funding to outstanding research environments, believing that these schemes give research environments good framework conditions for first-rate research. Norwegian Centres of Excellence (SFF) are an example of such a scheme. Excellence must be the main criterion for attaining Centre status, with no political or thematic directives. When Centre status is bestowed, it must be required to involve students in research carried out at the centre. The Research Council should establish a Norwegian Centres of Excellence in Research and Education (SFFU) scheme, bestowing the title on environments which show clearly that they see the connection between excellence in research and education.

2.1.3 Subsidies

To reach the goal of using 3% of gross domestic product on R&D funding, the public sector needs incentive schemes to encourage the business sector, industry and private participants to invest in R&D. NSO supports initiatives such as the Donation-Reinforcement Schemes (*Gaveforsterkningsordningen*), which encourage people to give private donations to research. Approved recipients of donation-reinforcement must include universities, university colleges and RCN. Reinforcement should be triggered by the donation of sums of 500,000 Norwegian kroner or more. NSO is also positive to initiatives such as the tax rebate scheme (*SkatteFUNN*), to increase the extent of R&D work in the business sector and industry.

2.2 International co-operation and the EU Framework Programme for Research and Innovation (Horizon 2020)

In order to solve societal challenges, Norwegian research communities need to participating in global academic and research environments. This demands greater collaboration between research groups and projects across international borders. To achieve this goal, Norwegian research environments (especially the outstanding research environments) must be encouraged to participate in EU's Framework Programme for Research and Innovation (Horizon 2020). The aim of participation in Horizon 2020 is to produce high quality research, regardless of who carries it out. Norwegian universities, university colleges, research institutes, health enterprises, the business sector and industry must create the right conditions for researchers, encouraging their participation in international research environments – especially those involved in Horizon 2020.

Institution management should facilitate for high quality applications for the EU Framework Programme, by allowing research groups to temporarily drop the requirement to publish academic work. However, this form of exemption must only be a temporary measure. RCN should offer expertise in application criteria and procedures to potential applicants.

Doctorate education must include training and development of the skills necessary to prepare applications and carry out collaborative international research. It is an advantage for young researchers to get experience in heading research projects early in their careers, as the experience of managing research projects is often a decisive factor in the allocation of grants from the European Research Council (ERC).

2.2.1 Research mobility

Norwegian researchers and doctoral candidates must have the opportunity to exchange knowledge and travel to other institutions, both nationally and internationally. This is important in order to create links with international research environments, giving Norway a better chance for participation in EU's Framework Programme. Project funding from RCN should include grants for this purpose, particularly for doctoral candidates. National research mobility is reliant on the cross-institutional use of research competence, interests and infrastructure in research projects. Students should also be included in research mobility. The Quota Scheme (Kvoteordningen) for students from developing countries should be expanded to also apply to doctoral candidates, to help build up expertise in students' home countries.

2.3 Evaluation of the research system

Every tenth year, the Norwegian research system must be evaluated by a panel consisting of both national and international experts. The panel should also have student representatives. The task of the panel is to assess whether the research system helps to promote quality in Norwegian research, create innovation opportunities and build connections between research and education. The Norwegian Agency for Quality Assurance in Education (NOKUT) and RCN are responsible for co-ordinating this work.

3.0 Research-based higher education and research training

All higher education must be research-based, giving students the chance to develop a good understanding of research and education. The term 'R&D in education' includes both R&D-based teaching methods and student participation in research. All study programme courses must be R&D-based.

Lecturers must have more than research qualifications for their teaching methods to be described as 'research-based.' These teaching methods must be academically documented and of a high quality. They may also form part of a process of developing new teaching methods. In addition, recent and up-to-date research must be a part of the education provision, giving students a real opportunity to participate in relevant research projects. It is the responsibility of the institution to ensure that all lecturers have pedagogical training for teaching at university/university college level, and that this is regularly supplemented.

To ensure that there is sufficient competence in the higher education sector, and in society in the future, there is a need to increase recruitment of doctoral candidates. Recruitment must be given top priority by higher education institutions, and this should be directed at

students studying at all degree levels. In addition, a scheme should be established for awarding grants to doctoral candidates as part of RCN funding for research projects.

It is important to recruit students who have great academic potential. To ensure diversity in academic environments, it is necessary to recruit both national and international doctoral candidates. Recruitment in academic disciplines which are also subject to strong recruitment from the business sector and industry must use a variety of methods to attract a sufficient supply of competence. These methods may include promoting student participation in research and the establishment of student research programmes at the institutions.

3.1 Student participation in research

Students are in daily contact with R&D work, and student participation in research is decisive in ensuring both good quality in education and recruitment to future research positions. Student participation in research is characterised by the active participation of students on research projects. Such projects should be part of a larger academic environment. The aim of such research should be to publish research results in a peer-evaluated channel.

All students at all academic levels should have the opportunity to participate in a research project. Students must be informed about these opportunities. At master's degree level, students should be given the opportunity to join research groups. Participation in research promotes understanding, interest and commitment to research. Student participation in research is a form of learning which gives students insight into methodology, knowledge acquisition and other aspects of R&D. All students should be offered an introduction to research early on in their studies.

Student participation in research and the inclusion of students in research projects should form a part of the institution's R&D strategy. To stimulate greater student participation in research, project funding from RCN should place emphasis on the degree to which a research project is open to student participation.

There should be a mentor scheme at all institutions, in which students are allocated an academic staff member who follows up their progression over a period of time.

3.2 Student Research programmes

Higher education institutions should have student research programmes as a part of their study provisions. These can be integrated into study programmes as an alternative to the normal progression. This will give students real research experience, an important measure for the future recruitment of researchers.

To provide opportunities for students who are strongly motivated towards research, there should be a central, application-based funding scheme which supports the employment of undergraduates for part-time work on research projects. This scheme should be open to academic staff with qualifications in research and supervision.

3.3 Temporary positions

The high rate of temporary employment represents a great problem in academia, especially for the working environment and equality. Temporary project funding forms a large portion of the research budget. Despite this, institutions must find ways to create more permanent positions as opposed to temporary ones.

3.4 Advertisement for doctoral candidate positions

Advertisements for doctoral candidate positions which feature very restrictive criteria can obstruct recruitment, resulting in a weak pool of applicants from which to choose and causing employment processes to drag out unnecessarily. Meanwhile, earmarked funds that have been allocated for such positions lie unutilised within the system. Institutions must be careful when preparing announcements for doctoral candidate positions. If there are few applicants, they must evaluate the process and the advertisement.

Open doctoral candidate positions are a good measure for ensuring the recruitment of young researchers.

3.4 Tenure-track positions

Academia doesn't need any more temporary position titles. This is the reason why NSO opposes tenure-track positions. However, if tenure-track positions are to be created, the criteria for permanent employment at the end of the contract period should be made clear in the position advertisement.

At the end of the contract period, a committee should assess whether the candidate fulfils the requirements for permanent employment. Teaching and dissemination skills should be strongly emphasised. The committee should consist of national and international academic associates, representatives from the institution and one student representative.

3.5 Early experience in heading research projects

Early experience in heading research and research administration is important to qualify for project grants, in both Norway and Europe. Therefore, trainee schemes are needed for young researchers. RCN grants should include the possibility for project leadership to be shared by one young researcher together with a more experienced researcher.

4.0 Dissemination and publication

Dissemination of knowledge and publication of research create the right conditions for healthy competition and also opportunities for international collaboration. Publication is about quality-assuring and spreading research results within academia. Dissemination is the spreading of knowledge both within and outside of academia.

4.1 Publication indicator

A publication indicator should be used to measure how much research is being carried out at Norwegian institutions. Academic publishing should promote academic progression.

Therefore, only peer-reviewed publications via approved channels can give publication points. Beyond the approval of channels, the indicator should not be divided into levels. The publication indicator can be used as part of the evaluation basis for employment and promotion processes, but should not be the deciding factor on its own.

The publication of textbooks should not result in publication points but institutions should have incentive schemes to reward staff who write them.

4.2 Citation indicator

There should be a citation indicator which records the use of citations by individual researchers in academic publications and textbooks. The citation indicator should provide a unit of measurement for an academic employee's relevance within an academic discipline. The indicator can be used as part of the evaluation basis for employment and promotion processes, but should not be the deciding factor on its own. The citation indicator should not form a part of the funding system.

4.3 Open Access (OA)

All research which is publicly funded must be published in open, academic journals (Open Access) and stored in a national archive. Open Access is founded on the principle that the results of publicly-funded research are a public asset, and that both academia and society in general must be ensured free access to knowledge. Research which is published via open channels (Open Access journals) is more visible and available, and is important for the effective spread of knowledge globally.

There should be a progression towards shorter restriction periods after printing for academic publishing. Published research should never have a restriction period of more than six months duration. Publishing expenses should be moved from the end of the publishing process to the start. This represents a transition, from spending money subscribing to a journal to spending money on publishing in an Open Access journal.

It is the responsibility of the institutions to make sure that their researchers publish work in an Open Access journal. All Norwegian higher education institutions should have a publishing fund for OA publication, and the board of the institution should adopt an OA policy. Such publishing funds should also cover the expenses of hybrid OA publishing. Master's degree theses should be published via open channels as a rule, and be made freely available through the library services of the institution.

4.4 Dissemination

Dissemination is one of the main tasks of universities and university colleges, and should be a high priority. Training in dissemination skills should be an integrated part of doctorate programmes.

Universities and university colleges are important members of society, with a responsibility to make knowledge accessible in an easily-understood form also outside of academia.

Institutions which incorporate museums have a special responsibility for maintaining buildings and for preserving museum collections in a secure manner.

At bachelor's degree and master's degree level, students must be exposed to teaching and evaluation methods which promote their ability to disseminate knowledge.

The Ministry of Education and Research should begin preparation of a dissemination indicator, which rewards dissemination skills. A dissemination component will send a clear signal to the sector that dissemination is an important task for academia, and ensure that institutions emphasise dissemination skills in employment and promotion processes. This component should cover the breadth of dissemination methods, without becoming too bureaucratic in the form of reporting and registration requirements.

The dissemination component should result in the allocation of a grant to the institution, if it is in excess of a specified lower limit. This limit should be regulated in accordance with the size of the institution.

5.0 Ethics

Research ethics is about academic integrity, the way in which you treat research data, what you research and which methods you choose. Researchers have a responsibility to see their activities in relation to society around them. This means that the production of knowledge must be carried out in an environment that is characterised by critical reflection about how research methods and results affect society and the individual, both contemporary and in the long-term.

A good foundation for research ethics is dependent upon research-ethical reflection throughout the duration of a course of study. In Norway, there should be national research-ethical guidelines which include these values.

Collaboration with the business sector, industry and private organisations should be transparent. A publicised statement of the external funding received for research should be readily available.

All academic staff should be given training in the correct procedures for treating research data and institutions should have secure storage facilities. If all research data and results are stored in open archives, this creates the need for more stringent controls to protect personal privacy and guarantee verifiability.

5.1 Academic dishonesty

Knowledge about honest research practices must be developed through open debate, to create awareness about what is morally right. The risk of individual dishonesty is reduced by establishing a culture within academia in which ethics are perceived as an integral part of academic disciplines.

There should be a legally-binding national regulation for the treatment of academic dishonesty in all academic disciplines. In addition, there should be schemes in place to

make it easy both to report academic dishonesty among colleagues or supervisors and get counselling on this issue. The schemes should include an ombudsperson who is available to students, researchers and other staff members. It is important to protect the rights of all involved parties in an academic dishonesty case, and to protect against both formal and informal reprisals. This is especially important for those who blow the whistle on academic dishonesty.

5.2 Academic freedom

Academic freedom entails researchers and students having the right to freely create thesis statements, frame questions, decide on source materials and methods, and put forth hypotheses. It is conditional on being allowed to challenge established truths and choose themes that are controversial or politically or emotionally sensitive, without being unjustly sanctioned.

However, academic freedom must be based on ethical norms. Academic freedom does not exclude the demands placed on researchers by research policy priorities, or how the results of publicly-funded research are published.

6.0 The research institute sector

The research institute sector helps to fulfil society's need for R&D work. Research institutes should be funded primarily by carrying out commissioned research and receiving grants from RCN and EU's Framework Programme.

The research institute sector must collaborate with universities and university colleges on joint research projects, by establishing cross-institutional research groups. In this way, it should be possible for bachelor's, master's and doctoral degree students to participate in research being done by research institutes.

The research institute sector should contribute to the supervision of doctoral candidates, helping to increase co-operation and recruitment. The research institute should be awarded a percentage of the remuneration fee that the university or university college receives when the doctoral candidate presents their final thesis, depending on the amount of time they have spent supervising and following-up the candidate. It is important that the expertise of the research institutes is utilised in tuition at universities and university colleges. Both parties must endeavour to co-operate, to promote this possibility. The research institute sector and the higher education sector must use the same method of calculation for loans and collaboration expenses.

7.0 Innovation and development

Innovation includes the development, creation or improvement of new products, services and processes. They may be commercialised or form a part of the public sector and lead to improvements. Innovation and development are important because they improve the adaptability of the business sector, industry and the public sector. They also stimulate economic growth, create employment and give existing and new industries space to

develop. Research can be used to develop and improve products, services or processes. This is why innovation is an integral part of education and research.

Higher education institutions must take into account the value of students being able to learn about and use innovation skills in the subjects and courses they offer. Innovation skills can be described as the ability to use theory, skills and competence to develop and improve the surrounding conditions. This may cover everything from the improvement of professional procedures at a nursing home to the commercialisation of new technical solutions. Innovation skills are not purely instrumental but also allow space for the free visualisation of new solutions and possibilities without instruction.

Accommodating innovation involves both building skills and allowing students to use them in their studies and training. Innovation and entrepreneurship should be integrated in courses at all levels of higher education – bachelor's, master's and doctoral degrees. Higher education institutions must have an express aim to stimulate the commercialisation of good ideas and research results. Individual courses and subjects within the field of innovation and entrepreneurship provide examples of how this can be achieved.

There should be schemes to provide support in the starting phase of researchers' and students' innovation processes. This form of support should address the starting phase for new innovation enterprises in particular. Technology Transfer Offices must take regional responsibility for backing-up innovation projects started by students at public higher education institutions.

NSO supports measures which bolster the long-term funding of innovation research directed towards industry. The Centres for Research-based Innovation (CRI¹) are examples of how research results can contribute to effectivity, improved competitive ability and development in business and industry. At the same time, such measures improve the collaboration of the business sector and industry with the higher education sector.

7.1 Industrial Ph.D. Scheme

To stimulate the development of greater research skills in industry, the Industrial Ph.D. Scheme must be further strengthened. This scheme links up students with industry, creating stronger contact between the two. To get an Industrial Ph.D., the institutions must have a strategy for creating a network between academia and the business where there is a Ph. D. student training position.

7.2 Public Sector Ph.D. Scheme

The Public Sector Ph.D. Scheme must be strengthened, to stimulate more collaboration between academia and public sector organisations. This scheme links up students with the public sector, improving contact between the two. To get a Public Sector Ph.D., you must

¹ Senter for forskningsdrevet innovasjon (SFI)

have a strategy for creating a network between academia and the public sector where there is a Ph.D. student training position.

The scheme should result in academic development within professional subjects, and help to create a R&D-based approach to work in the public sector.

7.3 Student-initiated research

Student-initiated research differs from student participation in research in its demand for a higher level of independence in the process. All students should have the opportunity to start research projects, and there must be support schemes for this. Economic support must be given to student-initiated R&D work, through a local, application-based funding scheme. This also means that resources must be reserved for the academic supervision of students who receive a grant.