

Mid-term Evaluation of Five National Research Schools

Report submitted by the evaluation panel

Division for Science

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Preface by the Research Council of Norway

The *scheme for national research schools (FORSKERSKOLER)* was launched in 2008. The purpose of the scheme is to enhance the quality and raise the academic level of PhD education in Norway based on national networks of cooperating institutions. Five research schools were funded after the first call and their activities were launched in 2009. A Nordic scientific programme committee was appointed, with responsibility for assessing grant applications, monitoring the progress of the FORSKERSKOLER scheme and serving as the evaluation panel for carrying out the mid-term evaluation.

The task of the evaluation panel has been to evaluate the quality of and progress achieved by the five research schools and to provide a recommendation as to whether funding should be continued to cover the full eight-year period or terminated after five years. The evaluation panel was also asked to provide general observations and recommendations regarding the programme as such.

This report summarises the findings of the evaluation panel.

Oslo, May 2013

Anders Hanneborg
Executive Director
Division for Science

Abbreviations used in the report

HiAls	University College of Ålesund
HiBu	University College of Buskerud
HiL	University College of Lillehammer
HiMolde	University College of Molde
HiOA	University College of Oslo and Akershus
HiOf	University College of Østfold
HiST	University College of Sør-Trøndelag
HiVe	University College of Vestfold
NHH	Norwegian School of Economics
NTNU	Norwegian University of Science and Technology
UiA	University of Agder
UiB	University of Bergen
UiN	University of Nordland
UiO	University of Oslo
UiS	University of Stavanger
UiT	University of Tromsø
UMB	Norwegian University of Life Sciences
UNIS	University Centre in Svalbard
NIFU	Nordic Institute for Studies in Innovation, Research and Education
NOKUT	Norwegian Agency for Quality Assurance in Education
RCN	Research Council of Norway
UHR	Norwegian Association of Higher Education Institutions

1. Executive summary

The Research Council of Norway (RCN) established the scheme for national research schools in 2008. The scheme was launched as a supplement to ordinary PhD programmes, offering specialised courses and networks across institutions. After the first call (amounting to a total of NOK 115 million) five schools were selected to run for an eight year period, pending a successful mid-term evaluation performed by a Nordic panel appointed by the Research Council.

In this report the panel presents the outcome of the midterm evaluation as well as insights gained across the schools and in relation to the second call launched in 2012 (NOK 215 million distributed amongst 10 research schools).

Chapters two to five give an introduction to the Norwegian PhD education and to the research school scheme. The evaluation process, the members of the panel, the mandate and the evaluation process are presented.

Chapter six covers the evaluation of each of the five research schools, the National Research School in Business, Economics and Administration (NFB), the Norwegian Research School in Climate Dynamics (ResClim), the National Graduate School in Educational Research (NATED), the National Research School in Medical Imaging (MedIm) and the National Graduate School in Structural Biology (BioStruct). The chapter presents recommendations for each of the schools and in addition gives the following advice:

- **Continuous funding is recommended for all five schools** to cover the full eight year period, according to the proposed budget
- **Stronger formal links between the institutions and the research schools** should be established. The schools should be more than just a 'course factory'. To meet this demand the Research Council is encouraged to prepare a "charter" to be agreed upon by the research schools and the grade giving institutions. The "charter" should ensure stronger involvement by the institutions and supervisors and also ensure rules for the relation between courses and ECTS points.
- **The organisation of the research schools** should be guided by rules set up by the Research Council and ensure that there is a separation between the school director and the chair of the board. Also, it should be ensured that a suitable number of PhD candidates are selected as members of each school's board.
- **All courses should be evaluated** by course participants and feedback used systematically, by criteria agreed upon by the partner institutions.

Chapter 7 summarise additional insights gained through the evaluation process and includes the following additional advice:

- **ECTS points given for a given** course should be accepted by all grade giving institutions.

- ***Measures to ensure agreements*** between all the faculties and institutions organising PhD programmes within the same field of science should be taken. The cooperation between the medical faculties at the universities seems to be well-functioning in this respect and may serve as a model.
- ***Internationalisation.*** It is to be considered to which extent a research school funded by the Research Council should be the institution of choice for funding grants for PhD candidates visiting international universities and labs. Alternatively this should be considered the responsibility by the home institution (the employer) or offered by a special Research Council programme.
- ***In relation to future*** calls demands should be to document a formal mutual acceptance and agreement between the partner institutions and the school (the host institution). In addition the application should describe plans for a continuation strategy (embedment of activities).
- ***Cost-effectiveness of the research schools*** and size of the grants should be considered. Large grants could be limited for a few selected key areas with a special potential for giving a high output, for example areas where a special effort is required.
- ***A final evaluation of the scheme*** should be performed some years after the funding has ceased. The evaluation parameters should include completion rate, time-to-degree and professional career of the research school attendees, and should be compared to similar information for the total Norwegian PhD candidate population. Measures should be taken at this point to ensure collection of the data needed.

In conclusion the panel finds the research school scheme of the Research Council of Norway successful, but with room for further improvement in order to reach the goals set forward for the scheme.

2. Introduction

The scheme for national research schools(FORSKERSKOLER)

The FORSKERSKOLER scheme was established in 2008, based on a report commissioned by the Ministry of Education and Research in 2006. The purpose of the programme is to enhance the quality and raise the academic level of PhD education by encouraging leading national institutions to join forces. The national research schools are meant as a supplement to ordinary PhD programmes. Thus, it continues to be the individual academic institutions, not the research schools, that confer PhD degrees upon their own candidates. All PhD candidates who take part in a national research school must first be admitted to an ordinary PhD programme at a degree-conferring institution, and consequently fulfil the requirements established by that institution.

The research schools are also expected to contribute to increasing degree completion and reducing the time-to-degree, as well as ensuring a broader base in researcher training. They should in particular strengthen doctoral training in specialised subject areas through organised cooperation between institutions. Typically each school will have a number of partners, one of which serves as the host institution and takes a leading position. The host institution must be a higher education institution offering PhD programmes. Most of the partners will be equally qualified, and higher education and research institutions without PhD programmes may also join in as partners. The FORSKERSKOLER scheme is financed by the Ministry of Education and Research and administered by the Research Council of Norway (RCN).

The first call for proposals was issued in 2008. A total of 27 applications was received, and five national research schools were awarded grants. The grants for all five schools amount to NOK 115 million for the full eight-year period, 2009–2016. The research schools started up their activities at the beginning of 2009. The schools signed contracts with the RCN for a period of up to eight years. Funding for the final three years of the period was made contingent on a positive outcome of a mid-term evaluation after approximately four years. The call is enclosed as Attachment A.

The second call was issued in 2012. A total of 29 applications was received in this round. Ten research schools were awarded grants and will start up their activities in 2013. The grants for all 10 schools amount to NOK 218 million for the full eight-year period, 2013–2020.

The Norwegian PhD system

The Norwegian PhD education system conforms with the Bologna reforms of 2002 and is part of the European Qualification Framework. It has a three-level degree structure, with bachelor's, master's and PhD. The Norwegian Agency for Quality Assurance in Education (NOKUT) is responsible for accreditation and quality assurance of the higher education institutions, and the Norwegian Association of Higher Education Institutions (UHR) develops recommended guidelines for regulation of PhD degrees. The Norwegian PhD education system was evaluated in 2011–2012, and much of the information in this section is based on the evaluation report: *PhD education in a knowledge society: An evaluation of PhD education in Norway*, [NIFU Report 25/2012](#).

Within these regulatory frameworks, the *universities* and the *specialised higher education institutions* can stipulate more detailed regulations for PhD degrees at their own institution, although they generally follow the recommended guidelines for regulation of PhD degrees adopted by the UHR. NOKUT grants the right to award PhD degrees to the *university colleges*.

A PhD degree is only attainable by following a structured programme, consisting of a research component and a taught component (courses) of at least a half year of full-time study. “Doctoral education normally consists of three years of full-time study, and includes required coursework comprising a minimum of 30 ECTS points. The way in which doctoral education is organised is to be stipulated in the institution’s regulations” (from the UHR guidelines).

Each institution normally has one general set of regulations for its PhD degrees. There may also be specific regulations for each PhD programme. According to the UHR recommendations, the degree-conferring institution is to sign a written agreement with each candidate admitted to one of its PhD programmes, regulating academic supervision, coursework and other training. The institution is responsible for providing adequate courses for the candidates at the institution itself or facilitating participation in relevant courses at other institutions. PhD-level courses taken at other institutions are to be approved according to the rules of the Act relating to universities and university colleges.¹

There are significant differences between the Norwegian higher education institutions regarding the balance between the coursework component and the research component of their PhD programmes. There is also significant variation regarding the proportion of ECTS points assigned to mandatory courses and the fraction of the coursework which candidates are allowed to take outside the institution.

The volume of the PhD system

In 2011 a total of 23 higher education institutions offered 112 different PhD programmes with a further 92 specialisation tracks. This means that PhD education is offered in more than 200 different academic specialisations in Norway. Most of the universities have one PhD programme *per faculty*, but each programme may have discipline-based specialisation tracks with different study plans. Most of the specialised higher education institutions and university colleges offer one or two PhD programmes.

The total number of persons enrolled in PhD programmes in Norway is presently about 9 000. About 6 000 of those enrolled hold recruitment positions as a PhD candidate (“doktorgradsstipendiat”). Most of the research fellows are employed at higher education institutions, with some 1 000 employed at independent research institutes, university hospitals etc. About 1 400 new PhD agreements are signed each year. The total number of PhD degrees awarded nationally has increased steadily from 647 in 2000, and was 1 461 in 2012. This is the highest number ever.

¹ Lov om universiteter og høyskoler – LOV 2005-04-01 nr. 15.

3. The evaluation panel

The scheme for national research schools (FORSKERSKOLER) is coordinated by a *scientific programme committee* (“styringsgruppe”) of Nordic scholars with significant experience from research schools in the other Nordic countries. The committee was appointed by the Research Council for a five-year period (spring 2008–spring 2013) with the following mandate: To be responsible for the process of assessing grant applications, to follow up the schools awarded funding, and to conduct the mid-term evaluation. The following members of the scientific programme committee for the FORSKERSKOLER scheme thus constituted *the evaluation panel* during the mid-term evaluation period:

Universitetslektor Göran Gustafsson (chair)
Professor Hanne Marlene Dahl
Professor Jens Jørgen Gaardhøje
Professor Christina Gustafsson
Professor Ebba Nexø

Chalmers University of Technology
Roskilde University
University of Copenhagen
Uppsala University
Aarhus University

4. Mandate and terms of reference for the mid-term evaluation

The mandate for the mid-term evaluation was approved by the Research Board of the Division for Science in September 2012 (DSV 58/12). The mandate provides a framework for the evaluation process and sets out terms of reference for the evaluation of the research schools, based on the criteria stipulated in the first call for proposals issued under the FORSKERSKOLER scheme.

The purpose of the mid-term evaluation is to assess the quality and success of the five research schools in relation to their original objectives and plans and to provide a recommendation to the Research Council as to whether the funding for the individual research schools should be maintained for the full eight-year period or terminated after five years.

In its mandate, the evaluation panel is also asked to provide general observations and recommendations regarding the programme as such, on the basis of the experience gained by the first five schools in the first four years.

The complete mandate for the evaluation is enclosed as Attachment B.

5. Evaluation process

The mid-term evaluation has been based on the following documents and background material on each of the research schools:

- A self-evaluation in a standardised form, submitted by the project manager and the chair of the board of each school. Self-evaluations were required to include an analysis of the research school: courses and activities, PhD education, recruitment, organisational aspects, national and international collaboration, and any added value. The self-evaluation was also to include a SWOT analysis.
- A fact sheet in a standardised form providing information on management, school activities, PhD candidates, supervisors, international cooperation and financial matters.
- An assessment (self-evaluation) by each of the partners, summing up the experience gained from being part of the national research school.
- An assessment by the host institution, summing up the experience of hosting the national research school.
- Dialogues with representatives of the five research schools conducted by the panel at Gardermoen (Oslo) on 31 January and 1 February 2013. The dialogues consisted of:
 - Presentations delivered by each of the project managers (school directors) focusing on objectives achieved and lessons learned, and comments to the SWOT analysis;
 - Meetings with the project manager (school director), chair of the board and selected board members for each school (in all five to six representatives per school);
 - Separate meetings with one to three PhD candidates from each research school.

The panel has based its evaluation and recommendations for each of the schools on this background material together with the original grant applications submitted to the RCN. The overall observations and recommendations in the report also benefit from the panel's having followed the schools from the beginning, and in general from the panel members' experience from research schools in Denmark and Sweden.

6. Evaluation of the research schools

6.0 Summary of the panel's recommendations to the research schools

The panel recommends that funding for all five schools in the evaluation is continued for the remaining project period, as defined in the contract between the Research Council of Norway and the research schools. Each of the evaluated schools is given specific advice for continued operations in the respective sections of this chapter. The evaluation of the five research schools has led to the emergence of some general themes for the programme as such. These are covered in Chapter 7.

It is not relevant to strive to achieve a general model for all research schools, as there are fundamental differences in the disciplinary structures and substance of the schools. It is, however, possible to extract some general observations and findings that are relevant to improving the functioning of all five research schools. The panel's general recommendations to the schools are as follows:

- Stronger formal links between the institutions and the research schools should be established. The schools should be more than just a “course factory” and the supervisors must be actively involved in school activities.
- The Research Council is encouraged to prepare a “charter” to be agreed upon by the research schools and the partners (degree-conferring institutions). The charter should commit the three parties – the PhD candidate, the host institution and the school – to ensure stronger involvement on the part of the supervisors.
- The ECTS points assigned to courses should follow rules that are accepted by all degree-conferring institutions in the network.
- All courses should be evaluated by course participants on the basis of criteria agreed upon by the partner institutions and this feedback should be used systematically to ensure the high quality of the courses.
- PhD candidate representation on the boards should be mandatory and based on a formalised election process among the school's PhD candidates. The PhD candidates should be represented by two board members, or one ordinary board member and one deputy.

6.1 National Research School in Business Economics and Administration (NFB)

Facts about NFB

- Operating period: 01.01.2009–31.12.2016.
- Grant (funding pledge) for the entire period: NOK 24 million.
- NHH is the host institution. The school network consists of 15 cooperating institutions: HiAls, HiBu, HiL, HiOA, HiMolde, HiOf, HiST, HiVe, UiA, UiN, UiS, UiT, NTNU, and UMB.
- Open model – voluntary participation – the candidates register online. Supervision and follow-up of the candidates at their home institutions.
- 147 PhD candidates have been registered at the school from the start and 11 of them have completed their degrees. 43 % of the PhD candidates are women.
- 15 PhD courses, a doctoral colloquium and a research school conference were offered in 2012.
- Courses offered by NFB are normally approved beforehand by the partner institutions in terms of ECTS points.
- All partner institutions are represented on the board. There are no PhD candidates on the board. The director of the school is also the chair of the board. The board meets once a year.
- The steering committee consists of some of the board members and has several meetings per year. There are six scientific committees, one for each specialisation at the school, which make decisions regarding which PhD courses to offer.

Objectives of NFB (from the contract)

The overall objective of the national research school is to enhance the quality of the education of researchers within business economics and administration in Norway.

This objective has been restated in the following three operational objectives:

- Increase *programme effectiveness*, measured as the fraction of candidates that completes the education within the expected timeframe with a dissertation of a high international standard;
- Increase *programme attractiveness*, measured as the increase in the number of well-qualified candidates that apply for admission;
- Increase “*product*” *attractiveness*, measured as the candidates’ success in pursuing further relevant careers.

Research school structure and recruitment

In its grant application, NFB stated that the partner institutions would have around 140 candidates that would participate in the network together with their supervisors. At present

147 PhD candidates have registered at NFB. The PhD student body is multidisciplinary and relatively international.

The research school's PhD candidates are formally registered at their home institutions, which monitor their supervision and progress. For most of the participants, the NFB courses and conferences are a supplement to the PhD courses offered by their home institutions (some small-scale institutions do not offer PhD courses).

The candidates have to apply for accreditation of the NFB courses at their home institutions. NFB claims to have had a standardising function and that ECTS points are transferred to the home institutions without problem.

Research school activities

The number of PhD courses offered has increased each year. In 2012, 15 PhD courses were offered, spanning generic, methodological and theoretical issues. There were both large (up to 78 participants) and smaller courses held at different partner institutions, with credits ranging from 2 to 10 ECTS points. NFB also has an annual research school conference and a yearly meeting for all the PhD candidates, called a doctoral colloquium.

The research school offers a wide variety of courses within the subfields. According to the partner institutions, the course catalogue is good and supplements the PhD courses that they offer. Some of the partner institutions only have a small number of candidates within the field covered by the school, and therefore do not have the necessary resources to offer satisfactory PhD courses.

NFB has developed an evaluation scheme for use in all courses. If used systematically, this is a helpful tool for developing the theme and structure of the courses and the teaching of the lecturer(s) in question. For the most part, candidates express high satisfaction with the PhD courses, even though some of the results appear to be based on very low reply rates. Some concerns were raised in the written material and during the meetings concerning the pedagogical quality of the lecturers.

The various courses and activities enable the PhD candidates to become acquainted with renowned scholars. This increases mobility within the scientific community, which together with the use of internationally recognised lecturers, is likely to improve the quality of the PhD education. The original plan to offer courses for supervisors at the school has been implemented as a supervisor workshop and seminar. The panel considers this a very good measure for enhancing the quality of the learning processes.

Management of the research school

NFB is a well-functioning research school, with a board, a steering committee, a group for day-to-day management (school director, scientific coordinator and administrative project coordinator) and six scientific committees. With regard to the management structure, one could question why there is no division between the director and the board, as the director also serves as the chair of the board.

Planning of PhD courses, selection of lecturers and financial responsibility for the courses are delegated to the six scientific committees. There are no representatives of the PhD candidates on the school board, and there seems to be little systematic contact with the candidates in course planning.

The leadership is evaluated as excellent by the partner institutions; there is good information flow and governance, regular meetings and courses are announced well ahead of time, knitting the participating institutions into a well-functioning network. In this way NFB seems to balance the interests and strengths of the various partners and include them all in fruitful cooperation. In addition, the use of internal resources appears to work well, with professors from the various institutions involved in the courses offered.

National network and international collaboration

The network consists of one large, PhD degree-conferring host institution (NHH) and a number of small partner institutions, some without PhD programmes. Collaboration and synergy between the partners appears to be good.

International collaboration is strengthened via the courses and by encouraging new contacts between the lecturers and individual PhD candidates and increasing the number of PhD candidates conducting a research stay abroad. The list of international professors that have given lectures at the school is impressive. The scholars are mainly from the US, but there have been researchers from Canada, Europe and the other Nordic countries as well. It has, however, proven difficult to attract visiting professors. Recruitment difficulties of this type are a well-known problem and are due to the fact that professors are busy and often live in two-career families.

NFB also had plans to contribute financially to the engagement of international part-time professors (professor II) at some of the partner institutions, with teaching obligations at NFB, but this has been limited to a few cases.

Strategic importance

NFB is strategically important for bringing together rather small research communities, thereby ensuring a critical mass of PhD candidates and making more efficient use of resources by avoiding overlapping and/or competing courses. The school promotes international networking between the Norwegian research community and scholars overseas, which is also of strategic importance, and appears to have improved the recruitment of international PhD candidates.

Gender aspects

Forty-three per cent of the PhD candidates are women, 22 % of the supervisors are women and 20 % (four out of 20) of the lecturers are women. The research school has a gender mainstreaming body ("Gender Panel"), but the initiatives taken by this panel are not discussed in NFB's internal evaluation. It is worth noting, however, that the new *Journal of the National Research School in Business Economics and Administration* has made women visible as role models as important professors in the field or as promising associate professors who already hold an internationally recognised position.

Financial aspects

NFB's finances are fine. The school could not use up its allocated resources in its initial years, but now that it is fully up and running, it uses all allocated funding, including the fees paid by the partner institutions. Although this is a small sum, the panel believes it plays a strong symbolic role in keeping up commitment to a well-run school after an enthusiastic start. The school has decided to cover travel expenses for PhD candidates in connection with the doctoral colloquium and research school conference, which means that the school uses

approximately 25 % of its total funding for the reimbursement of travel expenses within Norway.

Future perspectives

NFB is seeking to simplify its governance structure by eliminating the steering committee and having more frequent board meetings instead. Such simplification could reduce transaction costs. The smooth collaboration between the partners indicates a promising future for the research school, even after funding from the RCN has ended.

Overall assessment of achievements according to original objectives

The school laid down three objectives: increased programme effectiveness, programme attractiveness and “product” attractiveness (candidates’ success in pursuing further careers).

Program effectiveness or reduced time-to-degree is difficult to measure due to the mismatch between the expressed objective and the options available for NFB. The inability of PhD candidates to complete their degrees on time appears to be a general problem in Norway, and it is mainly up to the local degree-conferring institutions to ensure that their PhD candidates complete their degrees. However, it is likely that NFB helps to improve programme effectiveness by offering high-quality PhD courses with internationally recognised lecturers and highly skilled supervisors and thereby increasing the number of PhD degree holders of a high international standard.

The second objective of NFB has been to increase *programme attractiveness*. The school offers an impressive course portfolio which is likely to improve recruitment nationally and internationally. A recently published journal on *PhD essentials and career opportunities* may also be seen as an attempt to improve programme attractiveness for candidates contemplating a job in private enterprise versus pursuing a PhD. Another measure has been to use a professor II teaching at the master’s level across the universities, which is without doubt improving the quality of the potential PhD applicants and may perhaps be increasing the number of candidates interested in pursuing a PhD as well.

The third objective, to increase “product” attractiveness, cannot be evaluated at this stage.

In conclusion, the panel finds that NFB has performed very successfully, based on the achievement of its own objectives, the evaluations by the partner institutions and the criteria set out in the mandate for the evaluation. The panel recommends that NFB is granted funding for the remainder of the eight-year period.

Recommendations for the remaining funding period

- The panel strongly recommends that PhD candidates are appointed to the school board (two members, or one member and one deputy) through a formalised election process among the PhD candidates. NFB should also consider discussing the course portfolio and other activities with the PhD candidates at the annual research school conference.
- The panel recommends that the positions of school director and board chair are not held by the same person or by persons from the same institution.
- The panel recommends that NFB considers the number of courses offered. NFB seems to have reached its maximum capacity in offering 15 PhD courses and other meeting places for PhD candidates.

- NFB has developed an good tool for evaluating the courses, but the response rate needs to be increased and the results used more systematically to improve courses.

6.2 Norwegian Research School in Climate Dynamics (ResClim)

Facts about ResClim

- Operating period: 01.01.2009–31.12.2016.
- Grant (funding pledge) for the entire period: NOK 24 million.
- The Geophysical Institute, UiB, is the host institution. The school comprises 9 partners: UiB, UiT, UiO, UNIS, Bjerknes Centre for Climate Research, Institute of Marine Research, Nansen Environmental and Remote Sensing Centre, Norwegian Meteorological Institute, and Norwegian Polar Institute.
- Open model – voluntary membership and participation in courses – the candidates apply online. Supervision and follow-up of the candidates at their home institutions.
- 109 candidates have been registered at ResClim since the start, of which 51 % are women. 29 % of the candidates have completed their thesis. Seventy-six candidates are currently enrolled.
- Intensive courses, international specialist workshops and one or two international summer schools offered yearly. Six PhD courses in 2012.
- PhD candidates must apply to their home institution for approval of ECTS points from ResClim. Differing approval practice between institutions.
- The steering group (the board) has representatives from all partners and meets once a year. No PhD candidates on the board. The school director is also coordinator of the steering group.
ResClim also has an international evaluation (scientific advisory) board that meets once a year.

Objectives of ResClim (from the contract)

The main objective of this project is to establish an internationally recognized research training environment for PhD candidates in climate dynamics, giving them in-depth knowledge in their specific study field within climate research, trans-disciplinary knowledge in the dynamics of the entire climate system, insight into the political and societal impacts of climate change, and the necessary skills to play an active role in appropriately predicting, mitigating, and adapting to climatic and environmental change.

Sub goals:

- Improved national and international networks both for candidates and seniors;
- More collaboration between senior scientists and younger researchers both nationally and internationally;
- More candidates completing their PhD studies in required time and fewer candidates leaving their studies before finishing.

Research school structure and recruitment

The school has an open model; candidates are accepted on a voluntary basis and no formal agreements are made with their home institutions. A total of 109 candidates has been registered at ResClim thus far. Seventy-six candidates were enrolled in 2012. Fifty-one per cent of the candidates are woman. The PhD student body is multidisciplinary and international; 48 % of the candidates are from outside Norway.

Research school activities

The school has organised an appropriate number of courses and summer schools – seven in 2009, six in 2010, nine in 2011 and six in 2012 – representing a good level of activity. In general, the statements by the partner institutions indicate that the range and level of the courses offered is satisfactory and useful and that there is little overlap with existing courses at the universities. It is pointed out that there is a strong international component in the form of international lecturers. Most of the activities have been organised in Bergen, but the plan is to spread out the activities between the partner institutions.

Candidate satisfaction with the courses appears to be high. During the dialogues, candidates emphasised that the school has an adequate portfolio and clearly communicates the educational requirements. Candidates have, however, experienced complications at their home institutions in terms of approval of ResClim courses as part of their curriculum.

Management of the research school

The steering group meets once a year. It appears that the burden of managing the school has been shouldered by UiB. There are statements in the self-evaluation that the partners have contributed less than expected to the running of the school. This also became clear during the dialogue with the school management. This is perceived as a problem, and funding will be allocated to increase management and secretarial participation at the various sites.

National network and international collaboration

ResClim unites all Norwegian institutions with PhD candidates in climate research and much emphasis is placed on promoting an active national network both for candidates and researchers working in this field.

The school has had some difficulty in activating the partner institutions and their supervisors; the panel has encountered a similar issue at several of the schools. The school management expresses its awareness of these issues and plans to deal with them.

With regard to international collaboration, ResClim has a very good network of partners that contribute experts both to summer schools and other courses. The universities of Edinburgh and Exeter are particularly active partners, and there is fruitful collaboration with the University of Washington as well.

The summer schools are often organised in collaboration with international partners, the lecturers are international, and international candidates participate. The summer schools appear to play an important role in enhancing the candidates' international network.

The school also prioritises travel grants; thus far, about 40 candidates have received grants for attending international meeting or conferences, or for shorter research stays abroad. The international activity is judged by the panel to be very good.

Strategic importance

ResClim focuses on doctoral training in topics related to climate dynamics and the Arctic. This is an area of global interest, not least at a time of ongoing climate change, and is of particular relevance for Norway, given the country's geographic location.

Gender aspects

Fifty-one per cent of the candidates are women.

Financial aspects

The school had difficulties in meeting the proposed budget goals in the first few years, but since 2011 expenditure has approximately matched the budget. The annual budget has been increased accordingly in subsequent years. The school has re-allocated some funding internally between categories, to strengthen the administration both centrally and locally and increase the budgets for the summer schools and the annual all-staff meeting for candidates and supervisors. Minor cuts have been made in several of the activities to cover this; most importantly, the salary compensation for the school director will be covered by the host institution from 2012.

Future perspectives

The embedding of the school after the grant from the RCN has ended is a concern and the school management is well aware of this. The panel hopes that a culture of cooperation and increased international contact will have been established by then and will be the norm. There are signs in this direction. From a general perspective, it may be advantageous to ensure that the various partner institutions assume ownership of selected courses and run them as shared courses at the national level.

Overall assessment of achievements according to original objectives

The school has chosen an open model for its activities. Comments were made to the panel about the difficulty of activating the partner institutions, both in terms of administrative assistance and in terms of supervisors. Considering that this is a national initiative, the panel would have expected more well-founded mutual agreements between the institutions and the school. Efforts have been made to distribute the administrative tasks among the partner institutions from 2013.

More detailed statistics about the candidates would have been informative. The lack of such statistics is probably one of the limitations of the open model, where the candidates are formally registered and supervised at their home institutions.

In conclusion, ResClim appears to have followed and achieved its original stated objectives. The overall picture that emerges is that of a professionally active school that provides a number of important activities and courses for the candidates. The school has been successful in assembling a large body of candidates. Candidate satisfaction appears to be high and candidates find it useful to have a well-defined curriculum, stating that it is "good to know what is required". Networking among candidates and increased international perspectives seem to have been achieved. On the whole, ResClim is a successful school that is making a difference in the area of climate research in Norway. The panel recommends that the school is granted funding for the remainder of the eight-year period.

Recommendations for the remaining funding period

- The panel recommends some tightening of the leadership and central administration to enhance cooperation between the partners. In this respect the panel thinks that a single meeting of the steering group per year is insufficient for achieving the school's objectives.
- The panel recommends that two PhD candidates are appointed to the steering group through a formalised election process among the PhD candidates.
- The school should consider increasing the proportion of funding allocated to school activities. Secretarial assistance should be sought from the partner institutions.
- There should be a separation between the positions of school director and chair of the board. These positions should not be held by the same person or by persons from the same institution.

6.3 National Graduate School in Educational Research (NATED)

Facts about NATED

- Operating period: 01.10.2008–30.09.2016.
- Grant (funding pledge) for the entire period: NOK 24 million.
- University of Oslo is the host institution. Present partners are UiB, UiS, UiT, HiOA, NTNU and UMB. UiA withdrew from the partnership late in 2012.
- Closed model; candidates submit applications to the school and follow a compulsory programme once admitted. Supervisors are provided by the candidate's home institution.
- Sixty-nine candidates have been admitted to the school from the beginning, of which 75 % are women. Seven have finished their thesis, and 15 will finish during 2013.
- More than 50 courses and workshops/seminars have been organised between 2009 and 2012. School activities in 2012: 4 courses, 6 workshops, 4 combined courses/workshops.
- Varying practice between the institutions as to approval of ECTS points for courses and other activities prepared and offered by the school.
- The scientific board meets 2–3 times a year and has representatives from all partner institutions and one PhD candidate. The dean of the host institution serves as chair of the board. The school also has a scientific and educational committee that meets 4 times a year.

Objectives of NATED (from the contract)

- To give state of the art courses in research design and methodology;
- To provide rigorous training in different methodological approaches;
- To develop analytical skills in both quantitative and qualitative approaches;
- To provide state of the art courses within selected themes;
- To provide a research environment and a course programme in which all doctoral candidates have access to top level expertise in their research area;
- To internationalize research education in collaboration with key international partners;
- To develop a model for how research education in educational research can be organized.

Research school structure and recruitment

The school is organised into four thematic tracks; each track is led by an internationally recognised scholar. The tracks are responsible for preparing and giving courses within their thematic profile. When admitted to a track, the candidates are normally offered the compulsory course programme there. Contracts are signed with each PhD candidate, with both the supervisor and the institution.

The original plan was to recruit about 50 candidates during the first four to five years, and this goal has been surpassed by a wide margin. Thirty-eight per cent of the candidates belong to one track, while the remainder are fairly evenly distributed among the other three tracks. Five candidates have interrupted their studies, and four have finished their period without having graduated.

In the grant application submitted to the RCN, NATED expressed the ambition of making article-based dissertations the preferred convention at the school. Seeing as more than 80 % of the PhD candidates at NATED now base their dissertations on articles, this goal has been achieved.

Research school activities

The main activities of NATED comprise PhD courses, workshops and the annual national PhD days. In total, more than 50 courses and workshops/seminars have been organised between 2009 and 2012 (“pure” courses and a combination of courses and workshops). The school has sought to offer a wide range of methodology courses in both quantitative and qualitative approaches, but the panel finds that the methodological training still needs to be broadened.

The number of courses has been rather evenly distributed between the years, and only one course has involved interaction between two tracks. Given that the PhD projects in the four tracks are similar in many cases (as judged from the website), the panel observes that it could be possible to rationalise the number of courses offered by opening up for participation across the tracks.

The joint PhD days, workshops and courses have appeared to work well, although it is difficult to identify the extent to which the candidates belonging to the host institution have participated in courses at other universities and vice-versa.

Management of the research school

The school management has two levels: a scientific board and a scientific and educational committee. The board is responsible for long-term planning. The scientific and educational committee handles candidates’ research plans and plans the educational process. The scientific leader and track leaders are supported by an executive secretary at the host institution. The scientific leader, who has a distinct role from the scientific board, and the track leaders coordinate and are responsible for the programmes for the PhD days. According to the self-evaluation, the governance structure has functioned well, and this was confirmed convincingly in the interview.

National network and international collaboration

NATED appears to have fulfilled the function of a model for doctoral training, and has contributed to quality assurance and greater uniformity of quality requirements for admission, teaching, supervision, writing articles and the dissertation “coat”. The joint PhD days, for example, have served as collective feedback for the supervisors. The cooperation at NATED has focused on various procedures in the handling of PhD candidates, and has thus contributed to a more uniform approach to these issues.

The host institution has a special position as the hub of this network, as a key academic institution within educational research in Norway, and as the home of the majority of the PhD candidates registered at the school. The partners in the NATED network appear to have made

their cooperation function smoothly; they contribute to the school according to plan and they report that they benefit from taking part in the school and the network.

The University of Agder left the consortium in 2012, mainly due to a disagreement regarding the terms of acceptance of PhD candidates to the research school, which Agder believed to be biased. Another institution has indicated that the criteria for admission to NATED are unclear and that the school offers too many seminars, to the detriment of the courses. The other partners have expressed a largely positive attitude: in general, the school offers a graduate education of high quality with a good range of courses. The school is perceived as well-coordinated and important to the graduate education at their own university and to national cooperation within the field.

NATED's internationalisation activities have been prioritised in accordance with original plans, with some modifications. One means of promoting internationalisation has been the use of international scholars (professor II and other guest researchers) as contributors/lecturers in PhD courses, workshops and the annual conferences. This has stimulated both networking and the use of English as a working language. International publication has also become a norm. The school has therefore prioritised providing the candidates with financial support to conduct research stays abroad; however, the ambitions in this area have been too high to achieve. For candidates with families, shorter stays abroad have proven to be easier to implement than longer stays. The school has used less funding than planned on travel grants during the first period, but more than planned on international guest lecturers.

Strategic importance

The self-evaluation emphasises that the structure of the research school with four tracks is its most important feature. This model has made it possible to offer a tighter course structure and more coherent and focused training. All tracks have internationally recognised leaders, which would not have been possible if the school had not been a national organisation. The school gives the candidates access to international research contacts that otherwise would not have been available.

There is no doubt that many of the strategic objectives have been achieved. Many, but not all, partners have appreciated the national push to gather the highest competence in a joint organisation.

Gender aspects

Overall, the information in the internal evaluation indicates that the balance between women and men in terms of both PhD candidates and supervisors is uneven, but this situation is not discussed or commented on. The gender situation could be more explicitly addressed in future discussions between the partners.

Financial aspects

NATED is co-financed with contributions from the host institution (UiO) and the other partners, with the funding from the RCN as an important basis. After the initial period, the management of the day-to-day finances between the institutions appears to be running smoothly.

Differences in size and activity have necessitated some budget allocations between the tracks. More funds have been used on courses and guest lecturers, and less on travel grants than planned. Costs for board and committee meetings have been slightly reduced.

The financial management looks good. There are ambitions to enable more candidates to travel abroad in the next period and thereby meet the original proposed budget for internationalisation activities.

Future perspectives

NATED's activities in the first period are presented in a positive light in the internal evaluation, but some self-criticism is evident in relation to the planned activities for the last part of the period. There are ambitions to strengthen cooperation between the participating institutions (including increased quality assessment for admission), to enhance the quality of activities in terms of continuity and depth, to focus on methodological courses and text production, and to encourage visits abroad. The school has already begun a review of the demarcations of the four tracks.

The school has not yet developed/discussed plans for continuation after the eight-year period of funding from the RCN has ended.

Overall assessment of achievements according to original objectives

NATED has achieved its original objectives nearly as planned. The objective relating to internationalisation may not be fully achieved. PhD candidates have not spent time at a university abroad to the extent anticipated. Seen from the view of the evaluation panel, this objective may have been too ambitious.

Another important objective was to provide rigorous methodological training in both quantitative and qualitative approaches. It appears that methodology courses in qualitative approaches have been offered. However, it is questionable whether NATED has managed to offer sufficiently varied methodological training.

The fact that one partner (University of Agder) left the consortium after the first period is considered a loss in relation to the original idea behind the school. On the other hand, the majority of the partners are satisfied with the school. In the SWOT analysis the management of NATED lists provincialism and difficulties in envisioning the graduate school as a national concern as potential threats, and it has made a point of consolidating cooperation in future plans.

NATED appears to be well planned; no major adjustments to the original structure of activities have been made. Nevertheless, there are plans to make adjustments to the track structure. Seeing as the track boundaries do not appear to be entirely natural, such adjustments would be beneficial.

In conclusion, the panel believes that NATED has clearly demonstrated that it can operate this type of enterprise, both financially and in terms of content. NATED's management is aware of and has identified certain problems that appear to be quite small given the context. The panel recommends that NATED is granted funding for the remainder of the eight-year period.

Recommendations for the remaining funding period

- The panel sees a need to further define the individual tracks while at the same time identifying and handling possible overlap between them. The courses offered should match the PhD candidates' study process and attract candidates across the tracks, for instance by collaboration between courses.

- The panel recommends a registration system that makes it possible to track the individual PhD candidate's way through courses and workshops.
- There appears to be a need to enhance the breadth of the methodology courses offered.

6.4 National Research School in Medical Imaging (MedIm)

Facts about MedIm

- Operating period: 01.01.2009–31.12.2016.
- Grant (funding pledge) for the entire period: NOK 24 million.
- NTNU is the host institution, and there are 3 other partners: UiB, UiO and UiT.
- Open model – voluntary membership and participation in courses – the candidates register online. Supervision and follow-up of the candidates at their home institutions.
- Roughly 160 registered candidates, of which 1/3 are women. Twenty-two candidates have already received their PhD degrees and left the school.
- MedIm has a portfolio of 16 national PhD courses.
- MedIm coordinates and makes local PhD courses available nationally. All courses are embedded in the course structure of one of the partner institutions. Approval of ECTS points between institutions is still challenging.
- The board consists of members from all partners and meets 3–4 times a year. The chair of the board is from a partner institution. There are PhD candidates from all partner institutions on the board.

Objectives of MedIm (from the contract)

The main objective for MedIm is to strengthen national research collaboration in medical imaging in Norway in order to obtain research of top international quality.

MedIm will:

- Include all major imaging modalities (MR, Ultrasound, PET, Image guided surgery / drug delivery, Advanced light microscopy, EM, bio nanotechnology);
- Be highly interdisciplinary in recruiting PhD candidates;
- Improve recruitment
Best candidates, more female, more international;
- Improve quality
Research and science, PhD education, innovation for industry, innovation for better health care;
- Strengthen international networks and visibility.

Research school structure and recruitment

The school has an open model; candidates are recruited on a voluntary basis, register online and have no formal obligation to take courses. MedIm is open to candidates from medical faculties, university hospitals, natural science faculties, etc. The number of registered candidates is about 160 and the PhD student body is highly multidisciplinary. It is accepted

that the candidates can attend more than one research school. The supervisors may also register online and are invited to take part in the school activities.

A voluntary approach like this may present problems when it comes to the level of candidate activity, but the school seems to have been able to achieve roughly what was planned, which is impressive. The candidates only need to take 15 of their 30 ECTS points at the home university, which is a very positive and encouraging factor that may have contributed to increased mobility. However, the approval of ECTS points still differs between the institutions, which is an issue for MedIm.

The school's structure and organisation appear to work very well. There is an inclusive and open atmosphere with an apparent readiness among the collaborators to change course if needed.

Research school activities

MedIm primarily develops and coordinates local PhD courses to make them nationally available. The local institution is responsible for the normal operation of the courses, while MedIm pays for international lecturers and covers the costs for PhD candidates coming from other institutions. MedIm has produced five new national PhD courses, each embedded in one of the partner institutions.

MedIm offered 16 courses in 2012, with three more under development. Once these courses are in place, the school will have covered most needs for PhD candidates in medical imaging. The number of courses seems adequate, although, so far, the number of candidates taking advantage of the possibility to take courses at universities other than their own is lower than desirable. One reason for the comparatively low attendance at out-of-house courses appears to be practical difficulties on the part of the candidates to get to other universities. Another reason is that the universities are still somewhat reluctant to recognise each other's courses. MedIm has supported the drawing up of an agreement between the medical deans, committing the faculties to give credits for national PhD courses organised by medical faculties at other institutions. However, there is still a problem with approval at the other faculties taking part in MedIm.

There are no data available on how many candidates have taken the school's courses, but for reasons already mentioned it appears that they are fewer than expected.

The annual national PhD conferences appear to work well and have a good turnout. They also attract the supervisors and have an important function as national meeting places for them as well.

Management of the research school

The scientific director and the coordinator are both appreciated and credited for their efforts to set up the school and launch the activities. The coordinator travelled extensively during the build-up phase, which appears to have been very positive in terms of engaging people at the different institutions.

The original plan of having part-time coordinators at the partner universities was abandoned in light of how the activities were perceived by the partners and the candidates, a step which has saved resources that can be used for more productive purposes than administration.

National network and international collaboration

It appears that MedIm has managed to bring together the most prominent domestic research institutions within the field in fruitful cooperation, and that so far this collaboration has generally been successful and is appreciated. An agreement was entered into in September 2010 between the medical faculties at each of the four partner universities – UiO, UiB, UiT and NTNU – to coordinate their PhD education. There is, however, still *some* reluctance among the partners to recognise each other's courses, but it is unclear whether this is only the case for the one-third of the candidates who belong to *other* faculties than those bound by the agreement. A very important point for improvement for all the partner institutions is the willingness to fully recognise the courses given by the partners. Unless this is accomplished, the number of candidates who move between universities to take courses will continue to be much lower than its potential, and the possibilities offered by this new structure for PhD education will not be fully utilised.

MedIm's main measures to promote international collaboration are to offer scholarships to candidates for research stays abroad, to provide support for international guest lecturers in the courses, and to provide support for inviting international experts to the annual PhD conference.

The scholarships for studies abroad appear to be popular among the candidates who have conducted such a stay, but so far comparatively few candidates have actually taken advantage of the opportunity to secure funding to travel abroad.

MedIm takes part in the ESFRI project Euro-BioImaging, which offers opportunities for the PhD candidates to participate in research at the European level as well.

Strategic importance

Although the leaders of the school say that general knowledge about MedIm at Norwegian universities is less than they wish, it appears that the school has succeeded in bringing together the most important domestic research institutions in medical imaging. The collaborating partners are also overwhelmingly positive to the initiative, although – as one of them points out – it is too early to tell whether this has also actually improved research cooperation. There are, however, no notably critical comments from the partners.

Gender aspects

The school is seeking to recruit more women; at present one-third of the PhD candidates are women. Nevertheless, more women than men follow PhD courses and travel to other universities. MedIm also tries to attract women candidates by ensuring that women are well represented among the speakers, e.g. at the annual conferences.

Twenty-five per cent of the registered supervisors are women, so the ratio of women to men is lower in this category than among the candidates. There are no concrete plans to try to increase this number, which reflects the gender balance in this scientific field outside the universities as well.

Financial aspects

The school's expenditures were lower than planned during its first years, and a surplus has therefore accumulated which is planned to be reduced in the coming years. Administration costs have increased; for a period the school also financed part-time coordinators at two of the

partner institutions. To attract more women PhD candidates to medical imaging MedIm also offers grants (for several months) for the preparation of PhD project applications.

It is realistic to assume that the school will be able to fully utilise its available economic resources in the years to come and that it will make good use of them.

Future perspectives

Gatherings for supervisors are planned for 2013. There will also be more focus on how MedIm can stimulate more innovation to benefit industrial development and health care.

The SWOT analysis mentions that the school will be forced to offer a less extensive course programme once the Research Council funding has come to an end. It is, however, pointed out that work has already commenced to secure stable financing to enable the school to continue its activities after that date.

Overall assessment of achievements according to original objectives

The general impression is that MedIm has achieved its stated objectives and is very successful, although it has taken longer than expected to get the courses organised and running. There has been a slight change in the research school's administration, as the original plan to have part-time coordinators at the partner universities was abandoned. This decision appears to be well justified since the management of the school functions smoothly without this position, which saves resources.

In conclusion, it is the opinion of the panel that MedIm deserves continued funding and the opportunity to further develop and improve its already successful activities.

Recommendations for the remaining funding period

- The MedIm management is encouraged to remove any remaining obstacles that prevent candidates from taking full advantage of the possibility to take courses at all of the partner institutions.
- Another important improvement, which should be relatively easy to make, is to increase the number of candidates who travel abroad to study.

6.5 National Graduate School in Structural Biology (BioStruct)

Facts about BioStruct

- Operating period: 01.01.2009–31.12.2016.
- Grant (funding pledge) for the entire period: NOK 19 million.
- UiT is the host institution, and there are four other partners: UiB, UiO, NTNU and UMB.
- Open model, applications accepted year-round.
Supervision and follow-up of the candidates at their home institutions.
- Around 95 candidates have been registered since the start, of which approximately 50 % are women. Seventy candidates are registered at present. Twenty-five candidates have completed their degrees.
- Fourteen PhD courses are offered on a biannual basis. There were 7 courses in addition to other activities in 2012.
- The PhD courses are recognised by the home institutions beforehand; candidates do not need to apply for accreditation.
- The board consists of members from all partners and 2 PhD candidates and meets twice a year. The chair of the board comes from one of the partner institutions.

Objectives of BioStruct (from the contract)

The BioStruct graduate school aims at providing a network of excellent research groups and facilities for PhD education and research in structural biology in Norway, and by this to be highly visible in the international research community in the field, in the society and among the relevant industries. This new arena for research and research education will improve the PhD education, increase the recruitment to this fast growing field, and give an overall international perspective to the PhD training.

BioStruct will:

- Establish and provide 10 open national PhD courses;
- Establish partnerships with PhD schools abroad and with recognized research institutions;
- Form close relations to industry;
- Establish meeting places for the PhD candidates and their research groups through national conferences, workshops and PhD courses;
- Establish exchange programmes with 3–6 month research stays at national institutions.

Research school structure and recruitment

The school has an open model. All candidates who fulfil the formal requirements and are studying a relevant subject within the field encompassed by the school will be accepted, and may apply for acceptance all year round. The courses at the research school are not mandatory, and supervision and follow-up of the candidates are the responsibility of their home institution. However, the PhD candidate and his/her supervisor must sign an agreement with BioStruct, committing to take active part in the school's activities.

Around 95 candidates have been registered at the school, of which 25 candidates have completed their degrees. The number of candidates is less than the roughly 100 candidates estimated in the grant application. Some 70 candidates representing 27 nationalities are currently active in the school. The yearly enrolment is around 25 candidates, and the candidates are well distributed among the partners. Some candidates have prolonged their studies due to maternity leave, etc. It is too early to judge the time used for degree completion.

As is the case for the other research schools, it is a major challenge for BioStruct to find its place in relation to the institutions responsible for the candidates and their supervision and final evaluation of their work. The school is very aware of this challenge and a number of related problems. How can the school influence the curriculum of the candidates? And how can the school make demands in relation to the supervisors? In light of this rather complicated scenario, the school has chosen to have as little bureaucracy as possible. All interested candidates fulfilling the requirements of studying a subject relevant within the field encompassed by the school are accepted. Communication occurs mainly via a well-structured home page edited at least once a week and via Facebook. Notably, the home page also features a hall of fame presenting all the candidates who have graduated from the school. Candidate interplay appears to function well, while the inclusion of supervisors has proven more difficult.

Research school activities

The establishment of PhD courses, annual events and workshops has been the key task of the school during its first three years of operation. Fourteen courses (of which 13 are new) are up and running on a biannual basis, and the annual researcher conference has been a great success, with high-quality lectures, candidate presentations with feedback, and teambuilding. The school's activities in 2012 comprised seven courses: one 10 ECTS course and six 5 ECTS courses. Between four to 18 candidates participate in each course (with an average of more than 10), of which an average of around seven are PhD candidates. There were four additional activities listed for 2012, including the annual conference and workshops.

Notably, the school has found a model in which the courses given by BioStruct are embedded in the ordinary PhD portfolio of the partner institutions. In this way the candidates do not have to apply for ECTS points and there are fewer administrative challenges. A minor problem, however, seems to be that there are too few attendees in some of the courses, suggesting a need to reduce the frequency of such courses or to attract candidates from abroad.

An important and successful activity has been to organise interplay with industry in the form of lunch meetings. These events allow candidates to learn about industrial activities and allow industrial representatives to meet the candidates.

Management of the research school

Management of the school appears to be very competent and lean. The scientific director is responsible for the day-to-day management in cooperation with the coordinator, and their work is highly praised by the partner institutions. The board includes representatives of all the partner institutions, and all major decisions are taken at the biannual board meetings.

An advisory committee of three recognised scientists is affiliated with the school. This committee evaluates the activities of the school, and its input is used in further planning.

To solve the problem of the coordinator being located too far from the partner institutions, part-time administrators have been employed locally.

Altogether, the management of the school is judged to be appropriate and effective.

National network and international collaboration

All partners in the national network are very enthusiastic about the PhD school, emphasising that it has made a significant difference by offering courses that otherwise would not have been held. The ease of getting in touch with the director and the willingness to solve problems are emphasised as well. As mentioned above, the problem concerning administrative assistance at the larger institutions has been solved by hiring part-time staff at the individual sites.

It is the opinion of the panel that BioStruct has done a good job in overcoming the inherent problem of insufficient commitment on the part of the partner institutions.

The school has boosted networking, not least via its annual meetings and social activities, as well as increased collaboration between PhD supervisors from different sites. Networking is based in part on the assumption that PhD candidates may continue as post-doctoral fellows at one of the partner laboratories.

As for international activities, the school participates actively in a Nordic graduate school collaboration, which is funded by NordForsk. The school also collaborates with partners outside the Nordic countries, although less focus has been placed on this in the internal evaluation.

The original objective of enabling candidates to conduct long-term stays abroad appears to have been replaced by awarding grants to candidates for short-term stays. This is deemed satisfactory and meets the needs of the candidates.

Strategic importance

The school is embedded in a research unit, the Norwegian Structural Biology Centre (NorStruct), at UiT. It has benefitted from an effective network and the establishment of predominantly Nordic collaborations with the help of a NordForsk grant, among others, allowing candidates to participate in activities in the Nordic countries.

It is the opinion of the panel that continuation of the school will be of major strategic importance for strengthening the Norwegian position in the field. Importantly, the school has made a point of marketing itself in several different ways.

Gender aspects

No special focus has been placed on this. The school appears to have a balanced PhD student body, with probably slightly more than 50 % women. However, men supervisors still predominate.

Financial aspects

Due to a delayed start, the budget was not fully utilised during the first years of operation. Recently the school has made some re-allocations to strengthen administration at the partner institutions, the need for which was originally underestimated. It is highly realistic that the school will use the entire budget in the years to come and will make good use of the resources.

Future perspectives

BioStruct proposes relevant activities in the years to come, including continuation and consolidation of current activities and focus on ways of obtaining better involvement of the supervisor team. The school is well aware of the need to draw up a continuation strategy, which is considered to be of great importance in order to benefit from the tremendous effort invested in establishing this successful research school.

Overall assessment of achievements according to original objectives

Overall, the panel finds that the BioStruct research school has done a good job, and has by and large fulfilled the objectives set out in the grant application.

The school has recruited candidates from all partner institutions, albeit fewer than expected. There is now a total of 70 candidates, as compared to the 100 estimated in the application. It is the opinion of the panel, however, that the school covers the candidates that are relevant to include. The school has benefitted from its relationship with NorStruct and from an extended Nordic network made possible by a grant from NordForsk. The school has far exceeded the goal of offering 10 courses and has found a very efficient way of running the courses in close collaboration with the participating institutions. The school has cultivated relationships with industry in the form of lunch seminars, and has established an annual conference to create meeting places for the candidates. The school also makes active use of and regularly updates its home page. The goals relating to the development of Internet-based courses have not yet been achieved, and, according to the school, more needs to be done to engage supervisors.

The school has made some administrative changes. Part-time administrative staff have been hired at the major sites outside UiT to improve efficiency.

In conclusion, it is the opinion of the panel that BioStruct is run smoothly and has made a very good contribution to PhD education. Continuation of the funding from the RCN is recommended.

Recommendations for the remaining funding period

- It is recommended that the school consolidates its activities along the lines established.
- The major challenge will be to ensure a continuation strategy benefitting from the very successful work initiated by BioStruct.

7. General observations and recommendations

Introduction

The general observations and recommendations concerning *the scheme for national research schools (FORSKERSKOLER)* are based on limited empirical material: two calls for proposals (2008, 2012) and the evaluation of the five schools granted funding in 2009. The evaluation of these schools has taken place less than four years after start-up. Nevertheless, the evaluation panel feels that it has a good basis for providing some general observations and recommendations concerning the programme as such.

The recommendations are directed towards the Research Council of Norway in connection with a *potential new call for proposals* to be issued within the framework of the same (but revised) programme. The panel suggests creating some clear-cut requirements for obtaining funding. Some of the recommendations concern organisational issues and could be implemented by the schools already in operation. This applies to the five evaluated schools as well as the ten new schools starting up in 2013.

The FORSKERSKOLER scheme is envisioned as a tool to enhance the quality and raise the academic level of PhD education in Norway by encouraging leading national institutions to join forces. The evaluation panel has seen that launching a limited number of research schools has brought to light certain strengths and weaknesses of the current PhD education system as a whole, and may therefore pave the way for more general improvement of PhD education in Norway.

All of the five schools are judged to have done an excellent job – benefitting the candidates enrolled and, to a certain extent, networking between the candidates' home institutions. With regard to the achievement of the objectives of the programme, it is too early to determine whether the programme has actually resulted in:

- Increased quality of training;
- Reduced time-to-degree;
- Increased completion rate;
- Cost-benefit surplus of networking, especially for small and fragmented fields.

Facts and figures are necessary to evaluate these types of impacts, and the schools need to run for a longer period. A full evaluation of the programme should be conducted after the schools' eight-year period of operation has been concluded, or at the time most enrolled candidates have completed their PhD.

Such evaluations should be planned from the very start of the schools. Impact analyses, for instance, will necessitate complete registration of all courses offered by the school and all PhD candidates taking part in (and completing) each course, as well all resources invested in the school by the partner institutions, not only the grant from the RCN.

1. Organisation and management of the research schools

The panel considers it a strength of the programme that the calls have been fairly open when it comes to disciplinary and thematic focus and to the management and organisation of the schools. There are fundamental differences between the schools – for good reason – including the disciplinary structures and substance. The research schools evaluated have all managed to set up well-functioning structures. The panel finds that the five schools have all shown a strong commitment to the overall objectives of the programme, and have initiated activities

characterised by good organisation and coordination. However, a few issues are in need of re-defining, and should be addressed in a future call for proposals:

- The panel recommends that the RCN sets up some minimum requirements for the organisation and management of the schools.
- There is a need for separation between the functions of *chair of the board* and *school director* (CEO). This separation provides a foundation for the division of power and is in line with best organisational practices. Often the school director is from a major university (the host institution and grant recipient). To involve and make other (and smaller) partners responsible for the school, it seems wise to separate these two functions.
- PhD candidate participation on the board of the school should be mandatory and based on a formalised election process. The panel recommends that PhD candidates are represented by two board members, or one ordinary member and one deputy.

2. The research school and the degree-conferring institutions

Setting up a research school “between” the PhD candidates and the degree-conferring institutions may generate tension between the local PhD committees at the degree-conferring institutions and the school. The panel heard several complaints (from the schools) about bureaucratic obstacles and insufficient participation on the part of the partners, and about a lack of interest on the part of the supervisors (appointed by the degree-conferring institutions).

All five schools have attracted candidates on a voluntary basis, and limited or no evaluation has been involved in relation to the enrolment of candidates (except that they must be accepted to a PhD programme at an institution). In general, it has been difficult for the schools to be able to define a core portfolio of courses that all candidates must follow and that are recognised as relevant by candidates and institutions alike. Also, all of the schools have found it difficult to ensure that supervisors feel like they are part of the school and participate in school activities.

The majority of the five schools evaluated were established with an open model in which PhD candidates may select courses of relevance for their thesis as a supplement to courses taken at their home institution or elsewhere (abroad, for instance). Although this model is flexible, it may lead to loose commitment on the part of the partner institutions which should become fully engaged in the school and recognise the courses offered by the school, integrating them into their own PhD system.

- The panel recommends that a future call for proposals requires a formal mutual acceptance agreement to be established between the partner institutions and the school (the host institution). It should be stronger and more binding than the present agreement.
- The panel recommends that the RCN takes the initiative to prepare a *charter* to be agreed upon both by the research school and the degree-conferring institutions covering the commitment of the three parties – the PhD candidate, the degree-conferring institution and the school – and that ensures the participation of the supervisors.

3. Course activity – number and scope of courses

The programme has been successful in encouraging the schools to invest major effort into

creating PhD courses. In general, the partners have praised this effort, emphasising that it has made courses available that otherwise would not have been accessible.

All of the research schools have experienced problems related to rating of courses in ECTS points and subsequent acceptance of the rating at the various institutions. One particular issue is that the same course may be recognised differently by different institutions. This is a time-consuming and frustrating problem for the candidates, and it must be resolved.

- The panel recommends that actions are taken to harmonise the use of ECTS points and to ensure that the points assigned to a specific course are accepted by all degree-conferring institutions. For the research schools, this should be part of the partners' agreement.
- In general, consideration should be given to basing the PhD education system in Norway on agreements between all the faculties and institutions organising PhD programmes within the same field of science. The cooperation between the medical faculties at the universities appears to function well in this respect and may serve as a model.
- The panel considers the model in which each partner takes responsibility for certain courses to be excellent, and one which may provide an avenue for ensuring that the initiatives undertaken by the research schools can be continued after the funding from the RCN comes to an end. The panel recommends that the next call encourages this model.

4. Networking and internationalisation

National networking between the PhD programmes is desirable because of the wide range of institutions in Norway, many of which are small with (local) activities that may be subcritical on their own. International networking may enhance the quality of doctoral training through benchmarking against the best institutions in the world. On the basis of the five schools evaluated, the panel finds that networking has been significantly improved under the FORSKERSKOLER scheme. However, the extent to which the scheme has been able to *adequately* promote national and especially international networking (given the generous grants allocated) is unclear. In particular, the PhD supervisors appear to be less than optimally involved in the research schools. There also appears to be fewer PhD candidates conducting longer stays abroad than originally envisioned.

- The panel finds it unclear to what extent a research school funded by the RCN should be the institution of choice for funding grants for PhD candidates visiting international universities and labs. Alternatively, this could be considered the responsibility of the home institution (the employer) or provided by a special RCN programme set up for this purpose, possibly as a special call within the framework of the FORSKERSKOLER scheme. The panel recommends that the RCN considers these issues before issuing the next call. The scheme's budget seems sufficient for including such a call.

5. Future perspectives

Considering the significant resources invested in each research school it must be assured that the activities and improvements achieved by the schools should be continued in some form after the grant from the RCN ends.

The evaluation panel has noted that a model in which courses are offered at (owned by) different institutions (the responsibility of the partners) may provide the best foundation for maintaining the boost in quality achieved by the programme after Research Council funding has been terminated. Thus, the panel considers the distributed model to be more sustainable than the centralised model. The panel recommends that the schools established in 2009 and the new schools awarded grants from 2013 devise a transparent plan for the *post-grant period* together with the partner institutions.

- The panel recommends that a future call should require a plan for a continuation strategy (embedment of activities) as part of the project description. A concrete plan for the *post-grant period* should be a condition for continued funding after the initial period.

6. Measurable quality improvements

Based on the submitted documents and the dialogues, the panel finds that the PhD candidates attending the research schools are likely to have benefitted from the FORSKERSKOLER scheme. However, it is difficult to assess the benefits in relation to the quality of the training in general and the individual candidates themselves. To facilitate a future evaluation of the programme:

- The panel recommends that research schools receiving grants from the RCN should compile documentation concerning the candidates, including information on the duration of PhD studies, number of ECTS obtained at the research school as well as other information available on PhD candidates in Norway.
- The panel finds it advisable to carry out a final evaluation of the programme several years after funding has ceased and to document the findings in a report that may be used as input for future initiatives. The evaluation parameters should include completion rate, time-to-degree and professional career of the research school attendees (where did they go), and should be compared to similar information for the total population of Norwegian PhD candidates.

7. Cost-effectiveness of the research schools

Given the total number of candidates under the FORSKERSKOLER scheme, the panel thinks that the five schools have been generously funded. Similar programmes could probably not be made available to all Norwegian PhD candidates. The panel therefore suggests that it may be more cost-benefit efficient for future programmes to identify selected key areas in which special effort is required. These could include nationally prioritised fields of science, or fields that particularly need to be strengthened. This is a top-down model. On the other hand, the present scheme has the advantage of a bottom-up process in which the various communities take the initiative to propose a research school network to improve PhD education in their field.

It should also be considered whether awarding a smaller amount of funding to a larger number of schools would have a greater overall impact. In the opinion of the evaluation panel a somewhat reduced grant size may still lead to expected benefits while allowing more schools to be established. The panel agrees that a time horizon of eight years is adequate.

- The panel recommends that the RCN considers the size of the grant for each school. Large grants could be limited to a few areas with special potential for high output. An open call for smaller grants would allow more PhD candidates to become affiliated

with national research schools and more PhD programmes (and their institutions) to benefit from the programme.

Attachments

Attachment A

Call for proposals for national research schools, 2008–2016

Translated from Norwegian.

The FORSKERSKOLER scheme: Call for proposals for 2008

Call for proposals for national graduate-level research schools, 2008–2016

This programme/activity normally accepts grant applications from:

Universities and university colleges with research environments that collaborate, or plan to collaborate, on network-based research schools. The formal applicant and host institution must be an institution that is authorised to confer doctorates in the field.

Duration:

2012–2019

Overall budget:

NOK 160 million in total.

Approximately NOK 115 million in funding is available for national graduate-level research schools within all disciplines for the period 2008–2016. Schools must be network-based. Binding cooperation between institutions is required. The Research Council will hold an information meeting on the scheme on 1 April 2008. The application submission deadline is 4 June 2008.

Deadline:

04.06.2008 12:00 CET

Objectives for the programme:

The overall objective of the FORSKERSKOLER scheme is to raise the calibre of researcher training. The scheme is designed to supplement existing doctoral degree programmes and training activities at the various institutions. The objectives of the scheme are to increase degree completion, reduce time to degree completion and ensure a broader base in researcher training. National graduate-level research schools must be based on a network of research environments and must seek to enhance researcher training in specialised subject areas that would benefit significantly from inter-institutional collaboration.

Messages:

For further details please refer to the report on the scheme for national graduate-level research schools in Norway (*Utreddning av ordning med nasjonale forskerskoler i Norge*, Norwegian only), which serves as the basis for this call for proposals.

To be eligible for funding, proposals must incorporate binding cooperation between research groups and must ensure that PhD candidates will have access to research groups known to have adequate scope and depth.

Universities and specialised higher education institutions may submit a maximum of four grant applications. State university colleges may submit a maximum of two grant applications.

Amount of funding presumed available for this call for proposals:

Approximately NOK 115 million for the period 2008–2016.

Guidelines and important considerations relevant to all types of applications in this call for proposals:

The Norwegian-language call for proposals is the legally binding version.

Each research school should normally have a minimum of 20 PhD candidates and four to eight supervisors when it is fully established. In special cases, funding may be awarded to smaller schools. The assignment of supervisors and candidates may take place over time. The school must have a scientific director and a separate board that is responsible for recruiting PhD candidates and resource persons and has the overall responsibility for developing the scientific activities at the school. Schools may have an annual budget framework of NOK 3–5 million, and funding may be sought for a period of up to eight years. Schools will be evaluated after approximately four years to determine whether funding from the Research Council will be continued.

Grant applications must describe:

- The scientific content of the research school in broad terms, its objectives and the delimitation of its area of activity;
- The network, the key national players in the relevant research field and their affiliation with the network (when relevant), existing collaboration and the location of the research school;
- The number of earmarked positions at the research school (supervisor positions, fellowship positions and others) and other types of contributions from the participating institutions (infrastructure and the like);
- The value added of the research school, in scientific, strategic and societal terms;
- Plans for international cooperation;
- The management and organisation of the research school, including governance/coordination, scientific leadership functions and the relationship between the partners and the host institutions;
- Binding letters of confirmation from the partner institutions;
- The itemised overall budget for the research school.

Funding from the Research Council is primarily intended to cover costs associated with joint national and international measures to promote quality for a larger group of PhD candidates. Funding may not be sought for doctoral fellowships or ordinary expenses associated with doctoral degree programmes. It must be clear which budget items the Research Council is being asked to fund, and which will be covered by the institutions.

Funding awarded by the Research Council may be used in connection with the following budget items:

- National and international seminars, courses, workshops, etc.;
- Internationalisation measures;
- Measures to support the development of supervisory services;
- Compensation for salary costs for time used by the director of the research school (normally up to 30 per cent of one work-year per year);
- Funding for any secretariat services (normally up to 15 per cent of one work-year per year);
- Funding to incorporate post-doctoral fellows into the research school (up to 50 per cent of one work-year in extension of the post-doctoral period);

- Funding for ongoing quality assurance of the research school (by the board).

Requirements and criteria for this type of application:

Grant applications may be submitted in Norwegian or English. (The grant application form is available in Norwegian only.) **The description of the research school is not to exceed 10 pages** (Cf. guidelines and important considerations). Additional attachments (CVs, cooperation agreements, etc.) must not exceed a total of 20 pages.

Earliest permitted project start:

01.10.2008

Administrative procedures:

Grant proposals will be assessed by the steering committee for the FORSKERSKOLER scheme. The steering committee will submit its recommendation to the Division for Science, and the division research board will take the final decision regarding grant allocations.

Anticipated date for notification of results of application process:

The final decision is planned to be taken around 15 September 2008. The outcome will be published on the Research Council's website.

Attachment B

Mandate and terms of reference for the mid-term evaluation

Translated from Norwegian.

Attachment to DSV item no. 58/2012 Revised subsequent to the board meeting on 5 September 2012

Mandate and task description for the mid-term evaluation of five national, network-based, graduate-level research schools

Introduction

Since 2008 the Research Council of Norway has administered a scheme for national graduate-level research schools (FORSKERSKOLER), which was established on the basis of a report prepared for the Ministry of Education and Research in 2006. The overall objective of the FORSKERSKOLER scheme is to raise the calibre of researcher training, and was articulated as follows in the funding announcement issued in 2008:

The overall objective of the FORSKERSKOLER scheme is to raise the calibre of researcher training. The scheme is designed to supplement existing doctoral degree programmes and training activities at the various institutions. The objectives of the scheme are to increase degree completion, reduce time to degree completion and ensure a broader base in researcher training. National graduate-level research schools must be based on a network of research environments and must seek to enhance researcher training in specialised subject areas that would benefit significantly from inter-institutional collaboration.

At the launch of the FORSKERSKOLER scheme in 2008, the Research Council was requested to appoint a steering committee for the scheme that would be responsible for grant application review, follow-up of the research schools including mid-term evaluations, and an evaluation of the FORSKERSKOLER scheme itself after approximately five years.

The allocation letter from the Ministry of Education and Research for 2008 states:

A steering committee is to be appointed with responsibility for developing the scheme, including formulating criteria for the award of research school status, issuing funding announcements, reviewing grant applications and following up the activities. The scheme should aim to issue a funding announcement in 2009 as well. The steering committee is to conduct an assessment/evaluation of the scheme after approximately five years to determine whether any adjustments are needed.

Two funding announcements have been issued under the FORSKERSKOLER scheme in 2008 and 2012, respectively. In connection with the first call for proposals, five research schools received a funding pledge for an eight-year period and were launched on 1 January 2009. Funding for the final three years of the period was made contingent on a positive outcome of a mid-term evaluation. The review of grant applications submitted in connection with the 2012 call will be completed in autumn 2012, and the new research schools will be launched at the end of 2012/beginning of 2013.

At the time of the establishment of the FORSKERSKOLER scheme in 2008, the Ministry of Education and Research indicated that the scheme should seek to issue annual funding announcements and signalled that the scheme should be evaluated after approximately five

years in order to find out whether any adjustments were needed. Given that only one call for proposals for national-level research schools has been issued prior to 2012, the primary focus of the mid-term evaluation will be on the progression and target achievement of the five existing research schools. However, the steering committee has also been requested to comment on the scheme as such.

There is extensive focus on research recruitment and training in Norway. Under commission by the Ministry of Education and Research, a committee composed of representatives of the Norwegian Association of Higher Education Institutions (UHR), the Association of Norwegian Research Institutes (FFA) and the Research Council of Norway submitted a report in August 2011 on the role of the independent institute sector in doctoral education. In January 2012 a working group appointed by the Ministry and the UHR submitted a report entitled *Etterspørsel etter og tilbud av stipendiatstillinger i Norge frem mot 2020* ("Supply and demand: fellowship positions in Norway towards 2020", Norwegian only). In February 2012 another working group appointed by the UHR submitted a report entitled *Én ph.d.grad for fremtidens behov? Kunnskap, ferdigheter, generell kompetanse* ("One Ph.D. degree to satisfy future needs? Knowledge, skills, general competence", Norwegian only). Under commission from the University of Bergen, the consultancy firm DAMVAD submitted the report *New opportunities in the job market for PhDs from University of Bergen* in June 2012. The Ministry of Education and Research commissioned the Research Council to conduct an evaluation of doctoral education in Norway; in summer 2012 the Nordic Institute for Studies in Innovation, Research and Education (NIFU) submitted the report *PhD education in a knowledge society: An evaluation of PhD education in Norway*.

Purpose

The mid-term evaluation of the five existing research schools is to provide a basis for determining whether the research schools will continue to receive funding from the Research Council for the final three years of the total allocation period as well as provide advice regarding any adjustments to the activities of the research schools.

The evaluation is also to contain a discussion and assessment of how the FORSKERSKOLER scheme has functioned thus far, as well as any proposed adjustments to the scheme.

The evaluation may in addition provide recommendations regarding issues that should be given special attention when following up the new research schools.

Mandate of the steering committee

The steering committee is to conduct the mid-term evaluation of the research schools, on the basis of the existing and compiled material.

The steering committee is to submit a justified recommendation to the Research Board of the Division for Science for continuation or termination of funding for the five existing research schools.

The steering committee is also requested to provide an evaluation of how the FORSKERSKOLER scheme has functioned thus far, and any recommendations for changes/adjustments in connection with future funding announcements.

These assessments are to be made in the context of the intention behind the FORSKERSKOLER scheme as described in the 2006 report *Utrekning av ordning med*

nasjonale forskerskoler i Norge (“Report on the scheme for national graduate-level research schools in Norway”, Norwegian only).

Timetable

The mid-term evaluation is to be completed at the end of March 2013 and submitted for review to the Research Board of the Division for Science in April/May. The Research Board is responsible for final decisions regarding continuation/ termination of funding as of 1 January 2014. The research schools will be notified of the outcome well in advance of this date.

The steering committee will draw up a detailed timetable for its activities within this timeframe. The Research Council administration will deal with practical tasks and lay the groundwork for the work of the steering committee.

Material on which the evaluation will be based

- The report on the scheme for national research schools in Norway prepared by the Research Council and the UHR and submitted to the Ministry of Education and Research in May 2006.
- The scheme for national research schools (FORSKERSKOLER): funding announcement and criteria for grant awards for 2008.
- The project description of each research school (submitted with the grant application, forms the basis for the contract with the Research Council).
- Self-evaluations by the research schools and documentation of progression and target achievement in relation to the original project description, with SWOT analyses (to be compiled by the steering committee).
- Self-evaluations by the host institution and the partner institutions (to be compiled by the steering committee).
- Interviews with the director/board of the research school and doctoral fellows affiliated with the school.
- The experience of the steering committee with grant application review in connection with the 2012 funding announcement.

Other relevant material

- NIFU's report *PhD education in a knowledge society: An evaluation of PhD education in Norway* (2012).
- Other relevant studies and reports on researcher training and research schools.

Tasks of the steering committee

Based on the purpose of the mid-term evaluation and the mandate of the steering committee, the steering committee is requested to answer the following questions in so far as possible:

A. Mid-term evaluation of the research schools

- Each research school is to be evaluated in relation to its original plans and objectives and on the basis of the criteria for the funding announcements and grant awards:
 - scientific activities/course programmes;
 - strategic importance;
 - management/governance;
 - structure and organisation;
 - budget;
 - cooperation between the partners;

- recruitment to the research school (e.g. volume, completion, drop-out);
 - national networks and cooperation;
 - international cooperation;
 - gender equality.
- To what extent has the research school achieved its original objectives?
 - Are any course adjustments made underway well explained?
 - On the basis of an overall evaluation of the quality and activities of each research school are there grounds to recommend continued funding for the last three years of the project period?
 - Provided that funding is to be continued, do the activities of the research school need to be adjusted in any way?

B. Evaluation of the FORSKERSKOLER scheme as such

- How have the five established research schools served to realise the objective of and intentions behind the FORSKERSKOLER scheme?
- What is the relationship between the courses and seminars held by the research school and the institutions' ordinary research training programmes? (Is there overlap, reciprocal adaptation, other issues?)
- Does the steering committee have any specific recommendations for adjustments to the scheme in connection with future funding announcements?
- Are there any issues that should be given special attention when following up the new research schools which will be started up in 2013?

Attachment C
Self-evaluation forms

(To be found on the web-page for the scheme)