The Research Council of Norway

# Midterm evaluation of the NORSI research school

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Regional R&D and Innovation – VRI

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# 1. Introduction

The Norwegian Research School on Innovation (NORSI) started in Sept 2012 based on the funding from the Research Council of Norway. The school has, in the spring 2015, been in existence for about two and a half years and it is now time for the Research Council to evaluate if – and under what conditions – additional financial support should be given to the school. On request from the Research Council a panel has therefore during the early months of 2015 evaluated the performance of NORSI during its first two and a half years. This report summarizes the essence of that work.

The report is structured as follows: sections 2 and 3 introduce the panel and its mandate while section 4 discusses the general framework the panel has adopted for its evaluation. Section 5 offers a somewhat more detailed description and interpretation of the administrative processes behind the establishment of NORSI in its present form while section 6 briefly discusses innovation studies as a field for creating research schools and how to organize them. Section 7 contains a combined description and analysis basically following the requirements in the mandate while section 8 provides the general assessments of the panel. Section 9, finally, contains the recommendations of the panel.

# 2. Mandate

The mandate given to the evaluation panel was modelled after the mandate for the previous evaluation of five Norwegian research schools funded by the Research Council. It was, however, modified to comply with the objectives of the research school on innovation research.

The full mandate is enclosed in appendix 1.

# 3. The evaluation panel and its work

The evaluation panel has consisted of three members:

- Hanne Marlene Dahl – Professor, Roskilde University
- John Parm Ulhøi – Professor, Aarhus University
- Staffan Laestadius – Professor Emeritus, KTH, Stockholm

The latter has acted as Chair of the Panel. The panel has had administrative and secretarial support from

- Philip Lorentzen, Special Advisor, The Research Council of Norway

during the entire evaluation process.

The evaluation is based on primary and available secondary data, i.e. relevant documents and background material. The latter has been used to identify the general and specific objectives for a national research school on innovation research in Norway. More specifically it includes:

- Norges forskningsråd, Evaluering av norsk forskerutdanning, 2002
- Forskerskoler i Norge? UHR-notat 2/2003
- Forskningsmeldingen, St. m. nr.20 2004-2005, Vilje till forskning
- Utredning om nasjonale forskerskoler (2006), including the instructions from the Department of Education and Research (2005)
- The report from the mid-term evaluation of five national research schools (2013)
- The original call for proposals, the grant applications the evaluation of the panel of experts and the contract with NTNU.

The panel has gathered specific, primary data on the operation of NORSI. This material consists of:

- Self-evaluations from the board of NORSI, the directors of the two individual programmes (PING and PIMS), host institutions and partner institutions.
- A student survey
- Meetings with key persons from NORSI:
  - Johan Hustad, chair of the board
  - The management of the PING programme: Bjørn T. Asheim, Knut Sogner and Birte Horn-Hansen
  - Faculty of PING: Gry Alsos, Martin Rønningen and Magnus Gulbrandsen
  - Management of the PIMS programme: Alf Steinar Sætre.

  The director for each programme was asked to give a presentation of activities, lessons learned and a SWOT analysis.
- Separate meetings with doctoral students from both programmes; 6 students from PING and 8 students from PIMS

Finally, the Panel has benefitted from the experiences laid down in the upcoming European Code of Practice for Doctoral Studies in Management and Business[1] EIASM/EDAMBA Task Force document and associated discussions in European Doctoral Association in management and Business Administration, as one of the panel members (Prof. Ulhøi) has taken part in his capacity as member of the Executive Board.

# 4. On Research Schools

To establish a solid foundation for a thorough evaluation of NORSI, the panel has related this particular research school to its specific context. The panel has done so by establishing (i) an overview of the relevant theories on how to organize knowledge formation processes in general and research schools in particular, (ii) a short overview of the relevant official documents behind the Norwegian efforts to create research schools and (iii) by re-visiting and considering the outcome of the mid-term evaluation of five national research schools performed by the Research Council of Norway in May 2013.

[1] introduced at EIASM-EDAMBA Workshop on a European Code of Practice for Doctoral Education in Management and Business, Brusses, Belgium, October 22, 2013

## 4.1 The theoretical arguments for national research schools in small countries

The economic and epistemological arguments for the creation of research schools in countries like the Scandinavian – small populations, and primarily in sparsely populated areas – may be classified with help from the well-known dichotomies ”economies of scale and scope” or ”static and dynamic”[2]. The *economies of scale* argument, here, refers to the fact that countries with small academic environments thinly spread over a large area may benefit from coordinating their resources for research and teaching. This opens the possibility to invite distant or international specialists to national gatherings thus e.g. providing opportunities for PhD students within the same field but distributed throughout the country to meet them. Further, this situation provides opportunities to draw on the intra-disciplinary specialization between national (in this case Norwegian) academics in research, teaching and supervision. A Bodø located specialist in entrepreneurship, for example, may offer one course while a Stavanger located expert on regional innovation systems another. This is the question of allocating given resources efficiently and reducing unit costs.

The *economies of scope* argument is here related to the learning outcome of the knowledge formation processes rather than the short term efficiency of specialization and resource allocation. This argument in fact has two, although strongly related, aspects worth considering. The first relates to the *multi-disciplinarity dimension*. Some fields of knowledge typically are of such a character: i.e. they are preferably analysed by scholars within several academic disciplines and the understanding of them benefits from more than one analytical point of departure. In the last two decades it has been argued that the growing specialization between and within academic disciplines on the one hand and the more complex and multidimensional problems emerging in policy and industry on the other hand makes it increasingly important to create cross-disciplinary fora for knowledge formation within what has been labelled “Mode 2 production of knowledge” (cf. Gibbons et al, 1994). In section 6 below it is argued that the fields of innovation and entrepreneurship are such knowledge areas. This aspect is basically qualitative in nature: it is the *variety* of researchers from different disciplines/fields of knowledge that matter, not the *size* of the group per se.

The second aspect relates to *community creation* in knowledge formation. All communities – in particular small and isolated ones – develop bounded visions or ”group think”. Epistemologically that phenomenon was decades ago formulated and analysed by Ludvik Fleck (1935/1979;) who with his twin concepts ”thought community – thought styles” identified the creation of likeminded professions/academic groups developing processes of convergence in their beliefs. This community creation can however take place at different systemic levels, not the least depending on the character of the knowledge processes themselves but also on institutional context and the development of communication technologies. Not the least the recent two decades of the Internet has changed the conditions for human networking, interaction and knowledge formation.

Although geographers of knowledge may argue that physical proximity not necessarily is important for creative networking (see e.g. Amin & Cohendet, 2004 & 2005) in a global economy, sociologists of science have argued for the importance of the laboratory and small research units (Knorr-Cetina, 1982; Latour, 1979/1986).

[2] Cf. Teece (1980) for a more elaborated discussion on the scale/scope dichotomy.

In short, what has been labelled *situated learning* (Lave & Wenger, 1991) and *communities of practice* (Wenger, 1998) may – due to many various reasons - be situated in many different locations and organizational structures while obtaining similar performances. This community phenomenon may, on the one hand, be looked upon as a means to create a specialized unit with potential to develop expertise in a certain field, and on the other hand it carries the risk of developing boundary visions or group thinking over time – unless it is continuously challenged in a broader intellectual context.

These aspects have in turn an immediate impact on the analysis of the structure and performance of universities and university colleges and – which is the focal point of this evaluation – how to establish and organize national research schools in order to improve certain fields of knowledge and knowledge formation.

In a situation where academic productivity benefits not only from the microstructure context on the one hand (the laboratory or the small research group) but increasingly also from a more or less global networking via internet and conferences on the other, there is no a priori reason to assume that large universities will perform better than small university colleges - as long as the latter focus on what may be labelled *smart specialization*, that is fewer but reasonably specialised labs/group although exceeding some minimum critical mass. And, obviously, national research schools can be a means for broadening the perspectives for these groups.

Although the empirical research in this area is not overwhelming, some results seem to support the conclusion that small universities sometimes are, and definitively can be, competitive in research publications and citations (Wibe 2000; Sandström, 2012).

Summing up this section the panel finds that both the economies of scale (the allocative) and the economies of scope (the creative) dimensions are relevant for the type of national research schools discussed and introduced in a small country like Norway. Not the least they can be a lever for advanced teaching, learning and research in small university colleges in their aspirations to develop expertise.

## 4.2 The policy background for national research schools in Norway

The following section is based on the reading of the core policy documents which provide the administrative foundation for the national research schools created by the Research Council of Norway in general and of which NORSI is an example. The reason is to identify the intention behind these schools.

The Norwegian research schools seem to have their origin in the evaluation of Norwegian research education performed by the Research Council in 2002 (Norges forskningsråd, *Evaluering av norsk forskerutdanning*, 2002). Following that, another report *Forskerskoler i Norge?* UHR-notat 2/2003) discusses two models for organizing research schools: flagship and network. The *flagship* model is explained as institutional schools organised around research environments that initially already are disciplinary strong and have many students. A straight forward interpretation of such a model is the big universities. *Network* schools in turn are characterized by their connecting of activities within and among different institutions. The students and the supervisors will continue to be connected to their home institutions.

The analyses in the Norwegian university and research administration later feed into the government proposal to the parliament 2004-2005 (Forskningsmeldingen, St. m. nr.20 2004-2005, *Vilje til forskning*) where the government indicates that it will establish national research schools to improve PhD education. This is later followed up by a letter to the Research Council (13-09-05) where the government explicitly demands an investigation on how to establish national research schools and to create "…. a national system with research schools /that/ shall provide value added compared to existing institutions".

That work resulted in a report on National Research Schools in Norway (*Nasjonale Forskerskoler*, 2006). The aim, following the report, is to stimulate co-operation between several institutions and contribute to mobilising fragmented environments. The report argues that the research schools shall connect research environments through the establishment of national networks for research education and contribute to internationalization.

*Nasjonale forskerskoler* is clear in its preferences of the network model and that it should be a requirement that a research school shall be based on co-operation between several different institutions/departments. This is also assumed to be the foundation for the value these schools are expected to create compared to what can be achieved at the traditional institutional level.

## 4.3 The Mid-term Evaluation report

The panel has benefitted from the earlier mid-term evaluation of five research schools in two ways:

1. One of the panel members of the earlier evaluation – prof. Hanne Marlene Dahl - is also a member of the present panel.
2. The panel has benefitted from that evaluation report, the general observations and recommendations (CH 7) of which relevant sections are summarized below:

The mid-term evaluation report has a general positive conclusion, stating that "all 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"[3]. Still the report identifies some recommended areas of improvement. Among the general recommendations the following may be mentioned:

- The functions of chair of the board and school director should be separated.
- PhD candidate participation on the board of the school should be mandatory and based on a formalised election process.
- Strong formal links between the research school and involved institutions should be established. The school should be more than just a "course factory" and the supervisors must be actively involved in school activities.
- The use of ECTS points should be harmonized to ensure that the points assigned to a specific course are accepted by all degree-conferring institutions.
- The report stressed the importance of high networking ambitions for the evaluated schools

[3] The report from the mid-term evaluation of five national research schools (2013), p. 34.

- The report also focused on the importance for the evaluated schools to develop a strategy for embedding activities at existing university colleges and universities. for the post grant period.

### 4.4 General conclusions from the background reading

The broad theoretical discussion in section 4.1 as well as the policy documents referred to in 4.2 - *Forskerskoler i Norge* (2003) and *Nasjonale Forskerskoler* (2006) – and the work from the earlier Mid-term evaluation panel (discussed in 4.3 above) do all end up in strong recommendations for networking models. In short: it is *not* only a question of economies of scale – efficient allocation of economic resources – but also economies of scope: the value added through research schools should be provided via the network externalities created by connecting PhD candidates and supervisors from many different institutions.

This is also how this panel interprets its mandate: national research schools should be a network based means to both economise PhD education with international contacts and to contribute to high quality research (education) also within nationally distributed research communities. This refers to how the panel interprets the value added dimension frequently mentioned in the background documents.

## 5. Background for NORSI

The role of Virkemidler for Regional FoU og Innovasjion (VRI) within the Research Council of Norway is to evaluate and fund projects in regional innovation – research as well as innovation promotion. As part of the scheme, VRI has also funded a research school in innovation. The call for a research school was made in 2011 and the Norwegian Research School on Innovation (NORSI) was awarded funding in 2012. The call was based on previous calls in the scheme for national graduate level researcher schools (*Nasjonale Forskerskoler*), which was established on the basis of a report prepared for the Ministry of Education and Research in 2006 (See section 4.2 above).

The general objective as formulated in the call was to raise the calibre of researcher training and to supplement existing doctoral degree programmes and training activities at the various institutions. This was in line with the general objectives and requirements from the national research school scheme (Nasjonale Forskerskoler). In addition there were some specific objectives and requirements for the research school on innovation research. The research school was to connect the small and fragmented research environments of Norway internally and with the wider, international research network. There was a requirement to establish a network of cooperating institutions with a minimum of four participants, including one international institution.

The Research Council received two applications which were evaluated by an international review panel. According to the review panel, both applications were found to be of good quality, but exhibited different strengths and weaknesses and seemed to potentially complement one another.

Some specific comments and recommendations were given by the review panel:

- It found a considerable overlap between the two proposals in themes and disciplines.
- Attention should also, according to the panel, be paid to secure good skills in research methods.
- A gradual recruitment of students was found more likely to lead to a better outcome in the long run rather than a cohort model.
- The panel concluded that both proposals had highly reputed international scholars involved.
- The review panel also expressed concern as to whether the well known international scholars would commit to supervising a number of Norwegian PhD students.

The initial review panel further recommended that the two applicants should be encouraged to join forces to prepare a joint application. "A joint school may increase the possibility of innovative research: one where different traditions can meet, emerging from different disciplines and focussing on different objects and levels of analysis." [4]

Following these recommendations from the review panel, the programme committee for the VRI programme instructed the secretariat to negotiate with the two applying groups with the objective of merging the two applications (June 2011). The programme committee was clear that there should be one single research school (October 2011).

Following the submission and re-submission of a joint proposal and subsequent negotiations, the Research Council accepted a solution where NORSI was established as a single research school, although with two separate programmes.

The process to merge the two applications and application groups, however, proved difficult. There were strong differences of opinion with regard to the overall governance structure of the merged school and the possibility of integrating the course structure in such a way that the students could choose courses freely from the two programmes. The final outcome of this process, however, resulted in two separate programmes, one based on a cohort model and one open model, which were accepted by the Research Council, with the clear ambition to reduce barriers between the programmes over time.

The final contract contains the following summary:

"The Norwegian Research School in Innovation (NORSI) will:
a) Provide an internationally competitive PhD program in innovation, which attracts well qualified Norwegian as well as international students.
b) Stimulate high-quality innovation research in Norway.
c) The research school consists of several core courses on innovation research from a firm and system perspective, quantitative and qualitative methods, and common theoretical perspectives in innovation research.
d) Provide two programs that are built on the same basic pedagogical structure.
The programs focus on:
a. Innovation and innovation processes in and between corporations and organizations.
b. Innovation and growth in a multilevel perspective (corporate, systems, and policy levels).

e) Each program will have their own admission requirements that will come in addition to the requirements of the doctoral requirements of the degree awarding institutions.

[4] From the recommendations of the evaluation panel, p 1

NORSI consists of a research network that includes Norwegian universities and colleges, leading institutions in Scandinavia (Denmark and Sweden), as well as representatives from top international universities in the United States and Europe."[5]

NORSI was formally launched in September 2012.

# 6. Innovation – a field of knowledge well suited for cross- or interdisciplinary studies

## 6.1 Introduction

As argued by Gibbons et al (1994) the mirror image of the growing specialization of academic disciplines on the one hand and the emerging complexity of challenges faced by modern society on the other, argues for new forms for handling this "mode 2 production of knowledge". In addition it may be added that there are phenomena which for a long time have been of a character that they, preferably, may be analysed from/within more than one discipline. If 'globalization' is a topic illustrating the first aspect, 'gender' may illustrate the second. The panel argues that the issue of 'innovation' and its twin concept 'entrepreneurship' is multidisciplinary in character, and has been so for a long time.

## 6.2 Theoretical background

When Joseph Schumpeter published an upgraded version of his dissertation from 1911 – *The Theory of Economic Development* (Schumpeter, 1934) - he re-launched the concept *entrepreneur* and invented the concept *innovation* as distinct from *invention*. In the Schumpeterian approach the entrepreneur is the actor who launched innovations in the economy thus causing *creative destruction* (in fact a concept he developed somewhat later, in Schumpeter, 1942) in the equilibrium processes.

The twin concepts "entrepreneur" and "innovation" introduce *intentionality* and *disequilibrium* into economic theory which, according to Schumpeter, had developed into a sterile analysis of a "circular flow" (Schumpeter, 1934). Explicitly introducing historical time he also created the foundation for understanding economic change as a process of economic development with origin in intentionality instead of the time independent oscillations around equilibrium points. This also later become a point of departure for the branch of economic theory referred to as *evolutionary economics* (eg. Nelson & Winter, 1982).

It may be argued that the twin concepts innovation/entrepreneur not only are interlinked (Brem, 2011) but further that they offer a bridge between economic theory and management theory; it contributes to solving the problem of whether anything can be done, or is worthwhile doing, in a fully competitive market economy. This is what Coase (1937) addressed with his transaction economics approach and basically what entrepreneurial economists have argued: all actors cannot be (reactive) price takers. The Schumpeterian

[5] From the project contract dated 21.01.2012

innovation went far beyond price setting, however. Rather, it was about changing the rules of the game through processes of creative destruction and fundamentally recombining the production factors which in fact also made it possible to increase prices and collect temporary monopoly rents. ”Solutions” here may include new technologies, raw materials, modes of organization, new markets etc.

All in all, an adequate understanding and analysis of these innovative and entrepreneurial processes goes well beyond orthodox economic theory (in particular as it basically is related to non-equilibrium situations). In addition to economic theory and management theory/business economics, innovation studies is a field where sociologists can contribute as well as industrial economists, economic historians, historians of technology, geographers and others (like cognition researchers). Also institutional theory, policy research and political science can be mentioned. The role of the state in innovative and entrepreneurial processes is in addition a significant and related field of research (cf. Mazzucato, 2015). Moreover, innovation is a field where social science in a fruitful way can benefit from close cooperation with researchers with background in engineering science.

Innovation research, thus, is a field which is characterized by *variety* in the selection of topics, of research methods and of disciplinary orientation. It is also a field where researchers from different disciplines and different research traditions often meet in common projects and co-publish their results. Individual researchers, and research groups, may specialize within this field in different ways, including across traditional disciplines.

It may in fact be argued that innovation research in the US has had a stronger base in *management theory* than is the case in Europe where many industrial economists, economists and geographers have occupied the research field and where a *systems approach* has played a central role during the recent decades.

There are however several exceptions to simplistic dichotomizations:

- well positioned US scholars like Thomas Hughes, David Mowery, Richard Nelson, Everett Rogers and Nathan Rosenberg have not their disciplinary roots in management theory.
- in Europe many of the innovation researchers do have their disciplinary roots outside economic theory: eg. Keith Pavitt, John Bessant, Ove Granstrand, Charles Edquist, Björn Terje Asheim,
- several innovation researchers also have their academic origin in natural or engineering science: eg. Ove Granstrand, Tom Hughes, Ben Martin and Jim Utterback.

As regards the systems approach, which is more dominant in European innovation research, it may be argued that this is an outcome of the fragmented European markets and economies with different institutional conditions (Rickne & Laestadius, 2012).

## 6.3 General reflection

In short: these different approaches are non rival; they are complementary. Innovation processes take place in companies but also in NGOs and government agencies – of which some are small and entrepreneurial - which are embedded in various forms of networks and

institutional contexts, and the management processes have to relate to that. In addition it may be argued that also policy makers face similar challenges in relation to the innovation processes as do managers in large firms.

It may thus be argued that a research school in innovation is an obvious candidate for harvesting the benefits of economies of scale in coordinating fragmented national innovation research groups *within the same discipline*, but also obtaining economies of scope in creating cross- and interdisciplinary clusters *between different institutional groups with a variety of disciplines* and which have significant common intersections in their area of research and teaching.

# 7. NORSI At Work – Analysis and Description

This section contains a short descriptive subsection (7.1) on how NORSI is organised. The following subsections combine analytical elements from interviews, evaluation forms and reviewed documents on NORSI activities with more descriptive segments. Basically, the structure for this follows the structure of the panel's mandate (see appendix).

## 7.1 A Short Description

NORSI de facto turned into a research school with two specialised and rather disconnected doctoral programmes: Programme in Innovation and Growth (PING) and Programme in Innovation Management and Innovation Strategy (PIMS). The two programmes provide separate courses and other activities, but three courses have been shared between the programmes. In addition there has been a common conference where students presented papers. Apart from these activities the panel has not found evidence of other joint doctoral training activities across the two programmes.

NORSI has a board with a chair from NTNU – prof. Johan Hustad from NTNU - and representatives from the most important partner institutions. Students have not been represented at board meetings. The two programme directors – Alf Steinar Sætre (PIMS) and Björn Terje Asheim (PING) are affiliated to the board.

The financial resources are split equally between the two programmes. PIMS has in addition 2 MNOK funding from industry partners for the four year period

## 7.2 The PhD school's academic content in a broad sense and its objectives and constraints

At the time of this evaluation NORSI had provided 16 PhD courses, three joint courses, seven courses in the PING programme and six courses in the PIMS programme.

Figure 1

| NORSI common courses | Responsible teaching staff | ECTS |
|---|---|---|
| Perspectives on innovation | Jan Fagerberg (UiO), Andrew Van de Ven (University of Minnesota) | 7,5 |
| Research methods | Martin Andersson (CIRCLE), Yvonna Lincoln (Texas A&M) | 7,5 |
| Innovation in projects and networks | Jonas Søderlund (BI), Håkan Håkansson (BI) | 7,5 |

| PING courses | Responsible teaching staff | ECTS |
|---|---|---|
| Innovation systems, clusters and innovation policy | Bjørn T. Asheim (BI) | 7,5 |
| The innovative firm | Knut Sogner (BI) | 7,5 |
| Introduction to innovation | Bjørn T. Asheim (BI), Heidi Wiig Aslesen (BI) | 7,5 |
| Economics of innovation | Magnus Gulbrandsen (UiO), Ragnar Tveterås (UiS) | 8 |
| Foundations and future perspectives in entrepreneurial research | Gry A. Alsos (UiN), Åsa Lindholm Dahlstrand (CIRCLE) | 7,5 |
| Quantitative research methods for innovation research | Martin Andersson (CIRCLE) | 5 |
| Qualitative research methods for innovation research | Bjørn T. Asheim (BI)and Rune Dahl Fitjar (UiS) | 5 |

| PIMS courses | Responsible teaching staff | ECTS |
|---|---|---|
| Organisational theory and behaviour | Richard Harrison (The Universtity of Texas, Dallas), George Huber (The University of Texas, Austin) | 7,5 |
| Strategic management of innovation and Service innovation | Nicolai Foss (CBS), Keld Laursen (CBS), Per E. Pedersen (NHH), Per Kristensson (Karlstad) | 7,5 |
| Exploration and exploitation | Dovev Lavie (Technion), Michael Tushman (Harvard Business School), Henry Chesbrough (UC Berkeley) | 7,5 |
| Innovation Learning and Change | Daniel A. Levinthal (Wharton), Heinrich Greve (INSEAD) | 7,5 |
| Digital Innovation, design driven innovation and advocacy | George von Krogh (ETH Zurich), John A. Daly (University of Texas, Austin), Roberto Verganti (Politecnico di Milano) | 7,5 |
| Teaming and disruptive innovation | Amy C. Edmondson (Harvard Business School), Clayton M. Christensen (Harvard Business School) | 7,5 |

Both programmes have used leading international researchers in their teaching. PIMS in particular, has been outstanding in this respect and has recruited an impressive group of faculty with high academic reputation.

The PING and PIMS programmes are organised differently. They also have very different course requirements. PING has no mandatory courses and students can choose and attend any course they find useful and combine these with courses elsewhere. However, PING expressed interest in requiring a certain number of ECTS on top of what the home institutions requires and plans to require 15 to 30 ECTS from the PhD students. The number of ECTS required for each student is determined by their respective home institution. Most students are required to take 30 ECTS and can choose which proportion is taken at NORSI. PIMS, however, is based on a model where all students are required to take 60 ECTS at NORSI, with five mandatory courses and any three of the four remaining courses.

The different models in the two programmes has resulted in a strong separation in attendance at courses which can be seen from figure 2

Figure 2

| Course | Programme | Programme students | Other students |
|---|---|---|---|
| Perspectives on innovation | Joint | 24 | 0 |
| Research methods | Joint | 23 | 0 |
| Innovation in projects and networks | Joint | 22 | 0 |
| | | | |
| Innovation systems, clusters and innovation policy | PING | 13 | 1 |
| The innovative firm | PING | 13 | 1 |
| Introduction to innovation | PING | 15 | 2 |
| Economics of innovation | PING | 6 | 3 |
| Foundations and future perspectives in entrepreneurial research | PING | 13 | 5 |
| Quantitative research methods for innovation research | PING | 8 | 0 |
| Qualitative research methods for innovation research | PING | 15 | 0 |
| | | | |
| Organisational theory and behaviour | PIMS | 12 | 0 |
| Strategic management of innovation and Service innovation | PIMS | 12 | 1 |
| Exploration and exploitation | PIMS | 12 | 2 |
| Innovation Learning and Change | PIMS | 12 | 2 |
| Digital Innovation, design driven innovation and advocacy | PIMS | 8 | 5 |
| Teaming and disruptive innovation | PIMS | 11 | 5 |

The PING programme completed a cycle of courses during 2012-2013 and have started a new cycle in 2014 to accommodate new students. PIMS has only given one single cycle of courses as no new students have been admitted to the programme.

The students generally express great satisfaction with the courses provided. However, as the panel will revert to later, there are big differences concerning how the issue of quality in PhD courses is tackled. The PIMS students are particularly satisfied. The students appreciate being a small and very united group and the possibility to learn from and interact with some of the world's leading researchers in their fields. Some students have been able to establish relationships with the visiting international researchers.

There have been some critical comments, however. The course in research methods (a common course) was too advanced for some of the students who lacked the necessary skills and background knowledge. On the PING programme some of the teaching staff spent too much time presenting their own latest research as opposed to giving a general overview of the relevant field. And some PIMS students have expressed that the course load is extensive (60 ECTS required altogether from PIMS).

## 7.3 Capacity and quality of doctoral-level education

The two programmes have very different modes of organizing and therefore different capacities.

PIMS has a cohort model where 12 students were admitted at the beginning of the programme and are progressing through the programme together as a group. The courses in PIMS were initially limited to PIMS students. Later, they have allowed some other students to join, but in an apparently somewhat restricted manner.[6] Not counting the common courses, PIMS has had 80 students (19 individuals) participating in their courses.

PING is network-based and has registered 51 students which have been accepted in a continuous model and who attend courses according to their needs and interests. There is no limit to the number of participants in the PING courses.. PING has had an aggregate of 95 students (51 individuals).

In addition to the courses, the quality of supervision is crucial to the success and progress of PhD students. The research school itself has limited authority over the supervision given at the students' home institutions. Whereas PING recommends a co-supervisor ,PIMS require students to have a co-supervisor.

Also in the area of supervision the two programmes differ in that PIMS is highly concentrated at NTNU whereas PING draws upon their network partners to a larger degree:

[6] According to the informants, when PIMS participants occasionally had been accepted, they have been given 'second order' status in the courses.

Figure 3

| PIMS supervisors | Institution | Number of students for main supervisor |
|---|---|---|
| Alf Steinar Sætre | NTNU | 5 |
| Endre Sjøvold | NTNU | 3 |
| Arild Aspelund | NTNU | 2 |
| Inger Stensaker | NHH | 1 |
| Truls Eriksen | UiO | 1 |

| PING supervisors | Institution | Number of students for main supervisor |
|---|---|---|
| Jan Fagerberg | UiO | 2 |
| Bjørnar Sæter | UiO | 1 |
| Olav Wicken | UiO - TIC | 3 |
| Magnus Gulbrandsen | UiO - TIC | 3 |
| Jan Frick | UiS | 1 |
| Ragnar Tveterås | UiS | 1 |
| Frank Asche | UiS | 1 |
| Elisabeth Willumsen | UiS | 1 |
| Reidar Mykletun | UiS | 1 |
| Rune Dahl Fitjar | UiS | 1 |
| Bjørn T. Asheim | UiS/BI | 2 |
| Thomas Hoholm | BI | 2 |
| Birgit H. Jevnaker | BI | 1 |
| Sverre Knudsen | BI | 1 |
| Per Ingvar Olsen | BI | 1 |
| Knut Sogner | BI | 1 |
| Heidi Wiig Aslesen | BI | 1 |
| Martin Rønningen | HiL | 2 |
| Sveinung Jørgensen | HiL | 1 |
| Gulbrand Lien | HiL | 1 |
| Erik Haugom | HiL | 1 |
| Liv Solheim | HiL | 1 |
| Terje Slåtten | HiL | 1 |
| Gry Agnete Alsos | UiN | 3 |
| Einar Rasmussen | UiN | 2 |
| Tommy Høyvarde Clausen | UiN | 1 |
| Lene Foss | UiT | 4 |
| Elin M. Oftedal | UiT | 1 |
| Jerker Moodysson | CIRCLE | 2 |
| Lars Coenen | CIRCLE | 1 |
| Lars Fuglsang | Roskilde | 3 |
| Odd Jarl Borch | HHB | 1 |
| Stig Erik Jacobsen | HiB | 1 |
| Arne Isaksen | UiA | 1 |

The PING programme has organised a supervisor seminar in 2014 during which the supervisors could learn from each other, exchange experiences and gain better insight into NORSI and the PING programme. The partners in the PING programme point to the network of supervisors as important for exchanging experiences not only as supervisors, but also regarding PhD education in general. The partners, however, argue that there is a substantial potential for improvement and development in coordinating student supervision, especially for the smaller partner institutions. Interviews with PING students revealed, that it was not entirely clear to them and/or for some of their supervisors that NORSI includes all aspects of PhD training, not the course package alone.

The PIMS programme has not organised any kind of traceable or structured efforts to improve supervision. The programme uses an informal dialogue, according to information available to the panel, through which potential problems in the relations between school and students can be addressed.

### 7.4 Research environment

PIMS and PING have created very different research environments for their students. PIMS has created a very close cohort of 12 students with a lot of required courses. During the interviews with PIMS students, the panel observed clear indications of a closed community, including signs of 'group think'. There was an attitude of superiority and non-interest in relation to the PING programme and their students.

Some of the PIMS students have established relations with research environments at the institutions of the international teachers at the PIMS courses. On the other hand these students seem to have very limited interaction with other research environments in Norway and do not reveal any deeper integration in the Nordic innovation research community. The teaching at the PIMS programme is heavily based on 'flying in' high-profile scholars whereas the supervision is dominated by NTNUs internal staff with co-supervisors from other institutions.

Figure 4

| | | Local (BI/NTNU) | Nordic institutions | Global |
|---|---|---|---|---|
| PING | Faculty | 6 | 27 | 16 |
| | Supervisors | 10 | 74 | 3 |
| PIMS | Faculty | 1 | 4 | 12 |
| | Supervisors | 13 | 9 | 3 |

PING represents the profile of a network based research school with both faculty and supervisors mostly located at Nordic institutions, supplemented by internationally leading researchers in their teaching. The interviews with students suggest that although there is a potential for encouraging more cooperation between students across institutions they seem to know each other and the PING faculty reasonably well. They said that they have hitherto, however, had limited possibilities to meet and work on joint research and publications and that there are differences in the institutions' publication requirements.

## 7.5 The PhD school's network, the main national actors in the relevant fields and their connection to the network

A central premise and goal for establishing a national research school in innovation research is to contribute to connecting the small and fragmented research environments in Norway. The call set an explicit requirement of a minimum of four institutions to be part of the application of which one should be international. Also in this regard there are substantial differences between the two programmes.

The PING programme, for example, is designed to be a network-based programme where courses are delivered at the participating institutions and by local staff. The responses from the partner institutions indicate that the partners are satisfied to be part of NORSI. The fact that three partner institutions, in addition to BI, were present at the meeting with the evaluation panel also gives an indication of the strong commitment of the partners.

The benefit of participating in NORSI depends on the situation of each institution. Larger institutions (like UiO) have the capability to arrange their own PhD education, whereas the smaller institutions receive a substantial boost from participating in NORSI. Even so, UiO express benefits from bringing the research environments together through NORSI. The partners in PING agree that NORSI plays a positive networking role. Several would like the network to be further developed, and called for more efforts to be spent on involving all the partners and sharing further experiences across partners.

The partners highlight the flexible nature of PING as important as this flexibility enables them to fit the courses into their own activities for PhD students. At the same time NORSI/PING provides courses in areas they are unable to provide state of the art courses themselves. This mostly applies to the smaller institutions. The possibility for students to be accepted at the research school on a continuous basis is also important according to the partners.

Thus far a rather limited mobility between institutions has materialised because most students are still in the early stages of their PhD education. The network has been used to spread information on open PhD positions and this has resulted in a more open market for PhD positions.

As regards PIMS there is limited contact between NTNU and the other partners in the programme. Only two of the partners of PIMS answered the questionnaire. Among those that did, there are clear indications that the PIMS programme has not involved the partners in the development and running of the programme. Surprisingly, none of the partners were present at the meeting with the panel. This further adds to the clear impression that PIMS de facto is a NTNU-run programme. The partners state that if NTNU is able to open up to more cooperation and design a more flexible programme, there is potential to create an excellent research school programme.

## 7.6 The administration and organisation of the school

NORSI is managed through a board with, Johan Hustad from NTNU as chair.

The two programme directors Alf Steinar Sætre (PIMS) and Bjørn T. Asheim (PING) report directly to the board. The programmes have separate administrative staff at NTNU and at BI, respectively. Students are enrolled at NTNU in the case of PIMS. In the case of PING students can be enrolled in any institution which can issue a relevant PhD degree.

The administration of the PING programme seems to work well and is well appreciated by the partners and students. The panel have received detailed and well structured information from the programme.

The students are not represented on the NORSI board, but PING has appointed (not elected) a student representative. However the student representative is *not* involved with the programme management in a systematic way. There were no information available that suggests, that students are represented at the PIMS programme. Moreover, the two programmes do not have a common system for regular course evaluation from the users, i.e. collecting students experiences of the courses to be used for quality improvements and for future courses. PING has settled on a system with written feedback, whereas PIMS exclusively seems to rely on informal conversations between the programme director and some selected students. Despite these shortcomings, both programmes have adopted some changes based on unsystematic and irregular feedback from students. This is especially important for PING as they are running a second sequence of the same courses and has a larger group of students but also for PIMS which is planning to take in a second cohort of PhD students

In terms of cost per student and cost per course, there are some clear differences between the two programmes. Below key figures are provided.

Figure 5

| Costs | Joint | PING | PIMS |
|---|---|---|---|
| Average cost per course | 260 000 | 206 000 | 460 000 |
| Average number of student per course | 23 | 13,5 | 13,3 |
| Average cost per student/course | 11 500 | 15 200 | 34 500 |

Even if PING has far more students than PIMS enrolled, this programme does not have more students per course compared to PIMS. However the cost of running a course differ significantly across the two programmes. Thus sending a student to a PIMS course, for example, is more than twice as expensive than sending the student to a PING or a joint NORSI course.

## 7.7 The academic, strategic and social added value of the PhD school

The establishment of a national research school in innovation studies has added value in a number of ways.

- The PING programme has established a high quality portfolio of PhD courses available to all network partners and students and are currently running a second cycle of courses

- The PIMS programme has established a NTNU-based and controlled portfolio of high quality courses involving a high number of well reputated international scholars for a closed cohort of students.
- The PIMS programme has established increased opportunities for its 12 PhD candidates to have access to some of the leading researchers in the field.
- The PING programme has through its network model contributed to bridging fragmented research environments in Norway to each other as well as relevant international networks.

The panel also noted that the PIMS programme has chosen to have the courses taken place outside the campus. While it is hard to see what such a choice may add in terms of academic or institutional value, it certainly add to the expenses.

The panel has tried to evaluate the research output from NORSI as well as from the individual programmes. Although data from the student survey and some additional information on later publications have been made available, the panel is not convinced that they can be given a fair picture of the wider extent of the publication output due the short period NORSI has been operative. There were indications during the interview, that focus now needs to be directed towards the output dimension suggesting that this is recognized as a critical success factor. One tentative interpretation, however, suggests that the aggregate production at this point in time is relatively low. This may be somewhat affected by the high course demands and/or ambitions in both NORSI programmes (see section 8.1 below)

NORSI is expected to add more scientific knowledge to Norwegian society about the nature of innovation, its different forms, the importance of context and of drivers and obstacles to innovation. According to the panel it is, however, premature to draw any conclusion on that in the present evaluation. Too few publications are available, many of them are conference papers and a detailed analysis of them would not provide any reliable contribution to this evaluation.

The benefits from being part of NORSI seem to be more obvious for the smaller, more specialised institutions, primarily represented in the PING programme. The large universities often have critical mass of research, education and international connections to manage on their own. UiO, which through different institutions are partners in both programmes, states in their questionnaires that the value of a national research school should not be overestimated. Despite this, they have inserted their resources, students and networks into the PING programme primarily to benefit the entire network but probably also to receive some of its benefits. NTNU on the other hand has decided that there is no immediate benefit from involving other institutions.

It is further notable that neither the board nor any of the two individual programmes have specific plans on how they will work to establish the long-term future of a research school in innovation research. This is highly surprising to the panel, as most tax-financed sponsors offering funding of this size and to such purposes are likely to expect that the vested financial resources would have more lasting effects (beyond the funding period). Taken into consideration the costs per student, a plan for embedding the research training activities would certainly not be unreasonable to expect. This leaves an impression, that this scheme has been perceived as a funding opportunity for having some activities financed 100% rather than as 'start capital' to secure the establishment and further development of a high quality research training infrastructure. Few, if any, universities, would be pleased with the prospect of

overtaking an activity that implies this level of costs per student as has been the case in the PIMS programme in particular. Rather, it would probably imply additional sponsors and a serious reconsideration of the key cost drivers.

### 7.8 Distribution of national research responsibilities

NORSI has partner institutions covering the majority of the research environments in innovation research in Norway. In particular, the PING programme has successfully adopted a model where courses are organised at several institutions, using local faculty according to the specialty of each institution and the conditions laid down in the funding scheme. There have, however, been some cases of lack of involvement of partners in course design and teaching. This issue was acknowledged during the meeting with the panel and the PING management was working to solve these issues.

The PIMS programme appears to be a first and foremost NTNU-based programme. Despite the involvement of a few faculty from partner-institutions, the institutional partners do not appear to be involved in programme design nor used as venues for the offering of courses. The meeting with PIMS partners reveal that this programme is highly NTNU-based and thus not meeting the formal requirements regarding linking isolated and smaller Norwegian research environments.

### 7.9 Gender balance.

The gender balance of NORSI can be evaluated in various ways. Norway applies gender mainstreaming as one of its tools to achieve gender equality, but considering the time available for this evaluation this has not been realistic. Instead the research school and its programmes are evaluated in relatively simple way concerning gender equality. The results can be summarised by stating that there is a significant overrepresentation of women among students and a significant overrepresentation of men among faculty and supervisors. This is revealed in figure 6 below. To this can be added that 13 students of total 63 have a female supervisor: 12 in PING and one in PIMS.

Figure 6

| Gender balance | | PING | | PIMS | |
|---|---|---|---|---|---|
| | | Male | Female | Male | Female |
| Supervisors | Primary | 27 (79%) | 7 (21%) | 4 (80%) | 1 (20%) |
| | Secondary | 28 (85%) | 5 (15%) | 9 (75%) | 3 (25%) |
| Keynotes/teaching staff | | 41 (84%) | 8 (16%) | 15 (94%) | 1(6%) |
| Students | | 17 (33%) | 34 (67%) | 5 (42%) | 7 (58%) |

During the meetings with the evaluation panel a gender imbalance as regards faculty was acknowledged, but there were no indications regarding whether (or not) this may be an issue to be addressed or any concrete plans presented on how to address this imbalance. The panel, however, is not convinced that similar outstanding quality of international female scholars cannot be identified (such as for example Rosabeth Moss Kanter, Rebecca Henderson, Kathleen Eisenhardt, etc). This is a problem in relation to research quality and in relation to presenting female PhD students with proper role models.

# 8. General Assessment

The panel's general assessment of NORSI – based on the information presented above – is structured around five dimensions

## 8.1 The balance between courses and thesis

The panel notes that the US-inspired formal and centralized school-based programme approach (with predefined core-courses) to PhD education is prevalent in both PING and PIMS. While this model certainly has its indisputable advantages in terms of providing of a solid scientific ground in securing a common baseline of core theories, methods and research to be mastered in a specific field it also poses some potential challenges. Such challenges include first and foremost the issue of preparing the students for the transition from the pre-determined, structured and top-down led coursework component of the PhD towards the independent and self-led thesis component (well known from the previously prevalent apprenticeship model of doctoral education in the Scandinavian countries).

A second and related challenge refers to the critical balance of number of man-months reserved for pre-defined ECTS-courses and for the thesis. The panel is concerned that the latter component is threatened by the increasing number of ECTS required by the two school programmes – formally in PIMS and de facto in PING - thus risking at (i) making the transition from the tightly governed course-component towards the independent thesis component more difficult and (ii) leaving less time for producing and original research. Such a trend would make it increasingly difficult to prepare the PhD student for becoming a scholar capable of independently drafting a research project as well as independently identifying relevant theories outside the boundaries of the coursework included in the program.

Naturally it is certainly not a choice between two different competing models (the school-based vs the apprenticeship PhD model), rather it is about arriving at an adequate and sound balance between upgrading the students theoretical and methodological skills (the *coursework component*) and becoming a scholar capable of demonstrating critical and new thinking and contributions (the *thesis component*). However, the panel recommends that this balance is critically reconsidered, including proposed plans to further increase the number of ECTS required as the panel is not convinced that raising the number of ECTS required/strongly recommended in the research school will increase the quality of the PhD theses published. PhD students in any doctoral schools should be allowed also take courses out of curiosity and specifically of relevance to their own PhD thesis and thus not because of obligation (or interest of the course providers).

## 8.2 The fly in –fly out model (FIFO) vs networking-based faculty models.

Both programmes originally promoted their applications with the 'help' of a significant number of international scholars. This was also imported into to the two programmes that were formed within NORSI. Although both programmes utilize external and international experts there are differences between them as regards how these faculty networks are utilised. To some extent these differences seem to have their origin in the cohort/vintage divide which

also relates to differences as regards the size of the PhD groups. The differences in how faculty is used also reveal differences in network ambitions.

The FIFO-model as practiced by the PIMS programme has resulted in inflying professors and a relatively small PhD cohort. The panel does not doubt that the intensive workshops offered to a small group of students have been of high quality as well as offering fruitful contacts between PhD candidates and visiting professors. This has also offered some spill over potential in form of supervision and scholarly visits abroad.

However, and commented already by the evaluators of the original applications, the FIFO model if restricted to a small group of students only, creates only limited network effects outside the host institution. Further, this model does not seem to involve faculty from other institutions. In addition it remains unclear to what extent it creates long lasting learning effects after the FIFO staff has left. Finally this model, as practiced by the PIMS programme, has been extraordinary expensive. As revealed in section 7.6 above the cost is more than twice per PhD candidate.

The networking model as practiced by PING also contains international scholars who 'fly in and out' but as can be seen in section 7.4 above that model includes more Nordic staff, relatively as well as absolutely and may, at best, have an opportunity to contribute to more knowledge externalities.[7]

## 8.3 The two programme divide

It is clear to the panel that what was clearly stipulated in the conditions of the funding scheme and expected by the original evaluators of the proposal, by the board of VRI and by the secretariat of the Research Council, i.e. to integrate the two proposed programmes into one, has not succeeded. While it may be argued that the final contract did not explicitly reject a two track model, it remains, at the same time clear, however, from analyzing the documents, that the Research council expected NORSI to be one integrated research school, with two complementary tracks.

The issue of turning into a two-track school is not necessarily a problem. In fact, it may be argued that a well working, efficient two-track system which delivers value added as regards networking and quality should be acceptable even if it was not the ideal model expected by the Research Council. Evaluating innovation research schools must allow for structural arrangements – as long as they meet the explicated criteria of bridging dislocated and small research training environments and secure value added for Norwegian tax payers as regards research results (i.e. primarily publications) and human resources (i.e. PhDs). The evaluation thus, is not related to original structural intentions exclusively but also indeed on how NORSI de facto works. Based on the observations described above the panel concludes:

1 *The theoretical foundations for the two programme system.* Although the two programmes have slightly different profiles (PING is more ”systemic” and PIMS more ”management”) they are basically complementary and partly overlapping to each other. From an ”economies of scope” perspective the two programmes would benefit from utilizing the potential synergy and complementary steeming from the differences between the two

[7] The panel has, however, not made any detailed investigation of the magnitude or existence of such learning processes.

programmes. As argued in section 6 there is a large potential for an integrated research school within this field of knowledge. From an economies of scale perspective a joint organization would economize the use of human as well as economic resources.

2 *The cohort vs flexible/continuous pedagogical models.* A fundamental argument behind the two programmes seems to be their different views in relation to these pedagogical models. The real difference between these models is, however, dependent how a cohort model is constructed, not the least on the intervals between the cohorts. It is thus possible to recruit cohorts every year or every second year to achieve both pedagogical advantages and coherence among the students.

The panel acknowledges that the cohort model may offer advantages under certain circumstances such as seen in another Norwegian research school NATED organised according to cohorts. However, the panel does not find that the model practised by PIMS meets the requirements of bridging isolated research training environments as assumed in the background documents for Norwegian research schools. Neither is the panel convinced by the arguments for this model provided in the self evaluation by the head of the PIMS programme. In summary the cohort model, as implemented by PIMS,

- creates a system with very few PhD students
- results in extremely high costs per PhD student
- creates an unnecessary closeness among these PhD candidates in a period when they may benefit from opening their minds also to other PhD-students from Norway (limited potential to exchange views and/or experiences with PhD candidates from earlier or late cohorts)
- in addition the cohort variety (with four year cycles) tend to lead to unnecessary coursework inflexibility as regards handling individual study paths (e.g. sickness, maternity or parental leave). This implies missing a course which may be difficult to capture later. This might also unintentionally lead to gender issues concerning drop out rates etc.

De facto, the cohort model also has the implication to centralize the cohort to one big university (NTNU) programme. Continous models allowing for more students ad hoc to become enrolled do not face these problems although it may be true that a large group of PhD candidates of different vintages will not develop as tight relations as can arise in the cohort model. The panel is, however, not convinced that such very tight relations as such offers particular academic value. As mentioned above interviews made with the PhD candidates in the PIMS programme also exposed some degree of ‘group think’ tendency which the panel dos not find particular conducive for the advancement of science.

### 8.4 Towards a sustainable NORSI

Neither the NORSI board nor PING and PIMS seem to have developed any explicit models on how to secure the vested resources after the present grant period. The panel is well aware that NORSI is still only a few years into the programme, however, given the size of already allocated resources, such considerations seem both relevant and justifiable. There is, the panel argues, a need for a long term strategy formulation within the school.

The fact that the PING programme has developed a network model which involves a significant number of faculty from several partner-institutions suggests that a continuation beyond the funding period would be somewhat easier than in the case of PIMS - due to the fact that there are a wider number of partners to bear the overall costs (which also are

significantly more cost effective than in the case of PIMS). This leads the panel to conclude that the PING approach has a higher potential for offering robustness and long-term viability beyond the funding period.

In the case of PIMS both the lack of national research training infrastructure potential and the high level of running costs points to a model which seems to be more vulnerable and with little potential for benefitting small and isolated research training environments. However, the chosen model – with its strong connection to the programme directors private network – may well have the capacity to transform to a high quality and university based NTNU PhD programme in the future of benefits to the students of the NTNU. Not the least is this the case if NTNU can succeed in continuously raising funding from the corporate sector – an idea that already seems to attract some attention from the programme director.

## 8.5 A management failure

Only two and a half year have passed since NORSI was officially launched. And as discussed in section 7.7 above the panel has not clear evidence that suggests that the research output is bad. As regards the course programmes the panel has found that both programmes appears to have provided PhD-courses of high quality.

In consequence the panel has no reason to question that NORSI can provide high quality research training. However, there is limited documentation of this, i.e. a process of quality control with response rates and levels of satisfaction for each PhD course.

Nonetheless the panel concludes that the governance structure and lack of integration of the two programmes in NORSI represent a clear *management failure*. The reasons for that are all exposed in the evaluation above. In summary the management failure covers:

- NORSI developed into two relatively separate programmes - contrary to what the original evaluators suggested and to explicit criteria laid down in the funding programme (e.i. to bridge disconnected research training environments)
- The two programmes offer obvious potentials for being complementary to each other. The panel is convinced that students as well as research would benefit intellectually if they could be integrated (economies of cope argument). Management did not succeed in realizing this clear and important potential.
- The programmes also demonstrate an overlap which neither can be justified from the original intentions behind the applications nor from the point of view of efficiency (economies of scale) - it is a managerial failure that could have been avoided if the programmes had been more integrated (as promised).
- The PIMS programme fails to meet the expectations assumed in the Norwegian national research school programme in general as well as the requirements in the original call for NORSI. This is a clear management failure at the programme level.
- The PIMS programme students receive more than twice the resources allocated to the other half of the programme. It is obvious, that if resources are unlimited this is not a problem, then most programme directors would have an easy job in putting together a programme with a large proportion of expensive international faculty. While the panel would not necessarily refer to such behavior as a management failure, it represents a different 'attitude' towards expenses in general and specific cost drivers in particular.

The panel therefore suggests a reorganization of NORSI before the Research Council considers allocating additional funding for a second four-year period. This reorganization can be done in different ways, all of which are discussed in the final section 9 below.

# 9. Recommendations

- The panel is of the opinion that NORSI should continue under a different form of structure and governance. The panel acknowledges that NORSI has the potential of fulfilling the original intentions and of becoming a leading part of Norwegian and Nordic innovation research. For this to materialize, the panel suggests that:
- the Research Council, as a requirement for prolonged funding, unconditionally demands that NORSI adopts one coherent and network-based research training model along the lines practised by the PING approach, i.e. a combination of high ambitions on networking on Norwegian level and flexible intake of PhD candidates as they are admitted to the their home institutions This model does not exclude combining elements of the FIFO-faculty that has been heavily used in the PIMS programme.
- the Research Council acknowledges that, irrespective of which university that formally signs the contract, that the well-functioning NORSI administration office continues to be located at BI.
- the Research Council realizes that the management team in its present configuration (Johan Hustad, Alf Steinar Sætre and Björn T. Asheim) cannot – or will not – do what is needed for the required reorganization. In consequence, a new management is needed. While this may still include the director of PING, the panel recommends that one or two additional senior professors from the Norwegian innovation research community are recruited to the NORSI board and management. The panel is convinced, that such recruitment is possible.
- the reorganised NORSI includes representatives for the PhD students in the management of NORSI in order to improve communication with the PhD students concerning PhD courses and their needs for research training
- the Research Council demands, that NORSI demonstrate willingness to harmonize the course requirements (so they do not differ so much from what is regulated by Norwegian PhD regulations and local host regulations)
- the Research Council demands that all courses are systematically and anonymously evaluated and that the evaluations tools are harmonized and the results systematically used to improve PhD courses.
- the Research Council demands that at least 1/3 of the total ECTS requirements can be taken at providers outside NORSI (if better suited for the individual student's thesis).
- The Research Council demands that a revised NORSI prepares new application along the lines recommended in this report for a second funding period.

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# Appendix 1: Mandate

## Mandate and task description for the mid-term evaluation of NORSI

### Introduction

The VRI scheme is funding projects in regional innovation studies and a researcher school in innovation research. The call for a researcher school was made in 2011 and NORSI was awarded funding in 2012. The call was based on previous calls in the scheme for national graduate level researcher schools (FORSKERSKOLER), which was established on the basis of a report prepared for the Ministry of Education and Research in 2006.

The general objective of the call was in line with the overall objective of the FORSKERSKOLER scheme: To raise the calibre of researcher training and to supplement existing doctoral degree programs 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 researcher 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.

The specific objective of the call for a researcher school in innovation research is to further recruitment and raise the quality of researcher training in innovation research. The school offers courses at a high academic level with connections to Nordic and international research networks. In Norway, with its small and fragmented research groups, these ambitions will require cooperation between several institutions and links to the international research community. Cooperation in the required network will contribute to increased connections between research groups in Norway and increased interaction with the Scandinavian and international research community.

The Research Council received two applications. Both applications were considered of good quality, but had very different profiles. The expert panel recommended that the two applicants should be encouraged to join forces to present a single, common application. This recommendation was followed and NORSI was established from 31.1.2012.

The contract is for a four year project with the intent to continue for an additional four years subject to an evaluation after three years of operation.

### Purpose

The mid-term evaluation of NORSI is to provide a basis for determining whether the researcher school will continue to receive funding from the Research Council for the final four years of the total allocation period as well as provide advice regarding any adjustments to the researcher school.

### Mandate of the evaluation panel

The panel is to conduct the mid-term evaluation of the research school NORSI, on the basis of existing and compiled material.

The panel is to submit a justified recommendation to the Board of the
VRI programme for continuation (including any recommendation for changes) or termination of funding for the researcher school.
The panel is requested to answer the following questions in so far as possible:

- The researcher 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:
    - The PhD school's academic content in a broad sense and its objectives and constraints
    - Capacity and quality of doctoral-level education
    - Research environment
    - The PhD school's network, the main national actors in the relevant fields and their connection to the network
    - The administration and organisation of the school
    - The academic, strategic and social added value of the PhD school
    - Distribution of national research responsibilities
    - Gender balance.
    - Overall assessment from the referee/panel

- To what extent has the researcher school achieved its original objectives?
- To what extent has the researcher school been able to strengthen collaboration between different innovation research environments in Norway?
- Are any course adjustments made underway well explained?
- To what extent have the economic resources spent on the researcher school resulted in benefits to the objectives of the researcher school?
- 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 four years of the project period?
- Provided that funding is to be continued, do the activities of the researcher school need to be adjusted in any way?

## Evaluation method

The evaluation method will be as similar as possible to the method used when the FORSKERSKOLER scheme evaluated five researcher schools in 2013. This in order to be able to compare and learn from other schools. However, this evaluation must also refer to the specific objectives of NORSI and the criteria in the call for a researcher school in innovation research.

The evaluation will be conducted by an international panel consisting of expertise in the field of innovation research and management of researcher schools. The panel shall consist of 3-5 members. At least one shall be familiar with the VRI scheme and at least one shall be familiar with the other researcher schools funded by the Research Council.

## Material on which the evaluation will be based

The evaluation will be based on the following material:

- The report on the scheme for national researcher schools in Norway prepared by the Research Council and the UHR and submitted to the Ministry of Education and Research in May 2006.
- Information about how researcher schools in other countries have been organized and their results.
- The funding announcement and criteria for grant awards.
- The contract and project description of the researcher school (submitted with the grant application, forms the basis for the contract with the Research Council).
- Self-evaluations by the researcher school and documentation of progression and target achievement in relation to the original project description, with SWOT analysis (to be compiled by the steering committee of NORSI).
- Self-evaluations by the host institution and the partner institutions (to be compiled by the steering committee).
- Interviews with the director/board of the researcher school and doctoral fellows affiliated with the school.
- Feedback from the industry partners who contribute to the funding of NORSI
- Feedback survey of the PhD students of NORSI

### 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 researcher schools.
- The report from the evaluation of five researcher schools in 2013

## Time table

The mid-term evaluation is to be completed at the end of March 2015 and submitted for review to the Research Board of the Division for Innovation in May/June 2015. The VRI Board is responsible for final decisions regarding continuation/ termination of funding as of 1 January 2016. The researcher schools will be notified of the outcome well in advance of this date.

The panel 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 panel.

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