

Evaluating Centres of Excellence

A Nordic perspective

Comparative study of methods for follow-up and evaluation of centre of excellence (CoE) initiatives in the Nordic countries

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Preface

The Swedish Research Council has carried out a comparative study of methods for monitoring and evaluation of Centre of Excellence (CoE) initiatives in the Nordic countries. The study was conducted by the Department of Research Policy with the aim of increasing learning for the Swedish Research Council and other research funding institutions about similarities and differences in how CoE programs are designed in the Nordic countries, and above all, how the monitoring and evaluation framework of these programs are designed. The study is based on material from interviews with officials working with monitoring and evaluation of the CoE programs in the selected countries, and on public reports from each country's excellence program.

The main conclusion from the study is that initiatives that are long-term, with recurring calls within the same initiative, also have been successful in creating effective monitoring and evaluation frameworks for CoE programs. This includes incentives to create monitoring systems that deliver data from the centers to the research funders on an annual basis, and also incentives for higher education institutions to create structures for strategic decisions on how to proceed with the centers. The study also shows that the mid-term evaluation is the most important evaluation in a CoE program.

The study provides learning for the Swedish Research Council if similar grants are to be announced in the future.

Stockholm, 18 november 2021

Sven Stafström

Director General

Swedish Research Council

Sammanfattning

Syftet med denna jämförande studie är att bidra till lärande om hur andra länder har organiserat uppföljning och utvärdering av sina satsningar på excellenscenter, en form av forskningsfinansiering som i internationella sammanhang ofta benämns Centers of Excellence (CoE).

Även om större delen av forskningsfinansieringen i de nordiska länderna riktar sig till enskilda forskare genom projektfinansiering, finns också ett antal specifika satsningar som syftar till att identifiera tongivande forskare och excellenta forskningsmiljöer eller forskningscenter. Finansiering av sådan excellent forskning kräver ofta större ekonomiska resurser över en längre period, och det är därför av särskilt intresse att följa upp och utvärdera nyttan av sådana större investeringar liksom den vetenskapliga och samhällsliga påverkan de kan ha.

De flesta nordiska excellensprogram ställer krav på att varje excellenscenter skickar en årlig rapport till forskningsfinansiärerna, något som dock inte är lika vanligt i Sverige. Rapporteringen görs huvudsakligen genom att centren skickar sina årsredovisningar till respektive finansiär, där varje center dels rapporterar viss statistik, dels beskriver centrets utveckling. Finlands Akademi har ett annat rapporteringssystem, där centren enbart rapporterar in uppgifter rörande utvecklingen i förhållande till specifika indikatorer. Årsredovisningar och data som inrapporteras löpande under programperioden fungerar också som underlag vid halvtidsutvärderingar och slutrapporter.

I tillägg till den årliga uppföljningen gör finansiärerna i de övriga nordiska länderna också platsbesök. Danska Grundforskningsfonden gör årliga platsbesök på alla centra, där de diskuterar varje centers framsteg. I Finland besöker Finska Akademien centren tre gånger under den 10-åriga finansieringsperioden och i Norge gör norska Forskningsrådet två platsbesök på centren under finansieringsperioden. I Sverige har Vetenskapsrådet hittills inte gjort platsbesök annat än i samband med halvtidsutvärderingar.

Alla forskningsfinansiärer i de nordiska länderna utför halvtidsutvärderingar av sina excellensprogram. Halvtidsutvärderingen är den viktigaste utvärderingen och utförs efter cirka fem år av den 10-åriga finansieringsperioden. Syftet med halvtidsutvärdering är ganska likartat för alla nordiska forskningsfinansiärer, nämligen att bedöma den vetenskapliga kvaliteten på forskningen vid centren, och att ta ställning till om de ska få fortsatt finansiering.

Forskningsfinansiärerna i de nordiska länderna genomför då och då också slututvärderingar eller programutvärderingar, och då oftast med hjälp av internationella experter. Upplägget av dessa typer av utvärderingar varierar dock mellan länderna när det gäller omfattning och inriktning samt vad som ska bedömas av externa experter (peer review).

I vår studie drar vi följande slutsatser:

- Långsiktiga forskningspolitiska satsningar ger incitament till både forskningsfinansiären och den mottagande värdorganisationen att utveckla

stödande strukturer för ansökan till, uppföljning och utvärdering av excellensprogram. Långsiktigheten i satsningarna möjliggör också anpassningar av program, så att effektiviteten både i excellensprogrammet och i uppföljningssystemet kan förbättras över tid.

- Uppföljningssystemen i de övriga nordiska länderna har samma syften och innehåller årliga data från centren som sedan kan användas för forskningsfinansiärernas analyser under hela finansieringsperioden. Data som samlas in används också i halvtidsutvärderingen. Den årliga insamlingen av data och den nära uppföljningen av centren skapar transparens i programmen.
- Sverige skiljer ut sig i jämförelsen genom att vi inte hade något årligt uppföljningssystem för att samla in data från centren under det svenska excellensprogrammets (Linnéprogrammet) gång. Data samlades in separat för varje utvärdering, vilket innebar att centren var tvungna att leverera data som täckte flera år inför varje enskild utvärdering. Uppföljningsunderlagen ändrades dessutom under programperioden, vilket också gjorde det svårt för universiteten att planera datainsamlingen.
- Den främsta fördelen med ett väl genomtänkt uppföljningssystem för excellensprogram är att ansvaret för att utveckla dess ändamålsenlighet delas mellan forskningsfinansiären och de universitet som är värdar för excellenscenter.
- Sakkunniggranskning används både vid utvärdering av enskilda center samt vid utvärdering av hela program. Panelerna är ofta ganska små och anpassade till enskilda centers forskningsområde, med en blandning av specialister och generalister. Alla nordiska länder använder sakkunniggranskning vid sina halvtidsutvärderingar, men vanligtvis inte i de slutliga utvärderingarna.
- Utvärderingar görs för olika syften och används på olika sätt, vilket påverkar utvärderingarnas utformning och tidpunkt. Halvtidsutvärderingar används i stor utsträckning för att styra och eventuellt avsluta finansiering av center som inte lever upp till de krav som ställs. Slututvärderingar brukar användas för lärande och för att visa resultat från ett program.
- Slutrapporter/utvärderingar är ofta mindre formella vid långsiktiga satsningar på excellensprogram som funnits över en längre tid (20–30 år). Den svenska modellen sticker ut i jämförelse, eftersom Linnéprogrammet har utvärderats omfattande efter programmets slut.

Slutligen kunde vi i studien notera att vissa forskningsfinansiärer är mycket engagerade i centrens utveckling, med uppföljningsmöten varje år eller åtminstone ett par gånger under finansieringsperioden. Detta är ett sätt för forskningsfinansiärer att visa engagemang och ge stöd. Det visar att finansiären lägger stor vikt vid centrens förmåga att uppnå banbrytande forskning av högsta vetenskaplig kvalitet.

En viktig iakttagelse som gjorts i den svenska excellenssatsningen, är att fördelen med att tilldelas excellenscenterstatus, är att det ger centren tid att engagera sig i frågor som är helt nya och som kräver nya metoder, nya sätt att kombinera olika discipliner och möjlighet att kunna testa olika frågeställningar under finansieringsperioden för centret. Att få förtroendet att hitta vägen framåt utan att behöva redovisa den vetenskapliga utvecklingen i centret för tidigt under programmets gång är kanske också en viktig förutsättning för banbrytande forskning.

Summary

The purpose of this comparative study is to contribute to knowledge of how other countries have organised the follow-up and evaluation of their investments in the research funding format known as ‘Centre of Excellence’ (CoE).

Even though most of the research funding in the Nordic countries is targeted at individual researchers via project funding, there are also a number of specific initiatives aimed at identifying prominent researchers and excellent research environments or research centres. The funding of such excellent research often requires major financial resources over a long period, and it is therefore of particular interest to follow up and evaluate the benefit of such large investments, as well as the scientific and societal impact they might have.

Most Nordic excellence programmes require each centre of excellence to send an annual report to the research funding bodies, which is not as common a requirement in Sweden, however. The reporting is done primarily through the centres sending their annual reports to the respective funding bodies, where each centre both reports some statistics and also describes the development of the centre. The Academy of Finland has a different reporting system, where the centres only report data about the development in relation to specific indicators. Annual reports and data reported on an ongoing basis during the programme period also function as documentation for mid-term evaluations and final reports.

In addition to the annual follow-up, the funding bodies in the other Nordic countries also carry out site visits. The Danish National Research Foundation conducts annual site visits to all centres, where they discuss the centre’s progress. The Academy of Finland visits the centres three times during the ten-year funding period, and the Research Council of Norway makes two site visits to the centres during the funding period. The Swedish Research Council has to date not carried out any site visits, except in conjunction with mid-term evaluations.

All research funding bodies in the Nordic countries carry out mid-term evaluations of their excellence programmes. The mid-term evaluation is the most important evaluation, and is carried out after around five years of the ten-year funding period. The purpose of the mid-term evaluation is fairly similar for all Nordic research funding bodies, namely to assess the scientific quality of the research at the centres, and to decide whether they will continue to receive funding.

The research funding bodies in the Nordic countries also carry out final evaluations or programme evaluations from time to time, and then usually with the help of international experts. The design of these types of evaluations varies between countries, however, in terms of scope and focus, and on what is to be assessed by the external experts (peer review).

Our study draws the following conclusions:

- Long-term research policy initiatives provides incentives for both research funding bodies and the receiving host organisation to develop support

structures for applications to and also follow-up and evaluation of excellence programmes. The long-term approach of the initiatives also enables programme adaptation, so that the effectiveness of both the excellence programme and the system for follow-up can be improved over time.

- The follow-up systems in the other Nordic countries have the same purposes, and include annual data from the centres that can then be used for analysis by the research funding bodies throughout the funding period. Data collected are also used in the mid-term evaluation. The annual collection of data and the close monitoring of the centres creates transparency in the programmes.
- Sweden stands out in this comparison, as we did not have an annual follow-up system for collecting data from the centres during the course of the Swedish excellence programme (Linnaeus Programme). Data were collected separately for each evaluation, which means that the centres were forced to provide data covering several years ahead of each individual evaluation. The follow-up documentation was also changed during the programme period, which made it difficult for the universities to plan the data collection.
- The main advantage of a well thought-out follow-up system for excellence programmes is that the responsibility for developing their fitness for purpose is shared between the research funding body and the universities hosting the excellence centres.
- Peer review is used both for evaluating individual centres, and also for evaluating the whole programme. The review panels are usually fairly small and adapted to the research field of the individual centres, and consist of a mixture of specialists and generalists. All Nordic countries use peer review for their mid-term evaluations, but not usually for the final evaluations.
- Evaluations are done for different purposes and are used in different ways, which impacts on the design and timing of the evaluations. Mid-term evaluations have been used largely to manage and possibly terminate the funding of centres that do not live up to the requirements set. Final evaluations are usually used for learning, and to show results from a programme.
- Final reports/evaluations are often less formal for long-term investments in excellence programmes that have been running for a longer period (20–30 years). The Swedish model stands out in comparison, as the Linnaeus programme was extensively evaluated after the end of the programme.

Finally, we noted in the study that some research funding bodies are very engaged in the development of the centres, with follow-up meetings every year, or at least a couple of times during the funding period. This is a way for research funding bodies to show engagement, and to give support. They show that the funding bodies place great emphasis on the centres' ability to achieve ground-breaking research of the highest scientific quality.

An important observation made in the Swedish excellence initiative is that the advantage of being awarded centre of excellence status is that this gives the centre time to engage in issues that are entirely new and require new methods, new ways of combining different disciplines, and opportunities to test new ideas during the centre's funding period. Being trusted to find the way forward without having to report the scientific development of the centre too early during the course of the programme is perhaps another important precondition for ground-breaking research.

Introduction

Background

The Swedish Research Council is Sweden's largest governmental research funding body and supports research of the highest quality within all scientific disciplines by issuing calls for grant applications in open competition. Most of the project funding is aimed at individual researchers, but there are also a number of specific initiatives aimed at excellent researchers and excellent research environments or centres. Funding excellent research requires more financial resources over a longer period, and it is of particular interest to follow-up and evaluate the benefits of these investments and the scientific and societal impact they may have had. With this comparative study of the monitoring and evaluation practices in the Nordic countries of similar investments, the Swedish Research Council would like to learn from their experiences and improve our evaluation practice.

More specific reasons to choose evaluations of centres of excellence (CoE) as the object for our comparison are that these often have a common, internationally accepted definition, and that these types of programmes exist in most countries. However, there are differences: the length of the programmes differs, even if a period of 10 years is fairly common among CoE programmes. An important difference between the Swedish programme and the other Nordic programmes is that the Swedish programme has only had two calls during a limited period, while our neighbour countries have had their programmes for almost 30 years, and had calls evenly distributed over this period.

The organisation of how to finance CoE programmes varies - it can also vary in terms of selection criteria and expectations of what is intended to be achieved by establishing centres of excellence - that is, success factors. However, it is the follow-up and evaluation practices of the CoE programmes that are the main focus of our report.

The purpose of the study

The purpose of this comparative study is to learn. We want to see how other countries have organised the follow-up and evaluation activities of their CoE programmes. As comparison, we have included a country description of the Swedish Research Council's CoE programme as part of the comparative analyses.

The questions that are addressed in this study are;

- How are the monitoring and evaluation processes organised in the Nordic countries?
- What are the main purposes of the monitoring and the evaluations?
- What is the intended use of the evaluations, and how instrumental are the findings for adjusting or shaping future funding instruments?
- Who performs the evaluation?

- Have the CoE programme and the monitoring and evaluation framework been institutionalised in the funding organisation and at the higher education institution (HEI) receiving the funding?

Methodological framework

The basic idea that motivates national research funders to make calls relating to excellence initiatives is, in principle, that they want to increase the quality of the country's research by enabling high-level centre formations that bring together prominent researchers in an area. Such centre formations require long-term and large investments, as they are very resource-intensive. Like all other large investments that are financed using public funds, it is compulsory to follow up and evaluate the investment in some form. It is both a question of the legitimacy of the investment itself as part of the implementation of the country's research policy, but also of promoting the design of funding programmes and making them more effective, and creating a basis for making decisions about strategic considerations relating to the focus, shape and design of future initiatives.

In this study, a comparison is made between the Nordic countries (except Iceland) in terms of how the countries have designed their programmes for centres of excellence (CoE) in research, and how the follow-up and evaluation of these investments have been organised. The study started with a desktop search based on evaluation reports, and presentations of evaluations of CoE initiatives in the Nordic countries. This information was supplemented with semi-structured interviews with people in the research councils in the respective Nordic countries, who have worked with the CoE programmes, including monitoring and evaluating them. The compilation of the interviews follow the question structure to create a similar description of the countries' excellence initiatives and evaluations of these.

Delimitation and selection

The issues in the study are relevant for all countries with a research funding system similar to that of Sweden. We have chosen to limit the comparison to the Nordic countries, except Iceland, as our research funding systems are similar, and we all have funding initiatives aimed at excellent research and research environments.

This means that the focus is mainly on the follow-up and evaluation of CoE programmes. The study does not look at announcements of CoE programmes, or the selection processes of the centres. The study also does not make any deeper analysis of the general design of the CoE programmes, other than to provide a general understanding of similarities and differences.

The report presents the relevant Nordic countries' government research funders, although they may have additional government organisations that fund research.

Outline of the study

The study starts with a country-specific review of each country's CoE programme, and how they are followed-up and evaluated. The descriptions have been made on the basis of the following sections:

A brief description of the research funding organisation, followed by a brief description of the CoE programme. Thereafter follows a description of the monitoring and evaluation framework of the programme, which includes a section about yearly monitoring and follow-up of the individual initiatives, mid-term evaluations, and final evaluations of the initiatives. There is also a section about how gender equality is followed up, and how the whole CoE programme is evaluated.

Based on the country-specific review of CoE programmes in the Nordic countries, a descriptive comparison is made of the monitoring and evaluation in each country.

The study concludes with a comparative analysis of the similarities and differences in how monitoring and evaluation of CoE initiatives have been organised in the Nordic countries, with some conclusions and lessons learned.

CoE programmes and their monitoring and evaluation schemes in the Nordic countries

Denmark

Danish National Research Foundation

In 1991, the Danish Parliament established the Danish National Research Foundation (DNRF) as an independent research funding organisation. At present, the DNRF has an endowment of approximately 5.7 billion DKK (800 million EUR) and spends around 470 million DKK (nearly 60 million EUR) annually. The remit of the DNRF is to strengthen the development of Danish research, by funding outstanding basic research of the highest international quality in all fields.

CoE programme

Of the four active founding instruments, the ongoing programme of funding of centres of excellence (CoE) is the primary funding mechanism of the DNRF. The centres are funded for up to 10 years, and grants may cover expenses that are directly attributable to the centre, such as salaries, travel costs and conferences, operational costs, and equipment, which are relevant and necessary in order to carry out the project. As a rule, salaries for tenured staff cannot be covered by the DNRF grant. The remit of each centre is to produce ground-breaking results, which is also one of the three core values when deciding who to fund. The other two are transparency in the process, and supporting risk-taking.

The centres are funded over two periods; a first period of six years, and a potential second period of four years. The mid-term evaluation serves as a basis for the board's decision on the second period of funding for the centres.

The DNRF requests that the centres form a joint physical community, preferably with daily interaction between researchers. It is also important that the centres are well integrated with the host institution, and participate in education.

Monitoring and evaluation framework

The CoE programme has a rigorous monitoring and evaluation framework. The centres are monitored every year by the DNRF, and externally evaluated after five years (mid-term evaluation). After nine years, the centres are expected to submit a final report of the centre's performance. The mid-term evaluations of the centres are performed by international panels, and each centre is evaluated separately.

Yearly monitoring and follow-up

The DNRF actively engages in yearly monitoring and follow-up of each centre. The main part of the monitoring is delivered through the annual report, where the centres report on the development of the centre in terms of research and organisation, and of specific indicators, such as external financing, publications, spending and personnel.

These data also forms part of the information used to evaluate centres. Other types of data are also collected for the evaluations.

Every year, representatives from the DNRF (the director, representatives from the board and research advisers) visit each centre for a follow-up meeting. There are both open and closed sessions. All centre members are invited to the open session, as well as the dean and/or the head of department. For the closed session, there is a smaller group consisting of core members of the centre, such as the centre leader and the principal investigators. The dean/head of department can also be invited to these closed sessions if necessary. The DNRF also meet postdocs and doctoral students every two years. The centres appreciate these annual follow-up meetings, according to the DNFR.

There is a standard agenda for the follow-up meetings, which has been drawn up by the DNRF. The main topics are: ongoing research (2-3 presentations, typically by the centre's younger researchers), collaborations, external financing, dissemination and utilisation of results, internationalisation, researcher education/training, finances, administrative issues, and the centre leader's overall appraisal of the centre, as well as the interaction with and embedment in the host institution, and the relationship with DNRF. In addition, specific topics are discussed with all the centres during specific years. These can range from subjects such as research integrity to novel ways of engaging the public in scientific results.

The follow-up meetings are documented in minutes, and the board member who visited a centre will brief the others at the next board meeting. In this way, the DNRF engages deeply in the centres' development and progress.

Overall, there is close collaboration and dialogue between the DNFR and the centres, and they can easily get in touch if they have questions, or want to raise issues.

Mid-term evaluation of the CoE

All centres are evaluated after approximately five years of the grant period. The centres are requested to perform a self-evaluation, write a research proposal for the coming four years, and submit a selection of publication to the evaluation panel. An international expert panel of three members are appointed to perform the evaluation. The panel members should have knowledge and experience in research management and organisation, in addition to their expertise in the scientific field of the centre.

Ahead of the evaluation, the panel receives the self-evaluation (standard questions) from the centre, the first grant period's research plan, the research proposal for the second grant period, and a selection of publications. The panel used to make a site visit to the centre, before writing up their joint evaluation report. However, the DNRF has decided that, for the upcoming mid-term evaluation, there will be no contact between the panel and the centres - so the panel will base its assessment purely on written material. The reason for this change is that it did not add significantly to the quality of the evaluations. By using desk-top evaluations, the DNRF hopes to get more unbiased and critical evaluations from the experts. The panel's report will cover maximum 12 pages.

The mid-term evaluation serves as a basis for the board's funding decision for the coming four years of the centre. Mid-term reports are not published, instead, they are solely intended to assist in the funding decision by the DNRF board.

The fee for the experts is likely to be in the order of 3 000 DKR per person for one centre report. The experts are recruited using proposals from the centre (they can nominate three candidates, one of whom will be chosen), nominations from the DNRF board, and the personnel of DNRF can also suggest experts. When the DNRF secretariat has put together a panel, they inform the centre leader of the composition of the panel before it is settled, which leaves time for comments on the selection.

Final evaluation

The centres that have received funding for the full ten-year period should submit a shorter, 2-4 pages long final report after nine years of funding. The final report should cover the full grant period, and include insights and overall results from the centre's grant period. The report should also include the five most important research results, how the centre has contributed to its field of science internationally, and how the research environment will continue for the next five-year period after the funding period has ended. Based on the report, ten representative publications displaying the centre's research (selected by the centre), and data collected through the annual reports, the board will evaluate each centre at the board meeting. This is followed by a feedback letter to the centre leader.

Gender equality

The foundation does not have any requirements regarding a specific gender balance. However, the foundation does consider it very important to keep a running dialogue (using both the annual reports and the annual follow-up meetings) with the centres with regard to diversity in a broad sense, as well as the gender balance of the centre staff. However, the Danish Ministry of Science, Innovation and Higher Education pointed out in its last evaluation of the DNRF (in 2013) that they had concerns regarding the low representation of female researchers as grant holders.

CoE programme evaluations

The DNRF has not commissioned or performed any programme evaluation themselves of their CoE programme. However, there are ongoing evaluations at the board's annual strategy meetings in terms of fine-tuning the instrument for upcoming applications rounds. Furthermore, the DNRF is evaluated about every tenth year by the Ministry of Science, Innovation and Higher Education. The last evaluation in 2013 was very positive, where the panel concluded that "all in all, the very positive impact the DNRF had on the quality of research in Denmark is remarkable. The DNRF finds unreserved approval from all levels within the Danish research system."

General

We asked if there has been any criticism of the DNRF's monitoring and evaluation scheme for the CoE programme, but it is generally accepted by the universities and centres, since this is part of the terms for the grant from the beginning. There have been a few complaints from some centre leaders, but the DNRF thinks that they have been at a reasonable level in comparison with other large grant schemes, such as the ERC grants.

Finland

Academy of Finland

The Academy of Finland is the Finnish equivalent of the Swedish Research Council in Sweden, being a government agency under the Ministry of Education, Science and Culture. Their remit is basically the same, to fund high-quality scientific research, provide expertise in science and science policy, and strengthen the position of science and research. The annual funding budget is approximately 460 million EUR per year.

CoE programme

The Academy of Finland calls their CoE programmes, which have been running continuously since 1995, a success story. The centres are expected to be close to or at the very cutting edge of science in their field, developing creative research environments and innovations, and are seen as first-rate research communities with incentives for risk-taking and new initiatives in research, as well as having capacity for renewal and high societal impact. The centres also generate and train new, talented researchers for the Finnish research and business sector. The CoE term is eight years, and they are selected based on international review. The centres are jointly funded by the Academy of Finland, universities and research institutes. The funding from the Academy of Finland covers the overhead costs of the centres, and the budget for each centre is approximately 2 million EUR per year.

Monitoring and evaluation framework

The main purpose of the CoE programme is to enhance research quality and the societal impact of the research, which is also the focus of the monitoring and evaluation of the programme. The CoE programme is monitored yearly through annual reporting to an e-service from the centres, and the Academy of Finland also organises annual CoE seminars. The centres are also evaluated at mid-term of the funding period by an external expert panel. At the end of the funding period, the centres are expected to submit a final report to the funder.

Yearly monitoring and follow-up

The centres are expected to report annually to an e-service. The centres report using a fixed template every year, so that change is captured and monitored cumulatively for each centre over the eight-year funding period. The data reported are mostly quantitative (publications, patents, personnel), but for social impact the data is qualitative. The centres also report their overall funding sources in the reporting system, but use a different system for billing. The drawback of this fixed system of reporting is that it is not flexible enough to pick up new issues that could have been interesting when assessing the progress of the centres during the funding period.

SAB – scientific advisory board

All centres shall appoint a scientific advisory board (SAB) to oversee the running of the centre through the funding period. The SAB consists of two or three inter-

national scientists, as well as observers from the Academy of Finland, other funding organisations, and from the university. The SAB functions as a middleman between the CoE and the Academy of Finland. The task of the SAB is to support, strengthen and monitor the work of the CoE regarding science, administration and management. The SAB meets three times in the first five years, and once in the following three years. After each meeting, they produce a signed report and submit it to the Academy of Finland.

Mid-term evaluation of the CoE

The funding period for the CoE programme has recently been changed from six to eight years. The centres are evaluated after five years, according to the new funding scheme. The next mid-term evaluation will be in 2022, and twelve centres will be evaluated in that round. The mid-term evaluation focuses on scientific performance, and the results from this evaluation will serve as a basis for deciding on funding the centres for the final three years of the funding period. The evaluation is performed by an international panel, where some of the panel members are fixed for the whole evaluation, and if needed, some are appointed for the evaluation of specific centres in order to ensure that the specific expertise is represented on the panel. The reasons for having a fixed panel are that they then can make conclusions across the centres and quality-assure their assessments for that generation of centres.

The centres are asked to submit a self-evaluation and a new proposal for the remaining three years of the programme. The annual reporting from the centres also serves as information to the panel on the progress of the centres. The panel makes a pre-evaluation prior to the interviews, which are held in Helsinki. The interviews take approximately one hour, so the panel holds four interviews in a day. There are no site visits for the panel. All in all, the timeline for the mid/term evaluation is six months. The fee for a panel member is 500-1000 EUR per day, for approximately five days' work. The panel is recruited made from a database of experts that the Finnish Academy has compiled from all years of having the CoE programme. The Finnish Academy can also choose panel members from outside this list if they want.

A general sub-committee¹, appointed by the Academy of Finland with professors from Finnish universities, is responsible for overseeing the programme and decide which CoE proposal to fund. The committee consists of eight members, appointed for three years. The committee members do not receive any fee; instead, the assignment is considered a position of trust. It is the committee who finally decides on the recommendations from the panel, and whether the centres will receive additional funding, the same funding, or a decrease.

Final evaluation

The final evaluation of a generation of centres is carried out for two programmes at a time. A new call for the CoE programme is issued every second year; therefore, when performing the final evaluation, there is a two-year gap between the final year of each generation of centres to be evaluated. Most of the time, the centres have been running in parallel during the programme period.

The focus for the final evaluation is on assessing the quality of research, renewal of science, broader impact, and added value. The final evaluation focus on the whole

¹ <https://www.aka.fi/en/about-us/decision-making-bodies/subcommittees/>

programme, not on specific centre performances. The evaluation is performed by a scientific panel. The data analysis used for the scientific part of the evaluation consists mainly of bibliometrics, and the panel also assesses whether the centres have had any impact on research quality in Finland in general. However, the results from most of these evaluations show that the volumes from the centres are too small to have any major impact on the overall quality of Finnish science.

Gender equality

Gender equality is not specifically addressed in the Finnish CoE programme, however they strive for a balance. The Academy of Finland makes gender comparisons of the success rates regularly, and female applicants tend to be more successful than male applicants in Finland.

CoE programme evaluations

There have been a few overall CoE programme evaluations over the years. The main reasons for these are to validate the success of the programme in delivering high quality research and societal impact. The format and focus of the evaluations differ, so that they address questions that are timely and relevant at the time. The evaluations are mainly performed by the personnel at the Academy of Finland. The output from the CoE programme - that is, the data on performance - is mainly assessed in-house, whereas the assessment of societal impact of the centres is done by external consultants. Depending on what evaluation questions are addressed in the specific evaluation, the Academy of Finland decides whether the evaluation shall be done in-house, through peer review, or by external consultants.

The programme evaluations have been performed more or less at the same time as a new generation of CoE programme is planned, so there has been little feedback from the evaluations directly into the design and planning of the new CoE programme.

General

There has been some criticism of the annual reporting system from the centres, which consider it too ambitious to report on the progress of the centre annually.

Norway

Research Council of Norway

The Research Council of Norway (RCN) was established in 1993 by merging five already established research councils. The RCN works to promote research and innovation of high quality and relevance, and to generate knowledge in priority areas to enable Norway to deal with key challenges to society and the business sector. The annual funding is on average 10 billion NOK.

CoE programme

The idea behind the Norwegian Centre of Excellence (CoE) scheme is to give Norway's best scientists the opportunity to organise their research in centres in order to reach ambitious scientific goals. The aim is for the centres to generate ground-

breaking results that advance the international research frontier. The CoE scheme has so far funded four generations of centres; the most recent being started up in 2017. Each centre receives funding for a period of ten years, contingent on a positive mid-term evaluation. So far, 44 centres have been funded, with 23 operating now.

The Norwegian centres work with ambitious ideas and complex problems. Their primary objective is to conduct targeted, focused, long-term research of high international calibre, with researcher training and international collaboration as important secondary objectives. Centres may receive support for a total of ten years (an initial five-year period with the possibility of a five-year extension). Within this period, the centres are allowed a relatively large degree of flexibility compared to other RCN funding instruments. This flexibility extends, for instance, to making changes to collaborations and to the centre's constituent groups if this serves the pursuit of more interesting scientific leads.

The CoE scheme can be described as institutionalised and is announced every five years, so that HEIs and applicants can plan the application. The timeframe from call to selection is about 18-20 months. The selection is conducted in two phases and is based on international peer review. In the first phase, which is open to all applicants, there are three sub-committees. The reviewers are known to the applicants and they may choose the sub-committee that deals with their application. Multidisciplinary proposals will be evaluated by more than one sub-committee. The second phase is only open to the ~20 per cent of applicants who were invited, following phase one. In phase two, all applications are assessed by an international scientific panel consisting of three experts in the scientific field of the application. Subsequently, all Applications, as well as the assessments from the individual panels, are assessed by a new committee of nine international and highly merited scientists. This committee interviews the applicants and ranks the applications. The final decision is formally made by the executive board of the RCN.

Monitoring and evaluation framework

The RCN has developed its monitoring and evaluation scheme for the CoE programme over the years. The major parts of the monitoring system are 1) annual reporting, 2) site visits, 3) a mid-term evaluation, and 4) a final report.

It is the RCN's impression that the centres for the most part find the required level of reporting reasonable. The centres typically have very well-qualified support staff, and they are informed of their responsibility in terms of yearly reporting and midterm evaluation early on, so they are planning for this when establishing the centre.

Yearly monitoring and follow-up

The centres are expected to report annually to the RCN. The yearly reporting consists of a free format "brochure" plus a standard RCN progress report (which contains information on publications, other scientific results/production (dissemination and commercialisation measures, etc.), and international collaborations. In addition the Centres are asked to provide an overview of their total financing, personnel working at the centre, and scientific highlights. The RCN emphasises that ground-breaking research results as more important than the number of

publications. The RCN makes yearly aggregations and compilations of these data from the centres.

The RCN also makes site visits at least twice during a funding period. The first visit takes place during the first term of the funding (five years), and the second during the second term.

Mid-term evaluation of the CoE

The purpose of the mid-term evaluation is to assess the scientific quality and performance of the individual centres both in absolute terms, and relative to the centres' research plans. This will form the basis for the decision by the RCN whether to continue the individual centre for the remainder of the total ten-year period, or to terminate the centre's CoE funding and status after half the time. The timeline of the funding scheme for the mid-term evaluation has changed from 5+5 years, to 6+4 years, starting with SFF-IV. This change was made recently, and as a result of the programme evaluation performed in 2020 to avoid making centres feel pressured to publish too early - as it is important that publications are of high quality.

An evaluation committee with four members is selected by the RCN and appointed specifically for each centre. Two members are specialists in the research fields of the centre, and two members are generalists, professors with broad experience in research management. The generalists evaluate several centres in order to compare them. The centres are asked to fill in a self-evaluation report, which together with the annually collected information from the centres, and a selection of five of their best publications, serves as information for the committee's pre-evaluation prior to their site visit to the centre. At the site visits, the committee conducts interviews with the centre director, students, staff and representatives of the university. The site visits take about four hours, and typically contain scientific presentations from the major groups at the centre, a discussion of plans for the future, an interview with the centre director and a short group interview with the students and postdocs. After the site visit, the evaluation committee convenes (typically on site) to discuss and write a first draft of the evaluation report.

The two specialists within the centre's scientific field appointed as panel members for the mid-term evaluation of the centre are appointed only for that centre's evaluation, whereas the two generalists are appointed for mid-term evaluation of several centres. In this way, the generalists ensure that the evaluation process and assessments are similar between the centres that are evaluated during the same evaluation period.

For the most recent mid-term evaluation, the fee for the experts was 20 000 NOK per centre for the specialists, and 10 000 NOK per centre for the generalists. In addition, there are costs associated with travel, board and lodging. In total, the costs for performing the mid-term evaluation for the most recent generation of centres evaluated (the 13 SFF-III centres) amounted to approximately 1 400 000 NOK.

Based on the background material provided by the centre and the impression from a site visit, the evaluation committee will write a mid-term evaluation report. The report shall comment on how well the centre meets the midterm evaluation criteria:

1) scientific quality, 2) centre organisation, and 3) plans for the second five-year period, and also the strategy for the centre after that time.

The evaluation committee is provided with the following background information:

- Annual report (with specified contents)
- Self-evaluation from the centre – a document from the centre director to the evaluators
- Self-evaluation from the host institution to the evaluators
- The financing and costs of the centre (at the host institution)
- Report from each partner to the evaluators, including centre-related financing and costs
- Project description for the last five years of the centre
- Information on contract changes, etc. from the RCN
- The CoE application and the call text

The executive board of the RCN will decide, for each centre, whether or not corrective actions should be taken, based upon the main recommendation from the mid-term evaluation. If the board decides that a centre must take corrective action, the centre's actions will be evaluated after six months.

The administration of the RCN may call upon the evaluation committee, or additional expertise, for the evaluation of the actions in those cases where such expertise is of importance. The new evaluation will recommend continuation or termination of the centre. The executive board of the RCN will decide on whether or not to follow the recommendation. The centre will not be terminated before this board decision, even if the first period of 60 months is exceeded. The evaluation report will be made public.

Final evaluation

When the funding period ends, the centres are asked to submit a final report (self-report by the centre). The final report shall cover main research results, contribution to the development of new research areas, whether junior researchers established their own research groups, increased international acknowledgement, societal relevance and impact, added value of the CoE, the relationship to the host, impact on research locally and/or nationally, the role of the mid-term evaluation, and finally the future of the centre.

Gender equality

The RCN visits each centre twice during a funding period. The interviews that they hold with the centre leader, staff, doctoral students and postdocs concern administrative issues, such as organisation.

The gender balance at the centres in large part reflects the gender balance in Norwegian research as a whole. However, a wish has been expressed that the programme could do more to promote female scientists to more senior and secure positions. Gender balance is therefore discussed at the site visits. Also, the number of female centre directors has been lower than desired, in large part mirroring the gender balance among the applicants. In the current call for new centres (SFF-V), a requirement to send in a gender-balanced portfolio of applications has therefore been made to the institutions that send many applications. This has resulted in a larger

number of female applicants, as well as a large number of applications with shared leadership.

CoE programme evaluations

In 2020, the RCN commissioned a programme evaluation of the whole CoE funding programme. The evaluation sought to answer whether the programme has had an impact on overall science quality, on the Norwegian research system, and asked for recommendations for the future CoE programme. The evaluation was performed by an international committee consisting of six experienced scientists, and was based on a wide selection of material. This material included two reports commissioned by the RCN from NIFU (Nordic Institute for Studies in Innovation, Research and Education, an independent social science research institute, organised as a non-profit foundation). The evaluation showed that the centres produce research of high quality and have extensive and productive collaborations with the best universities internationally. The evaluation also showed that the centres have had a profound impact on the Norwegian research system, in that it has promoted an increased focus on scientific quality at the institutions. The centres also have provided high quality training for doctoral students and postdocs, and in many cases had great societal impact.

Sweden

Swedish Research Council

The Swedish Research Council is an agency reporting to the Ministry of Education and Research, and is responsible for funding and developing basic research in all academic disciplines, with an emphasis on achieving the highest scientific quality and bringing about development and renewal in research. The overall budget of the Swedish Research Council is 6.5 billion SEK per annum. Almost half of the funding is allocated to national infrastructures and membership of international research infrastructures. A large part of the budget is allocated to project funding of research at the highest level within all scientific fields.

CoE programme

In 2005, the Swedish Research Council and Formas, the Swedish Research Council for Environment, Agricultural Sciences and Spatial Planning, were commissioned by the Government to support the development of centres of excellence, known as Linnaeus Centres, at Swedish higher education institutions (HEIs). The Government's research bill "Research for a better future" (Govt. Bill 2004/05:80) announced the grant, and the remit was to strengthen the ability of Swedish HEIs to prioritise and profile Swedish research to be internationally competitive and at the forefront of research, by building strong research environments.

The Swedish Research Council announced the CoE grant in two separate calls in 2005 and 2007, and awarded funding to 20 centres for ten years at each call, with a maximum grant of 10 million SEK per year during the programme period. There were no more calls under this programme other than the two calls described above. However, VR has had many different excellence investments since the time before

and after the Linnaeus programme, both relating to investments in centres of excellence and also for specific international recruitment to support excellence in research environments. For the comparison in this memorandum, we have chosen to limit the example to the Linnaeus programme, since this corresponds more directly to the CoE programmes in Denmark, Finland and Norway.

Monitoring and evaluation framework

The CoE programme was thoroughly evaluated for both calls. The first evaluation was performed after two years into the funding period, when the centres were evaluated on their organisational set-up and strategies for research. The second evaluation was the mid-term evaluation after five years into the funding period, where all centres mainly evaluated their scientific performance, the potential for success and added value.

There was no particular monitoring of the programme during the programme period. Some financial reporting was done by the centres during the programme period, approximately three times, where they reported on the spending of the centre for a specific period of the programme.

The data collection was not coordinated between the evaluations, so for each evaluation, there were new forms for data collection, albeit with similar subjects.

Evaluation after two years

The first evaluation of the centres was performed after two years of the funding period. This evaluation focused on the organisation of the centres, leadership and cooperation, and also the research plan. The evaluation was performed by an international panel.

The data that was collected for the evaluation concerning data on personnel and an economic report was assembled and submitted by the Linnaeus centres. In addition, the centres had to submit a self-evaluation covering organisation and leadership, collaboration, and the research plans for the centres.

Representatives from each of the 20 Linnaeus centres were interviewed separately at a hearing in Stockholm. The international panel made its assessment based on both the written material and the hearings, before giving recommendations for the funding for each centre to be increased by up to 20 per cent, to remain the same, or decrease by 20 per cent. The panel's report was published by the Swedish Research Council and disseminated to the public.

Mid-term evaluation of the CoE

A midterm evaluation was performed for each call after five years into the funding period. The main focus for this evaluation was on scientific results, the added value provided, and the dynamism created. The remit of the Linnaeus centres was to perform high scientific quality research, which means making specific key findings and scientific breakthroughs, and having international impact. The evaluation of the centres was performed by five international expert panels, of which four were scientific subsidiary panels, and one was a general panel for the overall assessment.

Prior to the evaluation by the international expert panels, the vice-chancellor of the hosting universities and the Linnaeus centres had to write a self-evaluation report, which was submitted to the Swedish Research Council.

The international expert panels made their evaluations based on site visits, with hearings with the centres and the university management. The expert panel were able to suggest a change in the funding of the centres, with an increase or decrease of the funding with 20 per cent, or the same funding. The evaluation report mainly focuses on their assessment of each centre, with recommendations for improvements for the coming five years of the funding period. The recommendations mainly concerned organisation and leadership, and engagement with doctoral students and junior researchers.

Final evaluation and CoE programme evaluation

The final evaluation of the Linnaeus CoE programme was performed jointly for both calls after the funding period for the last call ended in 2019. The purpose of the evaluation was to provide feedback and learning to the Government, the research funders and the universities. The evaluation focused on the overall CoE programme, specifically on the international visibility and competitiveness of the centres, the capacity- building at the universities and the centres in establishing successful centres, and, finally, the societal relevance of the centres in their engagement with the non-academic community, and whether they addressed research that was relevant for having a societal impact. The analysis was done at CoE level, university level, and national level, in terms of the impact of the programme on the whole Swedish research system.

The evaluation was performed by an international expert panel. The panel did a pre-evaluation before their interviews with each HEI. The interviews were held jointly with the research management of the HEI and representatives from their centres at the same time.

The data collected for this evaluation were data on publications, personnel, additional external funding during the programme period and spending. In addition, the evaluation team at the Swedish Research Council collected information from the universities through interviews with research management at the university and with focus groups at the centres, and also by asking the centres to write impact case studies on their scientific performance, and on their societal impact. A survey was also sent out to researchers who had been doing research at the centres during the programme period.

The international panel concluded that the CoE programme was well-established in the science community in Sweden, with the centres producing higher scientific performance than the overall scientific production of universities in Sweden, and recommended a renewal of the programme.

Gender equality

The outcome from the first call was heavily criticised for only selecting male principal investigators as centre leaders, and the call was lacking a gender equality aspect. Therefore, the instructions for the second call also included gender equality as an assessment criterion.

General

Although the Linnaeus CoE programme was thoroughly evaluated three times during the funding period, the evaluations were not planned to cumulatively add evidence of the merits from one evaluation to the next for any of the centres, the universities or the performance of the programme itself. The evaluations were carried out as ad hoc events, but with great rigour in the planning and performance of the evaluations. This was quite time-consuming and costly for the Swedish Research Council. The lack of yearly monitoring made it quite difficult to gather data from the Linnaeus centres, which needed to report data that in part was almost ten years old. Some of the universities had changed the reporting system during the period, and this also made it more difficult to report the data asked for.

Comparative analysis

Organisations and programmes

Research funding organisations

The Nordic research funding organisations have (slightly) different tasks and scope as government agencies or foundations.

CoE programme

The CoE programmes in the Nordic countries are similar. Finland has a shorter funding programme, of eight years instead of ten years. The main purpose of the programmes is to fund outstanding research at the highest level within all fields of research.

The programme funding is divided into two parts, with the first funding period being six years (in Denmark and Norway) and five years (in Finland and Sweden). The second period covers the remaining years of the programme; that is, five, four or three years. In Denmark and Norway, the centres are expected to be physically integrated as much as possible.

Monitoring and evaluation framework

The CoE programmes are rigorously monitored, followed up and evaluated by all of the research funders, however in slightly different ways.

The general features of the monitoring and evaluation schemes for most of the countries are yearly monitoring throughout the programme period, combined with a mid-term evaluation after the first funding period. The Swedish Research Council has chosen to perform an evaluation of the organisation of the centres after two years, rather than having ongoing yearly monitoring of the performance of the centres, followed by a mid-term evaluation after five years of the programme.

The level of engagement by the research funders in the centres' progress during the programme differs, and a further comparison is provided below.

Methods for reporting/monitoring

Table 1. Methods for reporting/monitoring

	Annual report	Follow-up meeting	Final report
Denmark	Each centre reports indicators such as external financing, publications, spending and personnel and also development of the centre.	Yearly site visits by DNRF to each centre.	The centres shall submit a short (2-4 pages) final report after 9 years of funding. The reports are used by the DNRF board in its evaluation.
Finland	Annually to an e-service with a fixed template. Change is monitored cumulatively for each centre over the eight-year funding period.	Each centre is monitored by a scientific advisory board consisting of two or three international scientists, and observers from the Academy of Finland, other funding organisations, and from the university.	Final evaluation performed by a scientific panel mainly using bibliometrics. The focus is on the whole programme, not on specific centre performances.
Norway	Annual report to the RCN. The yearly reporting consists of a free format "brochure" plus a standard RCN progress report.	The RCN make site visits at least twice during a funding period. The first time in the first term of the funding (5 years), and the other in the second term.	Final report (self-report by the centre) covering main research results, contribution to the development of new research areas, etc.
Sweden	No annual reporting/follow-up other than occasional financial reporting. Instead there is a start-up evaluation after two years.	Site visits by an international panel at the mid-term evaluation.	Final evaluation by an international expert panel.

Most of the CoE programmes require centres to send a yearly report to the research funders. This is done in the form of an annual report plus other information from the centres. The Academy of Finland has a different reporting system, where the centres report on specific indicators. The research funders request fairly similar indicators, concerning data on publications, personnel, external financing, and spending. The centres also report on their progress in terms of research findings, such as a breakthrough or major finding.

The yearly reporting also serves as information for the mid-term evaluations and the final report. In addition to the monitoring, the DNFR also make yearly site visits to all centres, where they receive presentations on the progress of the centres, and they have a specific focus area each year which they discuss more thoroughly. In Finland, the Academy visits the centres three times, and in Norway, the NRC makes two site visits to the centres during a funding period.

Mid-term evaluation of the CoE

The midterm evaluations are the most important evaluation in the programme and are performed after approximately five years into the programme. The purpose of the mid-term evaluation is fairly similar for all research funders, namely to assess the scientific quality of the research at the centres, and to decide whether they should receive funding for the second period of the programme. All research funders in the Nordic countries perform the mid-term evaluations, and in some cases also the final evaluations or programme evaluations, using international experts. The design and the application of peer review varies to some degree, and is presented in the following section.

Table 2. Peer review - Design and application

	Occasion	Panel size	Site-visits for the experts	Remuneration	Recruitment
Denmark	Mid-term evaluation of the centres.	3 experts in the scientific field of the centre.	No	3 000 DKR per centre report (<12 pages).	Nominations from the centre, the DNRF board, and the personnel of DNRF.
Finland	Mid-term evaluation of the centres.	No fixed size.	No	500-1000 EUR per day, for approx. five days' work.	Academy of Finland can select from a database with experts from previous CoE.
Norway	I. Mid-term evaluation of the centres.	4 members per centre. 2 specialists and 2 generalists.	Yes	20 000 NOK per centre for the specialist, and 10.000 NOK per centre for the generalists. Plus costs for travel, etc.	By the RCN. The centres are allowed to suggest experts in their own fields and the RCN may use one of them.
Norway	II. Programme Evaluation.	6 panel members.	No		
Sweden	Start-up evaluation after 2 years, Mid-term evaluation. Final evaluation.	14 persons, evaluating all centres.	No		Selection by Swedish Research Council based in part on proposals from the higher education institutions.

All the countries in the study use the peer review method for their midterm evaluations. In Sweden, peer review is also used for final evaluations. In Norway, peer review is also used for evaluating the whole programme, but then in another format than for the midterm evaluation. In Denmark, peer review was also used when the Ministry of Science, Innovation and Higher Education evaluated the whole of the DNRF; an evaluation in which the CoE programmes were also examined.

In some countries, the panel makes site visits, although it is more common for the panel to gather in one place.

The size of the panel depends on whether it is to review a few centres, or all the centres in the programme. The number of panel members varies from three to ten. In the Swedish Research Council's application of the method, around ten experts have usually been recruited, with a chairman. All panel members worked with the assessment of the entire programme.

Denmark puts extra emphasis on the panel members not only being scientific experts, but also experienced in research management and organisation.

Gender equality

The research funders have no formal agenda for ensuring the CoE programmes have integrated gender equality as a basis for funding decisions and for recruiting centre personnel. However, in the Swedish CoE programme, adjustments were made to the second call in order to include gender equality as an assessment criteria. In Norway there was also a requirement in 2020 that, for each research organisation, at least 40 per cent of their applications should have had female centre directors. In addition, the gender balance in the centres is followed up at site-visits and during the mid-term evaluation.

Degree of institutionalisation of the monitoring and evaluation (MoE) framework

A question for this comparative analysis is whether the MoE framework has been institutionalised in the research councils and at the universities establishing and hosting the centres.

By institutionalisation, we mean adopting a set of established processes or procedures for a certain purpose in the organisation, such as an MoE framework for data collection and evaluation of CoE programmes. A high degree of institutionalisation is characterised by established processes, or procedures, that occur regularly and are the same for subsequent generations of CoE programmes. A low degree of institutionalisation is characterised by more customised evaluation and data collection for a specific CoE programme. This means that a high degree of institutionalised MoE framework can facilitate the planning and implementation of data collection, both by the universities and the research councils (that is, developing templates for the annual reporting, self-evaluation forms, etc).

Table 3. Comparison of CoE programme and MoE framework

	CoE programme	MoE framework	Degree of institutionalisation of MoE	Degree of flexibility of MoE
Denmark	30 years Ongoing (40 CoE at present).	Annual reports. Yearly site visits. Mid-term evaluation of each CoE. Final report after 9 years.	High degree – predictable CoE and MoE scheme, well embedded in the universities.	Low degree flexibility. Some flexibility at site visits, otherwise fixed MoE scheme.
Finland	26 years Ongoing	Annual reporting. Mid-term evaluation of each CoE. Site visits at three times during the programme period. Final evaluation of 2 consecutive CoE programmes.	High degree – predictable CoE and MoE scheme, well embedded in the universities.	Low degree flexibility.
Norway	20 years Ongoing	Annual report. Mid-term evaluation of each CoE. Site visits at two times during the programme period. Final report at the end of the funding period.	High degree – predictable CoE and MoE scheme, well embedded in the universities.	Low degree flexibility.
Sweden	12 years Ended	Evaluation after 2 years on set up of CoE. Mid-term evaluation of each CoE. Comprehensive final evaluation after the programme ended.	Low degree Ad hoc evaluations – data collection in relation to each evaluation - no common scheme.	High degree, customised evaluations for each call.

There are some obvious differences in the Nordic countries in terms of how the CoE programmes work, and whether they form an important part of the funding instruments of the funding agencies. The degree of establishment of the CoE programmes in the respective Nordic countries also provides the programmes' stakeholders with long-term conditions for adapting and delivering services that meet the requirements of the CoE programme (that is, conditions for institutionalising the MoE framework at universities).

However, the CoE programmes' MoE framework have certain common features among the funders, such as the use of peer review when performing the mid-term evaluation - even though the use of peer review and the scope of the mid-term evaluation differ. Another similarity is that the mid-term evaluation is a vital part of the funding mechanism for all research funders, since it is possible to terminate the funding of a CoE that does not perform according to the set criteria for being awarded the grant.

The DNFR in Denmark has the most rigorous MoE framework of their CoE programme of the Nordic countries, but perhaps this is because it is the main funding instrument for the organisation, and has been in place for 30 years. In addition, there seems to be little criticism of it from the centres or the hosting organisations. The model of highly institutionalised CoE programme and MoE framework gives incentives to the stakeholders - that is, universities - to develop the capacity to host centres of excellence and to deliver on the requested annual activities of the MoE framework. The MoE framework also delivers on transparency for the DNFR, even though the information from the MoE framework never reaches the public eye.

Finland also has a high degree of institutionalisation of its CoE programme, which has been running since the mid-1990s, and has recently extended the funding period from six to eight years. The CoE programme in Finland also has an MoE framework that requires annual reporting to a web-based form, and a separate form for reporting the spending of the CoE. They also have a mid-term evaluation, and then a different way of performing the final evaluation, where they evaluate two generations of the programme together. The programme is well-established within the research system, but the yearly monitoring has received some criticism from the centres, who think it is too frequent.

The CoE programme in Norway has also been in place for a long period, since xxx, and after the establishment, the RCN has funded four generations of CoE programmes. The MoE framework has gradually developed over the years, and is very similar to the Danish and Finnish model for MoE, with yearly monitoring, a mid-term evaluation of each CoE after half the programme has been completed, plus a final report by the centres at the end of the programme. The CoE programme has been well institutionalised, both at the RCN as a core funding scheme, and at the universities that are keen to host centres due to the added value they bring, to both the research environment and to the higher education at the universities.

The Swedish CoE programme only had two calls, and the selection criteria for the call for centres changed slightly between the first and the second call. The programme was thoroughly evaluated, but, since this was a new programme, there was no basis to form a specific MoE framework only for this funding instrument.

There was therefore a low degree of institutionalisation of the CoE programme and the modes for evaluating the programme. The universities and the centres had a large degree of independence and freedom to form the centres around a specific research endeavour, which have led to successful outcomes, such as ground-breaking research and, in general, a higher quality of the research performed at the centres in comparison to the overall quality of the universities' research production.

Conclusions/concluding remarks

The following are the main conclusions or lessons from this study;

1. Long-term investment in a funding scheme/instrument provides incentives to both the research funder and the receiving hosting organisation to develop supporting structures for the programme. It also enables adjustments and adaptation of the CoE programme and the MoE framework over time, so that both the efficiency and the effectiveness of the CoE programme and the MoE framework can be optimised over time.
2. The MoE frameworks serve similar purposes in the Nordic countries, and deliver accurate data for each year from the centres, which can then be analysed and used for comparison by the research funder throughout the funding period. The data that is collected also feeds into the mid-term evaluation. The annual collection of data and the close follow-up of the centres provides transparency in the workings of the centres; however, it can also be stressful for the centres to fulfil indicators prematurely, and therefore not achieving the potential of the centre. The latter is more of a risk, due to the close follow-up with site visits by some of the research councils.
3. Sweden did not have a yearly monitoring scheme for collecting data from the CoEs during the programme. Data was collected for each evaluation separately, which means that the centres had to deliver data that covered several years of the centre performance for each evaluation. The forms changed during the programme period, which also made it difficult for the universities to plan the data collection.
4. The foremost benefit of having a well thought-through MoE framework is that the responsibility of reporting and delivering the success of the CoE programme is shared between the research funder and the universities hosting the CoE's.
5. Peer review is used for evaluations of single initiatives, as well as evaluations of whole programmes. The panels are often rather small and customised by using a mix of specialists and generalists. All Nordic countries use peer review in their mid-term evaluations, but usually not in the final evaluations.
6. Evaluations are made for different purposes and are used in different ways, which affects the design and the timing of the evaluations. Mid-term evaluations are used to a large extent to control and possibly end initiatives that do not live up to the requirements set. Final evaluations tend to be used for learning, and to show results from a programme.

7. Final reports/evaluations are often less formal when CoE programmes have more long-term funding. The Swedish model stands out in comparison, since the Linnaeus programme was extensively evaluated after the programme ended.
8. Some research funders are very engaged in the workings of the centres, with follow-up meetings every year, or at least a couple of times during the funding period. This can be seen as being supportive and invested in their success, emphasising the importance of the centres in their quest for ground-breaking research at the highest international level. But although we did not speak to any of the centre leaders in our neighbouring countries, we understand from our own experience of evaluating this type of programme, that one of the things that the centres expressed as the main benefit of being awarded centre status is that it gives them time to engage in questions that are novel and require time to find new paths, new ways of combining different disciplines and to be able to make mistakes. To be given the trust of finding that way without the demand of presenting the progress in an early stage is perhaps also an important prerequisite for ground-breaking research.

REFERENCES

Interviewees

Academy of Finland

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APPENDIX

Interview questions for comparison of Evaluation Frameworks for Centre of Excellence Programmes in Denmark, Finland and Norway

Questions

1. What are the sought-for outcomes and objectives that the CoE programme are delivering on?
 - a. Are the monitoring and evaluation activities of the CoE's designed to capture change in their direction?
2. What is the main purpose of your evaluation framework?
 - a. What evaluation methods are used in your evaluation framework? Peer review? Bibliometry, interviews, surveys etc?
 - b. Are there any critique against your evaluation model from the CoE's or universities?
 - c. How does the CoE's and the universities perceive the burden of delivering annual reports and having annual follow up meetings?
3. How is your yearly monitoring and follow up of the CoE set-up?
 - a. Do you have a pre-designed format for the annual reporting?
 - b. Are the spending of the CoE's accounted for in the annual reporting?
 - c. Do you make any aggregation of the data from the annual reporting yearly?
4. How do you organise and finance your midterm evaluation of the CoE?
 - a. Do the experts meet with the CoE? Do you have hearings? Where are the hearings held?
 - b. What is the timeline for the evaluation?
 - c. Do you use the same questions/framework for all CoE's?
 - d. Do you collect additional data from the CoE's for the midterm evaluation?
 - e. How is the evaluation disseminated, to which audience? Is it public?
 - f. What are the costs for the evaluations?
 - g. What are your remuneration fees to the experts?
 - h. How do you recruit experts?
 - i. How do you find the right experts for your peer review?
 - j. What does the general evaluation assignment include in terms of work for the experts?
5. How do you organise and finance your final evaluation of the CoE?
 - a. How do you perform your final evaluation of the centre? Is it based on a peer review? If not, who makes the analysis?
6. How do you quality assure the data reporting?

- a. Who makes the data analysis?
 - b. How do you quality assure the data?
7. How do you promote a gender balance in the programme?
- a. How do you follow up gender equality in your CoE's? Do you have any specific policies for addressing this when evaluating the call and when evaluating the CoE's and the overall CoE programme?
8. Has the CoE programme been evaluated? (Programme evaluation)
- a. How many evaluations of the programme has been performed?
 - b. What was the purpose of these evaluations?
 - c. Who performed the evaluations?
 - d. Has there been any baseline mapping in order to be able to measure performance of the programme?
 - e. What is the intended use of the evaluations, and how instrumental are the findings for adjusting or shaping future funding instruments?
 - f. How do you evaluate the financing and the costs of the CoE programme including how overhead costs for the COE's has been accounted for or dealt with?
 - g. What type of data-analysis is made by your organisation? What is procured elsewhere? Do you commission independent data analysis?

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