

***Annual Report 2018***  
***PHD EDUCATION***  
***NMBU***

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## Abbreviations used in the report

**BIOVIT:** Faculty of Biosciences

**HH:** School of Economics and Business

**KBM:** Faculty of Chemistry, Biotechnology and Food Science

**LANDSAM:** Faculty of Landscape and Society

**MINA:** Faculty of Environmental Sciences and Natural Resource Management

**REALTEK:** Faculty of Natural Science and Technology

**VET:** Faculty of Veterinary MedicineFaculty of Veterinary Medicine

## Foreword

The annual report for 2018 is the fifth in the series, and reports from the faculties show that good work is being carried out in the various aspects of research education at NMBU. We have an independent responsibility as a university to continually ensure that the quality of our educations is up to standard. How we do this is very much up to ourselves, and establishing a living quality assurance system requires dedication and good academic management. Our PhD programmes cover a wide academic range in both the natural sciences and the social sciences. We need to balance the streamlining and evening out of unwanted differences between programmes without losing the academic characteristics and valuable traditional disciplines.

NMBU shall contribute to joint efforts for a sustainable future by educating outstanding candidates, conducting high-quality research and creating innovation. The PhD education at NMBU has roots dating back a hundred years and, in the course of all these years, has graduated highly-qualified employees and citizens who take responsibility, lead the way and make a difference in their fields. NMBU's candidates also represent a valuable ballast in terms of analytical capabilities, the ability to collaborate within and between different subjects and disciplines, and the ability to disseminate research results identify ideas. All of these qualifications have evolved over time and in step with social development, and will help to support NMBU's vision "NMBU shall contribute to securing the future basis of existence through outstanding research, education, dissemination and innovation."

Ås, 15 February 2019

Øystein Johnsen  
Pro-rector for research and innovation

Ragnhild Solheim  
Director of Research

## 1. Summary

NMBU's PhD education maintains a high academic level, but there is also room for improvement in some areas. An annual review of the PhD education at the faculty and university levels should help identify areas for improvement and thus implement appropriate action.

In 2018, 100 new PhD candidates were accepted and 86 PhD degrees and one Dr. philos. were awarded at NMBU. At the end of 2018, NMBU had 518 PhD candidates under education. NMBU's PhD candidates are employed by NMBU, in private or public enterprises, at research institutes, at other university or college institutions or are funded through international scholarship programmes. NMBU's PhD candidates are an international group of which approximately 53% of the PhD candidates have a nationality other than Norwegian and originate from a total of 67 different countries. NMBU also has a high representation of women in education, and in 2018 54% of the number of active candidates were women. The completion rate for PhD education is measured by looking at the number of candidates who have completed the training within six years of acceptance. In the years 2014-2017, the degree of completion at NMBU has varied from 63% to 73%, and in 2018 the degree of completion was 78% (cf. section 2 NMBU's PhD education in figures).

In 2018, for the second year, NMBU's faculties have carried out their own evaluation of their PhD programme. The self-evaluations are based on results from the annual survey of the PhD candidates in addition to their own assessments of the quality of the PhD programme(s). The results from the PhD survey show that NMBU's PhD candidates are mainly satisfied with their education at NMBU. There are still areas which PhD candidates find challenging, and which are repeated in both 2017 and 2018. Ensuring a good start will provide benefits throughout the education, and both academic and administrative resources must be applied in order to achieve this. More academic and informal social meeting places are called for that can result in mutual interaction and exchange of information in a linguistically inclusive way. We know that the PhD candidates are thriving and displaying good progress and ability to complete in the environments where the main supervisors and co-supervisors actively include the PhD candidates in specialist/research groups, contribute to good planning of the PhD project and courses/subjects, and carry out other activities that support the research (cf. section 3.2 PhD Candidate Survey 2018).

Several of the faculties have developed "timelines" for the PhD education with information on routines and regulations related to the different phases. This, combined with information on "who does what for me as a research fellow," are good measures that over time will make it easier for candidates and supervisors to deal with the tight timeframe of the PhD education. In 2018, the university and faculties have also devoted considerable attention to the development of academic writing skills. These are initiatives that the PhD candidates have demanded for several years, which should be further developed and which we hope will give good results in the short and long term (cf. section 3.4 The faculties' reports on PhD education for 2018).

Based on the results of quality work in recent years, there are three priority areas where additional efforts will be made in 2019. These are (1) further work on improvements to the start-up phase: clarification of expectations between candidate and supervisor, management of research data, info and start-up help, both academic and administrative, early start of writing work and social initiatives. Furthermore, NMBU will focus on (2) clear academic programme management and (3) quality of the doctoral theses. Key quality issues in the theses include planning and project management, academic writing, content (especially the "summary") and scope (number of manuscripts/articles) (cf. section 3.10 The road ahead and the three most important areas for improvement in 2019).

## 2. NMBU's PhD education in figures

### 2.1 PhD. Programmes

NMBU has ten PhD programmes divided between seven faculties, and 518 active PhD candidates at the end of 2018 (Table1). Nine of the 10 PhD programmes have two or more programme options, and there are differences between the programmes when you look at the number of programme options (Table1). In the PhD programme Science and Technology, there are nine programme options, whereas the PhD programme Veterinary Sciences has only one.

As a university, NMBU has an independent responsibility for ensuring that the education we offer meets current requirements. Essential to the PhD education are the quality, scope, stability, depth and breadth of the disciplines that encompass the PhD programmes. The Study Quality Regulations<sup>1</sup> section 3-3 state that "Doctoral studies shall have a working environment which is stable and consists of sufficient number of employees with Professor and Associate Professor competence within the entire breadth of the education offered." NMBU's PhD Regulation section 7 defines that "Supervisors shall have senior lectureship competence in the relevant fields and be active researchers". Therefore, when planning for NMBU's future doctoral education, it is relevant to consider different conditions around current PhD programmes.

Table1 shows how many PhD candidates the faculties at NMBU are responsible for and how many PhD candidates were registered in each programme at the end of 2018. In addition, the number of "potential supervisors" associated with each programme is shown. "Potential supervisors" means here the sum of the number of employees in positions where a doctorate degree is required; researcher, associate professor and professor, i.e. more than those who hold positions for which senior lectureship competence is required. Senior lecturer and reader are not included as employees in these positions may not act as PhD supervisors at NMBU. Where supervisor capacity is concerned, the academic environments seem to be "large- and good enough" in relation to the number of PhD candidates in each programme.

*Table1. The distribution of the number of programme options and the number of active PhD candidates and "potential supervisors" between faculties and PhD programmes at the end of 2018<sup>2</sup>.*

Faculty/PhD Programme	Programme Options	PhD candidates	"Potential supervisors"
<b>Faculty of Biosciences</b>		<b>89</b>	
Animal and Aquacultural Sciences	9	52	65
Plant Science	4	37	37
<b>School of Economics and Business</b>			
Economics and Business	2	49	34
<b>Faculty of Chemistry, Biotechnology and Food Science</b>			
Life and Food Science	6	51	53
<b>Faculty of Landscape and Society</b>		<b>68</b>	
Society, Development and Planning	4	54	34
International Environment and Development studies	2	27	34

<sup>1</sup>Regulations concerning quality assurance and quality development in higher education and tertiary vocational education (KD 01/02/2010).

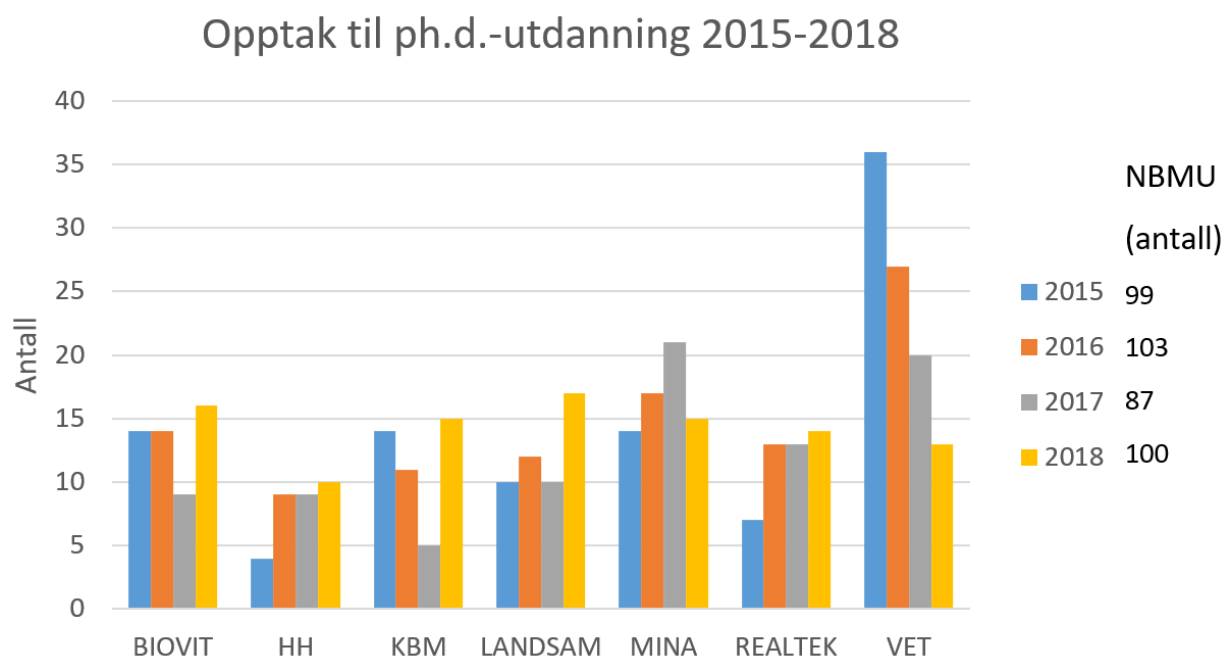
<sup>2</sup> Source: The finance department at NMBU.

<b>Faculty of Environmental Sciences, Ecology and Natural Resource Management</b>		<b>80</b>	
Ecology and Natural Resource Management	5	62	42
Environmental Sciences	3	35	38
<b>Faculty of Natural Science and Technology</b>			
Science and Technology	9	68	71
<b>Faculty of Veterinary Medicine</b>			
Veterinary Science	1	113	120
<b>TOTAL NMBU</b>	<b>45</b>	<b>518</b>	<b>558</b>

## 2.2 Admission to PhD education

In 2018, a total of 100 new PhD candidates were accepted at NMBU. LANDSAM accepted most PhD candidates

(17 candidates), followed by BIOVIT (16 candidates), KBM and MINA both 15 candidates, REALTEK (14 candidates), VET (13 candidates) and HH (10 candidates) (see Figure1).



*Figure1. Summary of the number of PhD candidates accepted for NMBU's PhD education for the years 2015–2018 at the seven faculties and overall at NMBU.*

There is no clear trend for admissions volume at the PhD level in the period 2015-2018. VET has had a steady decline in the number of PhD candidates admitted to PhD education from 36 candidates in 2015 to 13 in 2018. KBM had a decline from 14 candidates in 2015 to 5 in 2017, but increased again to 15 in 2018. HH has admitted an increasing number of PhD candidates, from 4 in 2015 to 10 in 2018.

Table2 shows the admission to the PhD education for the whole of NMBU for the last eight years. The admission has been slightly below 90 for five of these years, 2011-2013 and 2017. Admissions were particularly high in 2014, whereas in the years 2015, 2016 and 2018 they were about 100. NMBU has 164 recruitment positions in the framework from the Ministry of Education and Research. This number has risen from 142 in 2012 and NMBU was allocated 8 new positions in MNT courses in 2014, 7 new MNT positions in 2016, and 2 new natural science and technology positions in 2017. The faculties and NMBU as a whole have no declared admission strategy or official decisions on admission frameworks for the PhD education. The actual admission is the result of a number of different factors

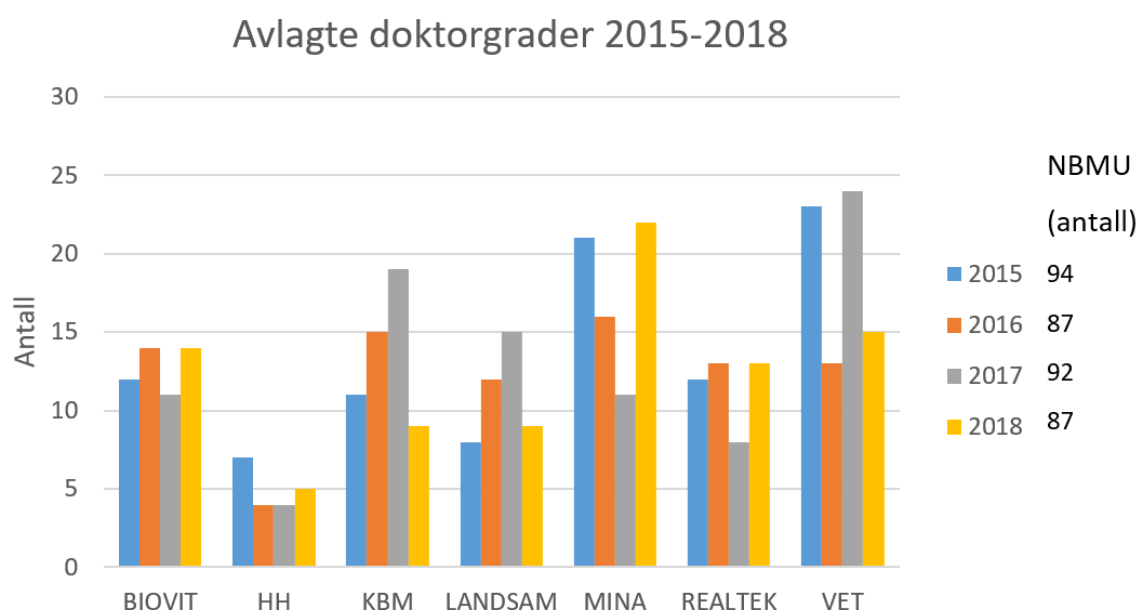
and decisions, such as the granting of external research projects, financial frameworks and human resources.

*Table2<sup>3</sup>. Admissions to PhD education at NMBU for the past eight years (2011-2018)<sup>4</sup>.*

Year	2011	2012	2013	2014	2015	2016	2017	2018
Number	86	87	89	111	99	103	87	100

### 2.3 Discontinued doctorate degrees

In 2018, 86 PhD.degrees were awarded and one Dr. Philos.degree (Figure2). Of the 86 PhD degrees that were awarded in 2018, two so-called “business PhD” were awarded, but there were no “public sector PhDs”.



*Figure2. Doctor degrees taken at NMBU in the period 2015-2018.*

Figure2 shows the distribution of PhD graduates between the faculties. MINA, had the most PhD graduates in 2018 with 22, followed by VET with 15, BIOVIT with 14 and REALTEK with 13. Both LANDSAM and KBM had 9, and HH had 5 PhD graduates in 2018. The complete list of PhD graduates in 2018, with their faculty and title of their thesis, may be found in Appendix 1.

Table3 shows the number of PhD degrees and Dr. philos degrees at NMBU for the years 2011-2018. The table shows that the number has ranged between 87 and 103. The high figure in 2013 can be explained by a high number of candidates who have received their PhD degree at the former Norwegian School of Veterinary Science before the merger in 2014.

<sup>3</sup> Source FS-NMBU. For the years 2011-2013, the figures are the sum of NVH and UMB.

*Table3. PhD degrees taken at NMBU in the last eight years (2011-2018)<sup>5</sup>.*

Year	2011	2012	2013	2014	2015	2016	2017	2018
<b>PhD Degrees</b>	90	86	99	91	94	86	92	86
<b>Dr. philos.</b>	3	1	4	2	0	1	0	1
<b>TOTAL</b>	<b>93</b>	<b>87</b>	<b>103</b>	<b>93</b>	<b>94</b>	<b>87</b>	<b>92</b>	<b>87</b>

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<sup>5</sup> For the years 2011-2013, the figures are the sum of the degrees taken at NVH and degrees taken at UMB.



## 2.4 Active PhD candidates

At the end of 2018, there were 518 “active PhD candidates” at NMBU. These are individuals with study rights at the PhD programme level at NMBU. Figure3 shows how the active PhD candidates are distributed by percentage between the programmes. Veterinary Science is the largest programme with 22% of PhD candidates (113 active PhDs), and Natural Science and Technology the second largest with 13% (68 active PhDs). The smallest programmes have between 35 and 40 active PhD candidates.

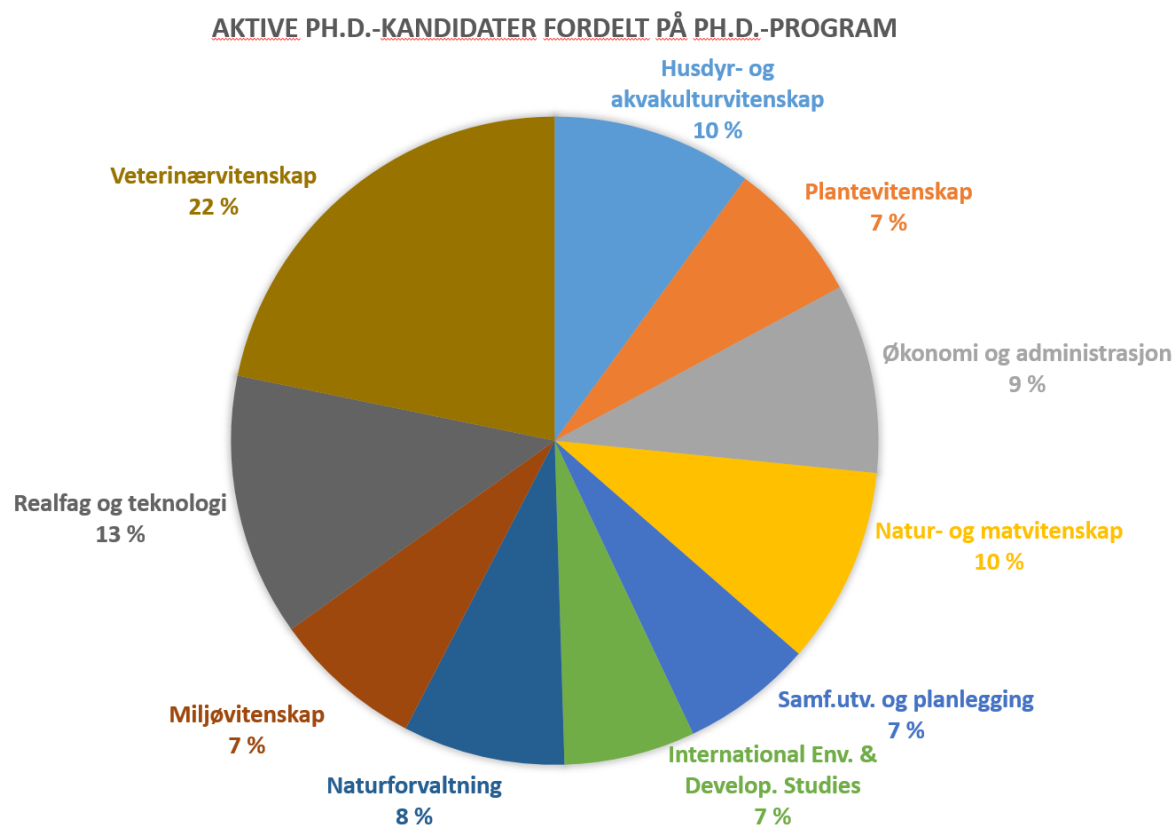


Figure3. Distribution in percentage of the 518 active PhD candidates on the 10 PhD programmes.

### Analysis of time consumption

The PhD education is standardised to "three years of full-time study" and discussions are being conducted in several arenas as to the optimal duration of the PhD education and the candidates' actual time consumption. When we discuss time consumption, we are talking about either "gross time" corresponding to the number of calendar years from admission to completion, or "net time" which is "gross time minus legally permitted and agreed interruption of education". The standard study period is three years "net time". With regard to the rule that maximum study time cannot exceed 7 years from admission to submission of the thesis, the "net study time" is what we should consider, not the total study time measured in calendar years.

When we then look more closely at *when* the active PhD candidates were admitted to the programme, we may, for example, assess whether we have candidates that are likely to spend more than seven years net study time on the education. In the "Common Student System" (FS) each candidate has a "time account" in which the faculties record periods of leave, sickness absence and other agreed interruption of education, so that we keep track of both gross and net study time.

Analysis of the figures in Figure 3 show that 52 (10%) of the 518 active PhD candidates were admitted in 2014, while 381 (74%) of the active candidates were admitted in the years 2015-2018. Moreover, 51 (10%) of the 518 active candidates were admitted in the period 2011-2013. These candidates will spend between six and eight calendar years (gross study time) on their PhD education if they complete it. However, even if the gross time amounts to eight years, the net time may be far lower, and well within the allowed maximum study time.

Of the 518 active PhD candidates 34 (6%) were admitted before 2011 (1998-2010). There may be some doubt as to whether these can and should still be considered "active". This is something that some faculties must decide on an ongoing basis and various "completion processes" may be carried out depending on the status of the agreement between the candidate and the faculty, research work, the training section and the thesis. All PhD candidates with active study rights at NMBU shall have a valid agreement with the faculty, including an agreed expected date of submission of the thesis.

### Interruption

We have also examined the number of candidates who started in the period 2008-2012 who have completed their education as of 1 February 2019, how many are still active and how many have discontinued their education (Table 4). Shows that of candidates admitted in 2008 75% have completed, 3% are still active and 22% have discontinued their education. Similarly, we find that for candidates accepted in 2010 82% have completed, 8% are active and 10% have discontinued their education. The classes of 2009-2012 have a dropout rate of about 10%, but this may increase if a number of those who are still "active" do not complete their education. NMBU has not decided what must be considered as an "acceptable dropout rate" from the PhD education.

*Table 4. PhD candidates accepted in the period 2008-2012, and their status as of 1 February 2019.*

Status	Accepted in 2008		Accepted in 2009		Accepted in 2010		Accepted in 2011		Accepted in 2012	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Completed	88	75.2%	109	80.1%	94	81.7%	61	70.9%	68	79.1%
Active	3	2.6%	9	6.6%	9	7.8%	18	20.9%	12	14.0%
Discontinued	26	22.2%	18	13.2%	12	10.4%	8	9.3%	7	8.1%
<b>TOTAL</b>	<b>117</b>	<b>100%</b>	<b>136</b>	<b>100%</b>	<b>115</b>	<b>100%</b>	<b>86</b>	<b>100%</b>	<b>87</b>	<b>100%</b>

## 2.5 Completion Rate

The completion rate for PhD education is measured by looking at the number of candidates who have completed the training within six years of acceptance. NMBU reports this annually to the Ministry of Education and Research.

Table 5 Shows an overview of the completion rate at the faculties and at NMBU for the years 2014-2018. These candidates have been accepted in the years 2008-2012 respectively. The completion rate at NMBU rose from 63% in 2014 to 72% in 2015 and 73% in 2016. For 2017, the completion rate was 67%, while for 2018 it was as much as 78%.

The completion rate varies from year to year, and a great deal of variation between the years is observed for some faculties. Some faculties have only a few PhD candidates, which will result in large percentage differences. It is nonetheless important for the faculties and the university to follow up and determine the causes of a low completion rate and initiate effective measures and activities.

*Table5. Completion rate i.e. percentage of candidates who have completed their education six years after acceptance.*

<b>Faculty</b>	<b>Accepted in 2008 and completed by 2014</b>	<b>Accepted in 2009 and completed by 2015</b>	<b>Accepted in 2010 and completed by 2016</b>	<b>Accepted in 2011 and completed by 2017</b>	<b>Accepted in 2012 and completed by 2018</b>
BIOVIT	74%	65%	72%	64%	73%
School of Economics and Business (HH)	56%	40%	86%	38%	100%
KBM	55%	79%	71%	77%	93%
LANDSAM	55%	55%	67%	78%	50%
MINA	65%	85%	72%	65%	71%
REALTEK	47%	67%	80%	38%	85%
VET	74%	82%	74%	83%	100%
<b>NMBU</b>	<b>63%</b>	<b>72%</b>	<b>73%</b>	<b>67%</b>	<b>78%</b>

## 2.6 Employer relationship and funding of PhD education

NMBU's PhD candidates are mainly in an employment relationship and are paid salary during their education (81%). 58% of PhD candidates have NMBU as their employer, while 23% have a different "Norwegian" employer during their research education (Table6). The education is therefore largely funded by the candidates' employer, but there may be many sources of the candidates' salary (and resources).

Research fellows who have NMBU as their employer may be financed through the Ministry of Education and Research's recruitment posts, with funds from the Research Council of Norway or other externally funded projects. Those who have other "Norwegian" employers are employed in private or public enterprises, at research institutions, or at other university or college institutions. Here funding sources are also many and often combined. Business PhDs and public sector PhDs are funded for example 50/50 by the Research Council of Norway and a business or public sector enterprise.

17% of the PhD candidates have no employer in Norway and are mainly funded through various scholarship programmes while taking their PhD education.

In 2017, 276 PhD candidates were registered with NMBU as their employer, and 45 were employed at the Research Institute. The number of QUOTA research fellows was higher in 2017 (31). The QUOTA programme has been discontinued so it is natural that this number decreases. Other groups were at the same level in 2017 as in 2018.

Table6. Overview of active PhD candidates' employers<sup>6</sup>.

PhD candidate's employer	PhDs 2018
NMBU	296 <sup>7</sup>
Research institute ("institute sector")	55
Other university or college institutions	13
Private Business (29 have industry PhD agreements with NMBU)	37
Public sector (6 have public sector agreements with NMBU)	15
No employer in Norway, funded via NORAD (NORHED) and other international programmes/sources	68
No employer in Norway, funded via the State Educational Loan Fund's QUOTA programme	19
Self-funded	14
Source of funding/employer not registered in the National Student Database	1
<b>Total number of "active" PhD candidates at NMBU as at 31.12. 2018</b>	<b>518</b>

## 2.7 Nationality

NMBU has an international student body and approximately 53% of the PhD candidates have a nationality other than Norwegian (Figure4). In addition to Norway, the candidates come from Europe (18%), Africa (16%), other Nordic countries (4%), Asia (9%) and other countries (6%).

The percentage of Norwegian candidates has been stable in recent years and varied only a few percentage points, while the percentage of candidates from Europe has varied between 13% and 23%. The proportion of candidates from Africa has ranged between 9% and 19%.

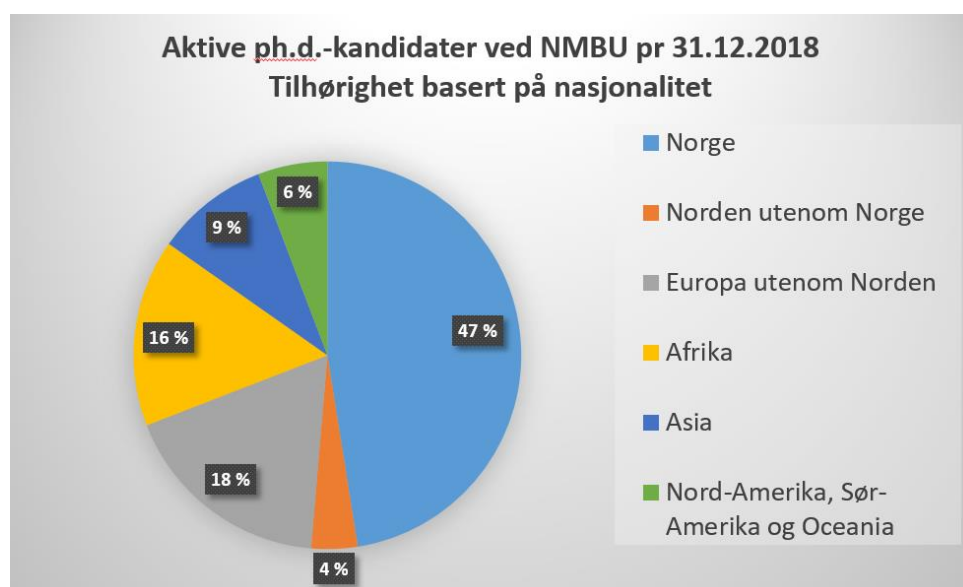


Figure4. The distribution between Norwegian and foreigners among NMBU's active PhD candidates at the end of 2018.

<sup>6</sup> Source: Common Student System (FS)- NMBU

<sup>7</sup>Of these 171 Ph D candidates are employed in the Ministry of Education and Research's recruitment posts

## 2.8 Gender distribution

NMBU seeks to promote equality between the genders in both academic and non-academic positions. The research education represents the first stage of an academic career, and the distribution between women and men under PhD education at NMBU in 2018 shows that women are slightly over-represented in this group (Figure 5). However, the gender balance of the two job categories of Associate Professor and Professor at NMBU is 36% women and 64% men<sup>8</sup>.

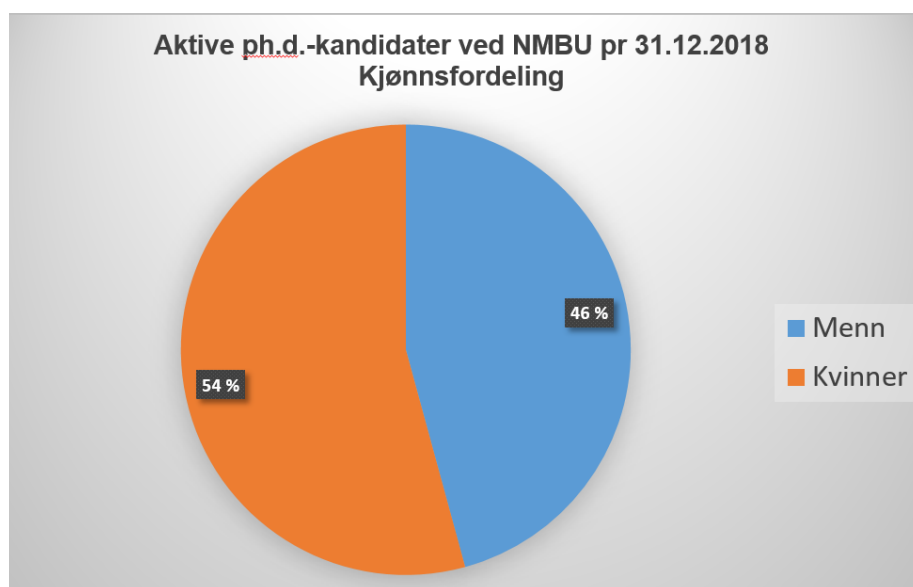


Figure 5. The distribution between women and men among NMBU's active PhD candidates

Of the graduated PhD candidates at NMBU in 2018, 40% were women and 60% were men, which is a change compared to previous years in which the proportion of women has been higher than the proportion of men (Table 7). This must be regarded as a random variation.

Table 7. Percentage gender distribution for NMBU's graduated doctors in the period 2011-2018.

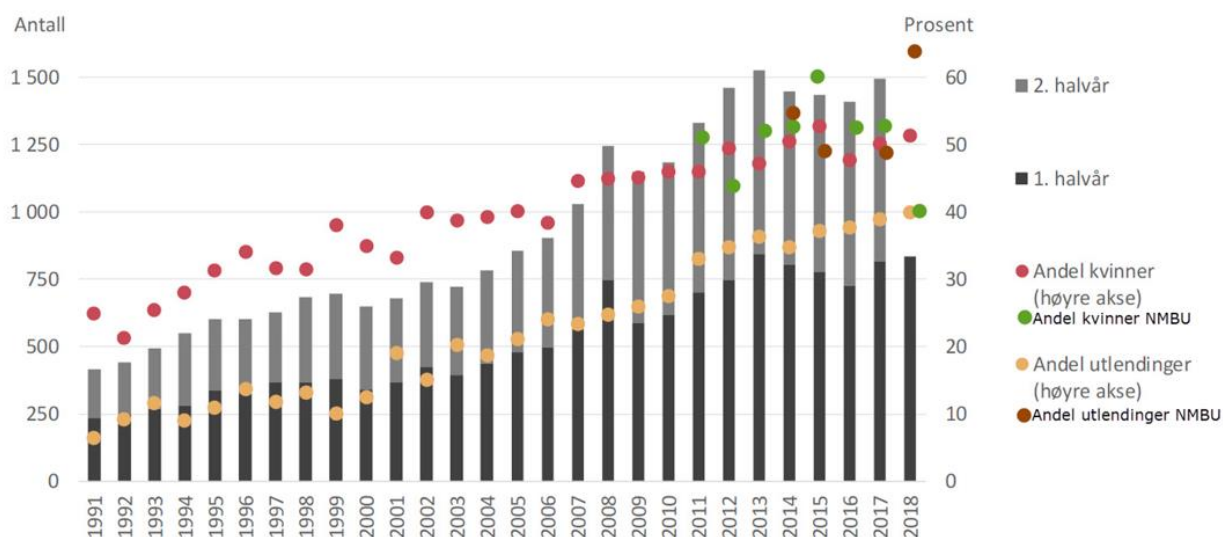
Year	2011	2012	2013	2014	2015	2016	2017	2018
Women	51%	44%	52%	53%	60%	53%	53%	40%
Men	49%	56%	48%	47%	40%	47%	47%	60%

The Nordic Institute for the Study of Innovation, Research and Education (NIFU) has also looked at the proportion of foreign candidates in Norway over time and the distribution between women and men (Figure 5).

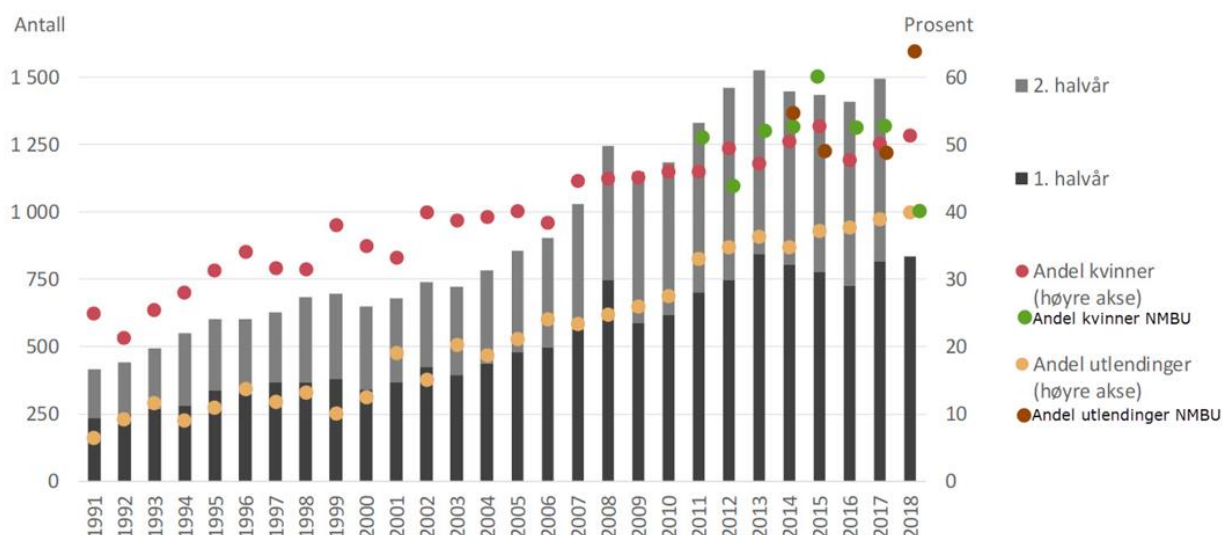
40% of doctoral degrees in Norway in the spring of 2018 were completed by foreign nationals, which is the highest proportion measured to date. This represents a slight increase over the previous year. The proportion of foreign nationals increased sharply until 2011, while the increase has been less in recent years.

<sup>8</sup> Source Database for higher education statistics (DBH).

On a national basis, 51% of the public defences in the spring semester of 2018 were undertaken by women. In the period 2012-2018, the gender distribution among the candidates for a doctorate has been steady, around 50% (



6Figure).



*6Figure. Number of doctor's degrees taken at Norwegian educational institutions 1991-1st half year 2018, and percentage taken by women and foreign nationals. Source: NIFU, Register of Doctoral degrees. The figure is supplemented with NMBU's figures for the women's share 2011-2018 and proportion of foreign nationals 2014-2018. Source: FS-NMBU.*



### 3. Quality in PhD education

Various activities are carried out to ensure and develop the quality of our education offered, and continuously improve the quality of NMBU's research education. These are linked to both the administrative routines and directly to the competence development of the candidates and supervisors. In this section, we will discuss the activities carried out in 2018.

The universities were given extended authorisations through the new Study Supervisory Regulations<sup>9</sup> in 2017; we have an independent responsibility to review the study programmes, to make sure that they fulfil the requirements and take action if necessary. "To fulfil the requirements" means in plain text that the relevant requirements in the Act relating to Universities and University Colleges with associated regulations shall be fulfilled.

NMBU has been notified that in the autumn of 2019 NOKUT will conduct supervision of our systematic efforts to ensure and improve the quality of education (cf. The Study Quality regulation<sup>10</sup>). NOKUT's supervision is based on the Act relating to Universities and University Colleges, the Education Supervision Regulations and the Study Quality regulation and the educational offerings'/NMBU's "condition and documented results".

In the study supervision regulation, there is now a requirement for academic management which applies to all education offered from 1 January 2019. The requirement was introduced after NIFU conducted an analysis of educational management in 2016<sup>11</sup> and NOKUT's stance is that educational management should be academic and strategic, and not administrative. At NMBU, the responsibility for the PhD programmes is defined for each faculty and lies with the PhD programme board or the faculty's research committee. There may be a need to work on establishing a common understanding of what academic management of study programmes entails and to strengthen these bodies in their strategic role performance.

#### 3.1 Quality assurance of the PhD programmes

All seven faculties submitted their annual reports by the deadline of 1 February 2019. The reports are mainly collocated by the R&D manager or by the PhD programme manager, and the Dean has approved the reports. The Faculty Boards are given the reports for their information. The Research Support Office is responsible for reviewing and summarising important elements in the faculties' reports and for including this in the annual report for the whole of NMBU's research education. This is presented to the University Board at their meeting in March, and forms the basis for further quality work.

In 2018, a plan will be prepared for periodic external evaluations that will be carried out for the first time in 2019 at the earliest. The rector has the overall responsibility for periodic PhD programme evaluations. NMBU's Research Committee has adopted guidelines on how to do this.

Information about NMBU's quality assurance system for the PhD programmes is published online: [https://www.nmbu.no/forskning/forskere/viktige\\_dokumeter/node/29861](https://www.nmbu.no/forskning/forskere/viktige_dokumeter/node/29861).

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<sup>9</sup>[\*Regulations concerning the supervision of the quality of education in higher education \(the Education Supervision Regulations\)\*](#). Effective from 09.02.2017.

<sup>10</sup>[\*Regulations concerning quality assurance and quality development in higher education and tertiary vocational education\*](#). Effective from 01/02/2010.

<sup>11</sup>Educational management An analysis of managers of study programmes in higher education. NIFU Working note 2016:10. <https://www.nifu.no/publications/1375706/>



### 3.2 PhD Candidate Survey 2018

In 2018, as in 2017, a survey was distributed to the PhD candidates, in which they could express how they experienced the PhD programme with which they are associated. The survey contained questions to the candidates in the various phases of their education, the start-up phase, midway phase and the final phase. The candidates were given an opportunity to give supplementary comments for several of the questions. A total of 197 candidates (of 520 candidates per 01.06.2018) responded to the survey distributed by 61% women and 39% men. The response rate for NMBU as a whole was 38%. Although the response rate is relatively low, we believe that the results, along with information and experiences shared in various NMBU forums, such as Research Committees, PhD Programme Board and PhD forums, provide good indications of what is good and what can be improved in organised research education at NMBU. The number of respondents ranged between the three phases with (max.) 40 respondents for the start-up phase (max.) 107 respondents for the midway phase and (max.) 50 respondents for the final phase.

The Research Support Office collated the responses from the survey for each faculty and has also selected input that is relevant to the university as a whole. Each faculty received the responses from their own candidates and used this for the evaluation of their own PhD programmes. Since the response rate was lower from some of the faculties, compared with NMBU as a whole, it has been important to use the results wisely, and not to draw too firm conclusions based on the survey alone.

The survey held in 2017 was structured in the same phases, but as the questions were somewhat changed from 2017 to 2018, the surveys as a whole cannot be totally compared. The two surveys are therefore compared in the best possible way and the results mainly give the same main impression as last year.

The PhD candidates gave a lot of positive feedback overall, and it appears that many are satisfied with being a PhD candidate at NMBU. The survey also identifies areas where there are challenges and these can be summarised as follows:

- There are significant differences in how cooperation with the supervisors works.
- The extent of academic networks around PhD candidates varies. Several candidates state that they do not belong to a research group.
- Some candidates say they feel alone. Some feel alone with their work and education, and some want more socializing among themselves and with other groups at the university
- Language is also a factor affecting several conditions during education, including the feeling of loneliness.
- A great deal suggests that there are major differences in expectations in the start-up phase and that this also affects the later phases of their education.

Below is a selection of questions and answers from the 2017 and 2018 surveys. The questions were structured slightly differently, but many of the questions were designed to let the respondents rate their satisfaction on a scale of 1-6, where 6 was the best/highest score.

## Start-up phase

PhD candidates in the start-up phase received questions about how satisfied they were with different conditions during the start-up phase of their education.

- Relevant and sufficient help
- Quality of information given during the start-up phase
- Access to recorded information about the start-up phase
- The social arena
- Academic support from the research group
- Academic support from the supervisors
- Administrative support from the faculty

Figure 7 is the average satisfaction with seven defined areas in 2018 is compared with the results from 2017 and shows that on average the PhD candidates are more satisfied with all conditions than those who responded in 2017. Due to the low number of respondents it is necessary to follow this over time in order to reach a conclusion. Academic support from the supervisors received a very high score in 2018, which may indicate that the majority receive good and close follow-up from the supervisors in the start-up phase.

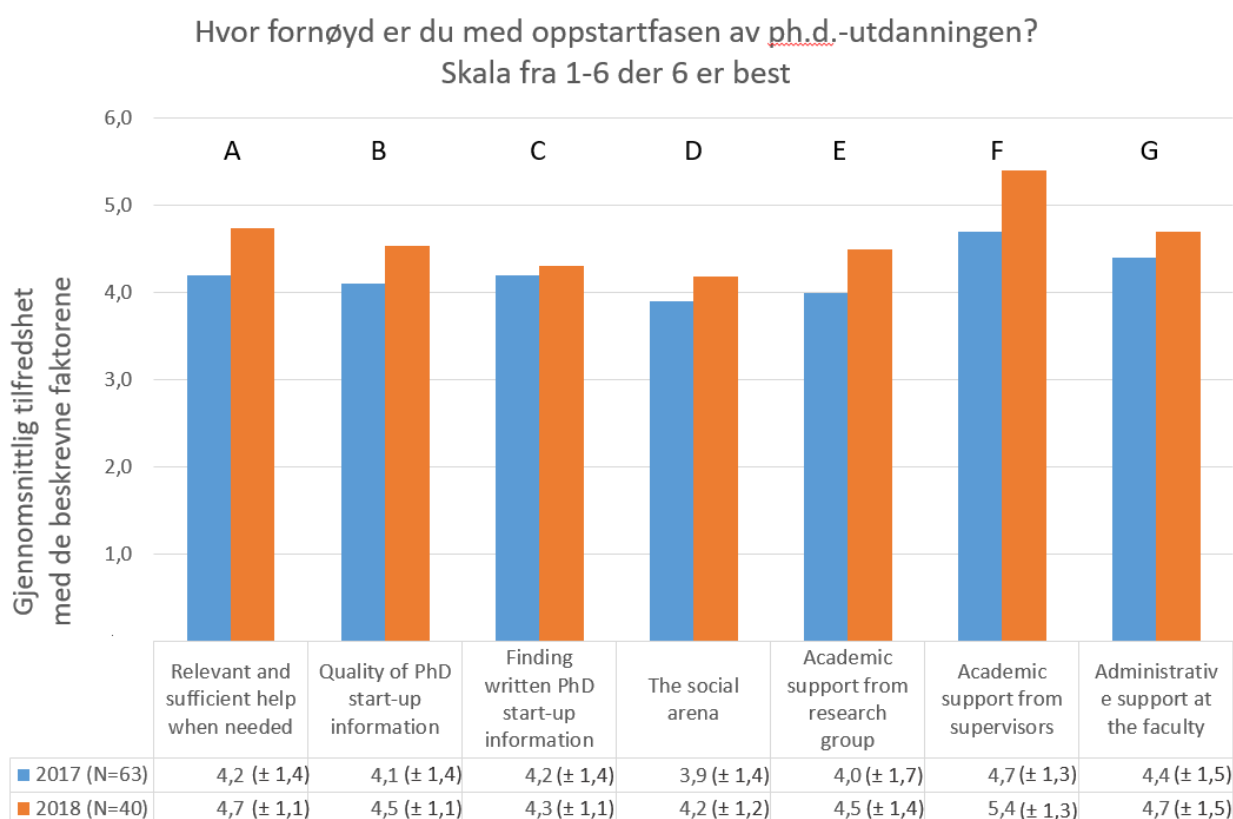


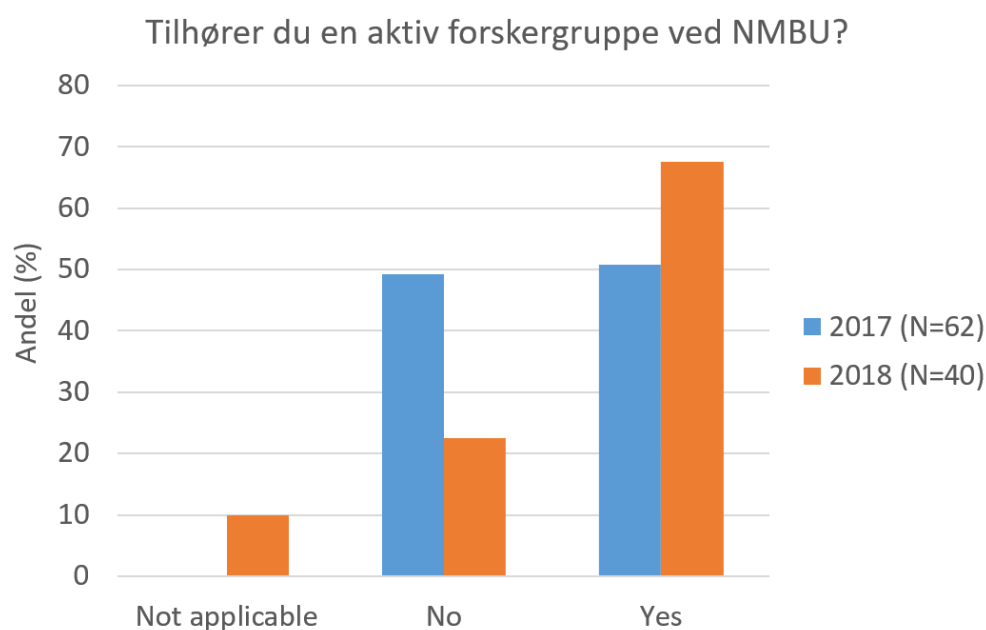
Figure 7. Average satisfaction (including standard deviation) with various conditions by 63 PhD candidates in the start-up phase in 2017 and 40 PhD candidates in the start-up phase in 2018. The candidates responded in a scale from 1 to 6, where 6 is the highest score.

In 2018, the PhD candidates in the start-up phase were also asked how often they met their main supervisor.

"Meet" was not defined further, and may be interpreted differently. Here, 18% responded "every day," 33% responded "2-3 days a week," 13% "once a week" and 18% "2-3 times a month."

In both 2017 and 2018 the PhD candidates were asked whether they belong to an active research group at their faculty. The results are shown in

Figure8 and show that the proportion of candidates who say they belong to an active research group has increased from approximately 50% in 2017 to less than 70% in 2018. Belonging to an active research group or an academic community is very important in ensuring a good education, and this proportion should therefore increase further. It is the supervisors' responsibility as a group, and the responsibility of the main supervisors in particular, to see that PhD candidates at NMBU "participate in an active research environment with senior researchers and other PhD candidates<sup>12</sup>." This can also be ensured in light of the fact that research at NMBU is organised differently at different faculties and within different subjects, and that formal "research groups" play a more central role in some subjects than in others.

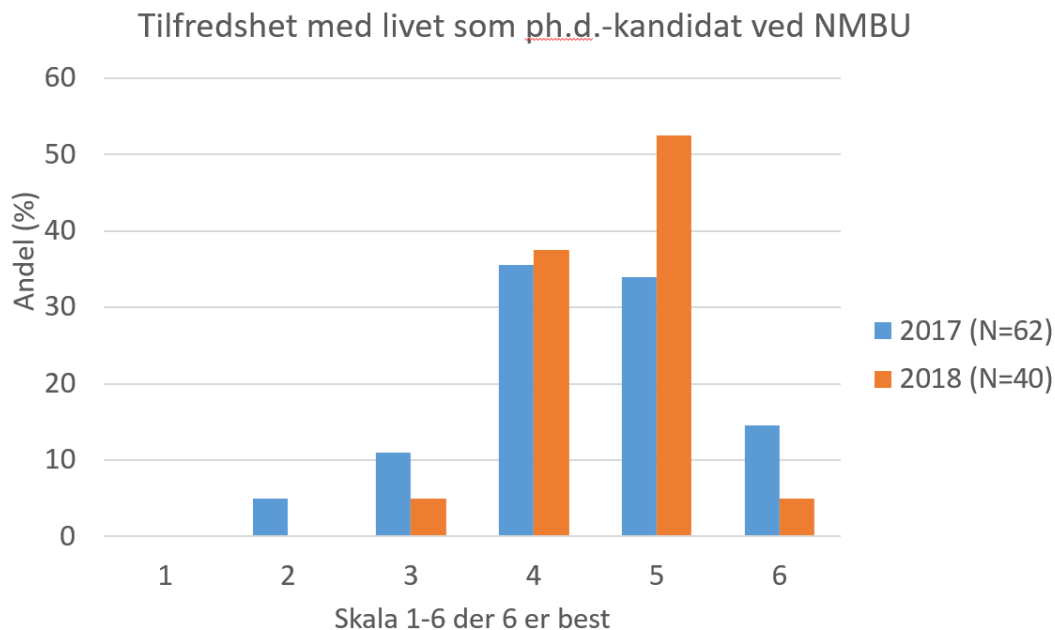


*Figure8. Questions for active PhD candidates in the start-up phase 2018 and 2017 about belonging to an active research group.*

The PhD candidates in the start-up phase were finally asked "How satisfied are you as a whole with life as a PhD candidate at NMBU" (Figure9). 16% of the candidates in the start-up phase answered alternative two or three in 2017, versus 5% who answered this in 2018. Figure 9 also shows that approx. 50% of candidates responded 5 in 2018, an increase from approx. 33% in 2017. The

<sup>12</sup> Source: NMBU's PhD. Regulation section 7-2.

proportion that responded 6 to this question decreased from approx. 15% in 2017 to approx. 5%, in 2018.



*Figure9. Overall assessment of satisfaction with life as a PhD candidate in the start-up phase in 2018 compared to 2017.*

### Midway phase

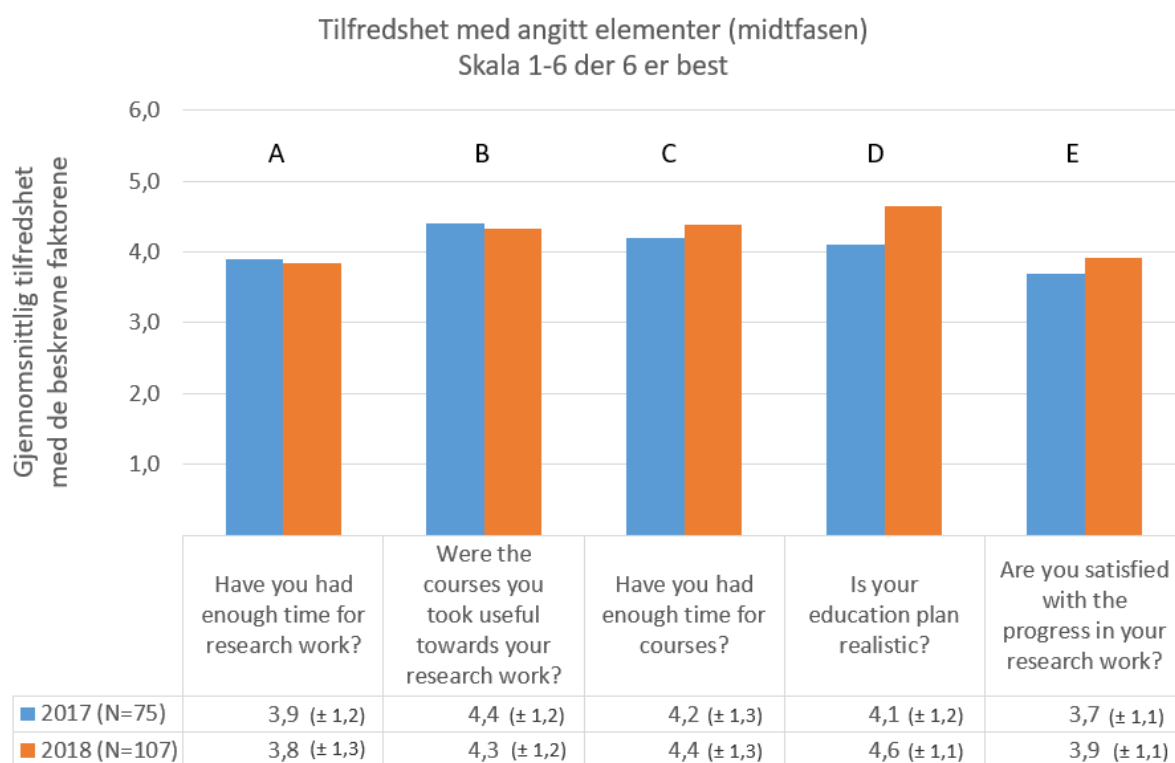
The PhD candidates in the midway phase were asked a number of questions about the training section and research work.

Among other things, they received questions both in 2017 and 2018 if they felt they had enough time for research and if they were satisfied with their progress (see 10FigureA and E). There were 107 PhD candidates who responded to these questions in 2018 and 75 that responded in 2017, roughly estimated about half and one third respectively of those who were then in the midway phase. Both of these questions received relatively low scores (below 4 on the scale from 1-6), and there were many comments to these questions in the free text field in the survey. A "content summary" of the free text comments has been summarised here:

- Lack of access to necessary experimental facilities, or laboratories that do not contain the necessary equipment
- Experimental equipment that is damaged/not repaired/not maintained
- Poor planning, unsuccessful experiments, problematic data collection or useless data
- (Too) time-consuming method development, training in necessary methods
- Supervision in different directions from different supervisors, incomplete or incomprehensible feedback from supervisors
- Lack of support and input from colleagues and others than the supervisors
- Economic and family concerns

There are hence a number of factors that lead to delayed start of research and to delays throughout the PhD education. Thus, the academic writing process and publication of results and submission of the thesis are also delayed in relation to the original plan. Many commented that they had too poor and unrealistic plans from start-up, and that this made a huge difference to progress and motivation.

When asked whether the PhD candidates experienced that they had enough time to take subjects/courses, and if these were useful compared to the research work, the average score was between 4.2 and 4.4 (column C). While this is not directly bad, the free text comments also show that there is most probably room for improvement of both volume and quality in the course offer.



*10Figure. Average satisfaction (including standard deviation) with various conditions by 107 PhD candidates in the midway phase in 2018 and 75 PhD candidates in the midway phase in 2017. The candidates responded in a scale from 1 to 6, where 6 is the highest score.*

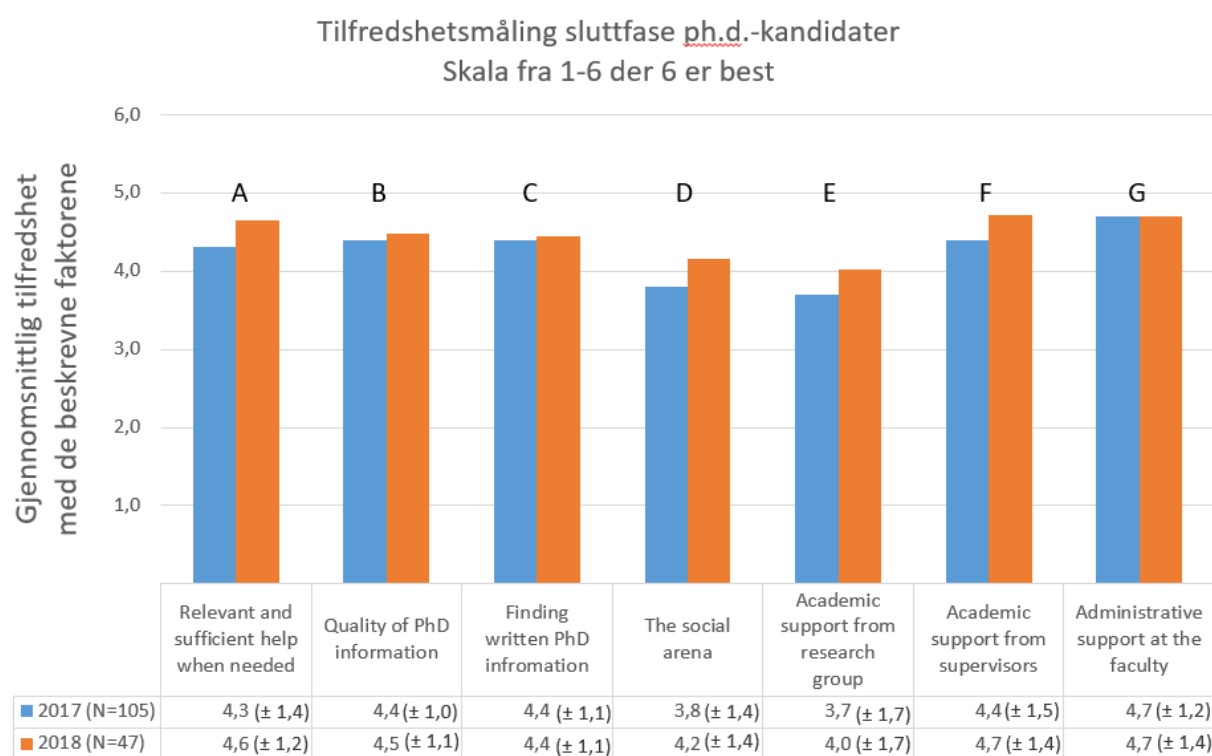
### The final phase

The PhD candidates in the final phase were questioned about factors that have had an impact on their education as a whole. They were asked, for example, whether they had met more obstacles than anticipated through their doctoral education, and 53% responded "yes", 37% "as expected" and 10% "no". Here there were also many free text responses and the most negative comments in the survey as a whole. Access to the necessary infrastructure for the implementation of the research work, and the quality of infrastructure and support functions appear to be limiting factors for several PhD candidates. At the same time, time pressure and mental challenges are repeated in many comments, such as: "I think there are few that can imagine beforehand how challenging, especially mentally, it is to write a PhD."

In Figure 11, the average satisfaction with seven defined areas in 2018 is compared with the results from 2017. The PhD candidates are, on average, about equally satisfied or somewhat more satisfied with all conditions than those who responded in 2017 (Figure 11 A-G). There are many PhD candidates that receive good and relevant help and support from the supervisor and administrative

staff at the faculty (Figure 11 A, F and G). Among other things, it appears from the free text field that more support is wanted for IT issues, practical facilitation, access to library services and quiet rooms. The average satisfaction of the PhD candidates with the social arena receives the worst scores in this survey with 3.8 in 2017 and 4.2 in 2018. The PhD candidates supplement this area with free text responses in the direction that they would like to have more contact (academic and social) with other colleagues and PhD candidates, both in the research group and at the faculty. There are also comments that indicate that it is difficult to balance work life and private life.

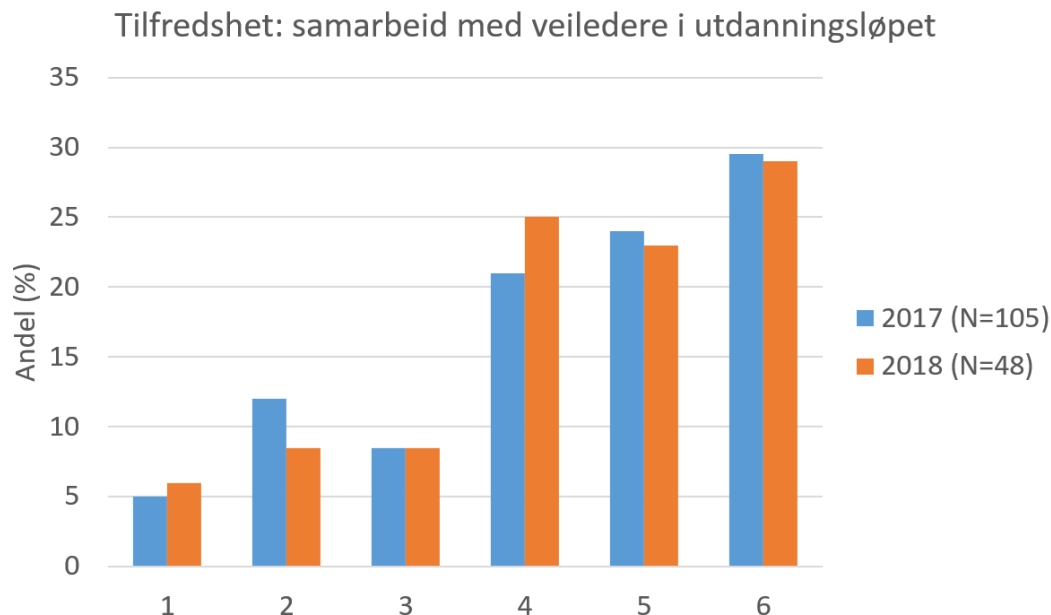
There is no doubt a need for a better clarification of expectations at the start of the PhD education, and an attentive look at the realism of the PhD projects compared with the regulatory requirement that the education should be completed in three years (full-time studies). In addition, regular and constructive communication with the supervisor (s) will help improve the progress of the projects. There is much to be learnt from adversity, but there cannot only be an upward climb in a time-limited education. The candidates who, for various reasons, find that the supervisors "let them down" have the greatest difficulty in handling adversity, and will be probably either the candidates who are mostly behind schedule or will be prone to interrupt their education.



*11Figure. Average satisfaction (including standard deviation) with various conditions by 47 PhD candidates in the final phase in 2018 and 105 PhD candidates in the final phase in 2017. The candidates responded on a scale of 1 to 6, where 6 is the highest score.*

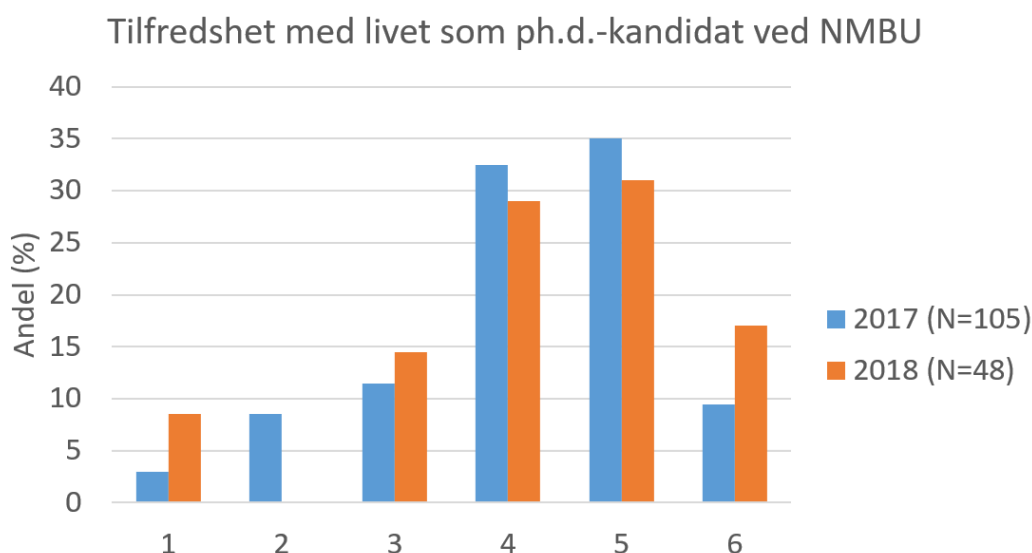
The PhD candidates in the final phase were also asked to rate their level of satisfaction with the interaction with the supervisors throughout their PhD education. The responses here give a predominantly positive impression of NMBU as a whole (Figure 12). Almost 30% of PhD candidates were extremely satisfied with the cooperation with the supervisors, this was the case both in 2017 and in 2018. Average satisfaction was 4.4 in both 2017 and 2018.

17% of the PhD candidates in the final phase in 2017 and 15% in 2018 were either dissatisfied or extremely dissatisfied with the cooperation with the supervisors (score given 1-2). Based on the number of responses, this comprises 18 candidates in 2017 and 7 in 2018. This is not a large number, and we do not know either the status of the work of those who were so dissatisfied or the reasons for the "cooperation problems". However, we must aim to ensure that the fewest possible PhD candidates, and also supervisors, have such a negative experience of their cooperation regardless of the phase of the PhD education.



*Figure 12. Satisfaction of the PhD candidates with the cooperation with the supervisors. Responses from 48 PhD candidates in the final phase of 2018 and 105 PhD candidates in the final phase of 2017. The candidates responded on a scale of 1 to 6, where 6 is the highest score.*

The PhD candidates in the start-up phase were finally asked "How satisfied are you as a whole with your life as a PhD candidate at NMBU?" The responses from both 2017 and 2018 show that a large proportion of NMBU's PhD candidates placed themselves in the upper part of the scale (Figure 13). This indicates that many PhD candidates are very satisfied with the education as a whole.



*Figure13. PhD candidates' satisfaction with the education as a whole. Results from 105 PhD candidates in the final phase of the education in 2018 compared with results from 48 PhD candidates in 2017. The candidates responded on a scale of 1 to 6, where 6 is the highest score.*

However, it may be worth noting input from those who responded on the lower part of the 1-6 scale (response from both midway and final phase candidates). The candidates in the midway phase had the opportunity to write something about what might have been the case if they were to respond 6 to this question, and the candidates in the final phases were allowed to comment freely:

- Want to be part of an active research group!
- Want more people to cooperate with! To discuss research and to work on the same tasks with!
- Scientific discussions are rare.
- There is not sufficient overview from the supervisor of my PhD project. This would give better structure and a manageable plan for my research work.
- Hard to balance work life and private life due to heavy workload.
- It can feel a little lonely. Social gatherings with doctoral students from your own building/own faculty would be great for getting to know others.
- Want common tea, coffee, lunch rooms – can make it easier to bump into each other on a daily basis.
- There are no clear guidelines in English for administrative procedures and as a student from a foreign country I feel excluded almost every day.
- The social and academic community suffers because many colleagues are rarely in the office.
- The quality of support from supervisors varies greatly. Some deserve 6 points, others 1-2.

### **3.3 PhD theses at NMBU**

#### **3.2.1 Language and form of thesis**

Of the 87 theses that were defended in a public defence at NMBU in 2018, 85 were written in English and two written in Norwegian. English has for a long time been the dominant language of theses in



doctoral education in Norway<sup>13</sup>. In the period 2012-2017, nine out of ten theses submitted at Norwegian educational institutions were written in English, while the proportion of Norwegian-language theses was below nine percent. In the period 1991-1993, 15 per cent of the theses were written in Norwegian.

All theses that were defended in public defence in 2018 were article-based theses. In the period 2011-2018, only 16 of a total of 736 approved theses at NMBU were monographs.

### 3.3.2 The evaluation committee's evaluation of PhD theses

From January 2015, a new evaluation of the doctoral theses was introduced that is based on the Nordic Institute for Studies in Innovation, Research and Education's (NIFU's) evaluation criteria, and NMBU plans to follow up the development of these evaluations over time. The external members of the assessment committee are asked to evaluate the thesis using the following criteria and comparison with theses from their own institution and/or fields of study:

1. Originality
2. Methodological level
3. Theoretical level
4. Depth and coverage
5. Skills in written presentation
6. Contribution to the advancement of the field
7. External relevance (applied/societal/cultural/industrial)

Appendix 2 shows the evaluation committees' evaluations of *approved theses*, at NMBU for the years 2015–2018 (N = 64<sup>14</sup>, 87, 93 and 87 theses, respectively). The faculties received the results for their theses for use in their own quality work. These summaries are not included here.

Figure 4 of Appendix 2 shows that a growing number of theses are evaluated as "very good" in terms of depth and scope for the years 2015-2018. In addition, Figure 2 shows that a growing number of theses are considered "very good" or "excellent" when comparing the same years. These are two very positive trends that we look forward to following over time. When we look at all the figures in Appendix 2 we see a trend showing that the number of theses considered "below average" declines from 2015-2018 (Appendix 2, Figures 1-7).

The Research Committee will, in its annual review of PhD education, evaluate whether the assessment committees' feedback works as intended and whether they give the faculties an appropriate foundation for developing the quality of the work being done.

## 3.4 The faculties' reports on PhD education for 2018

### 3.4.1 Assessment of the size of the academic environment related to the PhD programme

The faculties consider that the academic communities have sufficient size and competence within the breadth of the individual PhD programme, but that there are also small and vulnerable academic environments. The proportion of professors varies, MINA's share of professors is as much as 27% of

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<sup>13</sup> NIFU Innsikt no. 7/2018.

<sup>14</sup> The number of theses in 2015, which is the basis for Figures 1–7 in Appendix 2, is not equivalent to the total number of approved theses at NMBU this year. Not all theses submitted in 2015 were evaluated by means of the defined criteria.

the workforce, compared to an average of 15% in the other faculties. Several emphasise that they have strong academic communities with many highly qualified, research active and experienced supervisors. For example, KBM has 11 research groups, where PhDs are related to all the groups and PhD candidates take part in the group's academic development, activities and collaborations. The Faculty of Veterinary Medicine is accredited according to the standards of the European Association of Establishments for Veterinary Education (EAEVE).

Some faculties point out that the gender balance of main supervisor responsibility is uneven (approx. 60% men and 40% women), and that one should intensify efforts to achieve gender balance. LANDSAM has created its own [Action plan for more women in scientific top positions 2019-2022](#).

### 3.4.2 Assessing the quality of the PhD programme

The recruitment phase is mentioned by several faculties as an important phase and key factor affecting the quality of PhD education. KBM follows a separate quality assurance system for appointments, to ensure that research fellows they appoint meet the requirements for admission to the PhD programme. KBM has stringent requirements for applicants in respect of grades from Bachelor's degree, Master's programme and from the Master's thesis. Several faculties have extensive cooperation with research institutions and private and public businesses on PhD projects. These are partly business/public sector PhD projects and partly other projects led by, or in collaboration with, an external business or academic institution. All of them are now attempting to establish an early and good dialogue with the external actors regarding admission to the PhD education and connection of the appointment process and admission process.

Several faculties consider that the academic match with the main supervisor is the first condition for a successful PhD project, and will therefore also in the future refuse to admit PhD candidates if where the faculty is unable to offer the proper supervisor competence. The PhD regulation is slightly unclear on this point, which should be discussed at the next revision. The regulation states that "admission *may be adopted subject to funding, admission capacity, supplementary education, and that the need for infrastructure is resolved*". As there are no admission frameworks at the PhD level, and it is free to apply for admission on one's own initiative, cases will occur from time to time where the faculties are uncertain whether they are "allowed" to refuse admission applications. Clearer admission rules can reduce uncertainty and unnecessary time spent by both applicants and faculties/NMBU.

Several faculties emphasise that by far the biggest challenge in PhD education is to be able to finalise a thesis of a high scientific level in the course of three years. Many of the PhD candidates spend an unnecessary amount of time figuring out the structure, layout and other technical aspects around the summary and thesis, and this can lead to unnecessary errors and delays in the delivery of the thesis.

There is a great deal of variation between the faculties as to how the three mandatory seminars included in PhD education are conducted, and whether they are perceived as useful by candidates and supervisors. The start-up seminars work better than the midway and final seminar at BIOVIT. KBM believes that the midway seminars work according to purpose: The seminars are conducted in the democracy lesson, thus ensuring a good attendance, and the seminars are open to the entire faculty. The challenge is to provide clear and tangible enough feedback so that the seminars are really helpful for their implementation and contribute to increased quality. Start-up and final seminars are conducted in the research groups to which the research fellows are associated. In LANDSAM's programme International Environment and Development Studies, all three seminars are perceived as relevant both by PhD candidates and supervisors. In the final seminar, the main focus is on the

"summary" and two specialists are invited to provide constructive criticism and the candidates summarise afterwards how to handle the input.

Some have good cooperation in summer schools for PhD students, which is positive both academically and socially. The frequency of study abroad varies greatly between NMBU's PhD candidates, but at REALTEK many of the PhD candidates have a period (or more) abroad, and several groups have regular visits by PhD students and other academic employees from the rest of the world.

All PhD candidates at NMBU have at least two supervisors. PhD supervisors at NMBU tend to have one to three PhD candidates each, while some have as many as 5-7. The faculties are increasingly conscious of ensuring that supervisors have the capacity to follow up on their candidates. For NMBU as a whole, we can conclude that PhD candidates are generally satisfied with the supervision while those who are not report of insufficient availability (supervisor is too busy), unrealistic expectations in relation to work effort and scope of the PhD project, and delayed feedback on article drafts. This emphasises the importance of good feedback from the academic community at the start-up seminar, and of conversations to clarify expectations in the start-up phase, which the main supervisor is responsible for conducting.

The knowledge that the main supervisors and co-supervisors have of the regulations and routines for the PhD education varies. Several faculties want low-threshold measures to increase this competence and thereby to make the special start-up phase more well run and effective for the PhD candidates.

All faculties have used the survey results in 2017 and 2018 to assess various aspects of PhD education, with the proviso that there are small samples and that only a two-year comparison is a short time to measure changes. The evaluation reports express a genuine desire to ensure NMBU's PhD candidates a good education that makes them sought after in the labour market.

### **3.4.3 Recent measures and their effect**

There has been increased focus on the group's responsibility for academic and social inclusion of PhD candidates. At one faculty, 67% of the PhD candidates in the start-up phase of 2018 state that they are part of a research group, while only 20% of the candidates responded the same in 2017.

Several of the faculties have already established, or will establish, a buddy scheme (or "team players") for new research fellows who want this. In addition, better information is introduced about the PhD timeline, routines related to the final phase and public dispute, and "who does what for me as a research fellow". At VET, for example, the candidates get an email titled "Hurrah you've delivered" with information about the process leading up to the public defence, as well as a timeline that visualises milestones and deadlines. LANDSAM grants NOK 5,000 per PhD thesis for text editing at its faculty. Several of the faculties also have their own meetings for the PhD candidates, organised as public meetings or as one-to-one conversations with people in management or administration. Some faculties also have regular lunches with information on regulations and procedures, expectations for PhD work, academic writing etc. Several of the faculties report that they have improved midway evaluations so as to provide added value for both PhD candidate and supervisor.

In 2019, HH will admit all new PhD candidates in August and carry out a "start-up week". LANDSAM has had such a joint intake for several years and has been very satisfied with it.

At MINA, they observe that groups of PhD candidates meet with each other in different contexts in addition to formal research groups, thereby creating useful communities. The doctoral association SoDoC, low-threshold training courses at NMBU's Learning Centre, and NMBU's offer of Norwegian

courses for foreign research fellows all contribute to a better academic-social climate for the PhD candidates.

KBM introduced in 2018 a pilot scheme whereby the trial lecture was conducted on a different day than the public dispute. Both the candidate and supervisor have been satisfied with the scheme, and it will be permanent from 2019. KBM reports that they would like greater attendance at the trial lectures and to further develop the culture to provide concrete feedback on content, level and presentation.

At BIOVIT, they have followed up PhD candidates who should have delivered their thesis several years ago, and in many cases have started in new jobs. These have been offered short periods of employment (one month) or contribution to cover expenses associated with returning to the academic environment (e.g. travel and accommodation) in order to complete the thesis. They expect "extra" theses to be submitted to the faculty at the end of 2018 and beginning of 2019.

#### **3.4.4 Faculties' action plans with measures and responsibility for follow-up**

Several of the faculties report that they are focusing on increased contact between the PhD candidate and supervisor, and between the academic staff of the faculty (internal advisers) and external candidates and their employers. At BIOVIT, the administration will work to improve the reception of new PhD candidates, especially external ones, in order for the start-up to be improved. KBM and BIOVIT will focus on clarification of expectations between the PhD candidate and supervisor, especially in the start-up phase. This is an important "exercise" that can make the start of the PhD work better for both the candidate and the supervisor, and increase the overall quality. The social arena is also promoted as an important part of the start-up phase, and several faculties are considering introducing regular lunch meetings for the PhD candidates.

Several faculties point out the importance of association with active research groups/disciplines and will continue to focus on inclusion and academic and social activities in these. At HH, it is reported that there are PhD candidates whose sole conversation partner is their PhD supervisor. Therefore, groups have been introduced around PhD candidates to increase contact with more of the faculty's academic staff.

The faculties also focus on recruitment and career development. It is important that their own students have sufficient competence to compete for research fellow positions at the faculties, but also that well-qualified external candidates are recruited. At MINA, they want to evaluate the research option when all study programmes are reviewed in 2019. Several of the faculties will conduct seminars focusing on career development, and focusing on career and personal experience from previous or experienced PhD candidates is important.

A writing supervisor is sought for the design and content of the thesis's introduction/ ("kappa") "summary" that becomes common for the entire university. VET has started a working committee to look into this for its own faculty, and NMBU's Research Committee will discuss the subject for the entire university in 2019.

Together with BIOVIT, KBM and MINA, REALTEK will arrange gatherings that focus on supervisor competence.

Several of the faculties report that they want to set up more subjects at the PhD level. This has been requested by PhD candidates for several years, and it is positive that the faculties are handling this issue. It is important that PhD candidates are given the opportunity to provide feedback on existing and new PhD topics through course evaluations.

### 3.5 Digital solutions and open research

NMBU utilises Canvas as a learning platform for topics and other types of courses. NMBU's PhD candidates have access through Canvas to Master's and PhD topics and the [Scientific Writing Resource Portal \(SWR100\)](#). The latter is an e-learning course developed by the Writing Centre to assist students at every level of education in scientific writing.

At the conclusion of the PhD programme, the PhD thesis is delivered electronically in Brage, NMBU's science archive. As at 31/12/2018 NMBU has 362 PhD theses in Brage.

NMBU has created a separate archive for research data – [NMBU Open Research Data](#). The archive is part of the open source platform DataverseNO which is operated by the University of Tromsø. The University Library at NMBU is responsible for training and management of the archive. All employees at NMBU have access to this data archive via Feide login.

The NMBU Research Support Office has created a closed Facebook page (for researchers at NMBU) with useful information for PhD candidates and other employees at NMBU. This is a supplement to existing information channels.

### 3.6 Development of writing skills

The PhD candidates' writing skills and their ability to start early and to work purposefully with both manuscripts/articles and the summary of the thesis is a decisive factor in PhD education. The candidates acquire academic literacy in large part through interaction with supervisors and research groups. However, a great deal suggests that many PhD candidates spend too much time before they get started writing, and that writing progress is often slow up to the finalisation phase. In 2018, NOK 100,000 was set aside to develop the writing skills of PhD candidates.

NMBU offers one [academic writing course](#) that is held twice a year. The Writing Centre at NMBU's Learning Centre has primary responsibility for this course, which was held for the 12th consecutive year in 2018.

As a step in the further development of the writing assistance offer, the Research Support Office and Writing Centre started a pilot scheme in 2018, whereby the PhD candidates were given access to practical writing assistance at the Writing Centre as offered to the bachelor- and master's degree students. Input from SoDoC<sup>15</sup> was an important factor in the design of the offer. During the spring semester of 2018, 42 one-to-one consultations were conducted and 45 during the autumn semester. It was possible to arrange more than one consultation, but there were only a few that did so.

Previous experience, verbal feedback directly to those responsible for the writing course in spring 2018, and the evaluation of the offerings 1-3, suggest that there is a great need to establish a stable and permanent offer of writing assistance for PhD candidates at NMBU.

There is a need for education and training in writing good articles and summaries, intermediate-level publications, chronicles and blogs etc. This will undoubtedly strengthen the processing and dissemination of research questions, reduce writing fears, and give candidates "increased academic confidence". This was the basis for a series of workshops that were set up starting in the autumn semester 2018. Of a series of three

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<sup>15</sup> Association of PhD graduates and postdoctoral fellows at NMBU.

workshops, two were held in the autumn of 2018 (with 15 and 11 participants respectively) and the third will be held in the spring of 2019.

It is uncertain whether the offer reached out to enough of the PhD candidates. Information on the offer of writing help needs to be improved so that it is clear that writing assistance is "for everyone", that it is a lengthy process and that one should attend regularly and over time.

All the above measures received good feedback.

### 3.7 Development of the candidates' generic competence

NMBU's focus on outstanding research and education (FFU) started in 2015, and there have been a total of six courses in project management together with a total of approximately 150 participants, and 18 courses in presentation techniques with a total of approx. 120 participants. Both courses received very good feedback from the participants and a comparison of the evaluations from the courses in 2018 can be found in Appendix 3.

In 2018, strategic funding was set aside for the development of competence in the management of research data and data management plans. The latter is a new requirement by the Research Council of Norway effective from 2018, and applies to the conclusion of contracts for all new projects. In 2018, four courses were completed for PhD candidates and other employees.

New courses are set up for 2019 and the offer of generic courses appears on NMBU's websites (Norwegian and English): <http://www.nmbu.no/forskning/forskere/kurs-og-moter> and [http://www.nmbu.no/en/research/for\\_researchers/courses-and-meetings](http://www.nmbu.no/en/research/for_researchers/courses-and-meetings).

In the reports from the faculties, several state that they have arranged courses and seminars for each faculty that focus on career planning and academic writing, among others. There has also been a focus on the non-academic "impact" of research work. At LANDSAM, they offer support to PhD candidates who want to have their theses copy-edited before they are delivered. Courses in "Academic career planning" that apply for the entire university are sought after, which the Research Support Office will consider in 2019.

In 2018, as in previous years, NMBU was represented with participants in the competition to become Norway's best research intermediary, Researcher Grand Prix. Parasites and Alum Shale were the themes presented by the two PhD candidates Siri Helene Helland-Riise (VET) and Frøydis Meen Wærsted (MINA). The two candidates were featured on the website:

<https://www.nmbu.no/aktuelt/node/35541>

### 3.8 Research schools

The National Research Schools are a supplement to the institutions' own doctoral programmes. NMBU is a partner in six of the national research schools (Table8). NMBU's PhD candidates are offered many exciting and good courses and topics, both where NMBU is a partner, but also the other research schools.

*Table8. National research schools where NMBU is a partner.*

National Research School	Host	NMBU Partner?	Activities and courses/topics
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<a href="#">Norwegian Graduate School in Biocatalysis (BioCat)</a>	UiT	Yes	<a href="#">BioCat courses</a>
<a href="#">Digital Life Norway PhD School</a>	NTNU	Yes	<a href="#">Digital Life Events</a>
<a href="#">Norwegian Research School in Bioinformatics and Biostatistics (NORBIS)</a>	UiB	Yes	<a href="#">NORBIS activities</a>
<a href="#">Norwegian Research School in Infection Biology and Antimicrobials (IBA)</a>	UiO	Yes	<a href="#">IBA Events</a>
<a href="#">Norwegian Research School of Neuroscience (NRSN)</a>	NTNU	Yes	<a href="#">NRSN activities</a>
<a href="#">International Research School in Applied Ecology (IRSAE)</a>	HiHm	Yes	<a href="#">IRSA</a>

NMBU has its own website listing all the National Research Schools:

[https://www.nmbu.no/forskning/forskerutdanning/opplaringsdel/emner\\_nasjonale\\_forskerskoler](https://www.nmbu.no/forskning/forskerutdanning/opplaringsdel/emner_nasjonale_forskerskoler).

### 3.9 Development of supervisor competence

In 2018, NMBU also advertised centrally through the Research Support Office funding for the faculties (up to NOK 25,000 per faculty) for development of supervisor competence. All the faculties applied for funding. Four of the faculties submitted an application together (MINA, KBM, REALTEK and BIOVIT) and will conduct two seminars in early 2019. The focus of the seminars will be increased self-awareness in relation to its own supervisor function and greater transparency around the supervisor issue. HH, VET and LANDSAM applied for funds separately. LANDSAM has conducted a joint seminar for the two PhD programmes where they reviewed regulations and routines, and looked at the similarities and differences between the two programmes at the faculty. LANDSAM's supervisors have also discussed the content and scope of the three mandatory seminars. At VET, they have arranged several supervisor lunches and a dedicated seminar focusing on communication and "the difficult conversation." VET has also established a Canvas room for supervisors, and is experiencing increasing participation and activity.

Some faculties want NMBU to take main responsibility for the development of the supervisor competence at the university. In the period 2012-2015, the Research Support Office organised several "Supervisor forums", but then more locally-adapted gatherings were wanted where smaller groups of supervisors with common challenges/academic traditions/organisational affiliation could meet. The Research Committee should discuss how the supervisor competence at NMBU can be best developed.

The Research Support Office organised in 2018 two one-day courses for PhD supervisors with focus on the management and leadership of research and PhD projects. One course was held at Campus Adamstuen, but the second was held at Campus Ås. The courses have good registration, but also some cancellations just before the course start. Evaluations from the course participants have been good (see Appendix 3), and two new courses are planned in 2019.

### 3.10 Doctoral degree ceremony and awards

On 21 September 2018, NMBU arranged a doctoral degree ceremony for PhD candidates who had completed their doctor's degree during the period from 18 August 2017 to 20 June 2018. The ceremony is held once a year, and the rector presents a doctoral diploma to the successful candidates as a symbol of thanks from the university.

In connection with the doctoral degree ceremony, *Alf Bjørseth's Inspiration Award* was also awarded. Relevant candidates for the award must have completed a PhD at NMBU during the last two years that has

relevance to renewable energy or life sciences. Candidates are nominated by the university's permanent scientific staff. The award is NOK 100,000.

The winner of the Alf Bjørseth Inspiration Award for 2018 was Dr. Rannveig M. Jacobsen from MINA. Jacobsen took her PhD on how fungus can hitch-hike with insects to find new habitats. The project was considered by the evaluation committee to be innovative, ambitious and extremely interesting. The committee states that "Rannveig M. Jacobsen's studies have significance for both the management of the insect- and fungal diversity we find in our forests and for our understanding of interaction between these two groups of organisms."



*Rannveig M. Jacobsen received the Inspiration Award from Alf Bjørseth, who is the primus motor and the man behind the award. Photo: Ørjan Furnes*

The doctoral degree ceremony was concluded with a formal procession, a group photo outside the Clock Building and a celebration and banquet at the Science Park.



*Photo: Ørjan Furnes*

A mention of the event can be found online at: <https://www.nmbu.no/aktuelt/node/35606>.

### **3.11 The road ahead and the three most important areas for improvement in 2019**

Based on the results of quality work in recent years, including the information collected and compiled in this annual report – source data from the Common Student System, the PhD survey and programme



evaluation reports from the faculties – NMBU will emphasise three priority areas for action in 2019.

## **1. Good start-up phase for PhD candidates**

A great deal suggests that there are major differences in expectations in the start-up phase and that this also affects the later phases of their education. The extent of academic networks around PhD candidates varies. There are significant differences in how cooperation with the supervisors works. Some PhD candidates at NMBU can feel themselves alone with their work and education, and some would like more socialising among themselves and with other groups at the university. Language is also a factor affecting several conditions during education.

Some of the conditions that arise during the PhD education and become visible in the midway or final phases may be related to something that was done or not done during the start-up phase. In the survey, PhD candidates mention a number of factors that lead to delayed start-up of research, and to poor progress. Thus, the writing work, publication of results and submission of the thesis are also delayed in relation to the original plan. Many commented that they had too poor and unrealistic plans from start-up, and that this made a huge difference to progress and motivation.

Several initiatives that contribute to a good start-up for NMBU's PhD candidates, and to progress in the PhD project and education have already been initiated by the faculties. This work should be further strengthened. The examples below are not exhaustive and the measures must be discussed, prioritised and implemented in collaboration across the organisation:

- Early and realistic clarification of expectations between candidates and supervisors.
- Promote regular contact and constructive communication between supervisor(s) and PhD candidates.
- Ensure that the PhD candidates are included in the academic network, whether it be formal research groups or more informal structures, and that PhD candidates participate in the group's academic development, activities and collaboration.
- Good management and implementation of PhD projects – knowledge and tools for PhD candidates and supervisors.
- Training in data management plans and other mandatory tools in PhD projects.
- Academic writing – early start on writing work, why and how?
- Academic and administrative information and start-up help, (also) in English.
- Strengthen the main supervisors in their role.
- Social initiatives with and on behalf of PhD candidates (and colleagues) that can contribute to a good psychosocial work environment, among other things.

## **2. Clear academic programme management**

In NMBU's "[Routines for PhD programme evaluation](#)" adopted by the rector on 30.08.2016, it is established that "the Faculty's Research Committee has the operational responsibility for the content and organisation of the PhD programme, including annual reporting and ongoing quality work. The committees may involve external collaborators in the annual programme evaluations, if necessary. " Several faculties at NMBU have created PhD Programme Councils. If we compare this with the study supervision regulations, we see that there may be a need to look into these issues, among others:

- Academic management of study programmes – what does it mean?

- Is the responsibility for the academic management of the PhD programme clearly established and well defined?
- Do those who have this responsibility have any kind of support or competence enhancement?
- Do we hold established methods and do we make use of available methods and "tools" to further develop the PhD study offer at NMBU?

### **3. Good quality of all theses**

All theses that were defended in public defence in 2018 were article-based theses. Of the 87 theses that were defended in a public defence at NMBU in 2018, 85 were written in English and two written in Norwegian. We do not have data that gives us a basis to judge exactly "how good" the PhD theses produced at NMBU are, but we know that the quality varies and that both PhD candidates and supervisors can struggle with the thesis work as a whole.

From the survey, it is evident that many PhD candidates struggle to connect their research to the continuous and systematic work of building up a scientific thesis. When judging committees recommend that the submitted theses should be reworked, it is often the case that the introductory section ("kappe/summary") that has weaknesses. Poor language is another problem area, this can involve both weak academic language skills and too poor (written) English skills.

In the daily work of PhD education, both the faculties and NMBU's Research Support Office experience a number of issues related to the PhD thesis in the various phases of the education. Strengthening the supervisors', PhD candidates', and the assessment committees' insight into and common understanding of the requirements for PhD theses at NMBU should therefore have a high priority.

- A guide to the design and content of the thesis' "kappa/summary" that focuses on purpose, content and structure.
- Academic writing – training initiatives and writing training.
- Need to clarify the requirements for a PhD thesis in various disciplines.
- Scope of research – the number of manuscripts and published articles in a PhD thesis.