

High North Academy offers PhD candidates work-related skills and competences - DRAFT

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Background

“Today’s graduates need to combine transversal, multidisciplinary and innovation skills and competences with up-to-date subject-specific knowledge so as to be able to contribute to the wider needs of society and the labour market.”
(Bucharest Communiqué, 2012)

A PhD degree represents the highest level of education, and is the foundation for being a researcher. Employability is the ability to gain initial meaningful employment, or to become self-employed, to maintain employment, and to be able to move around within the labour market. The Bologna process (Bucharest Communiqué 2012) has focus on the employability of newly graduated PhDs and stresses the need of being able to combine skills and competences.

The number of graduated PhD-candidates annually in Norway is steadily increasing, from about 1000 in 2007 to about 1400 in 2016 (www.nifu.no), and the current Prime minister in Norway aims for 2000 PhDs in 2018 (Regjeringen 2013). The vast majority of PhDs have no difficulties finding a job, and less than 3 % are unemployed (Olsen 2012). In Norway, three out of four were employed in institutions related to the R&D sector in 2009, only 18 % worked exclusively with R&D, and 10 % of these worked at an university (Olsen 2012). This means that 82 % of the PhDs are not working with what their education was intended for. Of the PhDs from UiT 25% worked in the private sector 70% in the public sector and 15% in higher education in 2009. However, the numbers vary between faculties so for instance at the Faculty of Biosciences, Fisheries and Economics the distribution is different (private 56%, public 36%, higher education 32%) (TNS gallup 2012). So how can we ensure that the PhDs have the relevant education and skills to work also outside R&D?

Times are changing, and PhD-candidates today face an expectancy to finish their degree within a fixed period of time. Just as important, they need to expand their CV beyond pure scientific skills because there is tougher, international competition for jobs. In order to be attractive on the job market, and to be able choose among the most interesting positions, a broad CV is beyond doubt an advantage. According to the Norwegian qualifications framework, formulated by the Norwegian Agency for Quality Assurance in Education (NOKUT), a candidate holding a PhD degree should master a variety of knowledge, skills and general competence (Table 1).

Table 1. Learning outcomes of graduated PhD-candidates as defined in the Norwegian qualifications framework (NOKUT 2009)

Knowledge	Skills	General competence
The candidate... • is in the forefront of knowledge within his/her academic field and masters the field's philosophy of science and/or artistic issues and methods • can evaluate the expediency and application of different methods and processes in research and scholarly and/or artistic development projects • can contribute to the development of new knowledge, new theories, methods, interpretations and forms of documentation in the field	The candidate... • can formulate problems, plan and carry out research and scholarly and/or artistic development work • can carry out research and scholarly and/or artistic research work of a high international standard • can handle complex academic issues and challenge established knowledge and practice in the field	The candidate... • can identify new relevant ethical issues and carry out his/her research with scholarly integrity • can manage complex interdisciplinary assignments and projects • can communicate research and development work through recognized Norwegian and international channels • can participate in debates in the field in international forums • can assess the need for, initiate and practice innovation

The establishment of HNA

To meet the demands and adapt for the future, UiT The Arctic University of Norway (UiT) established High North Academy (HNA) in 2011. The overall aim of HNA is to increase the quality of PhD-studies, to stimulate High North research output and communication, and improve recruitment to higher education and research as well as to the private and public sectors. HNA organises courses that are intensive, not field specific and where participants as far as possible utilize their own data and results. The obtained skills are transferable, and are thus useful inside as well as outside academia.

The establishment answered a call from PhD-candidates at UiT. The students specifically requested courses in transferrable skills, such as popular and scientific writing, presentation techniques and poster construction, writing research funding applications, networking, and alternative research communication methods (e.g. film and blogging). In addition, the students asked for multidisciplinary PhD-courses in order to enhance social interaction across faculty boundaries (Todos 2011). In addition the experienced researchers involved in the ARCTOS research school had stressed the need for providing a wider curriculum for their PhD students.

BFE took charge and invited the Vice Deans responsible for research at each faculty and the leaders of research schools and at UiT:

- ARCTOS - Arctic Marine Ecosystem research Network
- AMGG - Arktisk marin geologi og geofysikk
- EPINOR - Epidemiological research in the high North
- BARESS - Barents remote Sensing School
- CEPIN - Citizenship, Encounters and Place Enactment in the North

A steering group, with members from the Fram Centre, faculties at UiT, research schools, Tromsø Doctoral Students (TODOS), Rectors office and Arctic Frontiers, was established and the following partner institutions were appointed:

- Associate of Polar Early Career Scientists (APECS)
- University of the Arctic (UArctic)
- Akvaplan-niva
- Tromsø Art Gallery
- ReCO Research Communication & Outreach, UoT

In 2015 the responsibility of the steering group was moved to the research strategic committee ("Forskningsstrategiskutvalg") at UiT (Vice Rector, Vice Deans with research responsibility leaders of the museum and library as well as one representative from TODOS). The Director of Research at UiT became the formal leader to ensure that HNA. The above organisational changes were done to ensure that HNA has a close association to UiT and the faculties. In this process the course in Philosophy and Ethics of Science (BIO-8603 now SVF-8600) hosted by BFE and attended by students from several faculties was taken out of the HNA course portfolio as there are altogether 6 competing ethics and/or science courses available at UiT.

What do employers need?

Learning outcomes of graduated PhD-candidates as defined in the Norwegian qualifications framework (NOKUT 2009). Some of the most valuable skills are the ones the PhD-candidates develop over time that are adaptable to other careers e.g. public speaking, problem solving, planning complex studies. In the dialogue with an employer, the PhD should also stress that he/she is good at following time schedules and can handle budgets. Although some transferable skills may be achieved "unconsciously" through the through doctoral training, the organised training in transferable skills provided by HNA is crucial for the optimal capacity building.

HNA in practice

Organisation

Initially, the board of HNA comprised several institutions and universities, although the initiative came from UiT and most activities were carried out at UiT. However, geographic distance from Svalbard in the north to Bodø in the south combined with

irregular meetings made it difficult to have a continuous progress and flow of information between partners. As the HNA activities and leadership were more strongly connected to UiT by making “Forskningsstrategiskutvalget” the HNA board, a common understanding for the need of HNA has developed. Thereby the board meets regularly, and the HNA coordinator, the leader, TODOS or any of the Vice Deans may present topics concerning HNA on the agenda. Any issues may therefore be taken care of rather quickly.

Funding

The coordinator spent substantial time during the early years to obtain funding. A conglomerate of funding agencies demanded a board structure such as above, but the UiT now solely funds it.

In contrast to BSc and MSc courses, there are no economic incentives for being involved in PhD courses in Norway. Consequently, goodwill from lecturers and mentors is needed. This is justified by using personnel from the participant’s respective departments, and should be considered as an investment in own interests.

HNA guideline

HNA courses follow three principles: 1) They must be intensive in terms of time, typically less than five days, 2) they are not subject-field specific and 3) the participants should use their own results and ideas. These guidelines make it easier for the PhDs to prioritise their time, and the courses are not something *additional*. Rather, the courses encourage the candidate to get started with e.g. writing a paper or making a scientific poster. The second principle ensures that the course has a general character, is interdisciplinary by character, that teachers and students represent a wide variety of fields and thereby allow the PhD students to expand their network.

Course portfolio and contents

HNA have given courses in scientific writing, research ethics and philosophy, scientific presentations, writing popular science articles, giving interviews to a camera-team, taking photos, how to combine science with art, making movies, doing maps, how to lead, and how to start your own business. All courses aim at giving the students practical tools and tangible products that they can use in their further careers. Currently, HNA offers six courses (Tab. 2). The three first are mainly for use during the PhD period, where the candidates are given a flying start of their first scientific paper, and an opportunity to improve their communication skills to a scientific and/or public audience. The three remaining courses become more relevant after fulfilment of the PhD degree. Full course descriptions are available at www.highnorthacademy.com.

Table 2. Number of courses given per April 2017 by High North Academy and corresponding credits (European Credit Transfer and Accumulation System, ECTS).

No.	Code	Name	ECTS
1	FSK-8002	Scientific writing	3
2	BIO-8007	Coping with media	1
3	BIO-8010	Visualizing your science	3
4	FSK-8003	Leadership skills	2
5	BED-8004	Academic entrepreneurship	5
6	FSK-8005	Funding your science	3

The portfolio matches the general competences required (see Table1) rather well. The lack of a HNA course Ethics and Science weakens the portfolio, and as we do argue later there is a need for more systematic career development for the early career scientists.

Principles for course development

There are European Qualifications Frameworks as well as National Qualifications Frameworks that guide us in the development of HNA. Especially the general competence defined in the Norwegian qualifications framework (Table 1) have been determining when prioritising between course ideas. The courses have been organised on the initiative of TODOS, scientific staff, the vice dean at BFE and the HNA coordinator, who has a central role in facilitating the planning, running and evaluation of the courses.

Organizing teaching on courses

The HNA coordinator, often in liaison with a professor, is responsible for course planning, and invites lecturers. Several lecturers are commonly involved, as they are experts within a particular field. In an ideal world, the lecturers should stay in class during the whole course. However, due to tight schedules this is not feasible all the time. Moreover, this allows for collegial peer review and may improve future performance significantly. The workload is distributed among the respective departments, depending on the participants' affiliation. This is important because there are no economic incentives for teaching at doctoral level.

Dissemination about courses

PhD candidates may receive hundreds of emails every day – including course advertisements – making it difficult for HNA to stand out from the crowd. It is thus imperative to sow seeds early, and make sure to present the HNA course portfolio during welcome gatherings for fresh PhDs at the university. The main supervisor is probably the single person with highest impact on their candidates' choice of courses, and a job needs to be done to make HNA known here. Attempts to meet the departments have been of limited success, and it seems difficult to pass on information from administrative to supervisor level.

Advertisement via other channels, such as posters around campus proved to be labour intensive and ineffective, leaving emails the preferred way of dissemination. Early career scientists are more likely to read emails if they come from their own research school or PhD networks such as TODOS (todos.uit.no). Therefore we have encouraged TODOS and the research schools to forward course announcements.

Evaluation and development of courses

Student evaluation and feedback

The students evaluate all HNA courses in plenary at course end when everything is still fresh in the participants mind. After the exam, an anonymous, standardised evaluation scheme is distributed as a quest back survey. Students express their opinion about the content, format, teacher performance, and whether they would recommend the course in question to others. They also provide written feedback and suggest changes to the course in question. The response rate is good and the individual comments and rating of each teacher allows for continuous course improvement. Teachers sit in at each other's lectures to ensure that the course is coherent and to allow for discussions across the teams of the lectures and seminars. The PhD students appreciate this very much and they conclude that discussions become more interesting when more than one experienced researcher is present. Students report high satisfaction and increased motivation for their PhD project after courses. Most candidates (80-90%) would recommend the course that they attended to other students. They say that the courses helps them to get through their PhD project, to integrate socially, and to build networks with students and staff across faculty boundaries. The students acknowledge that HNA gives the PhD students training in research communication, increases research output and gives a competitive edge in further career and an advantage both in academia and outside academia. We want our early career scientists to be happy while here and prosper when they leave

Course development

Based on the feedback from students and peers format and contents are revised after every course. Teachers discuss the feasibility and adjust during the course and meet at least for a planning meeting before and a evaluation meeting after the course. The HNA courses are developed in teams with teachers and the coordinator. We aim at have a responsible professor for each course as this gives the course credibility. In contrast to Norwegian culture, each lecturer is evaluated by the students after each course and thereby gets valuable information on how his or her teaching is perceived by the students. The early career researchers are analytical and often very constructive in their critique. This allows us as teachers to adjust and develop. Most teachers get better over time and some withdraw if they do not improve as well as they would like to.

Lessons learned

How other organizations do it?

In order to develop HNA further, we visited the Institute of academic development at the University of Edinburgh (UoE). UoE is among the top 25 universities in the world. They have had an Institute for Academic Development (IAD) for the last 15 years. It started small, just like HNA, with just one employee, but now employs 30 people and caters the whole university. UoE has ca. 4500 PhD-students and they

arrange over 200 courses aimed for undergraduates, PhD-students and research staff (Web-site: <http://www.ed.ac.uk/schools-departments/institute-academic-development>).

The main differences in practice between IAD and HNA were:

- mainly short half-day courses
- courses built as modules, that build on each other (especially writing courses)
- no ECTS given for courses
- funding centrally from all the faculties
- IAD uses money to 1) arrange generic courses to all students and faculty, 2) to give special courses to specific research schools on order, and 3) give funding for grass-root projects organized by students themselves
- IAD important in disseminating best practice/knowledge btw faculties, research schools and student organizations
- IAD active in organizing science communication events for the whole university

Main lessons learnt from the visit was to keep the administration as small as possible; no fees, no ECTS, this was a point they could not emphasize enough. They also stressed that funding is essential for legitimacy, dissemination, and relevance for the whole university.

For most PhD-candidates the HNA courses are an important contribution to their required amount of ECTS. Therefore, UiT should continue to award ECTS although it requires administrative capacity and is thereby costly. Another point is that all PhD courses should be available on one web page to allow for overview and good planning.

Structured career development needed

Gibbs and Griffin (2013) found that less than 50% of PhD candidates have a plan for what to do with their PhD. They conclude that faculty leaders need to focus not only on the individual skills of postgraduates but should attend to individuals' values and promote institutional and systemic reforms to ensure tailored career development. PhD candidates at the BFE faculty are requested to define their personal learning outcomes in discussions with supervisors when they write their project description at start-up. The PhD students are asked where they see themselves after their dissertation. By doing so the candidates grasp what working responsibilities and duties they will have in the future, and it becomes easier to identify what knowledge, skills and general competences they need to master. The PhD students specify their learning outcomes necessary for meeting their goals. This process increases the PhD students motivation and allows them to plan their curriculum and choose the most relevant courses, and very often they pick some of the ones provided by HNA.

Nevertheless, the supervisors are not trained to handle career development including general competence, nor do they necessarily have time. That UiT board has decided that all supervisors should have taken the course "Train the trainers" in

2020, this allows for systematic training also in how to support postgraduates in their career development.

This should be accompanied by a HNA course consisting of three one-day workshops for the PhD students, that may utilize some of the approaches practiced at BFE (workshops on career development with postgraduates). There are good career planning processes developed for early career scientists that can be adjusted and applied (e.g. Fiske 2008). Here the focus would be on identifying the future employer, conduct a self-assessment, set the individual learning outcomes, define the path, develop the career plan, work on the CV, build network etc.)

HNA as asset when applying for research schools and EU MCS International Training Networks

When applying for funding for international training networks (ITN) from Marie Skłodowska-Curie actions - European Commission Horizon 2020 programme a portfolio of courses in transferable skills is required and the Norwegian Research Council sees it as an asset when applying for research schools. The ITNS that have got funded have mentioned HNA in the project description, but the use of HNA varies. The maintenance and further development of HNA as a common interdisciplinary enterprise among faculties will strengthen UiT as a hub that prepares their early career scientists for life in and outside academia.

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Appendix

Number of participants/number of candidates for the exam

Faculty affiliation

Tabeller med kurs/detlakere per år, samt evaluering per kurs

Table X. Number of participants aiming for the exam ('undervisnings- og vurderingsmeldt) per course per year. BIO-8603 was runned twice in 2014. Researchers and Post Docs are not included in these figures.

Year	FSK-8002	FSK-8003	BED-8004	FSK-8005	BIO-8007	BIO-8008	BIO-8010	BIO-8603
2011	15	10						
2012	16	12			12	6		39
2013	14		14		8	7	15	35
2014	16	19	12				4	71
2015	24	13					9	33
2016	31	20		36	11		11	
2017		17			10			