UKÄ UNIVERSITETS KANSLERS ÄMBETET

A close-up of doctoral education

A thematic synthesis of results from third-cycle programme evaluations 2017–2022

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Contents

Summary 4

Structure of the report 6

Introduction 7

Earning a PhD in a complex educational environment 7

Part I: Quality of doctoral education 10

Principles for third-cycle programme evaluation 10

The selection focused on HEIs and fields of research 13

Outcome of programme evaluations 2017–2022 14

Follow-up of third-cycle programmes under review 21

Part II: Thematic analyses of the evaluation results 24

Analysis of assessment panel reflections 26

Analysis of the doctoral student perspective 38

Part III: UKÄ's conclusions 46

Individual study plans 46

Graduate schools 47

Digital courses and information events 48

Equal opportunities for all doctoral students 48

Proposals for UKÄ's contribution to the continued quality development of third-cycle education 49

References 50

Appendix 1 53

Summary

The following report is a thematic synthesis of results from third-cycle programme evaluations during the period 2017–2022. The results presented in the report should be used as a knowledge-based foundation for quality development of third-cycle programmes.

A Degree of Doctor (PhD) is the highest academic degree in the Swedish higher education system, a degree that provides society with research and expert competence in most important areas. A majority of PhD graduates find work after graduation, with an establishment rate of about 81 per cent three years after completion of studies. At the same time, the educational environment of doctoral students is complex and often stressful. Several doctoral students find themselves in small third-cycle programme environments that require cooperation and coordination to function optimally. The COVID-19 pandemic also posed several challenges for the doctoral student population.

During the period 2017–2022, the Swedish Higher Education Authority (UKÄ) reviewed 153 third-cycle programmes in 20 research subjects and 5 fields of research through programme evaluations. A programme evaluation focuses on whether the programme ensures that the doctoral students have good preconditions for achieving the degree outcomes of the System of Qualifications, and how the higher education institution (HEI) ensures that the doctoral students have achieved these outcomes when the degree is awarded. Of the 153 evaluated programmes, 114 of the programmes were judged to be of high quality and 39 of the programmes were put under review in the initial assessment. The 39 programmes under review were followed up after one year.

The synthesis of the results from the 153 third-cycle programme evaluations shows, among other things, that there are both strengths and development areas linked to the various assessment areas. For example, there have been both strengths and development areas linked to the education environment and supervision for the assessment area *Preconditions*. The assessment areas *Working life and collaboration* and *Doctoral student perspective* have often been assessed as satisfactory. The assessment area *Gender equality* has repeatedly been difficult to analyse for the assessment panels. Linked to the assessment area *Design, implementation and outcomes*, the assessment criterion that doctoral students should gain broad knowledge and understanding of the subject has repeatedly been a critical point.

The report's qualitative in-depth analysis of third-cycle programme evaluations 2017–2022 includes both a review and an analysis of the

assessment panels' overall reflections and an in-depth analysis of the assessment area *Doctoral student perspective*. Analysis of the assessment panel's overall reflections shows a number of different themes raised by the assessment panels at an aggregate level – educational support, gender equality, courses, individual study plans and graduate schools – in the form of both development areas and examples of good practice. Analysis of the assessment area *Doctoral student perspective* shows a complex day-to-day life for doctoral students behind the themes of influence, support and context. A day-to-day life filled with both development areas and examples of good practice.

Through the two analyses, four areas for further development have been identified for doctoral education: individual study plans, graduate schools, digital courses and information events, and equal opportunities for all doctoral students. UKÄ intends to organise a conference on the theme of doctoral education as a quality-developing conclusion to the third-cycle programme evaluations conducted between 2017 and 2022. In response to the conclusions in the report, UKÄ also wants to continue conducting quality development activities for doctoral education.

Structure of the report

The report begins by describing the basic context of Sweden's doctoral education today and presents the purpose of analysing the third-cycle programme evaluations conducted during the period 2017–2022.

The report then consists of three parts.

The first part describes the quality of doctoral education at an overarching level, presenting and broadly analysing the principles, selection and outcomes of the evaluations.

The second part presents two qualitative thematic analyses of the evaluation results. This is done, in part, by analysing the overall reflections of the assessment panels and by analysing questions related to the assessment area *Doctoral student perspective*.

The third part of the report draws conclusions from the contents of the report and, in accordance with the Authority's objective of contributing to ensuring Sweden's status as a knowledge society, proposes measures to improve the quality of Sweden's third-cycle programmes.

Parts of the report have also been published in the UKÄ report *Bokslut över ett system. Sammanfattande analys av Universitetskanslersämbetets kvalitetssäkringssystem 2017–2022* (UKÄ 2023).

Introduction

The purpose of the report is to

- compile outcomes and lessons learned from third-cycle programme evaluations during the period 2017–2022
- conduct a qualitative analysis of results from third-cycle programme evaluations during the period 2017–2022, with a focus on assessment panel reflections and the assessment area *Doctoral student perspective*.

The results presented in the report should be used as a knowledge-based foundation for quality development.

The third chapter of the *European Standards and Guidelines for Quality Assurance in the European Higher Education Area* (ESG), which concerns the activities of quality assurance organisations, contains standard 3.4 on thematic analysis. In line with ESG 3.4, we describe and analyse general observations made during the reviews. The conclusions can serve as a basis for UKÄ's long-term ambition to work in a knowledge-based manner and contain concrete proposals for measures for Sweden's third-cycle programmes.

Earning a PhD in a complex educational environment

The aim of third-cycle education is to train researchers. At the same time, third-cycle education contributes to providing the university with teachers/researchers, and to providing, for example, authorities and industry with qualified experts in various fields.

Doctoral education in brief:

• A third-cycle programme that ends with a PhD comprises 240 credits and corresponds to four years of study.
• The third-cycle programme consists of courses and an independent research project that results in a doctoral thesis.
• Most doctoral students have a doctoral studentship, which is a fixed-term post during the third-cycle programme.

The UKÄ project *Fokus forskarutbildning* (UKÄ 2021) found that 2,500–3,000 PhDs were awarded per year during the period 2017–2020. A majority of PhD graduates find work after graduation. UKÄ's annual

status report for 2022 (UKÄ 2023) states that the gender distribution of doctoral students has been relatively even over the past 10 years, but that autumn 2021 was the first time when the majority of doctoral students were women. The proportion of doctoral students with doctoral studentship is about 70 per cent, and more than half of the doctoral students study full-time. Most doctoral students are found in the fields of medicine and health sciences.

UKÄ's review of the establishment rate for PhD graduates (UKÄ 2021) shows that the establishment rate for doctoral students three years after graduation is 81 per cent. The highest establishment rate, 88 per cent, is in the field of technology, while the lowest establishment rate, 72 per cent, is in the humanities and arts. The UKÄ project *Fokus forskarutbildning* shows that the demand for third-cycle graduates is highest in the higher education sphere and in healthcare, and that many foreign doctoral students leave Sweden after graduation (UKÄ 2021).

In autumn 2020, a survey was conducted on the situation of doctoral students as research students (ST & SFS 2021). The survey was conducted by Statistics Sweden (SCB) on the initiative of Fackförbundet ST (the Union of Civil Servants) and the doctoral student committee of SRS (the Swedish National Union of Students). A questionnaire was sent to doctoral students at 8 HEIs and about 1,000 doctoral students responded, representing a response rate of 44 per cent. The survey showed that doctoral students work in an often stressful environment with a lack of recovery. 1 in 3 doctoral students worked overtime every day or several days a week. At the same time, 17 per cent of respondents were unable to take holidays due to their high level of workload, and 26 per cent chose not to do so, even though it was possible. Lack of information on the role of doctoral students was another development area: 1 in 5 respondents felt that they received a poor introduction or were not informed at all about their rights and obligations as a doctoral student. The individual study plan (ISP) was also addressed in the survey. 29 per cent of the responding doctoral students felt that it was not a meaningful document, and 13 per cent felt that it caused stress.

The pandemic challenged both autonomy and cooperation in doctoral education

The COVID-19 pandemic of 2020–2022 had a major impact on higher education, including doctoral education. UKÄ's doctoral student barometer *Doktorandspegeln 2021* (UKÄ 2021) examined doctoral students' views of what it was like to conduct their third-cycle studies as distance education during the COVID-19 pandemic.

What was found to work well overall for research students were the courses and seminars they attended. Although the amount of supervision

was reduced during the pandemic, the quality was maintained. Doctoral students were also satisfied with the way in which HEIs dealt with challenges that arose as a result of the pandemic.

The main challenges and difficulties brought about by the pandemic were reduced opportunities for cooperation between doctoral students and with senior researchers. Material collection and trips abroad have also had to be cancelled, which has led to problems with the timing of some doctoral projects. For about 40 per cent of the doctoral students, the pandemic resulted in studies progressing more slowly than planned, which resulted in about a quarter of them applying for an extension of their doctoral studentship.

Overall, the survey shows that several doctoral students felt stress and anxiety about not being able to complete their thesis work during the pandemic. They also lacked a social context. The most negative experiences of third-cycle studies during the pandemic were experienced by doctoral students in the fields of humanities and arts. Foreign doctoral students also experienced more stress than Swedish doctoral students.

UKÄ's report *Långsiktiga konsekvenser av pandemin för doktorander och juniora forskare* (UKÄ 2023) highlights both concerns and strengths as far-reaching consequences of the pandemic. An expert panel consisting of senior researchers with good insight into the situation of doctoral students before and during the pandemic indicates that doctoral students' professional skills, which are important for achieving autonomy, developed more poorly during the pandemic. At the same time, the pandemic may have had positive consequences. Doctoral students may be better prepared for future unpredictable events.

The highest academic degree

A Degree of Doctor (PhD) is the highest academic degree in the Swedish higher education system, a degree that provides society with research and expert competence in most important areas. At the same time, it is clear that doctoral students are in an exposed position, and that it is therefore of the utmost importance to learn from the third-cycle programme evaluations.

Part I: Quality of doctoral education

Programme evaluations are one of the four assessment components of the Swedish Higher Education Authority's (UKÄ) national quality assurance system for higher education.

Programme evaluations shall primarily focus on

- whether the programme ensures that the doctoral students have good preconditions for achieving the qualitative targets of the system of qualifications
- higher education institution (HEI) ensures that the doctoral students have achieved the qualitative targets when the degree is awarded.

During the period 2017–2022, UKÄ reviewed 153 third-cycle programmes in 20 research subjects and 5 fields of research.

Principles for third-cycle programme evaluation

The publication *Guidelines for the evaluation of third-cycle programmes* (UKÄ 2016) contains principles along with assessment areas and assessment criteria for these. These guidelines were in force during the period in question, 2017–2022. The purpose of programme evaluations has been both to check the outcomes of the programmes and to contribute to the HEIs' quality-development efforts for the evaluated programmes.

The model for programme evaluation at the third-cycle level consisted of four assessment areas.

Assessment areas and assessment criteria

Assessment area: Preconditions

Staff
Assessment criterion:
The number of supervisors and teachers and their combined expertise (scholarly/artistic, professional and pedagogical) are sufficient and

proportional to the volume, content and implementation of the programme in the short term and long term.

Education environment
Assessment criterion:
Research/artistic research at the HEI has sufficient quality and scale for third-cycle education to be carried out at a high scholarly/artistic level and within a good educational framework. Relevant collaboration occurs with the surrounding society, both nationally and internationally.

Assessment area: Design, implementation and outcomes

Achievement of qualitative targets for "knowledge and understanding"
Assessment criterion:
The programme facilitates through its design and implementation and ensures through examination that a doctoral student who has been awarded their degree can demonstrate broad knowledge and understanding both within their third-cycle subject and of the scientific methodology/artistic research methodology in the third-cycle subject.

Achievement of qualitative targets for "competence and skills"
Assessment criterion:
The programme facilitates through its design and implementation and ensures through examination that a doctoral student who has been awarded their degree can demonstrate the ability to plan and use appropriate methods to conduct research and other qualified (artistic) tasks within given time frames and, in both national and international contexts, can present and discuss research and research results orally and in writing with authority in dialogue with the academic community and society in general. The doctoral student shall also demonstrate the ability to contribute to the development of society and support the learning of others in both research and education as well as in other qualified professional contexts.

Achievement of qualitative targets for "judgement and approach"
Assessment criterion:
The programme facilitates through its design and implementation and ensures through examination that a doctoral student who has been awarded their degree can demonstrate intellectual autonomy, (artistic integrity), and scientific probity/disciplinary rectitude as well as the ability to make assessments of research ethics. The doctoral student also has a broader understanding of the science/art's capabilities and limitations, its role in society and human responsibility for how it is used.

Gender equality
Assessment criterion:
A gender-equality perspective taken into account, communicated and supported by the content, design and implementation of the programme.

Follow-up, measures and feedback

Assessment criterion:
The content, design, implementation and examinations are systematically followed up. Where necessary, the results of the follow-up are translated into measures for quality development, and feedback is given to relevant stakeholders. The HEI works for the doctoral student to carry out the programme within the planned period of study.

Assessment area: Doctoral student perspective

Assessment criterion:
The doctoral student is given the opportunity to take an active role in the work to develop the content and implementation of the programme. The programme ensures a good physical and psychosocial work environment for the doctoral student.

Assessment area: Working life and collaboration

Assessment criterion:
The programme is designed and implemented in such a way that it is useful and develops the doctoral student's preparedness to meet changes in working life, both within and beyond academia.

Since 2018, *Follow-up, measures and feedback* and *Gender equality*, both of which were previously separate assessment areas, have been incorporated into the assessment area *Design, implementation and outcomes*.

The model has links to both Swedish laws and regulations and the *European Standards and Guidelines for Quality Assurance in the European Higher Education Area* (ESG). UKÄ's reviews have been conducted based on the assessment criteria included in an assessment area, and the work has been carried out by an assessment panel composed on the basis of nominations. The assessment panels have consisted of doctoral student representatives, representatives of working life, and subject experts from the higher education sector.

The material used as underlying data for the third-cycle programme evaluations has been the HEIs' self-evaluations, interviews with various stakeholder groups linked to the third-cycle programmes in question, and a selection of current individual study plans. In connection with a programme evaluation, the HEIs are to describe and assess how well the procedures for *Follow-up, measures and feedback* systematically contribute to ensuring and developing the reviewed programme.

UKÄ decides on quality based on the assessment panel's review.

The selection focused on HEIs and fields of research

Leading up to the evaluation of third-cycle programmes 2017–2022, UKÄ defined selection principles for the subjects to be evaluated. These have been applied as far as possible, but for various reasons it has not always been possible to fulfil them.

Selection principles

- All HEIs offering third-cycle programmes would have at least one programme evaluated.
- At least one programme was to be evaluated from each of the six research fields in which an HEI offers third-cycle education: natural sciences, engineering and technology, medicine and health sciences, agricultural sciences, social sciences, and humanities, including artistic research.
- All programmes in selected research subjects would be evaluated to provide a picture of the situation at the national level.

As a result of the pandemic, no research subject in the field of medicine and health sciences was evaluated during the period 2017–2022. The programme evaluations of the natural science subjects analytical chemistry, physical chemistry and organic chemistry began in 2020, but were postponed due to the pandemic. The evaluations were completed in 2022 and follow-up was carried out in 2023.

Outcome of programme evaluations 2017–2022

During the period 2017–2022, UKÄ evaluated and made decisions on 153 third-cycle programmes in 20 research subjects – each of which can contain several specific research subjects – in 5 different fields of research.

Field	Subject	No. of programmes
Natural sciences	Computer science	14
	Analytical chemistry	9
	Physical chemistry	11
	Organic chemistry	10
Engineering and technology	Production engineering, human work science and ergonomics	12
	Textile, rubber and polymeric materials	2
	Energy systems	4
Agricultural sciences	Veterinary medicine	1
Social sciences	Psychology	9
	Applied psychology	3
	Economics	16
	Pedagogy	20
Humanities	History	13
	Ethics	1
	History of religions	3
	General literary studies	9
	Music	2
	Design	5
	Architecture	4
	Art history	5

Table 1: Evaluated research fields and subjects 2017–2022

A general reflection on the outcome of the reviews is that there is great variation in the quality of different programmes. For example, in general literary studies (8 HEIs), all programmes were considered to be of high quality. In organic chemistry (10 HEIs), half of the programmes were put under review, with difficulties concerning the degree outcomes for *Knowledge and understanding* being the most common reason for the

final assessment. Similarly, in computer science (14 HEIs), about half of the programmes were put under review (6 HEIs). In this last case, it was the *Gender equality* perspective that wasn't achieved. It is also noteworthy that 6 out of 12 production engineering, human work science and ergonomics programmes were assessed as unsatisfactory from a *Gender equality* perspective.

Overarching results of the 2017–2022 third-cycle programme reviews

Of the 153 programmes evaluated, 39 of the programmes were put under review in the initial assessment. These were therefore subject to a follow-up after one year.

Figure 1 below shows the distribution of assessments at the research subject level. Since the sample is limited, this may mean that individual subjects have a large impact on the overall picture for research fields (natural sciences, engineering, etc.). However, the outcome for each of the research subjects separately (computer science, pedagogy, etc.) can give an idea of the quality within each research subject.

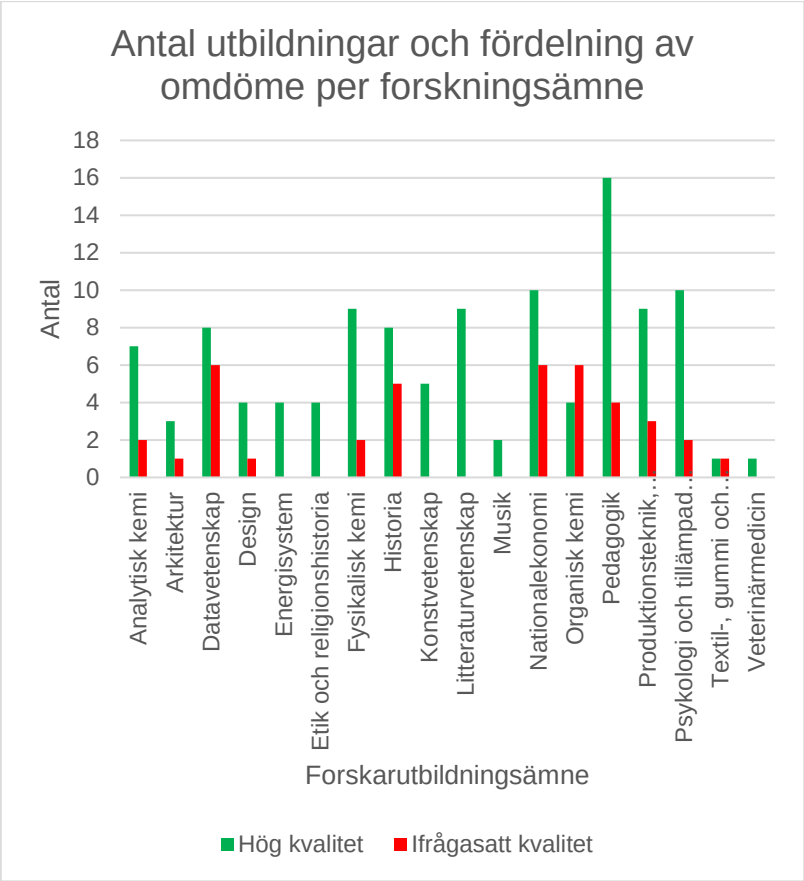

Figure 1. Overall assessment for all 153 programmes in the initial assessment for each research subject

What are the HEIs good at, and what are the areas in need of development?

As indicated in the table below, the deficiencies identified in the reviews are mainly in the assessment areas *Preconditions* and *Design, implementation and outcomes*.

Assessment area	Overall assessment	
	High quality	**Unsatisfactory**
Preconditions	131	22
Design, implementation and outcomes	126	27
Follow-up, measures and feedback[1]	90	5
Gender equality[2]	89	6
Doctoral student perspective	146	7
Working life and collaboration	150	3

Table 2. Outcome per assessment area 2017–2022 for all 153 programmes reviewed.

In the next section, we summarise the strengths, challenges and examples of good practice that emerged from UKÄ's third-cycle programme evaluations 2017–2022. The summary is made at an overall level, and specific themes are elaborated on in Part II of the report: thematic analyses of the evaluation results.

Education environment and supervision –strengths and areas in need of development

Both UKÄ's mapping of third-cycle programme evaluation results 2017–2019 (UKÄ 2019) and later evaluations find that there are several examples of good practice from the third-cycle programme evaluations linked to the assessment area *Preconditions.* Examples include integrating doctoral students into the research environment in various ways by allowing them to participate in supervisory committee meetings and higher-level seminars. The development areas related to the programme environment have concerned both the importance of doctoral students having access to different perspective and specialisations within their subject as well as access to a cohesive environment and sufficient critical mass linked to their own subject.

Several examples of good practice were also noted on the theme of supervision, such as guaranteed supervisor time and systematic efforts to ensure that supervisors are qualified and have a high proportion of research in their position. Another good example applied at HEIs is that doctoral students have access to a mentor who is not part of the supervisory team. At the same time, the most common development area related to supervision is linked to a low number of supervisors, a lack of subject expertise in the supervisory team, and the fact that expertise must be ensured in the long term and at a strategic level. In some cases the

[1]After 2018, incorporated into the assessment area *Design, implementation and outcomes*.
[2]After 2018, incorporated into the assessment area *Design, implementation and outcomes*.

amount of hours put on supervising by supervisors, have been too extensive.

Working life and collaboration often satisfactory

The third-cycle programme evaluations show that the HEIs, with a few exceptions, received a positive assessment in the area *Working life and collaboration*. This assessment area concerns the usefulness of the programme in the labour market, and the way in which the programme prepares doctoral students to meet changes within their future working life, both within and beyond academia. UKÄ's mapping of the third-cycle programme evaluation results 2017–2019 (UKÄ 2019) indicates that the assessment area is relatively narrow in terms of what is actually assessed. This is especially true in comparison with, for example, the assessment area *Preconditions*, which has a more multifaceted content. This makes it less challenging for HEIs to achieve a positive assessment for the area *Working life and collaboration*. Similar reasoning can be applied to, for example, the area *Doctoral student perspective*. Despite favourable ratings overall, the assessment area *Working life and collaboration* was still the one described in the assessment reports as having the most potential for development. Most commonly, the assessors felt that career planning for work outside academia needed to be strengthened.

In the report *Arbetsliv och samverkan. En kartläggning av hur arbetsliv och samverkan kommer till uttryck i UKÄ:s granskningar* (UKÄ 2021), there is a sub-study which, through a close reading of 25 assessment reports, focuses on how issues of working life and collaboration function in third-cycle programme evaluations. The results reveal a predominantly positive picture of the work in this area, but the assessors also encourage HEIs to develop better systematic and equal access to existing networks and collaboration platforms, and call for more well-developed alumni activities. In addition, the assessors note that it is difficult for many assessment panels to fully grasp the implications of a changing working life, and questions about how doctoral students should be able to meet changes in working life are only explored to a limited extent.

In UKÄ's report to the Government for 2021 (UKÄ 2022), an overall analysis was made of the reviews of programmes in the research subjects analytical chemistry, organic chemistry and physical chemistry. The aim was, inter alia, to look at strengths in the programme environment. It emerged that the scholarly and pedagogical expertise among supervisors was good, international and national partnerships were common, and there was good collaboration with industry. Most HEIs also had a well-functioning organisation for the supervision of doctoral students and their work environment, as well as good opportunities for doctoral

students to influence their education. The fact that there are good job opportunities after graduation for these doctoral students was also something that was emphasised as positive in the evaluations of the three chemistry subjects.

Broad knowledge and understanding of the subject often insufficient

The assessment criterion that the doctoral students should acquire broad knowledge and understanding of the subject has been decisive for the outcome in several evaluations. However, its prominence varied in the evaluated subjects. For example, in chemistry and economics, a third of the programmes failed this assessment criterion. This was in line with the fact that many of the development areas described in the assessment reports were within the theme of programme content. More specifically, the assessors touched on course content, the individual study plan and seminar activities.

In the UKÄ's report to the Government for 2021 (UKÄ 2022), an analysis of the third-cycle programme evaluations within the subject group chemistry – the research subjects analytical chemistry, organic chemistry and physical chemistry – shows that there is a need for HEIs to review how to achieve broad knowledge in the area for the degree. The assessment panels considered the creation of better conditions for doctoral students to take relevant courses and participate in relevant seminar series to be important development work. The assessment panels emphasised that it may be a good idea for HEIs to join forces, for example through a national graduate school, to create joint courses, as the third-cycle programme environments within each chemistry specialisation are sometimes small.

Doctoral students sometimes have different types of employment form and background. Doctoral students can be funded through scholarships or be externally employed doctoral students. The background and thus language skills may mean that the doctoral students are not always able to teach in Swedish. In connection with this, the assessment panels have identified a need to ensure that all doctoral students, regardless of funding form or Swedish language skills, have the same opportunity to achieve all of the qualitative targets of the system of qualifications.

Gender equality difficult to assess

In 2019–2020, UKÄ analysed how assessment panels have worked with assessments of the area *Gender equality* in third-cycle programme evaluation during the period 2016–2018 (UKÄ 2020). Analysis of the assessment reports showed that both different HEIs and different assessment panels – despite using the same guidelines – interpreted the

concept of gender equality in different ways. In 93 per cent of the evaluated third-cycle programmes during the period, gender equality had been assessed quantitatively, often by counting numbers linked to the gender balance in the doctoral student group or among the supervisors. In several cases, the term “awareness” is used in the assessment reports, i.e. the assessment panels reacted positively to HEIs demonstrating awareness of issues such as gender imbalances. At the same time, no direct action has been required. The lack of systematic gender equality work that has an impact extending all the way to the third-cycle programmes has also been identified in several evaluations. In summary, the gender equality work seems to have been more effective at the HEI level than at the third-cycle programme level.

The analysis concludes that it cannot be ruled out that the assessment panels were excessively positive in their assessment of *Gender equality* in order to avoid calling the entire programme into question. Another explanation could be that the assessment panels felt that they lacked sufficient expertise to assess *Gender equality*.

Small environments: both challenges and solutions

Of the first 123 programmes evaluated in the period 2017–2019, 80 per cent had fewer than 10 doctoral students. This observation formed the basis for UKÄ's in-depth analysis of small doctoral education environments, entitled *Små forskarutbildningsmiljöer. Utmaningar och framgångsfaktorer* (UKÄ 2019).

One of the distinguishing characteristics of a doctoral education environment with a small number of doctoral students is that it often has a small supervisory pool, limited seminar activities and a limited range of courses. The small pool of supervisors can be addressed, for example, by recruiting new supervisors or creating good conditions for existing staff to gain qualifications. Several HEIs also employ external supervisors.

Doctoral students need access to an active research environment with structured forms for scientific exchange. The report shows a number of different cooperation and coordination activities that HEIs have developed, such as trying to strengthen the doctoral education environment through same-subject cooperation with other HEIs or through cooperation with related subjects within their own HEI.

Too small a range of courses is another problem in research subjects with a small number of doctoral students. The report shows various solutions, including financial support for doctoral students to take courses at other HEIs. In several cases, the course offering has also been strengthened and expanded through various forms of cooperation, such as networks or graduate schools.

To summarise, there are several challenges with small doctoral education environments, but cooperation and coordination are some of the keys to solutions.

Follow-up of third-cycle programmes under review

For a programme that has been put under review in an ordinary programme evaluation, this implies that UKÄ questions whether the HEI should retain its degree-awarding powers for the evaluated programme. The HEIs whose programmes are under review must submit an account of the measures implemented no later than one year after UKÄ's decision.

An HEI may also choose to discontinue the programme under review. In such cases, the HEI must submit a decision on the discontinuation of the programme under review to UKÄ by the deadline for submission of the action report.

The follow-up process does not differ depending on programme level. The HEI's action report serves as the basis for the follow-up. In the action report, the HEI describes the measures taken for the assessment area(s) that have not been assessed as satisfactory. The assessment panel may request additional information and suggest that an interview be conducted. Based on the assessment report, UKÄ decides whether to give the programme a high-quality rating or to revoke the degree-awarding powers. However, for independent higher education providers, the Swedish Defence University and the Swedish University of Agricultural Sciences, it is the Government that decides whether degree-awarding powers should be revoked.

Majority of programmes under review approved after follow-up

In total, 39 of 153 evaluated programmes were put under review during the period 2017–2022. The two programmes that were put under review in the pilot review of third-cycle programmes were slated for follow-up within the framework of the regular evaluation cycle for quality review of third-cycle education.

For 25 of the programmes under review, the HEIs worked with measures that lead to high quality. In 13 cases, the HEIs chose to discontinue the programmes under review. At one HEI, the questioning of quality led to revocation of degree-awarding powers. It should be noted that the discontinuation of a third-cycle subject may mean that the subject is integrated into another, often less specified, subject through internal reorganisation. In this way, doctoral students and associated supervisors

remain at the HEI. In some cases, a subject has been discontinued due to low activity in terms of the number of doctoral students, i.e. a small number, or because the subject demonstrated low activity overall.

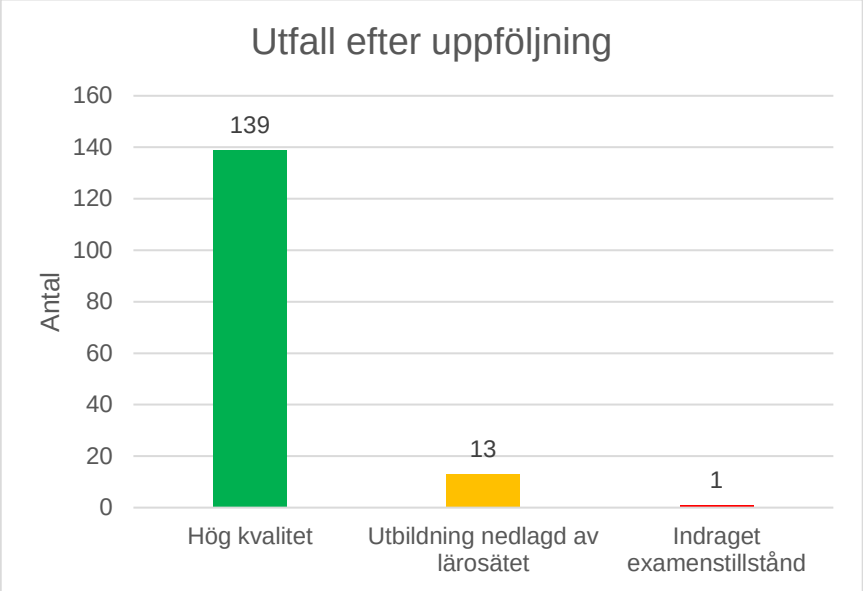

Figure 2. Outcome after follow-up

For degree-awarding powers that were revoked, the deficiency in how the HEI quality assured the courses given within the framework of an HEI-wide doctoral student network persisted. Although the HEIs in the network implemented measures to strengthen continuity and to ensure the quality of the courses, the assessment panel found that the programme was completely dependent on the doctoral student network. The preconditions were therefore assessed as insufficient.

New recruitments and expanded environments

UKÄ's reports to the Government for 2019–2021 (UKÄ 2020; 2021; 2022) show how third-cycle programmes that were put under review have most often been rated unsatisfactory in the assessment areas *Preconditions* and *Design, implementation and outcomes*. The follow-ups of third-cycle programmes show that some of the most common measures have been to increase teaching resources, recruit more doctoral students, offer more third-cycle courses, expand seminar activities, integrate gender equality in the programmes and work in a more structured way with the individual study plan and other types of follow-up. Teacher resources have been addressed in various ways. In some cases, this involved the recruitment of new teachers. In a few cases, it was a matter of having internal instead of external supervisors, and of ensuring that the supervisors have the relevant subject background. In one case, the subject's visiting professor was given more resources. Measures can sometimes be specific to a particular subject. For one

third-cycle subject, all HEIs made changes to the general syllabus in such a way as to cover the compulsory knowledge requirements according to national and international standards.

Increased planning of doctoral education and strengthened collaborations

There were only a few follow-ups in the assessment area *Doctoral student perspective* since only a small number of programmes were put under review. The measures implemented by the HEIs include the development of third-cycle programme follow-up, the establishment of a doctoral student council, and the compilation of a third-cycle handbook with guidelines for the supervisor relationship and practical information about the content of the programme and the rights of doctoral students.

There was also a small number of follow-ups in the assessment area *Working life and collaboration*. Here, the measures have involved strengthening internal collaboration with other departments, strengthening cooperation with industry and, in some cases, allowing doctoral students to take greater responsibility for laboratory equipment.

Part II: Thematic analyses of the evaluation results

The third chapter of the *European Standards and Guidelines for Quality Assurance in the European Higher Education Area* (ESG) which concerns the activities of quality assurance organisations contains standard 3.4 on thematic analysis. The standard states that organisations should regularly publish reports that describe and analyse the general findings of their quality assurance activities. The analyses may show developments, trends and areas of good practice or persistent difficulty. The aim is to reach conclusions that can be useful beyond the scope of an individual review process and provide a basis for structured analyses of the higher education system as a whole. The conclusions should provide reflections for the development of HEIs' activities and quality assurance strategies in a national or international context.

This second part of our report provides a qualitative in-depth analysis of third-cycle programme evaluations for 2017–2022. The analysis has two separate but related focuses: a review and analysis of the overall reflections of the assessment panels, and an in-depth analysis in the assessment area *Doctoral student perspective*. These two thematic analyses form the basis for UKÄ's conclusions, which are presented in the third and final part of the report. The conclusions can serve as a basis for the Authority's long-term ambition to work in a knowledge-based manner and contain concrete proposals for quality-enhancing measures for Sweden's third-cycle programmes.

Assessment reports as a tool for development

As already mentioned, the purpose of the programme evaluations is both to check the outcomes of the programmes and to contribute to the HEIs' quality-development efforts for the evaluated programmes (*Guidelines for the evaluation of third-cycle programmes* as of 30 June 2020). As part of achieving this goal, the assessors use their report to give the programmes feedback on what they consider examples of good practice and development areas. Assessment reports shall clearly present assessments and reasoning in relation to the respective assessment criterion and assessment area. In addition to the more structured parts of the report, assessment panels are also encouraged to provide overall reflections that cover all programmes evaluated in the research subject and provide a national picture.

Quantitative analysis of assessment reports in the previous report

A previous report dealt with the first rounds of third-cycle programme evaluations, *Granskning för utveckling. 95 utvärderade utbildningar på forskarnivå 2017–2018* (UKÄ 2019). The evaluations that were carried out and decided during that period were analysed, with a focus on examples of good practice and development areas for each individual programme: 40 per cent consisted of examples of good practice and 60 per cent of development areas. For further details about the results, please see the report in question (UKÄ 2019).

Unlike the previous report, Part II of our report uses a qualitative method in the analysis of assessment panel reflections and analysis of the assessment area *Doctoral perspective*.

Programmes in the analysis

The programmes included in the analysis of *Doctoral student perspective* are as follows:

- Computer science, 14 programmes
- Analytical chemistry, 9 programmes
- Physical chemistry, 11 programmes
- Organic chemistry, 10 programmes
- Production engineering, human work science and ergonomics, 12 programmes
- Textile, rubber and polymeric materials, 2 programmes
- Energy systems, 4 programmes
- Veterinary medicine, 1 programme
- Psychology, 9 programmes
- Applied psychology, 3 programmes
- Economics, 16 programmes
- Pedagogy, 20 programmes
- History, 13 programmes
- Ethics, 1 programme
- History of religions, 3 programmes
- General literary studies, 9 programmes
- Music, 2 programmes
- Design, 5 programmes
- Architecture, 4 programmes
- Art history, 5 programmes

The analysis of assessment panel reflections is based on the same programmes, but with some exceptions (see below).

Analysis of assessment panel reflections

In this section, we present a more in-depth qualitative analysis of the overall reflections of the assessment panel, something that assessment panels are encouraged to do across an entire programme evaluation. The reflections cover all programmes discussed in the assessment report and are intended to provide a national picture of each research subject. Individual programme evaluations are thus not included in the analysis because programme-specific assessment reports lack the overall perspective sought here.

The overall reflections are freer in form than the rest of the assessment report, and the assessment panels are free to decide what lessons learned they want to highlight and in what way. For this reason, there are no overall reflections for all evaluations conducted; there is simply no formal requirement that such reflections must be written. 5 of the 20 evaluated research subjects have no overall reflections: *Textile, rubber and polymeric materials* (2 programmes), *Energy systems* (4 programmes), *Veterinary medicine* (1 programme), *Ethics* (1 programme) and *History of religions* (3 programmes). In addition, the research subjects of psychology and applied psychology are evaluated jointly. There are thus a total of 14 overall texts with reflections that form the main basis for this analysis.

With reference to the free form of the overall texts, the texts vary in length. In addition to the differences in length, the texts also vary considerably in terms of which aspects of the subject's third-cycle programmes the assessors choose to emphasise. Some, in principle, refrain from making judgements and evaluations. They instead describe the current status of the third-cycle programme in the given subject, in some cases combined with a longer history. Other texts include evaluative statements by highlighting positive features or deficiencies in the subject's third-cycle programmes. Whether the texts contain only general observations or highlight deficiencies and merits, there are always some recommendations on how the subject should be developed.

To gain an overview of the assessment panels' overall reflections, the texts in each statement about the third-cycle programmes were categorised as *general observations, positive statements, identification of deficiencies* or *recommendations*. Each statement within these categories was then sorted into themes. These themes are presented here in descending order according to how many of the different research subjects' overall reflections they are found in:

Themes to capture trends in our report

Educational support (13 out of 14 research subjects)
This theme concerns questions about support for doctoral students, supervisor training and various forms of progression checks during the course of the programme.

Gender equality (11 of 14 research subjects)
This theme addresses the extent to which an HEI works with and has a holistic approach to gender equality issues.

Courses (11 of 14 research subjects)
This theme deals with how an adequate range of courses is offered and quality assured at the local level.

Working life, alumni and careers (11 of 14 research subjects)
This theme concerns observations of the extent to which third-cycle programmes prepare doctoral students for working life and involve alumni and career issues in the education process.

Individual study plans (10 of 14 research subjects)
This theme addresses the different ways in which individual study plans work better or worse.

Graduate schools and collaboration (9 of 14 research subjects)
This theme compiles observations on collaboration within and between HEIs within the framework of graduate schools and related forms of collaboration.

Critical mass and size of environments (6 of 14 research subjects)
This theme concerns the significance of the critical mass of research students and the size of the environments in general for the quality of education.

Internationalisation (5 of 14 research subjects)
This theme deals with issues related to internationalisation, such as exchanges, visiting research, international admissions and participation.

Influence and representation (5 of 14 research subjects)
This theme concerns how well doctoral student influence works in relation to the programme.

Externally employed doctoral students and external funding (4 of 14 research subjects)
This theme concerns the opportunities and risks associated with externally employed doctoral students and the funding of doctoral positions by external parties. It is only highlighted in the field of natural sciences.

Profiling (3 of 14 research subjects)

Where applicable, this theme deals with how different environments can be strategically strengthened through profiling within the subject.

Other
In addition to the above-mentioned themes, individual observations of a different nature also emerge, such as the communication of research results to a broader public or remarks on UKÄ's categorisation of research subjects. There are also various general observations about differences between different environments within a given subject.

The themes differ from those in the report *Granskning för utveckling. 95 utvärderade utbildningar på forskarnivå 2017–2018* (UKÄ 2019), as the texts analysed here are at a more general level. The overall reflections that form the basis of this analysis place greater emphasis on general trends and statements. Thus, categories such as *individual study plans* and *graduate schools* are treated in separate themes rather than as part of, for example, *educational support* or *programme and research environments*.

In order to provide a common national picture of the situation in the country's third-cycle programmes, we have identified and analysed in more detail the six themes that occur in the greatest number of research subjects. These themes are also the ones that have common features across most research fields. The theme of *individual study plans* and the theme of *graduate schools* contain particularly interesting cross-disciplinary characteristics and will be addressed in more depth and given further context and background. However, themes that are limited to fewer than half of the research subjects or fields covered are not discussed further, as they do not appear to be representative of third-cycle education as a whole based on this data.

A closer look at the themes

Educational support – clear structures as a unifying factor

The most common theme in the overall reflections concerns issues such as support for doctoral students, supervisor training and various forms of progression checks during the course of the programme. One reason why this theme does not appear in all evaluated research subjects (with the exception of computer science) is that certain issues that could have been included in this category are dealt with separately, such as courses, individual study plans and graduate schools Thus, this theme focuses on basic structural issues. Overall, the assessment panels give a mixed picture of the different subjects and fields – some are entirely positive, others entirely negative and the majority appear neutral.

A number of phenomena that often occur across different subjects are positively identified by the assessment panels. These include preventive support and early information to doctoral students, for example in the form of systems with mentors and introduction courses for new doctoral students. The assessment panels write favourably about workshops on equal treatment and gender equality, to strengthen doctoral students in these issues. The assessment panels also highlight mid-way reviews as a particularly successful way of ensuring progression. A consistent success factor for third-cycle programmes is good access to supervisors and that HEIs actively promote a fruitful relationship between them and the doctoral students. One way of ensuring a sufficient number of supervisors is the partial funding offered within the framework of certain third-cycle programmes to make supervisors available without extensive external funding.

When it comes to deficiencies and development areas pointed out by the assessment panels, it is not infrequently a matter of inadequate procedures within the third-cycle programmes. In several cases, the lack of check points outside of supervision is highlighted, which is seen as a potential risk for doctoral students' progression and as too great a responsibility for individual supervisors. Mid-way evaluations and other types of progression checks are proposed to be introduced in subjects that do not currently have them regularly (e.g. physical chemistry, production engineering, psychology, education and design). If there are externally employed doctoral students, it is underscored that their situation may be unclear and it is uncertain how their needs are met. Follow-up and assurance of the quality of the psychosocial work environment for doctoral students generally needs development in many cases. Supervisory committees and supervisor courses are put forward by several assessment panels as a way of developing the quality of supervision. In several subjects, systematic follow-up and development of supervisor competence is desired.

To summarise, it can be noted that what is requested in the theme varies greatly between research subjects. At the same time, there are common aspects in the form of developed procedures and systematic working methods being requested regardless of the programme. According to the assessment panels, the clearest educational support for doctoral students often consists of clear support structures. The questions that come up in these parts of the reflections clearly relate to matters dealt with within the framework of the assessment area *Doctoral student perspective*, which this report analyses in depth further on.

Gender equality – usually dealt with at the HEI level

The *Gender equality* perspective is often raised by the assessors in the overall reflections, mainly as general observations. Not infrequently, this concerns issues that are at a more general level than just doctoral

education, such as the number of female professors, gender differences in sick leave rates or the gender distribution among incoming students. Even in high-quality third-cycle programmes, the *Gender equality* perspective is often not addressed with greater concreteness at the programme level. There is general awareness, but these are issues that HEIs work with to varying degrees; there are large variations across levels and subjects, and deficiencies can arise particularly in everyday activities. The assessment panels call for such things as more elaborate action plans for gender equality issues, recruitment and the visibility of female role models. An in-depth analysis of the assessment area *Gender equality* and its outcome in the third-cycle programmes evaluated in 2017–2018 can be found in the report *Bedömning av jämställdhet i forskarutbildningar. En analys av metod och resultat i UKÄ:s utvärderingar*.

Courses – cooperation as a solution, quality assurance as a challenge

A recurring theme concerns courses at the third-cycle programme level and how these are handled within the framework of each programme. It should be emphasised here that the course development areas highlighted by the assessment panels within the framework of this theme concern the local level of the programmes. For example, the difficulty for smaller environments to ensure a sufficient range of courses is mentioned.

In response to this difficulty, the courses in many subjects have been made more interdisciplinary, and the number of reading or optional courses has increased significantly, or the programmes have fewer and fewer course credits in favour of the thesis. This has the advantage of being more flexible, but the assessment panels also recognise that it makes it more difficult for those responsible for the respective programmes to ensure that the knowledge objectives in the subject are achieved and quality assured. Another potential side effect of cooperation is the failure of quality assurance of the courses and development of local courses due to lack of funding and prioritisation. One assessment panel (organic chemistry) states: “In several cases, the assessment panel has not seen that the courses are evaluated and developed in line with the HEI's quality assurance system.”

Another recurring point made is that compulsory courses are a good and necessary component of the programmes, with the proviso that they must have relevant content. Beyond just more compulsory courses, the most common measure called for by assessment panels is some kind of central control. One assessment panel (organic chemistry) calls for a national assignment to coordinate doctoral courses, while another panel (psychology) calls for better structures for compiling course evaluations and clearer consequences of them. A third panel (art history) recommends the development of guidelines for the distribution of course

credits. The purpose of such guidelines would be to strengthen the subject, for example by ensuring that the proportion of inter-faculty or other thematic courses does not constitute too large a part of the programme. These are questions that touch on what is stated below about graduate schools and that particularly illustrate the challenges that exist for smaller research subjects and third-cycle programmes in particular.

Working life, alumni and careers – opportunities for exchange of experience

Issues related to links to working life, alumni contacts and career support form clusters in the assessment panel reflections. Deficiencies in one of these areas are usually linked to deficiencies in the others. The assessment panel for the subject of education is representative of this; they note that even in relation to high-quality third-cycle programmes, there is often a narrow perspective on working life. Strong programmes in the subject tend to be geared towards a continued career in academia, for example by providing an understanding of local collegial forms and a lot of teaching time. Descriptions of a narrow focus on an academic career are most prevalent in social sciences and humanities. In natural sciences and in engineering and technology, the emphasis is more on the well-established link to the labour market and the high degree of establishment of graduates (e.g. in computer science, analytical chemistry, organic chemistry and production technology).

In addition to education, the panels for history and art history emphasise that the third-cycle programmes are particularly geared towards a continued career in academia. At the same time, doctoral students on the programmes are described as open to and aware of the need for broader career paths. An interesting difference emerges here, as research students and the HEI appear to be out of step. The assessment panels therefore suggest that HEIs should “develop and compile intended learning outcomes adapted to a labour market outside academia” and consider elements of third-cycle education “that increase doctoral students' skills and ability to face a [broader] professional career”. Internships may also be considered. The assessment panel for art history “sees a need for more knowledge at HEIs about the conditions of non-academic working life for third-cycle graduates in art history, but perhaps also a clearer picture from employers of what the programme is expected to lead to in this respect”. There is great potential for development here and room for new forms of cooperation.

The view of alumni as an untapped resource is recurrent, and several assessment panels (e.g. architecture, history, organic chemistry, education and psychology) urge HEIs that are not already doing so to explore how they can be used to enrich programmes. Several panels (design, general literary studies, production engineering and psychology) also highlight collaborative approaches in which researchers meet with

sector representatives and industry offers career planning seminars and counselling on careers outside academia. Courses that are career-oriented in a broader sense are described as either working well or as something that should be more common. Newly established courses in, for example, project management, statistics management or media and communication are proposed by the assessment panel in history to be interdisciplinary and university-wide, and perhaps under the auspices of the graduate schools, in order to reach critical mass. There is potential here to learn from examples of good practice, both within and between research subjects.

Individual study plans – untapped potential in all subjects

One theme that emerges in 10 of 14 research subjects, but is represented in all of the fields, stands out in the sense that it is almost never mentioned in neutral terms: individual study plans.

According to Chapter 6, Sections 26 and 27 of the Higher Education Ordinance (1993:100), each subject that provides third-cycle education must have a general syllabus that specifies, inter alia, the main content of the programme. However, the general syllabus does not specify what individual doctoral students are required to do or achieve in their studies, nor what responsibility the HEI has to assist with this. Such information can instead be found in the individual study plan which, according to Chapter 6, Section 29 of the Higher Education Ordinance, must be drawn up for each doctoral student. This shall contain the commitments of the HEI and the doctoral student and a timetable for the doctoral student's studies. The plan shall be decided and followed up regularly in consultation with the doctoral student and supervisor. Individual study plans are thus a central part of each individual doctoral student's third-cycle programme and deserve a brief historical review.

Brief background – establishment over 25 years

The individual study plan was introduced in the Higher Education Ordinance in 1993, but prior to 1998 it was only stated that the supervisor should specify the knowledge requirements for each doctoral student. This led the Government to state the following in budget bill 1997/98:1, expenditure area 16, page 102:

> The design and follow-up of the individual study plan should be given closer attention. The study plan should be drawn up on admission and clearly state the commitments of both the doctoral student and the faculty board, e.g. with regard to the doctoral student's access to supervision and other resources. It should be appropriately documented that both supervisor and doctoral student have read the individual study plan to emphasise its importance. The study plan should be followed up every year. Under normal

> circumstances, when the studies have progressed satisfactorily, only minor adjustments to the plan should be necessary.

This is the origin of the current individual study plan, which specifies not only the doctoral student's but also the faculty board's commitment to the realisation of the third-cycle programme. The fact that the individual study plan contains mutual commitments between two parties and must be followed up regularly has thus been the case for 25 years.

This gives an indication of what the basic function and content of an individual study plan should be. With the current wording of the Higher Education Ordinance, however, the exact design of individual study plans is left to each HEI to manage, and there are therefore major differences from one HEI to another. In 2015, UKÄ reviewed about 900 individual study plans at the 25 state HEIs that were conducting third-cycle programmes at that time in the report *Granskning av individuella studieplaner för doktorander* (2015:23). The review focused on the HEIs' compliance with the regulations in the following respects: that individual study plans existed; that they clarified the HEI's and the doctoral student's commitments; that they contained a timetable; that consultation between the doctoral student and supervisor took place; and that the study plan was decided on and followed up regularly.

The outcome can be summarised by saying that study plans were generally in place, with a few exceptions. This can be seen as the fulfilment of a long-standing development (According to *Doktorandspegeln* 2003, 13 per cent of doctoral students did not have an individual study plan. This figure was 7 per cent in *Doktorandspegeln* 2008 and 1 per cent in *Doktorandspegeln* 2016). However, the management of individual study plans differed greatly between and within HEIs, and to some extent the management was lacking in the other points examined.

Untapped potential in all fields

It must be regarded as positive that individual study plans now generally exist and are used at Swedish HEIs. However, there is considerable development potential for study plans as a tool. In the assessment panels' overall reflections on third-cycle programmes, the individual study plans stand out in that they are rarely mentioned in neutral (or, for that matter, positive) terms. This is a development area that recurs across several different research subjects. That said, there are also examples of good practice that also appear in a wide range of subjects.

So, what does it mean that the assessment panels are rarely exclusively positive about the individual study plans? The closest that the overall reflections come to such statements is in the statement from the assessment panel for psychology and applied psychology, which states

that the individual study plan is a good instrument for quality assurance of supervision and for monitoring the doctoral student's progress. However, it can be noted that the same assessment panel also finds that the doctoral students themselves perceive the individual study plan as overrated, and that the individual study plans work better as an instrument in some programmes than others.

With regard to the deficiencies highlighted by different assessment panels, there is a consensus regardless of the field of research. In the natural sciences, it is stressed that the individual study plans are recurrently unclear or incorrectly fulfilled, that they are “often not fully utilised or sometimes disregarded” (analytical chemistry) and that “a common problem is that the individual study plans in many cases could be utilised locally as a useful tool and not just seen as a way of collecting data for the university centrally” (organic chemistry).

In the social sciences as well, in addition to psychology as mentioned above, the individual study plans often lack follow-up and the information they offer is not used for long-term development of the programmes (e.g. economics). It should be noted that the overall reflections in the fields of engineering and technology and the humanities do not mention individual study plans as solely deficient, but looking at individual statements in these fields and from the subjects that lack the assessment panel's reflections, the criticism is recurrent even there.

The assessment panels make a variety of suggestions to address mismanagement, inefficient use and similar deficiencies in the management of individual study plans. This includes such things as support for supervisors “through a structure that can provide continuity, exchange of experience and engagement, for example in the form of annual updates within the framework of the supervisory committee and clearer templates in which the link between qualitative targets and components of the programme is made clear” (physical chemistry). The importance of such discussions also emerges in other subjects, and some assessment panels highlight in particular the need to clarify the link between general syllabuses and individual study plans (economics). Based on a few well-functioning programmes, they highlight suggestions that the individual study plans work particularly well where programmes use complements such as special follow-up via objective and programme matrices or logbooks (production engineering, human work science and ergonomics). Digitalisation of individual study plans is also highlighted as a way to ensure that they are used more actively (education).

Overall, there are large differences between different programmes within the same research subjects. In design, it is noted that individual study plans exist in all programmes, but that they are used in different ways and are effective to varying degrees in measuring progression. In some

programmes, the individual study plans are only short documents that look at course participation, project activities and departmental duties, while in other programmes they contain more comprehensive accounts and provide greater added value. In some cases, the assessment panel for design would like the individual study plans to be generally reflective and not just a report. To achieve this goal, the assessors stress the importance of the tool's purpose being clear to the doctoral students, so that the individual study plans add value and do not hinder the doctoral students' creativity. The assessment panel for music expressed a similar view, stating that the individual study plans can be used to measure doctoral students' progression and intellectual development more clearly, as well as to demonstrate success within the framework of collaboration.

Overall, it can be noted that the assessment panels, regardless of the field of research, call for development on a number of different aspects of the individual study plans. This involves structures and forms for programme coordinators and supervisors' handling of them. It involves making doctoral students aware of the purpose and potential of individual study plans. It also involves technological development and complementary tools. Finally, it also involves an in-depth discussion about the tasks and functions that the study plans should actually contain. All in all, there is untapped potential regardless of the field.

Graduate schools – clearly quality-driving, but lacking an overview

Graduate schools is a theme that stands out in the overall reflections in that the assessment panels always have a favourable attitude towards them. This is the case in all 9 of 14 research subjects that raise the issue and across all fields of research. The concept of a graduate school is flexible and there is no fixed definition of what it should contain. Most often, however, a graduate school consists of collaboration within or between HEIs across broader areas or within subjects to enable contact between groups of research students and greater supervisor resources. Other characteristics may include a clear but varied organisation for cooperation in relation to courses and seminars, multidisciplinarity and networks.

Brief background – establishment and development

The first graduate schools were introduced in Sweden in the 1980s, and the number rose sharply in the 1990s. In the early 1990s, a number of initiatives were implemented by various funding bodies, and the Ministry of Education's experimental activities initiated graduate schools according to the 1992/93 research bill. In 2001, 16 national graduate schools were established and allocated special funds through the Government's research policy bill *Forskning och förnyelse*. Recent decades have seen an increasing number of initiatives for graduate

schools from a variety of funding bodies, including government initiatives.[3]

It is impossible to gain an overview of the number of graduate schools in Sweden today and their general effects without more in-depth studies. At present, UKÄ and Statistics Sweden only follow up current statistics for the graduate schools for professional teachers established through the Ordinance (SFS 2007:753) on third-cycle education for teachers and the Ordinance (SFS 2007:754) on government grants for third-cycle education for teachers, as well as their subsequent government initiatives. There is currently no overview of other graduate schools in the country and what they contain in practice. However, the national initiatives appear to have been largely successful. Among the positive examples highlighted by the assessment panels in their overall reflections are examples from the national graduate schools initiated in 2001.

Quality driven – but to what extent?

In the fields of natural sciences and engineering and technology, the assessment panels mainly identify graduate schools as something that exists and generally works well. The assessment panel for physical chemistry, however, delves into the subject and argues that HEIs should increase cooperation among themselves to provide all doctoral students with a more easily accessible and broader range of courses, for example through a national graduate school.

An in-depth analysis of the third-cycle programme evaluations in the field of chemistry can be found in UKÄ's report to the Government for 2021, *Kvalitetssäkring och kvalitetsutveckling* (UKÄ 2022). It states that the assessment panels for analytical chemistry, organic chemistry and physical chemistry all recommend more cooperation between HEIs. For example, a national graduate school is a way to create joint courses and manage challenges for smaller third-cycle programme environments within each chemistry specialisation.

Graduate schools as a solution to the specific challenges faced by small third-cycle programme environments have also been highlighted in the report *Små forskarutbildningsmiljöer. Utmaningar och framgångsfaktorer* (UKÄ 2019:17). Based to some degree on the same data as discussed in our report, subjects such as literature, architecture, psychology, design, energy systems, architecture and computer science are mentioned, where the critical mass of smaller programmes can be maintained through graduate schools.

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[3] *Forskarskolor – ett regeringsuppdrag*, National Agency for Higher Education's report series, 2000:2 R, pp. 21–31, 41–42; Government bill 2000/01:3 *Forskning och förnyelse*, pp. 43, 151–161; Government bill 2020/21:60, *Forskning, frihet, framtid – kunskap och innovation för Sverige*.

Looking at the overall reflections in the UKÄ reports, it is primarily in the fields of social sciences and humanities that the assessment panels most emphasise the importance of graduate schools. In these fields, the schools and other forms of collaboration between different HEIs appear to play a key role in the quality of third-cycle programmes. For example, researcher networks and graduate schools in economics are mentioned as being “absolutely crucial for the small programmes, as it is not uncommon for the limit for critical mass for the implementation of courses at one's own HEI not to be reached in any other way”.

The assessment panels repeatedly mention various successful graduate schools and initiatives, and consider it crucial that doctoral students maintain a critical mass. According to the assessment panel, networks and graduate schools can be a way to ensure this, and the evaluation of history states that “in the long term, the HEIs have a national responsibility to strategically develop various forms of cooperation”.

The assessment panel for economics also finds that established cooperation within graduate schools and networks should be developed and made more long-term. In architecture, the assessors describe that there is a good spirit of cooperation between HEIs and that they are impressed by joint projects and shared resources. According to the assessment panel, the established network that exists should be developed and formally become a national graduate school in the subject. At the same time, the HEIs must not forget to monitor the profile and special status of the individual programmes.

Graduate schools are also emphasised as a way of preserving and developing the distinctiveness of different research subjects. The assessment panel for general literary studies notes that doctoral student groups have generally shrunk in recent years, and that this has been managed through cross-listing with other subjects. Greater collaboration between HEIs, both within and outside Sweden, would serve to strengthen the subject.

In design, variation between programmes is highlighted with reference to their very specific backgrounds. In such cases, the assessors highlight national graduate school initiatives as important for developing the subject's own profiles and competence bases: “In general, there is a need for a formalised range of courses that more clearly underpins subject-specific specialisation for doctoral students”. Departments often have insufficient resources to offer what is required beyond reading courses, and cooperation between HEIs is described as a possible way forward: “A broader, formalised range of courses achieved, for example, through increased cooperation between HEIs, both at the national and the Nordic level, would support the work of doctoral students and also contribute to giving doctoral students a better position with regard to formalisation of intended learning outcomes and transparent examination”. Similar

arguments can also be found within the framework of other research subjects.

Overall, it can be noted that the assessment panels, regardless of field of research, highlight the graduate schools as favourable to the quality of education based on three aspects:

- They serve as a way to maintain a critical mass for doctoral students.
- They serve as a way to strengthen smaller subjects that would otherwise risk being absorbed by larger neighbouring environments at their own HEI.
- They serve as an effective way to maintain a relevant course offering.

It can be noted that all three aspects appear to be defensive in nature, and that what the assessment panels usually emphasise is the preserving rather than developing nature of graduate schools. This is possibly an effect of the evaluation context itself and should not be regarded as a statement on the added value that graduate schools generally contribute to Swedish higher education. The overall benefit of graduate schools for the quality of education is thus only partially revealed by this analysis.

Analysis of the Doctoral student perspective

On 5 May 2021, a web conference called *Forskarutbildning i gränslandet: i gränslandet utbildning och forskning, student och anställd* was organised on the theme of third-cycle programmes in the borderland between education and research, student and employee. The conference was hosted by the Association of Swedish Higher Education Institutions (SUHF), the Swedish National Union of Students (SFS) and UKÄ. During the conference, presentations on the theme were mixed with panel and group discussions. The purpose of the conference was to discuss the conditions of doctoral students as both students and employees, in order to raise the quality of third-cycle education and improve the conditions of doctoral students. During the conference, the participants present [4]were also given the opportunity to provide feedback

[4]For example, representatives from HEI management and persons working in management functions with third-cycle education-related issues, as well as doctoral student members/representatives in various governing bodies.

on issues that they felt needed to be addressed in third-cycle education in order to raise the quality.

Examples of areas for improvement in doctoral education according to discussions between representatives of HEIs and doctoral students in May 2021

Form of employment. It is desirable for all doctoral students to have a doctoral studentship.

Information. All doctoral students should receive initial and consistent information on their rights and obligations as doctoral students; this is especially important for English-speaking doctoral students.

Individual study plan. It should serve more as support and less as control, and needs to be combined with flexible/interactive/digital tools for an overview of progression during the studies.

Supervisor model. Doctoral students can easily be abandoned to their supervisors, so a team of supervisors and a mentor outside the team is desirable.

Doctoral courses. More national and joint doctoral courses are requested, for example on regulations.

In connection with the conference, UKÄ presented an overview of third-cycle education based on UKÄ's statistical data and results from third-cycle programme evaluations. Part of the presentation was based on an ongoing thematic analysis of the *Doctoral student perspective* in 123 statements from third-cycle programme evaluations. The full analysis of data, which included 153 statements, is presented below.

The analysis was conducted at an overarching level and thus did not focus on similarities and differences for specific programmes.

What is the Doctoral student perspective?

The *Doctoral student perspective* is a separate assessment area in the third-cycle programme evaluation and the assessment criterion is:

The doctoral student is given the opportunity to take an active role in the work to develop the content and implementation of the programme. The programme ensures a good physical and psychosocial work environment for the doctoral student.

Guidelines for the evaluation of third-cycle programmes (UKÄ 2016; 2018) states that the focus of a review of the *Doctoral student perspective* is on actual doctoral student influence, both formal and informal. The formal influence can, for example, relate to representation in bodies and participation in decision-making processes, while the informal influence can be linked to, for example, the individual doctoral student's influence on their learning processes and the quality of their third-cycle education. The review of good physical and psychosocial work environment is also a focus area related to the *Doctoral student perspective*. The psychosocial work environment may relate to a functioning learning environment with the opportunity to influence the quality of the programme, changes of supervisor, etc. The physical work environment may relate to ensuring access to the necessary infrastructure, such as learning materials and laboratory environments.

Targeted content analysis as a method of analysis

In this section, we describe a qualitative analysis of the assessment area *Doctoral student perspective* in 153 statements from third-cycle programme evaluations conducted during the period 2017–2022. More specifically, the method used was a targeted content analysis. Of 153 assessments of *Doctoral student perspective* in an equal number of statements, 146 were judged satisfactory. Only 7 were rated unsatisfactory.

The starting point for the targeted content analysis was three different input themes derived from the assessment criterion for *Doctoral student perspective*:

Sensitising themes for the analysis of Doctoral student perspective:

Influence – representation in various bodies, annual revision of the individual study plan, etc.

Support – known structures for e.g. change of supervisor, campus health services, external support such as mentors, etc.

Context – participation in different types of networks, opportunities to teach and supervise, etc.

The sensitising themes of influence, support and context were thus used as three predetermined focus areas when the content of the assessment area *Doctoral student perspective* was analysed.

A closer look at the themes

Based on the analysis of the three sensitising themes – influence, support and context – phenomena and patterns were identified.

Influence – being a co-creator of one's own doctoral education

Information about rights and obligations in the role as a doctoral student is often an important input for creating influence over one's doctoral education. The assessment panels note that there are examples of good and early information initiatives for new doctoral students, such as introduction courses, information events, discussions and written information, for example in the form of a doctoral student handbook. At the same time, there are also examples of the opposite: a lack of information that can lead to a lack of opportunities to create influence.

Doctoral students' influence over their education is perhaps most evident in the form of formal influence. The statements include examples of being represented in preparatory and decision-making bodies that may exist at different levels: departmental, faculty and HEI level. Representation in various relevant meeting forms at the department and in the supervisory committee is also mentioned as positive.

In some environments, doctoral students are also natural members of, for example, work environment and equal opportunities groups. Doctoral student councils and doctoral student committees – especially those that are actively supported by the department management – are highlighted as good examples of doctoral student influence by the assessment panels. For example, the groups organise social activities for the doctoral students while ensuring a good psychosocial work environment. An active doctoral student section centrally at the HEI is also highlighted as a positive factor for influence.

In environments in which doctoral students feel that their influence is less effective, the assessment panels identify that this may be because they are physically separated from the rest of the employees, or that they feel that the information they receive is inadequate or that they are not heard as a group. It may also be a matter of doctoral students being confused with first or second-cycle students in various bodies; doctoral student issues are not specifically addressed despite representation. Doctoral students who have a form of funding other than employment, are distance doctoral students, are externally employed doctoral students, or do not have Swedish as their first language also find it more difficult to be represented in various bodies and to have their voice heard.

Other ways that are highlighted in the statements as examples of what has worked well for doctoral students in terms of creating influence over their education is to have the opportunity to discuss it with people other

than their supervisors. This allows them to discuss their situation with a neutral dialogue partner. By having the opportunity to have regular and structured discussions about their education with, for example, a mentor outside the supervisor group, director of studies, head of department, research group leader or head of division, doctoral students can build autonomy and ownership of their own situation. Being able to influence which supervisors they are assigned is also emphasised as an active and positive way for doctoral students to gain influence over their own education.

By having insight into, for example, which research activities, projects and courses should and will be included in the third-cycle programme, the doctoral student can also feel that they have the opportunity to influence their own education. A common way to achieve this is through their individual study plan. The assessment panels note that, in cases where the individual study plan is used actively and forward-looking with milestones and clear and ongoing revision, the doctoral students often perceive it as positive. In cases where the work with the individual study plans has not functioned optimally, it may be that their potential is not fully utilised: for example, the planning in and follow-up of the individual study plan does not work and the doctoral student thus loses influence over their education by becoming passive. In addition, the link between the qualitative targets and the learning activities is not always clear. The opportunity to start formulating the individual study plan at an early stage is also seen as positive. Another good example is to link ongoing progression seminars to the individual study plan. The assessment panels point out that it is important that externally employed doctoral students also get to work with their individual study plan in a constructive way, and that the individual study plan is also used to get an overview of their workload.

Being able to provide regular feedback on the quality of their third-cycle education, for example in the form of a questionnaire, is another way of contributing to influence over their own education. However, problems sometimes arise when the results are not fed back or when the quality follow-up of the programme takes place at too general a level at the HEI. The reason is often that the doctoral student environment at the department is too small. In some cases, there are also no channels for providing feedback on or criticism of the third-cycle programme, or surveys are conducted too infrequently to have a good impact.

The department's encouragement of doctoral students to go abroad, as well as choosing courses themselves and influencing the content of the courses during their studies, are also examples of how doctoral student influence and autonomy can be strengthened. The doctoral student having influence over their own department duties is also cited by assessment panels as positive. The assessment panels also stress that it is important that doctoral students receive information about their teaching

periods in advance so that they can plan their studies. The doctoral students' ability to influence their own project – such as the research question, the scope of the project and the courses included – varies.

Support – feeling secure within the learning environment

The assessment panels note the importance of the doctoral students creating a sense of security during their studies through various types and forms of support structures and networks. Even in environments in which the assessment panels found the assessment area *Doctoral student perspective* to be satisfactory, there have been examples of employee survey results showing that doctoral students were the group in the workplace that was least satisfied with their work situation.

Support networks are common in various forms: doctoral student networks in their own local environment, doctoral student networks that extend beyond their own environment, as well as networks with senior researchers that are cultivated through, for example, participation in research seminars and the like.

Where the assessment panels noted a lack of support structures, they conclude that too much responsibility for the educational situation falls on the doctoral student's shoulders. A lack of critical mass in the research environment is also a common reason for a lack of support. Networks provide doctoral students with social security, and one of the most vulnerable situations for doctoral students is when networks or support structures are non-existent or inadequate when there is a need to change supervisors. It is important that support structures for changes of supervisor are in place, formalised and known to all concerned even before a change of supervisor becomes necessary. It is also important that there is a readiness to capture and manage different types of deviations and delays during the period of study. This creates security for the doctoral students as well as good conditions for completing the programme within the given time frame. Doctoral student forums are another form of network that can help to offer doctoral students peer support.

Stress is common among doctoral students during their studies, and there are several ways to prevent stress and build support structures for doctoral students. Initiatives for the creation of doctoral student support structures that the assessment panels identified as working well include active campus health services, targeted efforts to develop the doctoral students' work situation, training for doctoral students in stress management and psychosocial work environment, introductory dialogues and workplace meetings. Another way to reduce doctoral students' stress is to adjust the timing of doctoral students' courses to avoid clashes between different workload peaks.

Another way to create support for doctoral students is to create a multi-person supervisor team. This gives the doctoral student more people to turn to for support on various issues, and there is less dependence on a single supervisor. The assessment panels also believe that a good model for supporting doctoral students is to have a mentor outside of the supervisor group.

In some doctoral student environments, a functioning physical environment – such as a laboratory environment – is particularly important. In this context, courses in laboratory safety are important for doctoral students to feel safe and supported.

Context – feeling a sense of belonging during their studies

It is important for well-being and the psychosocial environment for doctoral students to feel a sense of belonging and to be part of a context. In small research environments, there is a greater risk that doctoral students will lack a social sense of belonging, and the psychosocial environment may also be strained by the fact that it can be more difficult in a limited environment when, for example, there is a change of supervisor.

However, even in normal-sized research environments, a well-functioning psychosocial environment is not created by itself. Good conditions that the assessment panels highlight in this context are the opportunity for doctoral students to teach and supervise, and that there are financial conditions for them to participate in conferences so that they can make important contacts and create networks. It is also important that conditions are created for doctoral students to be socialised into the faculty. Good examples of how newly admitted doctoral students can create a context at an early stage are a mentoring programme for new doctoral students, group supervision, and seminars at which doctoral students can present their ongoing work.

Doctoral students who do not have Swedish as their first language is a group who may find it more difficult to find a context and feel a sense of belonging. Here, a lack of information in English and fewer opportunities to supervise and teach are examples of possible contributing factors. A good example of how it is possible to influence this situation is to work actively with intercultural issues and to translate policy documents into English. Externally employed doctoral students are also highlighted as an example of a doctoral student group that finds it more difficult to build a sense of belonging with the collegial environment.

Role and target conflicts – a threat to the quality of doctoral education?

It can again be noted that out of 153 assessments of *Doctoral student perspective*, as many as 146 were judged as satisfactory. Only 7 were rated unsatisfactory. In other words, there is a lot that works well, and the assessment panels also highlight many examples of good practice in areas in which there is potential for development.

But when we summarise the phenomena and patterns hidden behind the three sensitising themes of influence, support and context, we can also note that the world of the doctoral student is a world full of role and target conflicts. While the doctoral student is a research student, he or she is also a colleague in the teaching faculty. At the same time as they have to teach, they also have to complete their studies within the set time frame. In this context, it can be difficult for doctoral students to prioritise without support. In an environment that is often stressful, where one may not always feel a sense of belonging in a group, and where the individual study plan functions more like a checklist than a pedagogical development document, it can become overwhelming.

It is therefore important to always ensure that doctoral students have a good work environment, so that it is possible for them to devote the necessary time and focus to their thesis work. In the work environment, it is also important that the doctoral students can have their voice heard, regardless of the form of funding and language. The themes linked to the doctoral students' work and study environment that emerged through the analysis of the assessment area *Doctoral student perspective* largely correspond to the results of the report *Hur mår doktoranden?* (ST & SFS 2021) mentioned in Part I of the report.

Part III: UKÄ's conclusions

In this third part of the report, we present some of the conclusions drawn from the results of the third-cycle programme evaluations during the period 2017–2022, along with our own analyses. The conclusions are mainly linked to identified development areas and are often in line with development needs in third-cycle education identified in other contexts and presented earlier in the report. Although the results of the third-cycle programme evaluations 2017–2022 show that doctoral education in Sweden is generally of high quality, our report also shows that there are areas in need of further development.

Many of the strengths, challenges and examples of good practice from Swedish doctoral education that were summarised in the first part of the report have been highlighted through thematic analyses of the evaluation results in the second part of the report. In this way, there is a clear common thread from Part I of the report – the overall account of the evaluations' outcomes – through the assessment panels' overall reflections and the in-depth analysis of the assessment area *Doctoral student perspective* in Part II, to the conclusions here in Part III.

Individual study plans

Individual study plans are identified as a development area in the report's two thematic analyses – the assessors' overall reflections and the assessment area *Doctoral student perspective*.

After 25 years with the individual study plan in its current form, it is a natural part of doctoral education.

In 2015, UKÄ conducted a review of the existence and quality of individual study plans (UKÄ 2015), in which more than 900 individual study plans were examined. The review showed that most of the doctoral students had an individual study plan in place, but that there were deficiencies in the content of a number of study plans. The most common deficiency concerned the lack of follow-up (41 per cent), but other deficiencies included the lack of the HEI's commitments (23 per cent), timetable (22 per cent), determination/decision (18 per cent) and consultation with the doctoral student on the individual study plan (17 per cent).

Although the review was conducted almost a decade ago, it is clear from the analyses in this report that several development areas persist and

repeatedly appear in third-cycle programme evaluations. HEIs have great freedom to decide on the design of doctoral students' individual study plans, but there is also much to be gained from developing the forms even more and learning from successful examples both internally between research subjects and fields and externally between HEIs. To get a clearer picture, however, a more systematic and in-depth study of the situation with individual study plans at our HEIs would be required.

Two projects that are in line with the observations on individual study plans from this report are the Ladok consortium's development of a solution for managing individual study plans at the third-cycle level in Ladok and the work initiated by the Swedish Association of University Teachers and Researchers (SULF), whereby a focus group will work with doctoral students' individual study plans and produce good examples of how they can work. Both projects are planned to be completed in autumn 2023. The projects are timely and further demonstrate the value of evaluating individual study plans at an overarching level. In our opinion, such an evaluation could highlight and identify better forms for their structure and management, make doctoral students aware of their potential, point to successful complementary tools, and deepen the discussion on the function they should fulfil over the next 25 years.

Graduate schools

Graduate schools are a phenomenon that is identified in the report's thematic analysis of the assessors' overall reflections as an area with development potential that should be examined more closely.

Graduate schools are a multifaceted and natural part of most research subjects today. Since their introduction in the 1980s, they have increased significantly in recent decades. Their design and funding vary greatly, making it difficult to talk about graduate schools in broad terms. One factor that seems to unite them, however, is their favourable impact on the quality of third-cycle programmes. Our report has potentially revealed only some aspects of their importance for research and education.

There has not been a comprehensive review of graduate schools in Sweden since 2000. Since then, the 16 national graduate schools have been followed up and reported on. At present, Statistics Sweden and UKÄ only produce current statistics on the graduate schools for professional teachers that the Government has targeted with special initiatives since 2008. In addition, there is no current knowledge base that would be beneficial to many parties in the higher education sphere. A new study (e.g. through a survey of all relevant education providers) of the number, funding, organisation and content of graduate schools

would make it possible to identify their effects and areas for development.

Digital courses and information events

Digital courses and information events are identified as a development area in the report's thematic analysis of the assessment area *Doctoral student perspective*.

Previous reports from UKÄ have shown that the pandemic posed both extensive challenges and some potential benefits for the doctoral students who were active during the period (UKÄ 2021:7; UKÄ 2023:8). However, it is worth emphasising the importance of further developing opportunities for conducting both doctoral courses and information events for doctoral students in a digital format.

UKÄ's evaluations of third-cycle programmes in chemistry have shown that there is a need to create and offer courses in certain specialisations at the national level, in order to coordinate resources nationally and create the best opportunities for doctoral students to achieve their qualitative targets. In line with the views highlighted at the digital seminar *Forskarutbildning i gränslandet* in May 2021 – organised jointly by SUHF, SFS and UKÄ – the results of our report show that there is a need to create better and more appropriate information events for doctoral students in the initial stages of their doctoral studies. It would be beneficial for such information events to focus on both the rights and obligations of doctoral students and, if possible, to be coordinated at the national level. It is also important that the information is provided in both Swedish and English.

Equal opportunities for all doctoral students

Equal opportunities for all doctoral students are identified as a development area in the report's thematic analysis of the assessment area *Doctoral student perspective*.

In line with the results of our report, it is still important that HEIs enable and follow up that all doctoral students can achieve influence and ensure support and context during their third-cycle studies. To achieve this, it is important to take into account that different categories of doctoral students – internally employed, grant-funded, externally employed, English-speaking, Swedish-speaking, distance doctoral students, on-site doctoral students, doctoral students in small and large research environments – should have the same opportunities. However, different solutions for different doctoral student categories may be required to

achieve the same targets. The importance of international doctoral students being able to participate in their doctoral education has previously been highlighted in connection with UKÄ's reviews of HEIs (UKÄ 2022). The importance of HEIs communicating both the quality system and its results to international doctoral students in English has previously been noted by UKÄ in the report *Studentperspektivet. En kartläggning av hur studentfrågor kommer till uttryck i UKÄ:s granskningar* (UKÄ 2020).

Proposals for UKÄ's contribution to the continued quality development of doctoral education

Based on the conclusions in our report, UKÄ intends to organise a conference on the theme of third-cycle education as a quality-developing conclusion to the third-cycle programme evaluations conducted between 2017 and 2022. The main themes identified in the report's conclusions as development areas – individual study plans, graduate schools, digital courses and information events, and equal opportunities for all doctoral students – are examples of suitable themes for workshops in connection with the conference.

In response to the conclusions in the report, UKÄ wants to continue conducting quality development activities for third-cycle education. One example of this could be a review on the theme of third-cycle education. The review could include a review of the existence and quality of individual study plans and/or graduate schools.

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Veterinary medicine	Reg. no. 411-00382-16
Economics	Reg. no. 411-00391-16
History	Reg. no. 411-00394-16
Psychology and applied psychology	Reg. no. 411-00401-16
Art history	Reg. no. 411-00423-16
Textile, rubber and polymeric materials	Reg. no. 411-00431-16

Energy systems	Reg. no. 411-00432-16
Ethics and history of religions	Reg. no. 411-00450-16
Architecture	Reg. no. 411-00465-16
Design	Reg. no. 411-00072-18
Music	Reg. no. 411-00073-18
General literary studies	Reg. no. 411-00084-18
Production engineering, human work science and ergonomics	Reg. no. 411-00087-18
Analytical chemistry	Reg. no. 411-00050-20
Physical chemistry	Reg. no. 411-00051-20
Organic chemistry	Reg. no. 411-00052-20

Appendix 1

The third-cycle programme subjects included in the evaluations conducted between 2017 and 2022 are classified as the following research subjects in the Swedish classification standard *Standard för svensk indelning av forskningsämnen 2011* (UKÄ 2016):

10201 Computer science
10401 Analytical chemistry
10402 Physical chemistry
10405 Organic chemistry
20307 Production engineering, human work science and ergonomics
20504 Textile, rubber and polymeric materials
20702 Energy systems
40304 Other veterinary medicine
50101 Psychology
50102 Applied psychology
50201 Economics
50301 Pedagogy
60101 History
60203 General literary studies
60302 Ethics
60304 History of religions
60402 Music
60405 Architecture
60406 Design
60407 Art history

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