



A world-class doctoral education

The Doctoral Committee within
Swedish National Union of Students, June 2021

Useful acronyms

ASP: The general study plan, or in Swedish den allmänna studieplanen. This is the document that regulates a doctoral education program.

HEA: The Higher Education Act or in Swedish Högskolelagen (1992:1434) is the law that regulates public university colleges and universities in Sweden.

HEO: The Higher Education Ordinance or in Swedish Högskoleförordningen (1993:100) .

HEI: Higher Education Institution. In Sweden this can be either a university or a university college.

ISP: The individual study plan, or in Swedish den individuella studieplanen. This is the document that regulates the individual doctoral students' education.

SFS: Sveriges Förenade Studentkårer The umbrella organization consisting of student unions in Sweden. SFS is the national student (and doctoral student) voice in Sweden.

SFS-DK: The doctoral committee within SFS.

SUHF: Sveriges Universitets och Högskoleförbund. The umbrella organization for universities and university colleges in Sweden.

UHR: The Swedish Council for Higher Education or Universitets och högskoleerådet is a government agency tasked with providing support to the education sector through a number of various activities.

UKÄ: The Swedish higher education authority or Universitetskanslerämbetet in Swedish. This is the agency that reviews quality in higher education and research at national level.

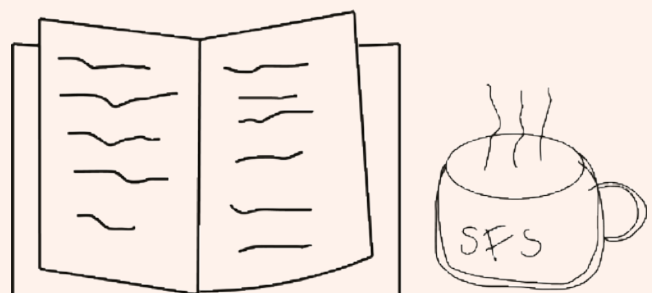


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Foreword

This guide was written by SFS-DK in the spring of 2021, and it grew out of discussions about what consequences the corona pandemic had had on the quality of doctoral education. From our perspective, such a discussion could and should not stand alone. It is not enough to put focus on how the quality of doctoral education has been affected, one also has to discuss what quality of doctoral education actually means.

But where to start? It is not an easy discussion to start. Doctoral education is complex and highly individualized, but we aim with this guide to make it easier for more people to take part in this discussion! We wish that Swedish academia aims high, both for its students and researchers today, but also for the future.

We hope that you will read this guide and use it to discuss with us and others how to ensure that the Swedish doctoral education is a world-class doctoral education - now and in the future. Finally we would like to thank all of those who discussed, read, or commented on the guide. This includes members of the board of SFS, the SFS office, SFS committee for quality assurance (SQC), representatives from student unions, members of last year's SFS-DK and other collaborators. In particular we wish to thank Anton, Irina, Karl, Phillip, Simon and Sofia.

Last but not least we want to acknowledge Alex, Daniel, Emma, Emil and Sebastian - the members of SFS-DK 2020/2021. This guide was very much a joint work!



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Summary

In the Swedish Higher Education Act (Högskolelagen, HEA), third-cycle education or research education is defined as the highest level of academic education. In Sweden there exist four types of research education, leading to four different degrees: an artistic and a general licentiate degree and an artistic and a general doctoral degree. Here we focus on the last one, which we will call doctoral education.

This guide is written with the purpose of starting a discussion about what a world-class doctoral education is, and while reading there are two things you should keep in the back of your mind:

- The doctoral education is an **education** and the aim of the doctoral education is to educate independent researchers, not to produce a specific amount of research. It is the independent researcher and not the research that is the product of doctoral education.
- While doctoral education is flexible, it is not unregulated. Each doctoral student has their education regulated in their individual study plan.

This guide has three parts. In part 1, we describe the regulative and the financial prerequisites of doctoral education, In part 2, we discuss the different components of doctoral education. In part 3, we discuss how to ensure a world-class doctoral education. Besides references to the Higher Education Act (HEA) and the Higher Education Ordinance (HEO), we avoid references in order to keep this document easier to read.

Whether you are a representative of doctoral students, a vice-chancellor or an external actor - we hope this guide can be of help and inspirational!

Enjoy reading!

What is doctoral education?

Doctoral education is where the future professors are educated, and the doctoral education today will form academia tomorrow. But doctoral education's role in academia is more than this, doctoral students are also central when it comes to the research, teaching and outreach that the universities carry out now. While the latter may seem like a natural training towards the first, it can also create tensions in terms of what the focus of doctoral education should be.

In a historical context, doctoral education has first and foremost been where the future professors were educated. This has been changing over the last 50 years, and today more and more doctorate holders leave academia and transition to another career.

Research is big business, and today a significant part of the financing of research at the Swedish universities comes in the form of external financing, and this also affects doctoral education. Today not only academia itself has an interest in doctoral education, but also industry, government authorities, and politicians have opinions about what the aim and scope of doctoral education should be.

To some degree they all agree, a high quality doctoral education is an education that educates independent researchers and where the learning outcomes in HEO (appendix 2) are met. But what this actually means, and how one sees these researchers using their education upon graduation may vary.

From our perspective it is important to recognize that all doctoral education lives within academia, even when it is carried out in collaboration with external partners. At the same time one must also recognize that most doctoral students will eventually leave academia and pursue a career elsewhere. What we present here is the doctoral students' perspective on what the cornerstones of a world-class doctoral education consists of, and where the challenges and friction lie.

Part 1

Situating doctoral education



Rules, rights and regulations

Doctoral education, despite sometimes being viewed as very flexible and free, is highly regulated; from a national level where the regulation comes in terms of the legislation, to the individual level where it comes in the form of the individual study plan. Doctoral students are met with rules, regulations and recommendations that all set boundaries for their education.

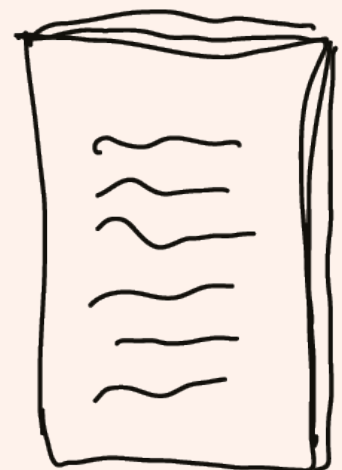
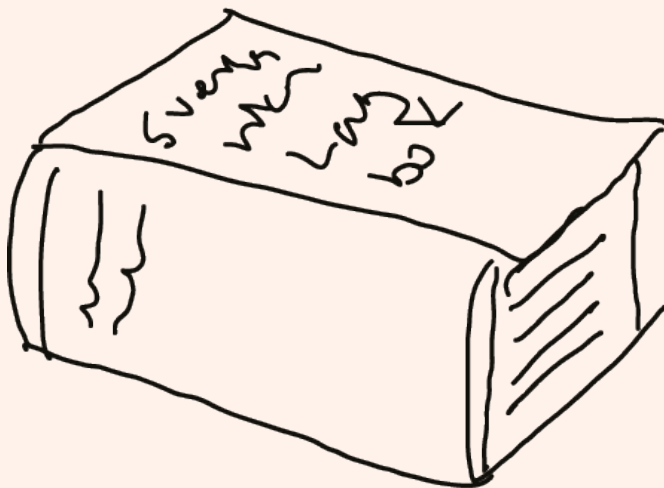
The Swedish Higher Education Act (Högskolelagen, HEA) is the Swedish law that governs the Higher Education Institutions (HEIs). It is here that the purpose of the HEI's is defined, in the form of three tasks; research, education and outreach, and it is here that doctoral education is defined as well. It is in HEA (1 Ch. 7§) that it is stated that within HEI's there are three different cycles of education. First cycle education is also called bachelor education, second cycle is also called master education, and the third cycle of education is doctoral education. In the HEA it is specified that the research and education within the HEI's should be of high quality, and that education should be tightly connected to research.

In the HEA (1Ch. 9a§), the special status of doctoral education shines through. In Sweden there exist two types of HEI's: the universities and the university colleges (högskola in Swedish), What sets them apart relates to who decides what doctoral education they each give. For the universities this is decided by themselves whereas it for the university colleges is decided by the Swedish Higher Education Authority (Universitetskanslersämbetet, UKÄ).

The HEA only defines the existence of doctoral education, and in broad term what the purpose of it is. To understand what makes up doctoral education one has to look at the Higher Education Ordinance (Högskoleförordningen, HEO). In the HEO (7 Ch. 34§) it is specified that the universities must not admit more doctoral students into the doctoral education, than they can provide an adequate education for, that all

doctoral student must have an adequate financing, and that the said financing must be secured for the entire length of the doctoral education (240 ECTS or 4 years) before admitting doctoral students into the education. It is also in the HEO (5 Ch.) that the employment type doctoral studentship is defined.

In HEO (appendix 2) the learning outcomes that the doctoral student must fulfill upon graduation is specified. This includes what overall type of knowledge and understanding the doctoral student should exhibit, what prerequisites they should fulfill before the final examination (the thesis and defense), and finally which criteria are used to evaluate the examination for the doctoral degree.



The individual and general study plan

For each doctoral education, HEO (6 Ch. 27§) states that a general study plan (ASP) must exist. The HEO states that the ASP should describe the main content of the education, any special requirements that potential doctoral students must fulfill before admittance and other necessary regulations. SUHF (Sveriges universitets- och högskoleförbund) recommends that it also includes what is normally required to obtain the degree, and that the ratio between the course and thesis part is specified.

HEO (6 Ch. 29§) states that each doctoral student must have an individual study plan (ISP). The ISP contains the commitments of both the university and the doctoral student towards each other. For doctoral students the commitments come in the form of a

timeplan for the doctoral studies. For the universities their commitments come in the form of what resources, such as supervision, that they must provide the doctoral student. The ISP is the agreement between the university and the doctoral student and is decided upon after consultation of both the doctoral student and the supervisors. According to HEO (6 Ch. 30§), a doctoral student who seriously violates their side of the commitments in the ISP can lose their resources. This is a lengthy and rigorous process and the decision is made by the vice-chancellor.

The ISP should state how the learning outcomes are to be achieved within the education. If the doctoral student has departmental duties or representational tasks, these must be addressed as well. The ISP must be kept relevant - it is recommended that it is updated at least once per year, but in case of significant deviations it should be updated more frequently.

The HEA and the HEO are not the only places where doctoral education is governed. SUHF has made a number of recommendations that regard doctoral education. The SUHF recommendations are recommendations, and while the HEI are recommended to follow them, they are not legally bound to do so. On top of this, all HEI's have their own regulations and guidelines for doctoral education. Within an HEI further regulations might be set at faculty level or on departmental or divisional level.

Doctoral students and representational rights

Research education is an education, and doctoral students are, no matter how they are financed, students. In Sweden, all students have the right to be represented in decisions that regard their situation and education HEA (2 Ch 7§) . This right extends from departmental level all the way up to national level. The representation is organized by the student unions at the HEI's while at national level it is organized by SFS. To enable doctoral students to carry out representational tasks, SUHF recommends that representational tasks should lead to prolongation of the doctoral studies (SUHF REK 2020-2).

Other relevant regulations

Förvaltningslagen

Förvaltningslagen is what is called a subsidiary law (subsidiär lag). That means that the law is applicable only if there is no other law that states otherwise. Förvaltningslagen contains the legal rights that citizens have when they come in contact with a governmental authority. This includes the legal rights on how decisions should be made, and the said decisions can be appealed. The public universities are government authorities and therefore bound, when nothing conflicting is stated elsewhere, to follow förvaltningslagen.

Employment regulations

In the next chapter we will return to the question of how doctoral students are financed. In the context of regulations it should however be noted that for those doctoral students who are employed by a Swedish employer, it is the Swedish labour market laws that regulate their working conditions as well as their social security rights, such as sick leave and parental leave. Local employment and salary conditions are regulated by the collective agreements (kollektivavtal) and are negotiated by the trade unions.

Migration legislation

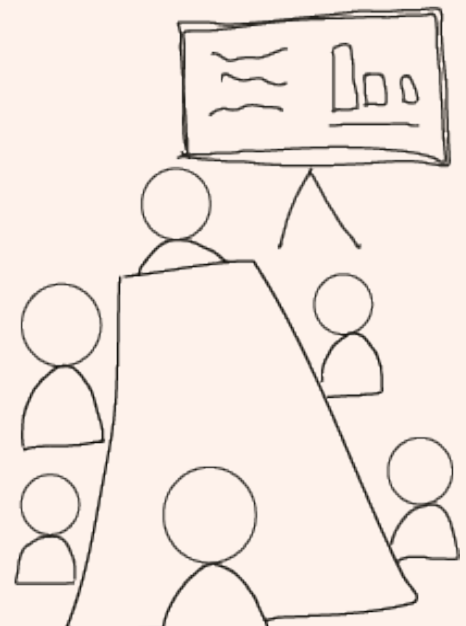
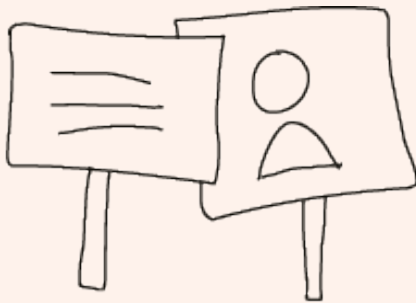
For those international doctoral students that do not hold a permanent residency instead hold a study permit. Such a study permit gives them the right to work, however, the study permit requires that the student is a full time student. This means that this group of doctoral students, as opposed to those with permanent residency, can not lower their study rate.

Kammarkollegiet

Kammarkollegiet, or the Legal, Financial and Administrative Services Agency as it is called in English, is the public agency that insures all of the government activities in Sweden, including students. As not all doctoral students are employed, those who are not employed are insured through Kammarkollegiet as other students. However they do not have access to the same level of social security as those who are employed.

Doctoral students and the regulations

Doctoral students are responsible for their own education, but in order to execute this responsibility they must also be aware of the regulations that guard it. While doctoral students have significant freedom when it comes to structuring their research on a daily basis, the doctoral education as an object is highly regulated. When describing the individual doctoral education in the ISP, it is necessary for doctoral students to understand the regulations that describe their education, the responsibilities they have as doctoral students and researchers, the rights they have as doctoral students, and the responsibilities and rights they have when employed. No one wins when doctoral students must seek high and low in order to find the necessary information or when they are left to interpret ambiguities on their own. Another important challenge is that academic culture in some instances dominates over legislation. This becomes visible when doctoral students for instance feel they do not have the possibility to take vacation, even if they have the right to.



Enrollment in doctoral education

In order to enroll a student into a doctoral education, there are a number of requirements that must be met by the potential doctoral student and the university of enrollment. These requirements are specified in HEO chapter 7.

Requirements for enrollment

The requirements fall into three categories: academic and non-academic prerequisites that the applicant must fulfill, requirements of the financing of the doctoral student during the education, and requirements for educational resources the doctoral student needs during their education.

The requirements of the doctoral student come in the form of basic requirements, a doctoral student must have what corresponds to at least a magister degree upon enrollment, and more specialized requirements that are tied to the potential doctoral student's ability to carry out the doctoral education within the given research field. The requirements may be both academic, such as a requirement of prior university education within the field, or non-academic, such as relevant work experience or language proficiency. It is the university that decides on these requirements, and they may under special circumstances also exempt potential candidates from these requirements.

The university may not enroll someone into doctoral education if they do not have the necessary financing to sustain themselves through the education. In the next chapter we discuss the different forms of financing of doctoral students, but in short it is specified in (HEO, Chap. 7, 36§) that the university may only enroll someone into doctoral education if they can employ them with a doctoral studentship or if they judge that the applicant has another form of financing secured for the entire duration of the education. In (HEO, Chap. 7, 4§) it is also specified that the university may not accept more doctoral students than they can provide educational resources for. What constitutes these resources is something we return to in part 2.

Financing, resources and enrollment

The enrollment of doctoral students, their financing and the educational resources is of course related, however they are not the same thing. For a potential doctoral student to be enrolled at the university, there has to be the necessary financing and resources for them to complete their education. This means that there has to be financing for four years of full time education and the educational resources needed for the doctoral student to be able to complete their education.

The doctoral student can get their financing extended due to a number of reasons. However even if the doctoral student runs out of financing it does not mean that they lose their educational resources nor that they are expelled from the university.

The educational resources that the university has to provide for the doctoral student to be able to complete their education are things such as supervision, a work and research environment, and the defense, but it can be many other things as well. The doctoral student can lose the access to these, but it requires that the doctoral student seriously violates their side of the commitments as specified in the ISP. In the case that doctoral students lose their resources, they have the possibility of getting these back if they can justify that they will be able to fulfill the requirements needed to complete the education.

However, for the doctoral student to be expelled by the university the process is the same as for other students. In reality it is very hard to complete the doctoral education without the access to the necessary educational resources, but it is important to stress the difference between these concepts, and to remember that as long as the doctoral student stay enrolled at the university they can in theory apply and succeed in getting their resources back, however unlikely it may be that they succeed.

Financing of doctoral education

Understanding how doctoral education is financed is tightly coupled to understanding how the Swedish research landscape in general is financed. In the HEI's budget doctoral education is accounted for together with research, whereas first and second cycle education is accounted for separately. Financing doctoral education is a question about how the individual doctoral student is financed, but also a question about what role the funding of research plays for doctoral education.

Funding of Swedish research

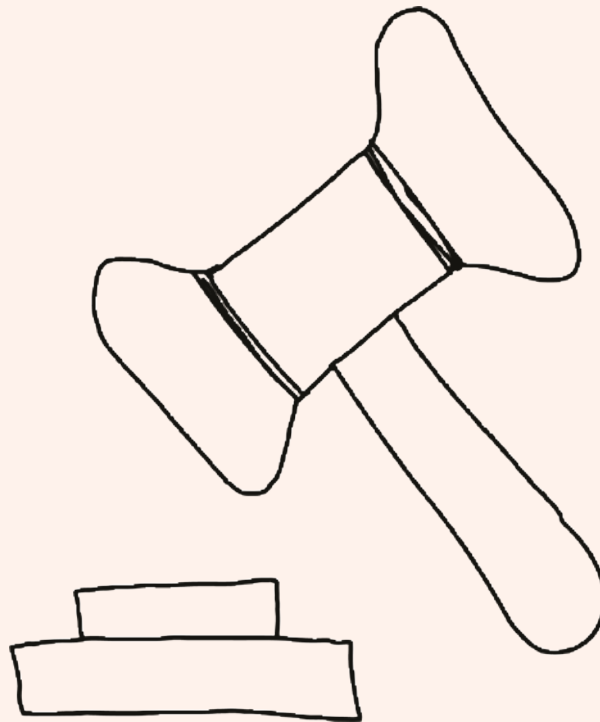
In Sweden, research at the HEI's is financed in one of three ways, either by direct funding (basanslag), external funding, or assignment funding. Direct funding is given directly from the government to the universities, and the universities are then in theory in control of how to distribute this money internally. External funding can come in the form of partnership financing, where a HEI's and an external partner together co-finance a research project, but most often comes in the form of project financing where researchers at the HEI's have applied for funding for a specific project in an open call. Finally there is a third type of financing which is that of Assignment funding. This is when the universities are tasked by government authorities to carry out a specific research assignment. The assignment funding can in this case come from any governmental institution, at either municipality, region or national level.

One way to divide project financing further is to look at the financier. Is it a government agency such as Vetenskapsrådet (VR) or is it at private foundations such as the Knut and Alice Wallenberg Foundation (KAW). Another way is to look at if the funding comes from Sweden or abroad, such as Vetenskapsrådet versus European Research Council (ERC) grants, and yet another way is to look at how narrow the financing is, again such as Vetenskapsrådet versus Formas.

The internal and external financing is not completely decoupled. A large fraction of external financiers will demand co-financing by the HEI's. Through this, external financing also controls parts of the internal financing. When it comes to how doctoral education is influenced by the financing of research the keypoint is who designs the doctoral student's project. When doctoral education is financed by internal financing, the norm will be that a potential doctoral student includes a project description in their application, and it is then the future doctoral student who designs their project. When the financing is external financing, the norm is often that the doctoral education is set within the frames of the overall project.

Financing of the individual doctoral education

For an individual doctoral student, HEO (7 Ch. 34§) states that at admission funding for a doctoral student should be secured for the entire duration of the doctoral education. There are however several different ways one can be financed as a doctoral student, we follow UKÄ's division, and below describe the eight different types of financing that doctoral students in Sweden can have.



Financing of the individual doctoral education

The most common form of employment for doctoral students is that of a **doctoral studentship** (Doktorandanställning, DTJ). This type of employment is regulated in the HEA and the employer is a Swedish HEI. The university has to offer full time employment, but it is specified in HEO (5 Ch. 3a§) that the doctoral students can request to be employed part time, the minimum employment rate is however 50%. In HEA it is specified that doctoral studentships, as a part of their employment, can have departmental duties (institutionstjänstgöring in Swedish). The doctoral studentship is limited to four years of full time education over a period of maximum eight years, however it can be extended due to different exceptions (HEO 5 Ch. 7§).

Doctoral students can also be employed by a university in **another university employment** (Annan anställning inom Högskolan, HTJ). An example of such a form of employment can be that of a lecturer, which is a permanent position. However, that the employment is more permanent is not necessarily the case. The enrollment can be at one university while the employment can be at another university which does not need to be Swedish.

Doctoral students can also be employed in the private sector and are then employed as **industrial doctoral studentships** (Företagsdoktorand, FTG). Here the company that handles the costs associated with the employment and the university those associated with the education. This means that the company pays for the salary while the university provides supervision, courses and is responsible for the defense. However the line between employment and education can be blurry, e.g. whether participation in a conference is to be considered a part of the employment or a part of the education. At some universities there is a formal agreement between the company and the university about what the two respective partners should provide. and in some cases the university is compensated financially by the company for the part that they provide.

We call doctoral students, who are employed externally but not in the private sector, **other external doctoral studentships** (Annan anställning utanför högskolan, AUH). The employment can be at government authorities, trade unions and similar.

The last type of employment exists for doctoral students, and it is that of **clinical doctoral studentships** (Anställning som läkare”, USL). In this case the doctoral student is employed within the health care sector in a clinical position which includes time doctoral education. The employment can be as a doctor, a nurse, a physiotherapeut, or similar.

Swedish research

Doctoral students who are employed by a Swedish employer, have the same social security rights as all other employees in Sweden. They have the right to pension, sick leave, parental leave and so on. When a doctoral student is on sick leave or parental leave they receive their compensation for their leave from Försäkringskassan and their salary will be paused. When their leave ends, their salary is continued and their financing (and time allocated) for doctoral studies are accordingly extended. Note that one can be working part time while on part time sick or parental leave, in that case one receives compensation for the part time leave from Försäkringskassan while the employer pays the part time salary.

All doctoral students who are employed are insured at their workplace by their employer, however those who are not employed by the university are not necessarily insured when they are at the universities through this insurance. In the cases where they are not, they are however still students and enrolled at the university, and therefore insured in the same way as doctoral students without employment are insured.

Doctoral students without employment

Not all doctoral students are employed and doctoral students who are not employed can hold two different types of non-employment financing **scholarships** (Stipendie, STP) and **doctoral grants** (utbildningsbidrag , UBB).

Scholarships are not an employment form, and doctoral students with scholarships do not have employment benefits such as pension. They are not entitled to the same compensation as doctoral students when on sick or parental leave, and they hold no formal right to holidays. Scholarships as financing for doctoral studies are today only to be used for one year- After that, the doctoral student is supposed to be offered employment as a doctoral studentship. However, there are exceptions to this, and in the case of overseas aid or capacity-building programmes or for certain EU projects such as the Marie Skłodowska-Curie Actions, scholarships may be used for more than a year. The scholarship should correspond to the salary of an employed doctoral studentship after taxes. The amount of the scholarship has to be equivalent to the salary of doctoral studentships that follows from the Swedish collective agreement HEO (7 Ch. 36§).

Another funding alternative is doctoral grants, which is paid by the universities own funds. Doctoral grants were earlier a common form of financing for doctoral students. However, since 2017 it has not been possible for new doctoral students to have this form of financing, and now there are few left.

Finally for some doctoral students their financing is unknown. This category is called others (Övrigt, ÖVR). This covers doctoral students who have run out of financing, but also doctoral students who use the student finance system or where the financing does not fit in one of the other categories, e.g. if the doctoral student is financing their education themselves out of savings or by working somewhere where the doctoral studies is not a part of the employment.

Combinations of financing forms

Doctoral students can belong to more than one of the eight categories mentioned above, and the categories that a doctoral student belongs to, may change during their studies. To understand how this works we give a few examples, but one should keep in mind that there are many others.

Many doctoral students who are financed by scholarships in their first year are later employed as doctoral students. Hence they start their doctoral studies belonging to one category, but by the end of it they have moved to another category. Also doctoral students can belong to two different categories at the same time, say if they have a doctoral studentship for 80% and another university employment for the last 20%.

Departmental duties

In the HEA it is stated that doctoral students who are employed as doctoral studentships by the universities may use up to 20% of their time on departmental duties. It is specified that the time doctoral students use on departmental duties leads to an extension of their employment. If the doctoral studentships have departmental duties for 20% of their time, their employment will correspond to five years of full time employment.

Often departmental duties come in the form of teaching and supervision tasks, but it is not limited to these tasks. How much and which departmental duties a doctoral student has is formally decided upon by the employer, which in the case of doctoral studentships is the university. However it is often something which is decided upon in agreement between the doctoral student and the department,

While the HEA regulates departmental duties for doctoral students who are employed as doctoral studentships, other doctoral students who are not employed as doctoral studentships can have similar responsibilities and will similarly have their financing extended by such duties.

Doctoral students who are employed outside of academia may carry out such duties at their employer or at the university. In many cases the amount of duties are limited to 20%, but this limit comes from the departmental duties that are regulated in the HEA and regards those employed as doctoral studentships. Doctoral students who have another employment than the doctoral studentship, they are still expected to be able to finish the doctoral education within eight years, so de facto any other task should not accumulate to more than on average 50% of their time. The amount of departmental duties that doctoral students who have another employment than doctoral studentship should be regulated in the ISP, the ASP, or in both.

Part 2

How to improve doctoral education



What is doctoral education?

While doctoral education in its essence is a very individual education there are still some common learning outcomes that all doctoral education must fulfill. These learning outcomes are specified in HEO (appendix 2). They are general but they still provide an important insight into what doctoral education constitutes.

Linking back to the previous chapter, when a doctoral student is enrolled it is these learning outcomes that the university has to provide the educational resources for such that the doctoral student can achieve these.

In Sweden the doctoral education is 240 ECTS, it consists of both research and courses. Each course is examined separately, while the research is examined in the doctoral thesis. The doctoral thesis, and thereby the research, should correspond to at least 120 ECTS, leaving at most 120 ECTS to course work.

A doctoral student should upon graduation have not only a specialized and expert knowledge within their narrow field of research but also a solid knowledge of their general research field. They should be familiar with scientific methods in general and in particular within their own field. Furthermore they should show the ability to analyze and assess new and complex questions, and be able to critically, independently, and creatively with scientific rigour to formulate new questions of relevance and identify where there is a need for new knowledge.

Though research is the main focus in doctoral education, it is not the only focus. The universities have three tasks and this shines through in the learning outcomes from the HEO for doctoral education. Doctoral graduates are expected to be able to, both orally and in writing, explain and discuss their research, both within academia but also within society in general. Similarly doctoral graduates are expected in research, educational, and other professional relationships, to contribute to the development of society and support the learning of others.

These expectations of doctoral education are ambitious, and in general we agree that doctoral education that includes all of these aspects, at least to some degree, is what is to be considered a good doctoral education. However, as doctoral education is an individual education, each doctoral student has to be aware of these expectations such that they can be integrated into the individual doctoral education. All of academia's three tasks need to be integrated from an early stage in doctoral education, and this leads us to the question about what role the introduction to doctoral education plays in terms of securing a good doctoral education.

The introduction to the doctoral education

As the previous chapter shows when enrolling in a doctoral education there are many regulations that new doctoral students need to be informed about. Doctoral education is a highly individual education, and as a doctoral student one is the main responsible for this education, and to some degree it requires that one can plan 4-5 years into the future. The introduction that doctoral students receive plays a key role in educating the doctoral students about their responsibilities and their rights.

A world-class doctoral education ensures that all new doctoral students are familiar with the learning outcomes. It ensures that doctoral students are introduced to the three tasks of academia: research, education and outreach. It provides the doctoral students with an overview of other regulations that their education takes place within. It addresses issues that doctoral students could encounter, either first-hand or through others, such as harassment and stress. It shows doctoral students where to turn for help if needed within academia, and given the high number of international doctoral students also outside of the universities. And finally a good introduction should introduce the ISP as a useful tool rather than an unnecessary burden

The ISP from an educational perspective

The individual study plan (ISP) is a mandatory document for all doctoral students enrolled at a Swedish university. It is also an essential document for both the university and the individual doctoral student as it states the commitments of the involved parties and is where planning and progress is recorded and evaluated.

The ISP is a tool that both governs the rights and obligations of the doctoral student as well as it should be helpful for planning the doctoral education. The document should include how the work is proceeding towards fulfilling the learning outcomes stated in HEO (appendix 2), and in any requirements as given by the ASP. This is also where the courses to take, the departmental duties assigned and the planning of the research project is described.

The ISP is more than just a document that needs to be filled in, it is also the process around the document. In order to make it useful, a discussion about its contents needs to be a part of the process. The process of getting an ISP approved can be experienced as bureaucratic. Hence, both the content and the process are two integral aspects of making the ISP achieve its full potential of being the backbone of the doctoral student's education.

In a world-class doctoral education, the ISP is a tool for regulating the doctoral education as well as for management of the doctoral education. It is clear what the purpose of the ISP is, and doctoral students receive feedback on their ISP's.

The resources in the ISP

Related to the rights of the doctoral student, the ISP should state the resources a doctoral student is entitled to. It states the resources that the university is obliged to provide the doctoral student with and for how long. The ISP and its working procedures are essential for the doctoral student and the possibility to graduate.

But besides these, other resources also need to be described as well. This includes the physical facilities that the doctoral student should have access to, such as laboratories, archives, work space etc, it includes equipment such as software that the doctoral student needs to have access to in order to carry out their research, and it should also include a description of what financing the doctoral student has access to. The latter should not only include information about where the financing of the individual doctoral student's salary or scholarship comes from, but also what financial resources are needed for different components of the doctoral education such as conferences, field trips, or costs associated with publications, and where these resources are to come from.

The supervision and the supervisor

The relationships between the doctoral student and their supervisors are perhaps the most important relationships of a doctoral education. In a well functioning relationship the supervisor becomes the gateway for the doctoral student into the world of research and academia. They are there to assist in the selection of relevant courses, help make ethical decisions in research, make sure that the doctoral student's progress is on track, and in general act like a mentor for the doctoral student.

Doctoral students must have both a main supervisor and at least one co-supervisor according to the HEO (6 Ch. 28§). Many universities have requirements on who is allowed to be a main supervisor to doctoral students. However the role of the main supervisor and the co-supervisors can vary, and it is therefore necessary to specify both their roles as well as their responsibilities in the ISP. In general the supervision should be followed up through the ISP.

The student-supervisor relationship highly impacts the doctoral student's ability and opportunity to conduct their research as well as their future career. How one ensures a good relationship between the doctoral student and their supervisor is one of the key questions in doctoral education. In order to secure such a relationship, it is important that both parties know and understand their role and their responsibilities.

In fields where the research is highly individual there is the risk that the doctoral student does not receive sufficient supervision. In fields where research is more collective, there is on the other hand a risk that research output becomes the only focus, and that the doctoral student is reduced to a research assistant.

Although all doctoral students have the right, according to HEO (6 kap. §28), to change supervisors if requested, it is often difficult to do in practice when say the funding for the position might also be tied to the supervisor, or in smaller research environments.

A world-class doctoral education requires that doctoral students receive adequate supervision, that supervisors are continuously trained in the task of supervision, and that doctoral students have more than one academic advisor that they can turn to for help. It also requires that the HEI supports the doctoral student in the cases where the supervision is inadequate. Finally it requires that supervisors have enough time and resources per doctoral student.

The role of the research environment

The relationship between the doctoral student and the supervisor can not stand alone. In the last year it has become evident how important access to research environments are for doctoral education. The research environment is made up of all the small interactions between the doctoral student and their academic network. It happens in supervision, it happens when the doctoral student attends colloquiums within the department, at conferences, or at summer schools. It happens in discussions during the lunch break, or when bouncing ideas off their office mates in the afternoon. It happens when the doctoral student engages in other aspects of academia as well, when teaching, doing outreach, and even in representational tasks. And it happens in many other places as well.

Research environments can span more than one university, and are not only present at the universities, they present in any interaction doctoral students have as researchers. Some other examples of research environments can be doctoral programs, collaboration with industry and civil society, and international collaborations.

Of course the premises of the department or the conference set some outer boundaries for where the research environment is physically located. But the research environment as we describe it above first and foremost happens in the interaction between the doctoral student and other actors in academia.

A world-class doctoral education demands the existence of a good research environment but also that the doctoral student is successfully integrated into it. A vibrant open research environment therefore needs to be maintained and developed to facilitate a world-class doctoral education.

The three tasks of academia

In the HEA it is stated in (1 Ch. 2§) that a HEI has three tasks. The HEI's exist with the purpose of providing higher education (teaching), carrying out research (research), and to share their work with the society (outreach). The doctoral education is also an education of the future researchers and educators at the HEI's, and these three tasks are the tasks that we expect tomorrow's academia to be able to do. Below we discuss their role in doctoral education.

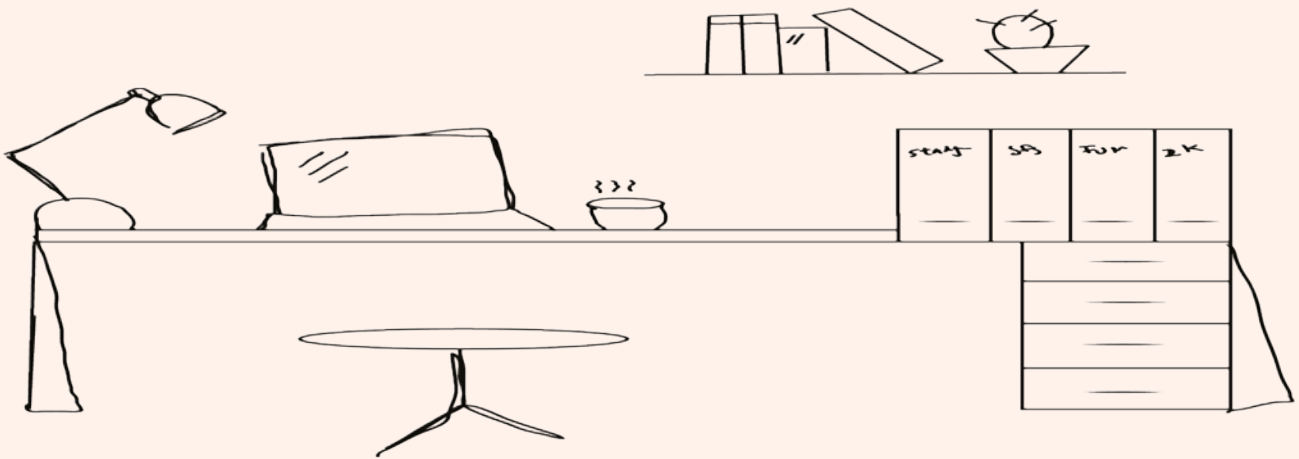
Teaching

Besides becoming independent researchers, doctoral students should also be trained to become teachers and supervisors for the first and second cycle education.

The teaching and supervision that doctoral students do is a part of their departmental duties. This can be as a teaching assistant, where tasks include to lead exercise or lab sessions, grading of exams, but it can also be as co-supervisors of bachelor or master thesis projects, or as a lecturer or course coordinator.

More than becoming a teacher and supervisor by actually performing the tasks and learning from more senior staff, it is recommended by SUHF that doctoral students take courses in higher education pedagogics. These courses can be taken either within the frame of departmental duties or as credits within the course part. Doctoral students should be given sufficient time for both the teaching and supervision and their participation in courses.

A world-class doctoral education should offer all doctoral students, no matter how they are financed, the opportunity to teach and supervise as a part of departmental duties. All doctoral students should receive basic training in how to act in the role of educators. Furthermore, we think that all doctoral students should have the possibility to do up to 15 ECTS in higher education pedagogics if they wish to. In a world-class doctoral education not only the formal training in teaching and supervision is supported but also the informal training.



Research

The doctoral education is a research education, according to the Salzburg principles, this means that doctoral students are expected to learn to become researchers primarily through doing research themselves. At the same time it is important to keep in mind that doctoral students are not fully fledged researchers when they begin their doctoral studies, but by the end of it they are expected to have transformed into independent researchers.

How one does research varies greatly from field to field. It can be anything from a highly individual process to a collective process. Similarly, what is understood by the term research project can be either narrowly or broadly defined. There is not one best practice for how research should be done, it depends on the field and the type of research in question, and this should also be reflected in the doctoral education.

In solitary research there is a risk that the doctoral student's research does not receive enough feedback, which limits the doctoral student's ability to grow as a researcher and to form networks for the future. On the other hand, in very project-based research the risk is that the doctoral student research is not independent enough.

In a world-class doctoral education, the training the doctoral student receives is balanced, and is neither too general nor too specialized. This means that in very specialized projects, it is important that doctoral students are also trained to conduct research more broadly and vice versa. While doctoral education is a specialized education, it should give the doctoral student the training to broaden their research perspective beyond a very narrow field.

Outreach

The ability to discuss research and research results with both the academic and scientific community, and society in general is part of the requirements for obtaining a doctoral degree in Sweden, per HEO.

Outreach to the academic and scientific community and can be done through scientific papers, presentations, seminars and workshops. The skills for performing this kind of outreach are acquired by doctoral students through learning by doing and feedback from supervisors and interaction with the research environment. The skill of communicating with the scientific community is, in practice, tested as part of the examination. But the role of doctoral education in society means that the doctoral student should be trained in outreach towards a non-academic audience as well.

Outreach skills are important for all doctoral students. For students who continue in academia, the skills are necessary in order to continue to contribute to fulfilling the role of HEI in society. For doctoral graduates who move on to work in industry, civil service, culture, or other sectors outside academia, outreach and communication skills constitute valuable transferable skills. However there is a large variation in the opportunities doctoral students get for developing and practising these skills.

A world-class doctoral education should ensure that doctoral students develop outreach skills early on, targeting both an academic as well as a non-academic audience. It should furthermore ensure that all doctoral students have the option to take courses in outreach if they wish to.

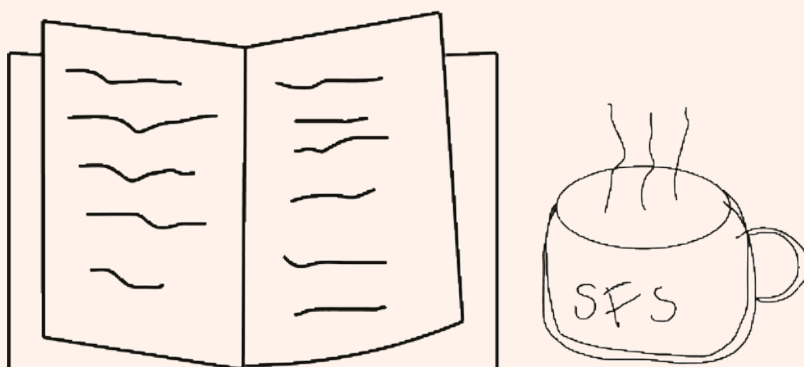
The purpose of course work

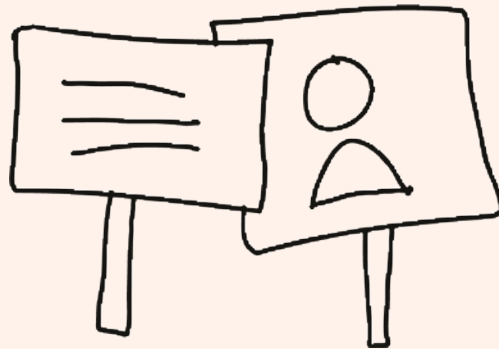
A part of doctoral education comes in the form of course work. Exactly how many credits a doctoral student needs to pass to obtain their degree is specified in the ASP. It is limited in HEO (appendix 2) to at most 120 ECTS, but often it will be between 30 ECTS and 90 ECTS. The courses the doctoral student takes are specified in the ISP.

The courses can come in many different forms. They can serve to ensure that the doctoral student gets the necessary general or specialized training in their own research field. Course work can also include courses in pedagogics, outreach, and in some cases even in transferable skill courses, such as courses in project management or innovation.

Mandatory courses for an entire doctoral program are specified in the ASP but it is rare that all courses in the doctoral program are mandatory. Doctoral students do not decide on their elective courses alone; rather, as the courses are specified in the ISP instead it is the head of the research program, or similar, that approves of the courses. In reality most doctoral students together with their supervisors have a lot of influence on their elective courses, but it is not unheard of that doctoral students are denied permission to take courses in outreach or even pedagogics.

A world-class doctoral education should make it possible for doctoral students to take courses to develop their skills in all three of academia's core tasks, i.e. research, education and outreach. There should be enough courses available for doctoral students to choose their courses such that the courses act to support them in their studies, mandatory courses should be given regularly, and it should be possible for all doctoral students to take courses at other Swedish universities.





The purpose of the thesis and the defense

The final step towards obtaining the doctoral degree is the defense of the doctoral thesis. This defense has to be public and the grading of the thesis happens in conjunction with the public defense.

The purpose of the thesis is, according to HEO (appendix 2), to show that through their own research the doctoral student can contribute to the development of knowledge, the thesis is the part of the doctoral education that evaluates the doctoral student's research, and should be at least 120 ECTS. There are, in general, two forms of a doctoral thesis, a monograph or a compilation thesis. The monograph is a unified scientific work, representing the entire research work done during the doctoral studies, while the compilation contains an introductory chapter ("kappa") unifying and summarising the work that the doctoral student has done together with a number of published scientific works. While formally the thesis and the defense are just two parts of what is required for a doctoral degree, they have a symbolic meaning as well

For a doctoral education to be world-class, the education needs to be designed so that there is the possibility for adequate feedback and supervision during the writing process. In a world class doctoral education is given opportunities to train for the defense as part of the education. This can e.g be done by presenting one's research throughout the education, in half time seminars or in pre defenses. Similarly the doctoral student receives feedback on the thesis in the writing process, and the thesis should be considered as something that could potentially also add to the doctoral student's outreach skills.

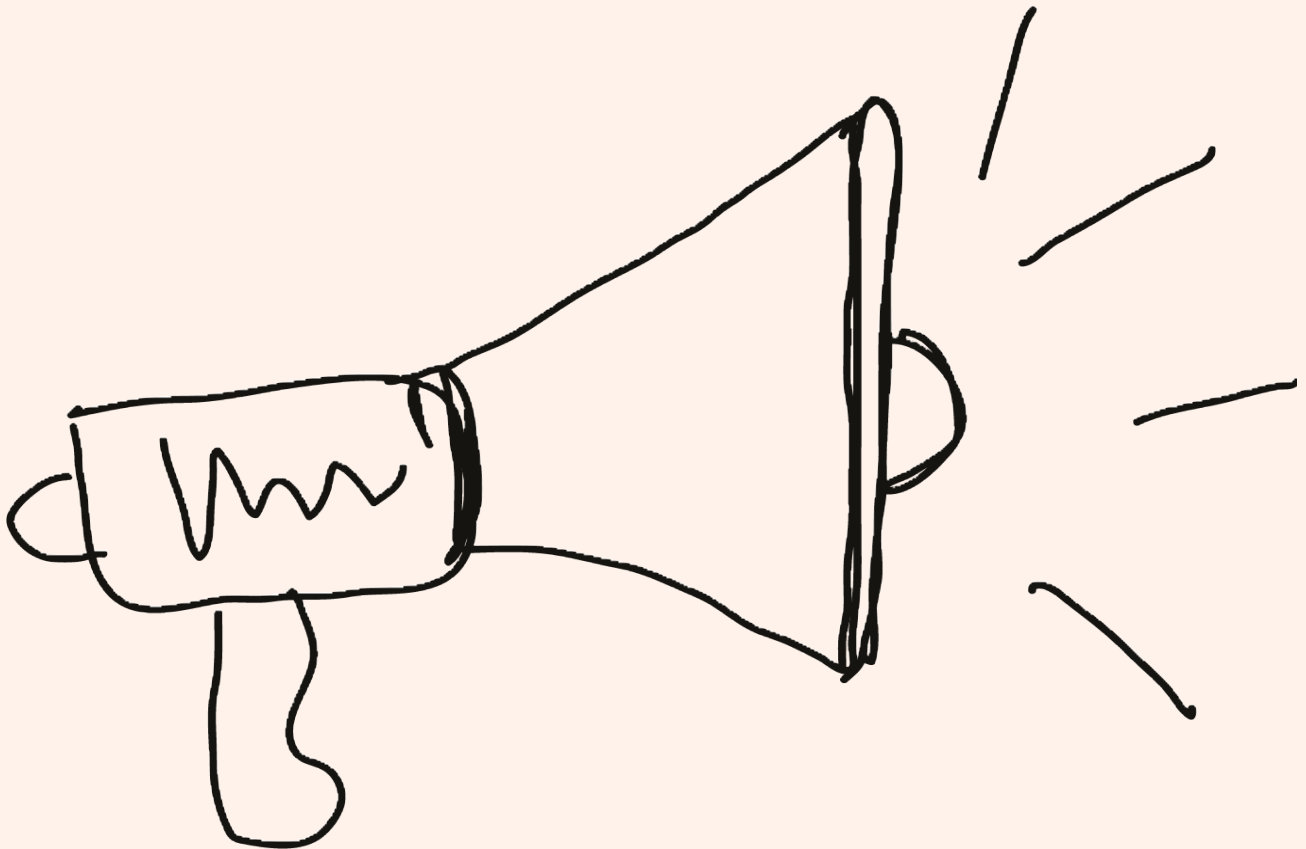
Doctoral students as independent researchers

The purpose of doctoral education is to transform the doctoral student into an independent researcher. By the end of the doctoral education the doctoral student should now be able to conduct independent research. It is crucial for ensuring a world-class doctoral education that the educational aspect is kept in focus, the output of the doctoral education is not the research that the doctoral student produces but the doctoral student itself.

While no two doctoral educations are identical, and it can therefore be hard to say what makes a specific doctoral education world-class, a good place to start is to ensure that the doctoral education is viewed as an education, and that doctoral students are given the support and the opportunities described in this chapter. But this cannot stand alone, a world-class doctoral education requires attention and it should be evolved

Part 3

How to improve doctoral education



Make a world class doctoral education!

What is a world-class doctoral education is a question which is worth millions and a question worth addressing. Doctoral education deserves attention as all other forms of education, hence there need to be forums where the doctoral education can be discussed and evolved, and these forums need to be accessible to doctoral students and/or their representatives. That the perspective of doctoral students should be included can, if given the opportunity, give a lot of relevant feedback on how to improve doctoral education and thereby how to improve the future of academia.

We would like to encourage those who work with doctoral education and doctoral students conditions to work inclusively. Centralize the relevant information and make it available in English. Ensure that doctoral students can voice their opinion in matters that regard their education, even if they do not speak Swedish.

Doctoral student representation within the student unions

We would encourage the student unions who represent doctoral students to consider how to make forums where doctoral students can voice their opinion about their education within the student union.

Work inclusively, not only when it comes to language barriers, but be aware that many doctoral students are not familiar with the Swedish student representational system and doctoral students' role in it. Ensure that doctoral students who represent are informed not only about the formal forums they are part of, but also of informal ones such as social media groups.

If your student union represents doctoral students, and there is an issue regarding the doctoral education then ask a doctoral student for input. And finally, let us in SFS-DK know how we can support your work.

Doctoral student representation at the HEI

We would like to encourage the university management to work towards centralizing relevant information, removing language barriers, and implementing SUHF's prolongation recommendations. As we see it this is an investment in tomorrow's academia.

Doctoral education and the UKÄ evaluations

It is UKÄ which is the Swedish government authority responsible for quality assurance of higher education and research, and appraisal of the degree-awarding powers of public-sector higher education institutions.

UKÄ works with quality assurance in many different ways, but relevant here are the quality assurance evaluations. There are four kinds of evaluations 1) "the institutional reviews of the HEIs' quality assurance processes", 2) "the programme evaluations", 3) "the appraisal of applications for degree-awarding powers" 4) "thematic evaluations" where topics that spans universities, such as the universities' work with broader recruitment, is evaluated. These evaluations are carried out as evaluations of how the universities work with ensuring quality.

In the context of doctoral education, evaluations of type 2 is where the quality of doctoral educations within a given field across universities are evaluated and type 3 is where the university colleges applications for the formation of new doctoral educations are evaluated. In these evaluations that focus directly on the quality of doctoral education, we wish that the ISP and the process that surrounds the ISP becomes a focal point, more than what is the case today.

We also wish to emphasize that here, as well as for doctoral representation at the universities, it is important that the doctoral student perspective is heard. It means that also the quality assurance process should work inclusively, and this includes addressing language and information barriers that doctoral students experience also in this process.

Suggested measures

Evaluation of the use of the ISP

The ISP is a legal document, but in many cases it ends up also being a project management tool. When it works well, this is great, however in many cases it does not work optimally. Even within a university there can be several different ways to use the ISP, and this makes it a challenge as a doctoral student to understand the role of the ISP. Hence we would like to see clearer recommendations for what the ISP should include, and clear guidelines for how it should be filled out and how feedback on the ISP should be given.

In SFS-DK we would like to see an evaluation done by UKÄ on how the ISP should be used in order to fulfill the role it has in doctoral education.

Remove barriers for doctoral student representation

We would like to encourage those who work with doctoral education and doctoral students conditions to work inclusively. Centralize the relevant information and make it available in English. Ensure that doctoral students can voice their opinion in matters that regard their education, even if they do not speak Swedish.

Implement SUHF's recommendations for representational tasks

We would like to encourage the university management to implement SUHF's prolongation recommendations. As we see it, this is an investment in tomorrow's academia.

Reviews of UKÄ's guides for evaluations

UKÄ's evaluations touch on many important aspects when it comes to ensuring quality in doctoral education. We would however like to see the focus on the ISP and the process that surrounds it strengthen as well as a revision of how educational resources, such as supervision and the research environment are accounted for in these evaluations.

A sustainable academia

As a doctoral student in Sweden one has good conditions compared to many other places, but this is not the same as there is no room for improvement. And in this context we wish to stress that doctoral education does not live a life decoupled from the rest of academia or the rest of society.

Many doctoral students struggle with their mental wellbeing or experience harassment. Ensuring equal opportunities between genders is one of the big challenges that academia has to address, but the discussion about equal opportunities should be broader than this. We need to talk about what academic culture we wish to have, and not only to ensure quality of doctoral education but in all of academia.

The career trajectory within and outside of academia is also something that needs to be addressed. Many doctoral students leave academia after graduation, this can be a hard transition, especially for international doctoral students, and how to make this a good transition is a question worth addressing. Also the scaling of doctoral education needs attention, in some fields the number of doctoral students has decreased significantly during the last 20 years. It should be remembered that the scaling of doctoral education affects the entire higher education sector.

We wish to also stress that academies role in society is ever changing. In these years there is both a push towards making science as open as possible, but at the same time more and more researchers experience threats when they share their research. In these years there is a large focus on academic freedom, and it is important that researchers are not censored in their research and do not experience threats. If faced with threats there is a risk that researchers, especially young researchers, become wary of sharing their results.

These are some of the issues that academia faces, and we hope that together we can work on how to address them, to make a more *sustainable academia*.

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