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## How the learning outcomes of the doctoral degree are conceived of and assessed in some research disciplines at Lund University – a report to the EQ11

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### Background

Doctoral education in Sweden has by tradition a quite informal structure and the main element of doctoral programmes is the practice of research. Doctoral students produce a substantial part of the research published at Swedish universities and they are also employed by the universities, at the latest two years into their studies but often as soon as they are admitted to a programme. Formal coursework is too an important element in Swedish doctoral education, but length and scope varies considerably between programmes. Doctoral education is structured through two documents: a general syllabus, decided by the faculties, and an individual study plan, that is designed for each student. The principal mode of assessment is the thesis. The formal decision to award the degree is taken by an examination board right after the student has made a public defence of his or her thesis.

In 2007, new degree outcomes were decided as a part of the Swedish implementation of the Bologna process. The outcomes are part of the Higher Education ordinance<sup>1</sup> and should be met by every student that is awarded the degree of doctor (Appendix 2). The new outcomes are quite broad and complex – and some are clearly difficult to assess by the thesis or the oral defence only. It is not known to what extent doctoral programmes at the universities have been reformed or indeed affected by these new outcomes, or if they are at all used for assessment purposes. It is important to point out that the introduction of the new degree outcomes has not been subject to any evaluation, so we do not really know if they are conceived as useful or even appropriate.

In 2011, a new national quality assurance system for the first and second cycle of Swedish higher education was put into practice. The system is designed to evaluate how well the intended learning outcomes for each degree are met. In 2012, the new quality assurance system will include also the third cycle. The role of the new outcomes in this process, however, is not yet decided. But it is a safe bet that they will have some part to play. Thus, there are several good reasons to explore the role of the new degree outcomes in the assessment of doctoral students at Lund University.

### Aim of the study

The study was carried out on behalf of the *Research Studies Council*. It should serve both as input to the EQ11 project and as preparation for the Higher Education Agency's upcoming evaluation of third-cycle education. The study aims to provide the faculties and the university as a whole with a picture of how the intended learning outcomes for the doctoral degree are conceived of, and if and how they are assessed in a sample of the research subjects at Lund University. The intention is that the compiled answers and analysis will be useful in the preparations for the upcoming third-cycle quality assurance activities. The discussion prompted by the requirement to answer the questions should be regarded as

<sup>1</sup> These degree outcomes are closely related to the third-cycle level descriptors in the QF-EHEA (2005).

important as the answers found. The overall question is how the faculties ensure that students awarded the degree of doctor have achieved the degree learning outcomes, through dissertation and other assessment procedures.

### **Method – a questionnaire to be answered collectively**

A questionnaire (in Swedish only) was designed around the new learning outcomes (see Appendix 1 for principal structure). It was to be answered collectively and officially by a relevant group appointed by each faculty. The faculties were asked to choose at least one research subject (guided by one general study syllabus) or one specialisation or research discipline within such a syllabus<sup>2</sup>, for the study.

The ten outcomes of the Qualifications Ordinance for the doctoral degree are so complex that they had to be divided into 19 items (Appendix 1). The respondents were first asked to answer to what extent an 'average' doctoral student was assessed in relation to the 19 items. Then they were asked how important each of the 19 items was conceived to be. The questionnaire concluded with a few general questions.

The questionnaire was distributed at the end of January 2011 and was to be returned no later than 10<sup>th</sup> of April 2011. By that date fourteen questionnaires were returned from the faculties. The groups appointed to the task differed. In most cases, a director of research education appointed a group of supervisors and doctoral students to discuss the answers, but in some cases, as in medicine, the faculty research committee, or some other official body (in one case it was the dean), had discussed and/or confirmed the answers. In most cases, doctoral students contributed to answering the questionnaire. The answers, therefore, represents more research disciplines than the fourteen returned questionnaires would suggest.

In order to present a report to the external panels of EQ11, a preliminary analysis of some of the data has been produced and is presented here. A final report, with an analysis of the full range of data gathered, will be presented in September 2011 to the faculties and to the *Research Studies Council*.

### **Results – a preliminary analysis**

The fourteen returned questionnaires represent the faculties in different ways (Table 1). Since the variation also within faculties is of interest and as no calculations will be made on the data, this is not compensated or balanced in this general overview. Nor does the number of questionnaires from each faculty correspond to the size of their research education. The aim of the forthcoming presentation is only to show the variation within the university.

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<sup>2</sup> The scopes of each general study syllabus differ between the faculties. In the faculty of medicine there are only a few syllabi, all designed in the same way, but in the humanities, for instance, each specialisation has its own general syllabus.

Table 1. Returned questionnaires related to faculty, discipline and group.

| Faculty | Number of quest. | Research subjects/disciplines                         | Group/level                   |
|---------|------------------|---|-------------------------------|
| LTH     | 3                | Combustion Engines, Automated Control, Bio-technology | Three groups close to subject |
| N       | 1                | Astronomy and Theoretical Physics (answered as one)   | One group                     |
| M       | 1                | Covers the whole faculty at a general level           | Faculty level                 |
| HT      | 3                | Theology, Archaeology, Literature                     | Three groups close to subject |
| S       | 1                | Political Science                                     | One group                     |
| EHL     | 3                | Business Administration, Economy and Economic History | Three groups, board           |
| J       | 1                | Cover several research specialties in law             | Faculty level                 |
| K       | 1                | Music   | Faculty level/dean            |
| Total   | 14               |   |                               |

*How are the degree outcomes conceived?*

The research degree often takes longer than the stipulated four years to achieve. The doctoral student may work 20% at their department, outside the doctoral programme, which adds an extra year to the process. It is also common that the doctoral students study part time (the minimum speed is 50%) or takes parental leave. Many of the university's present doctoral students thus started out on their programmes before the degree outcomes were introduced four years ago. This means that many supervisors perhaps have not yet integrated the new outcomes in their perspective on the supervisory task. Some of the free comments in the questionnaire illustrated that this was the case. For instance, one of the research disciplines in the humanities commented that the assessment of doctoral education should focus *only* on the thesis and refrain from judging the competence of the doctoral students in any other way. In some cases, the degree outcomes probably were quite unknown to some of the participants in the groups.

The degree outcomes were represented by 19 items (Appendix 1). The groups were asked to rate the importance of each of these items by answering the question: "How **important** do you consider this outcome to be for the qualifications the doctoral student should develop during his or her third-cycle education?". Figure 1 shows that the groups found most items to be very important or important. Only seven items are regarded as *less important* by some of the groups and only three items by more than two groups:

11. To present research findings in national contexts and in dialogue with society in general.
14. The capacity to support the learning of others.
15. The capacity to contribute to social development.

However, four groups or more have rated also these items as *very important*. There are no single outcomes rated to be only important or less important. The outcomes that are rated as *very important* by *all* of the groups are:

2. Advanced and up-to-date specialised knowledge in a limited area of the field.
5. The capacity for scholarly analysis and synthesis as well independent critical review.
16. Intellectual autonomy and disciplinary rectitude.

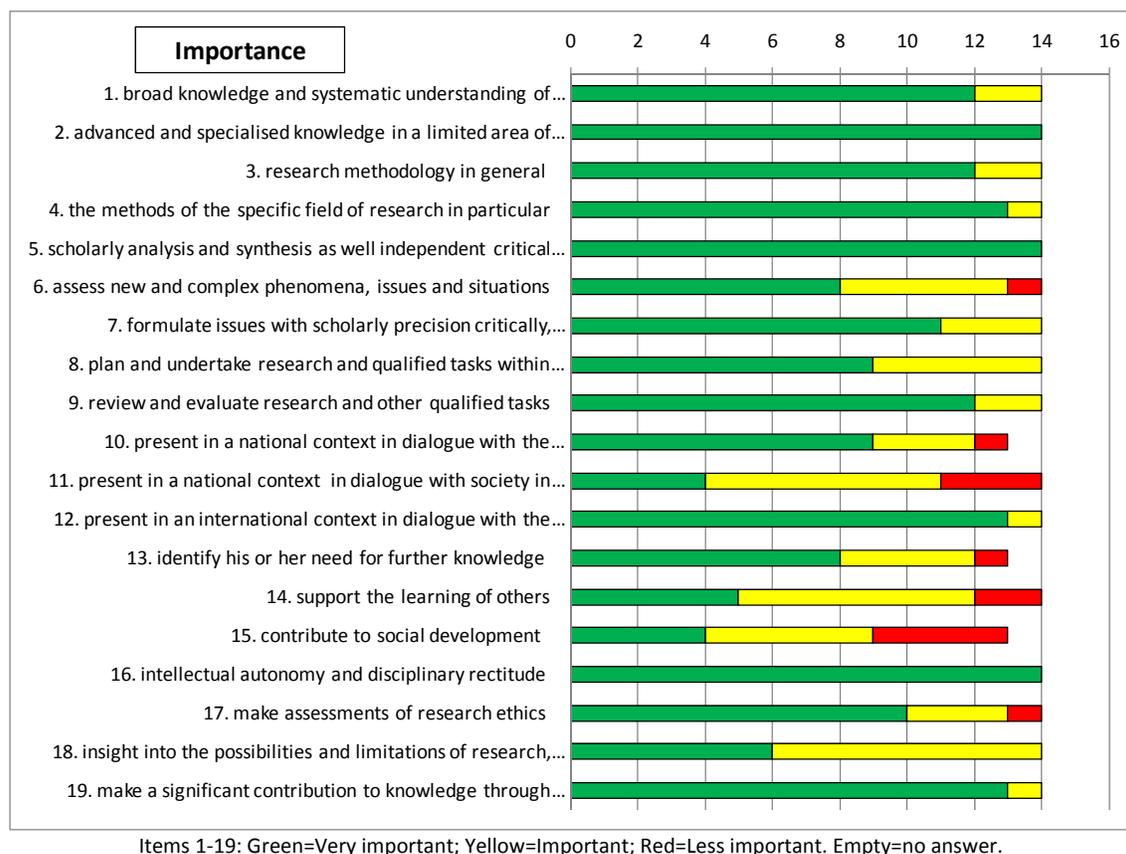


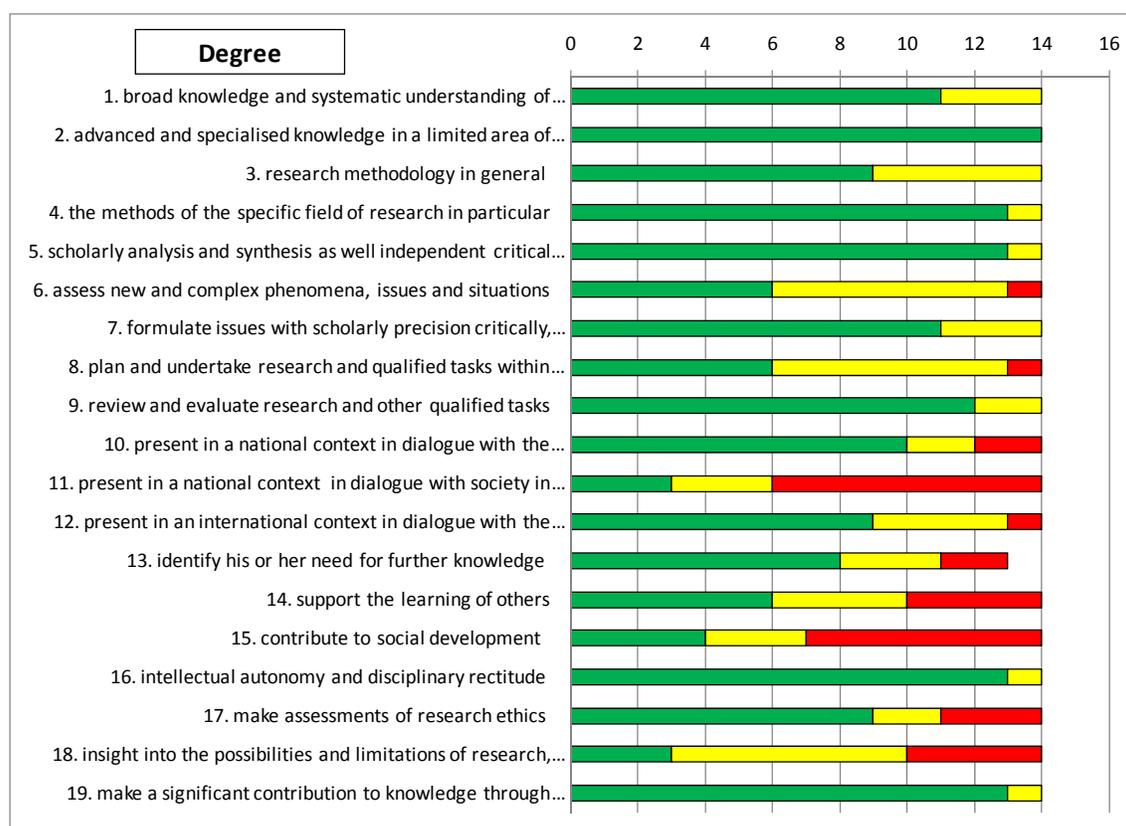
Figure 1. The importance of the degree outcomes for the qualifications the doctoral student should develop.

The outcomes where there are the highest level of agreement (beside items 2, 5 & 16 also 4, 12 & 19) outline a quite traditional view on doctoral education, where the task of the doctoral programme is to qualify the student as a researcher in the discipline. The items with a lower level of agreement are the ones pointing to a broader set of qualifications, as the capability to teach or to contribute to society.

The overall picture is that of a high degree of acceptance of the intended outcomes as important objectives for doctoral students. But perhaps the pattern had fallen out differently if the answers from the research disciplines were collected individually and anonymously? The questionnaire also asked for comments on the intended learning outcomes. A reflection from one of the groups at LTH was that the relevance of different outcomes varies a great deal between research disciplines. Another group puts forward that the outcomes aims at a quite high level of performance and may be hard to reach. A couple of comments focus the need to either simplify or clarify the outcomes, and one group concludes that several outcomes are more or less impossible to assess. But which of the degree outcomes are assessed and in what way?

*To what extent are the outcomes assessed during research education?*

The questionnaire was constructed to discern between 1) the extent to which the assessment of the thesis contributes to the overall assessment of the degree outcomes, and 2) the extent to which other assessment procedures add to the former, perhaps by assessing outcomes not easily assessed through a thesis. Looking at the answers and comments it is evident that some of the groups interpreted the construction as intended - but others did not. If one conceives of the thesis as the final proof of the doctoral student's competence and views *all* the other assessments during the programme as building up only to this performance, there will be no difference in the answers given to alternative A and C in the questionnaire (Appendix 1, page 2). But if one views the thesis as assessing *most* of the outcomes and the other assessments as tools to assess the *remaining* outcomes, and thus adding up to the full qualification, the construction of the questions works as intended. And since the results compiled from question A was more or less equivalent with results from question C it is relevant to show only the results from question C in figure 2. This, then, is the picture of to which extent the different research disciplines estimate that the different learning outcomes are assessed at graduation.



Item 1-19: Green=to a large extent; Yellow=to a certain extent; Red= to a small extent. Empty=no answer.

*Figure 2. The extent to which each learning outcome is assessed at graduation.*

The outcomes regarded as the most important also are the ones that most groups agree to be assessed to a large extent at graduation (Items 2, 4, 5, 16 & 19). It is also evident that the outcomes that several groups rated as less important are assessed to a smaller extent (Items 11, 14 & 15). But the overall picture contains a large variation and also shows that there are several important outcomes which according to several groups are assessed only to a certain or to a small extent:

- 6. The capacity to assess new and complex phenomena, issues and situations.
- 8. The ability to plan and use appropriate methods to undertake research and other qualified tasks within predetermined time frames.

12. To present research in international contexts in dialogue with the academic community.
13. The ability to identify his or her need for further knowledge.
17. To make assessments of research ethics.
18. Insight into the possibilities and limitations of research and its role in society.

Still, the variation is substantial and for the outcomes listed above other groups have estimated them to be assessed to a large extent (for item 12, 13 and 17 a majority of the respondents). For some of the outcomes, the variation can probably be attributed to inherent properties of the research disciplines. For example, the outcome “present in international contexts” (12) has very different meaning in Theoretical physics compared to Literature, reflecting differences in the character of both the research object and the research community. The two outcomes reported to be assessed to the extent least are about the capacity for dialogue with and service to society (items 11 & 15). Irrespective of differences between disciplines, these two outcomes are arguably difficult to assess through any thesis. Comments to outcome 14 (to support the learning of others) may explain also the results for item 11 and 15: the competence may be regarded as important, but activities building up to this competence are not viewed as necessary or mandatory parts of research education.

*Are there other assessments or examinations in the research programmes?*

For each outcome the groups were asked to describe if the doctoral student’s achievement was *assessed or examined* in any other way than by the thesis. The answers varied and included references to courses, seminars, peer-review of journal manuscripts, licentiate-thesis, conference presentations, the individual study plan, and informal discussions and meetings with the supervisor. The answers prompt a qualitative analysis that lays outside the time-frame allocated for this report, but interestingly the activities presented were described with very little reference to how they related to assessment. The activities presented were predominantly collective and social in nature, with feedback or judgement, if present at all, being quite informally handled. Accordingly, suggestions from the respondents for further development were mostly about new activities, and their potential for learning, rather than new ways to assess competence. Some research disciplines, however, suggested an academic portfolio to assess the outcomes not covered by the thesis. At the Medical faculty such a portfolio was introduced in 2009.

**Discussion – on the assessment of learning outcomes for the doctoral degree**

One effect of the shift to the outcome-oriented curricular perspective of the Bologna process is that all learning outcomes should be explicitly assessed and examined. In the first and second cycle of Swedish higher education, each individual course in the modularised curriculum has specific intended learning outcomes that are to be assessed. When an outcome-oriented perspective is applied to the traditions and informal structures of research education, some paradoxes become visible. The degree outcomes are broad, open and complex – and since research studies neither are nor should be modularised they are to be applied directly on a programme, which should be flexible: Programme structures should not be pre-defined in its details. Activities are to be developed along the way and adapted to the needs of the individual doctoral student. Most handbooks in “how to use learning outcomes” falls short facing such a challenge. To be fit for use in circumstances like this, the degree outcomes have to be transformed to serve the individual doctoral student more directly. And there is a document that may be adapted to the needs of the doctoral student and his or her research project – the individual study plan. One of the last questions in the questionnaire was: Is the individual study plan

designed in such a way that it provides support to ensure that the outcomes for the doctoral degree are achieved? Five of the respondents said that the study plan could be further developed in this respect.

From Figure 1 we can see an apparent agreement that most of the intended learning outcomes for the doctoral degree are seen as very important or important. From Figure 2, however, we can see that not all of these outcomes are assessed. The question how this “gap” could be filled is not served by a stereotyped answer. It is a situation to be interpreted and discussed with regard to the unique encounter between each doctoral programme and the degree outcomes. But judging from the comments from the different research disciplines, a clarification of which of the degree outcomes that are satisfied by the assessment of the thesis, could work as a starting point for educational development.

## Appendix 1

### **Qualifications Ordinance: Intended learning outcomes for the doctoral degree, broken down into the items used in this questionnaire**

For the degree of Doctor of Philosophy the third-cycle student shall

1. demonstrate broad knowledge and systematic understanding of the research field,
2. demonstrate advanced and up-to-date specialised knowledge in a limited area of this field,
3. demonstrate familiarity with research methodology in general,
4. demonstrate familiarity with the methods of the specific field of research in particular,
5. demonstrate the capacity for scholarly analysis and synthesis as well independent critical review,
6. demonstrate the capacity to assess new and complex phenomena, issues and situations,
7. demonstrate the ability to identify and formulate issues with scholarly precision critically, autonomously and creatively,
8. demonstrate the ability to plan and use appropriate methods to undertake research and other qualified tasks within predetermined time frames,
9. demonstrate the ability to review and evaluate research and other qualified tasks,
10. demonstrate the ability in national contexts to present and discuss research and research findings authoritatively in speech and writing and in dialogue with the academic community,
11. demonstrate the ability in national contexts to present and discuss research and research findings authoritatively in speech and writing and in dialogue with society in general,
12. demonstrate the ability in international contexts to present and discuss research and research findings authoritatively in speech and writing and in dialogue with the academic community,
13. demonstrate the ability to identify his or her need for further knowledge,
14. demonstrate the capacity to support the learning of others both through research and education and in some other qualified professional capacity,
15. demonstrate the capacity to contribute to social development both through research and education and in some other qualified professional capacity,
16. demonstrate intellectual autonomy and disciplinary rectitude,
17. demonstrate the ability to make assessments of research ethics,
18. demonstrate specialised insight into the possibilities and limitations of research, its role in society and the responsibility of the individual for how it is used,
19. demonstrate the ability to make a significant contribution to the formation of knowledge through his or her own research.

## Principal structure of the questionnaire:

**1. For the degree of Doctor of Philosophy, the third-cycle student shall:  
– demonstrate broad knowledge and systematic understanding of the  
research field.**

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**A.** To what extent is this outcome assessed through the completion of the **thesis**?

to a small extent       to a certain extent       to a large extent

Space for comments:

**B.** Is the doctoral student's achievement of this outcome assessed or examined **in any other way** during his or her third-cycle education?

Please give details:

**C.** In the light of both the assessment of the thesis and any other assessment:

To what extent do you consider that this outcome has been **assessed when the student graduates**?

to a small extent       to a certain extent       to a large extent

Space for comments:

**D.** How **important** do you consider this outcome to be for the qualifications the doctoral student should develop during his or her third-cycle education?

very important       important       less important

**E.** If you have answered *to a small extent* or *to a certain extent* for question **C**: What do you feel would be a desirable development to be able to better guarantee doctoral students' skills on graduation with regard to this outcome?

Please give details:

## Appendix 2

### Qualifications Ordinance: Doctor of Philosophy

#### Scope

A Doctor of Philosophy is awarded after the third-cycle student has completed a study programme of at least 240 credits in a subject in which third-cycle teaching is offered.

#### Outcomes

##### Knowledge and understanding

For the degree of Doctor of Philosophy the third-cycle student shall have:

- demonstrated broad knowledge and systematic understanding of the research field as well as advanced and up-to-date specialised knowledge in a limited area of this field, and
- demonstrated familiarity with research methodology in general and the methods of the specific field of research in particular.
- demonstrated the capacity for scholarly analysis and synthesis as well to review and assess new and complex phenomena, issues and situations autonomously and critically
- demonstrated the ability to identify and formulate issues with scholarly precision critically, autonomously and creatively, and to plan and use appropriate methods to undertake research and other qualified tasks within predetermined time frames and to review and evaluate such work
- demonstrated through a dissertation the ability to make a significant contribution to the formation of knowledge through his or her own research
- demonstrated the ability in both national and international contexts to present and discuss research and research findings authoritatively in speech and writing and in dialogue with the academic community and society in general
- demonstrated the ability to identify the need for further knowledge and
- demonstrated the capacity to contribute to social development and support the learning of others both through research and education and in some other qualified professional capacity.

##### Judgement and approach

For the degree of Doctor of Philosophy the third-cycle student shall have:

- demonstrated intellectual autonomy and disciplinary rectitude as well as the ability to make assessments of research ethics, and
- demonstrated specialised insight into the possibilities and limitations of research, its role in society and the responsibility of the individual for how it is used.

##### Research thesis (doctoral thesis)

For the degree of Doctor of Philosophy the third-cycle student shall have been awarded a pass grade for a research thesis (doctoral thesis) of at least 120 credits.

#### Miscellaneous

Specific requirements determined by each higher education institution itself within the parameters of the requirements laid down in this qualification descriptor shall also apply for a degree of Doctor of Philosophy with a defined specialisation. Ordinance (2008:132)