

# Master's degree: What do we expect from our supervisors?

Our employees at the Institute of Physics have various experiences supervising master students. Some follow up on the students conscientiously, and perhaps help them more than they should. How are the students supposed to acquire the learning outcomes we have decided (see attachment) if the supervisors do not entrust the students with the responsibility to do it themselves? On the other hand, some supervisors do not follow up on their students enough. They end up working on their own too much and are afraid to ask for guidance when they need it. These students hardly acquire the learning outcomes we expect them to either. The student administration meet quite a few frustrated master students and wishes the institute to take more responsibility in order for the supervision of master students to become more predictable than it already is. This is also something the management and UU are concerned with. This note suggests some possible options.

## 1. Project description

The learning outcomes states the following: "...can plan and manage a research project". An important foundation for this outcome is that enough work and effort is put into the project description already the first semester. Some students claim the project description to be useless when writing their master thesis, and that it is just some administrative nonsense requested by the student administration. Other students receive an almost complete project description from their supervisor, and have no real understanding of its content. Some supervisors express that the project description is of no value; instead, you have to wait and see what happens during the project.

It is important to remember that the master's degree today is regulated in a completely different way than previous years. The aim is for the students to complete their studies in two years, these are hard deadlines, which one cannot expect to change. This means that the planning of the master thesis must be taken more seriously than some supervisors have done previously. Luckily, today the student and the supervisor is supposed to work closely together on the project description. With this, we can accomplish a more thoughtful document that both the student and the supervisor can look back at occasionally to evaluate if the plans are working and if the progression is good enough.

## 2. Expectation clarification

It is very important during the master's degree that the student and supervisor communicate openly about the responsibilities. Do both agree on whether a student should learn a special theory, experimental method or numerical modelling completely on their own, or how much is the supervisor supposed to contribute? If the supervisor will contribute, at what time should it happen? A great deal of considerations such as these needs to be clarified already in the project description.

However, there will be a need to be more detailed once in a while throughout the process. We strongly recommend that all supervisors meet with their students at least twice per semester where *expectation clarification* is the main subject of discussion. This could also be a good opportunity to evaluate whether the student is following the agreed upon progression in the project description, and if not what measures need to be taken to correct the situation. It also needs to be made apparent which expectations the supervisor and the research community have regarding attendance to seminars, group meetings etc. In most cases, it would be wise to have a fixed agreement on when

to meet each week where the supervisor and the student can discuss and decide on more day-to-day issues.

### **3. The master thesis is not a mini-PhD**

Some might take offence of this headline. If we compare learning outcomes for a master thesis and a PhD thesis, there are many similarities. The reason behind the headline is to point out that a master thesis has a greater degree of supervision than a PhD thesis, and that you are not necessarily supposed to end up with results you can publish. Some supervisors expect the master students to write scientific articles and value this more than the students finishing their master thesis in time. That is not OK! A master's degree should result in a thesis! The work does not have to be published in a scientific journal. If one can do both, that is great, but the main priority is the master thesis!

### **4. The master's degree has a lot of learning outcomes!**

When reading the learning outcomes for the master program (see attachment), you realize that there is actually a lot of different aspects mentioned. We especially expect the student to mature and develop a more reflective attitude to research and science as well as our role/responsibility in society. We are not supposed to graduate ignorant idiots! This means that we as supervisors have to reconsider our responsibilities and not just make sure the students can get through the research.

We are currently attempting to relieve the supervisors in some areas. First we wish to give the students training in scientific writing through the "Writing Science" program which now is mandatory for the master students in physics from the fall of 2019. The other master programs will hopefully follow up and offer something similar to their students (Electrical engineering already have something similar in place). There is also a mini course in place on how to use the library, in addition we should encourage our students to participate in the course about scientific communication (MNKOM4000 – Communication and scientific journalism) or in courses given by the Career center.

We could get better at organizing collective gatherings to cover the learning outcomes that are of general character in order for more students to be able to get educated at the same time. Suggestions are welcome! It is important that we rationalize our job in order for the supervision of master student is to become as efficient as possible. At the same time, we need to remember that we are responsible for the entirety, what we cannot get others to cover; we have to take responsibility for ourselves.

### **Summary: Main points**

- A supervisor has to take responsibility for the project description to become a common project between the student and the supervisor, and that the document becomes an important tool to follow up on the project for the remainder of the master's degree.
- Expectation clarification should take place at least twice per semester the last three semesters of the degree.
- The master's degree ends with a master thesis. Publication in scientific journals is not required, and must have a lesser priority than the thesis.
- The learning outcomes for the master's degree are broad. It is the supervisors' responsibility that the different aspects are taken seriously. However, organizing courses together could potentially relieve the supervisors' workload a bit.

- This document should be read by students and supervisors before the work on the project description starts.

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ATTACHMENT:

Learning outcomes (Master in Physics used as an example)

After having completed a Master's degree in Physics, you have obtained:

## Knowledge

You have insights in physics at an advanced level:

- You have thorough knowledge in physical theories, models and methods within your program option.
- You have broad knowledge of relevant experimental and numerical Methods.
- You have broad knowledge regarding advanced analytical models and methods in physics.

You have developed professional intuition and comprehensive understanding which makes it possible to present and discuss physics problems, results and uncertainties.

## Skills

You can develop and apply advanced analytical, numerical and experimental methods used in physics:

- You can apply already acquired methods to new problems.
- You can execute preliminary simulations and experiments in order to approach new phenomena/problems.
- You can apply the relevant analytical, numerical and experimental methods to examine the problem/hypothesis:
- You can (one or several):
  - develop and utilize measurement devices and execute advanced experiments
  - develop and apply advanced analytical models
  - implement numerical methods and use existing programs

You can structure and present scientific data that is being produced.

## General competence

You develop professional competence through work with physics:

- You develop professional maturity and can work independently.
- You can communicate topics of physics to peers, experts from other disciplines and the general public.
- You can plan and manage a research project.
- You are familiar with principles for commercial activity and innovation.

You can reflect on and develop learning strategies for lifelong learning.

You have values and attitudes that create the basis for sound development and use of the subject:

- You have an understanding of both pure and applied research.
- You are familiar with the scientific requirements of verifiability and sharing of knowledge.
- You understand ethical aspects of your role as a professional and can reflect ethically on the methods and their applications.
- You can assess the aspects of health, environment and safety for your own work.