Designing “coursework” for Third Cycle Degrees

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Degrees in Norway

The Norwegian system for higher education has changed significantly during the past fifty years. A very open academic system with a great deal of flexibility has gradually been restructured to a school-like system of increased rigidity. The system as now found is a modern Bologna-compatible model with compact well defined degrees of shorter duration than in the past. A Bachelor (3 years) is followed by a Master (2 years) with a Ph.D. (nominally 3 years) to complete the standard path.
At first/second cycle levels the changes have at least on paper been a question of rearranging an approximately six-seven year system, into a somewhat shorter three year bachelor (first cycle) followed by a two year master (second cycle) system.

Changes at doctoral level have been extensive and involved the introduction of doctoral studies designed to form the central element in a structured research education. The traditional doctorate (dr. philos.) normally obtained after a substantial academic career has been largely replaced by a PhD degree which is regarded as training for research. The consequences have been multifaceted and continuing.
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Doctorates awarded in Norway 1980-2008
(increasing numbers)

Source: The Doctoral Degree Register/NIFU STEP
Doctoral candidates 1990-2008. Percentage with non-Norwegian citizenship at the time of dissertation (increasing diversity of background)

Source: The Doctoral Degree Register/NIFU STEP
The Challenge for the Institutions

The new doctorate (PhD) must:

• Cater for a much larger number of candidates.

• Cater for candidates with a more diverse educational background.

• Ensure quality of the Ph.D. graduate (Which means what?)
Doctoral graduates

• Are capable of critical analysis, evaluation and synthesis of new and complex ideas;

• Can communicate with their peers, the larger scholarly community and with society in general about their areas of expertise;

• Can be expected to be able to promote within both academic and professional contexts, scientific and technological advancement in a knowledge based society.

(Reference Points for the Design and Delivery of Degree Programmes in Chemistry, Tuning)
Suggested elements to be developed

• Work in an interdisciplinary team: thus it is vital that the PhD student continually looks outside the narrow area of the research project

• Problem-solving: one could say perhaps say that the whole purpose of our scientific training is to make us capable of problem-solving on ever higher levels.

• Communication and dialogue: communication and defence of one’s own results and discussion of their relevance.

(Reference Points for the Design and Delivery of Degree Programmes in Chemistry, Tuning)
General/transferable skills

Doctoral training aims to qualify the PhD candidates for research activities and other kinds of work requiring a high level of scientific insight.

In addition to conducting independent research resulting in a scientific dissertation, the doctoral candidate shall also acquire advanced theoretical and methodological competence and communication skills, particularly aimed at disseminating academic work to students and the general public. Supervisors, research groups and research schools are responsible for strengthening general and transferable skills and offering special targeted training or courses that meet the PhD candidates' skills development needs.

(Univ. Bergen, Policy statement)
Ph.D. Students: Teaching and studying

The extent to which teaching in laboratories, colloquia groups etc leads to the improvement of transferable skills has been discussed and generally agreed to have a positive effect.

Graduate students in Norway are of two types. Those funded by the University for four years are expected to carry out teaching duties corresponding to one academic year.

Those funded independently are expected to complete their studies during three years but to carry out no teaching duties.

Even this small difference is often acknowledged when appointing staff, with those having teaching experience being preferred.
Content of PhD Programmes
(Research and other elements)

Balance between research and coursework. Discussion in Norway has followed the European trends with general agreement that transferable skills can only be adequately developed through such coursework.

Arguments against this have largely been along the lines:
- I did not need coursework
- It takes time from the research work
- It breaks the concentration of the candidate
- It violates the trust between supervisor and candidate
Content of PhD Programmes
(Research and other elements)

Discussions on how much coursework should be included have been wide ranging and thorough. Initially a total of 60 ECTS credits was required in the course of a three year programme (short-lived dr.scient. programme). However it was rapidly found that the research component could not be accomplished with so much coursework. The result was an adjustment which has led to a final position with 30 ECTS coursework.
Coursework - 1

At the start of the new PhD programmes, the tendency was to demand that all 30 ECTS points (10 vekttal, 30 studiepoeng) be taken at the highest available level within the subject being studied. Specialised courses were often set up to cover this requirement. The putative reason was that such high level courses would ensure top level PhDs irrespective of their educational background.

Levels:

- Introductory/Basic: 100 codes (Bachelor)
- Intermediate: 200 codes (Bachelor/Master)
- Advanced I: 300 codes (Master/Doctoral)
- Advanced II: 400 codes (Doctoral)
It was quickly realised that courses from other disciplines might be more useful to the PhD candidate and it was possible and in some cases recommended that these be included. This opened the way to interdisciplinary degrees (physics - archeology, chemistry – geology, mathematics – meterology etc). At the same time this meant that courses at intermediate level could be included.

This development has generally led to a more outward looking project and to ensuring a broader approach to the research project itself. (Formalised joint supervision etc.)
Having first decided that 30 ECTS credits of the core discipline might not be the best solution for a modern degree, discussions were started on what components could be included other than traditional courses.

The first approaches were still of a course-like character, summer schools, intensive courses etc. and these were generally restricted to less than 20% of the coursework requirement. These are of course still very much like “taught” modules, but they did open the door to a broader debate on what might be included.

This debate was further animated by European discussions on transferable skills and their usefulness.
Movement away from standard taught courses has been increasingly encouraged in the last five years. Both international and national specialised courses, research schools and workshops may be included although the requirement for a minimum of standard courses has been retained (10+ ECTS seems normal in science). Additional individualised courses based on specialised reading are also included.

All of this development is designed to broaden the disciplinary base of the candidate and to improve employability.

A recent development with a societal focus has been to encourage all candidates to include in their course programme an ethics course (usually 3-5 ECTS credits).
The above coursework are all essentially designed to provide the candidate with knowledge of his own and surrounding disciplines. While this will in many cases involve contact outside his/her own immediate circle it does not generally expose the candidate to the world outside.

This has been seen as an important requirement in Norway, and has now been built into the Ph.D. in the form of a requirement for “Knowledge transmission”. Currently regulated to 3-5 ECTS credits this requires the candidate to present his/her results or field of work to a broader audience in the form of a poster presentation, a lecture, a popular scientific article etc. Normally two such presentations are included in the doctoral programme.
Who decides?

- The programme for the coursework is submitted by the candidate and his two supervisors together with the research project. This is then examined by a departmental committee and then by a faculty committee, either of which can require changes.
Situation today

• The course work components in science today might be (25 ECTS Formal and 5 ECTS Knowledge transmission):

• Part 1:
  – Standard courses 10 ECTS
  – Special reading 7 ECTS
  – Ethics 3 ECTS
  – Summer school 5 ECTS

• Part 2:
  – Presentation at national conference 1 ECTS
  – Popular science article 1 ECTS
  – Knowledge transmission 3 ECTS
## Example 1

### Part 1
- **PHYS391** Datasystems for experimental physics: 10 ECTS
- **PHYS321** Computer aided construction electronics: 10 ECTS
- **MNF490** Scientific theory and ethics: 3 ECTS
- Research School (Development and applications of intelligent detectors, 1 and 2): 4 ECTS

### Part 2
- Presentation at international conf.: 2 ECTS
- Popular science article: 2 ECTS

**Total:** 31 ECTS
Example 2

Part 1
MAR354 Sea food quality 10 ECTS
BIO332 Phylogenetic methods 5 ECTS
BIO323 Parasitic protozoa 5 ECTS
MNF490 Scientific theory and ethics 3 ECTS
Research School (to be decided) 2 ECTS

Part 2
Presentation at international conf. 2 ECTS
MNF490 Knowledge transmission 2 ECTS
Lecture over a given theme 1 ECTS

Total 30 ECTS
Conclusion

The discussion about the amount and nature of coursework in PhD studies in Norway has arrived at a stable situation. There is no reason to believe that further changes will not take place. Everything suggests that further changes will be in the direction of a broadening of acceptable components.