

Management of the Level of Coursework in PhD Education: A Case of Sweden

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Abstract

PhD programs around the world include a variable amount of coursework. Using a curriculum design perspective, this paper explores the pros and cons of using different levels of coursework in PhD education. Inefficient management of coursework can jeopardize the quality of the PhD programs, since the students will be forced to devote less time to their research. On the contrary, coursework can also become a powerful teaching and learning activity that can help the PhD students to attain the intended learning outcomes of the program. However, a deep involvement of the administration and supervisors in the design of coursework is necessary for the latter case. Although the paper uses the Swedish system as a reference, most of the discussion is well applicable to most PhD programs elsewhere.

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1. Introduction

Most universities in the world require coursework in their PhD programs. In the case of Sweden, every single department has the freedom to define their own rules regarding the minimum amount of points required to defend a thesis. The differences are actually huge even within the same university. For example, the Medical Faculty at Linköping University requires as few as 33 ECTS, which can be accomplished in a bit more than a semester, while the Department of Mathematics at the same university is requiring 120 ECTS to its doctoral students, which corresponds to two years of work, exactly half the time of the whole PhD. Since the number of required credits does not seem to be correlated with the quality of the defended theses, the question that naturally arises is: what is the ideal amount of coursework for a PhD? Answering this question is extremely relevant for administration, supervisors and students, since they have to plan the best way to manage PhD students' time in order to achieve the final goals at the end of the doctorate, which can improve the global quality of the PhD program. A timely and well-chosen coursework can be beneficial for the student, while late or non-relevant ones can be seen as a waste of time and resources, jeopardizing the final results of the PhD.

The best way to find an answer to this question is to analyze the PhD education management from a curriculum design perspective. Thus, the main aim of this paper is to theorize about the purposes of coursework in PhD studies from a curricular perspective. The final goal is to give some tools to the administrators and supervisors for making better decisions regarding the most appropriate coursework PhD students should follow for attaining the intended learning outcomes (ILOs) of the PhD programs.

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The paper is structured as follows. Section 2 describes the purposes of coursework from a curriculum design perspective. Section 3 shows some possible explanations for the large amount of coursework required by some PhD programs. Section 4 describes different types of coursework in PhD programs and its implication in the design of PhD studies. Finally, Section 5 summarizes and discusses how coursework should be used in PhD education based on the discussion of the previous sections and the observations made at different universities. Although the paper uses the Swedish system as a reference, most of the discussion is well applicable to other PhD programs elsewhere.

2. Coursework from a Curriculum Perspective

Curriculum can be seen as all activities designed or encouraged to promote the ILOs of the students (Ross, 2000). While curriculum design for primary, secondary and higher education studies have largely been studied, the specific topic of curriculum design for PhD studies is relatively new (Gilbert, 2004). However, the methodology for designing curricular programs, with certain particularities, involves similar steps. In general, designing a curriculum involves answering the following questions (Moreno et al., 2005; Ministerio de Educación Nacional, 2010):

1. What is the relevance of the program for the society?
2. How should the studies be structured and why is that the most effective way to do it?
3. What is the profile of the accepted candidates to the program?
4. What are the intended occupational and professional profiles of a graduate?
5. What are the ILOs of the whole program?
6. Which mechanisms are going to be used in order to assess whether or not the students have attained the ILOs of the whole program?
7. How objectives of the actors involved in the program are aligned with the ILOs of the program?
8. How is the quality of the program assessed and guaranteed?
9. Which resources are available in order to help the students to attain the ILOs?

Not all of these questions are directly related to coursework, so the discussion will be focused on the relevant ones in the following subsections (Questions 3-7).

2.1. Profile of Candidates

The first important question is related to the profile of the accepted candidates to the doctoral program (Question 3). The main purpose of requiring a certain profile for the candidates is to assure that most of the students will finish the studies in a pre-established amount of time, 4 years in the case of most universities in Sweden. Usually, a master's degree or its equivalent is required. However, there are different types of masters that are offered around the world. They can be classified into two main groups: one where the focus is to deepen the knowledge in a specific area, and one another where the focus is to develop research skills (Consejo Nacional de Acreditación, 2010). Evidently, students that have a research-oriented master's degree are expected to have more chances to advance quicker in their PhDs, although this is not always the case. However, it is difficult to argue that coursework in a PhD program can help students who did not followed a research-oriented master's degree to develop their research skills. On the contrary, it seems more natural to promote research skills through supervised research as it is performed in research-oriented master's studies (Drennan and Clarke, 2009).

2.2. Profile of Alumni

The second relevant question is related to the profile of a PhD graduate (Question 4). A fresh PhD usually has two options of employment: to go either to academy or to industry. In the first case, the PhD is supposed to do a postdoc. It is not a secret that most of the offers for postdoctoral positions give more importance to the quality (and sometimes also the quantity) of candidate's scientific production rather than to the grades and amount of courses they took during their doctoral studies. In the second case, it is difficult to create a unique profile of the PhDs required by the industry. However, a general skill expected by the industry is the capacity of the PhD to bridge the gap between research and generation of tangible products and services. Such a skill can be developed in different ways, one of them is through coursework. This means that it could make sense to make mandatory a few courses whose aim is to bridge the aforementioned gap, at least for industrial PhDs.

Another scheme that has been proven effective to tackle this problem is to offer funds for hiring PhDs to university-industry consortiums. In this case, the PhD student will face the challenges of both sides at the same time. In the case of Sweden, big funding agencies, such as The Swedish Research Council and Vinnova, have succeeded in applying such a scheme to PhD studies. For instance, The Swedish Research Council regularly opens calls for industry PhD projects (Vetenskapsrådet, 2013).

2.3. Intended Learning Outcomes of the Program

A third question to analyze has to do with the ILOs of the whole program (Questions 5 and 6). It is clear that different challenges, concerns and circumstances over the years and countries have made change different doctoral programs in very different ways. Thus, one can find different types of doctorate even within a specific country. For instance, Winter et al. (2000) and Gilbert (2004) describe many different types of doctorate in the USA, which range from fully coursework-oriented to fully research-oriented studies. While large amounts of courses make sense for the former, the same is not clear for the latter case. This means that, research-oriented PhDs with mandatory large amounts of courses might have contradictory aims. As it is well-known, the tradition in most European countries has been to have research-oriented PhDs. Within the research-oriented category, there has been an increasing awareness that quality of the studies have not only to do with the quality of the scientific production of the PhD candidates, but also with their acquired research skills. In this sense, the ILOs of the PhD programs are changing from delivering a final product of quality (the thesis) to developing skills and expertise for doing research (Deem and Brehony, 2000). Definitely, such skills can be better attained through appropriate research supervision rather than through coursework.

In the Swedish context, The Swedish Higher Education Authority (2013) has established that all PhD candidates, regardless the field, must demonstrate at least:

1. A broad knowledge and a systematic understanding of the research field as well as advanced and up-to-date specialized knowledge in a limited area of this field.
2. Familiarity with research methodology in general and with the methods of the specific field of research in particular.
3. The capacity for performing scholarly analyses and syntheses as well to review and assess new and complex phenomena, issues and situations autonomously and critically.
4. 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.

5. The ability to make a significant contribution to the generation of new knowledge through a dissertation.
6. 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.
7. The ability to identify specific areas where further research is needed within the specific field of research.
8. 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.
9. Intellectual autonomy and disciplinary rectitude as well as the ability to make assessments of ethics of research.
10. Specialized insight into the possibilities and limitations of research, its role in society and the responsibility of the individual for how it is used.

Since these ILOs are mandatory by law, management of PhD programs have been forced to create verifiable mechanisms to assure that all PhD candidates have attained these general ILOs at the end of their education. Some PhD programs in Sweden have decided to use coursework to fulfill some of the aforementioned ILOs. For example, the Technical Faculty at Linköping University has made mandatory the courses “Scientific Methods and Research Practice” and “Teaching in Higher Education” for all PhD students in order to partially attain ILOs 2 and 8 respectively. It is important to mention that requiring a determined amount of coursework points does not seem related to the fulfillment of the aforementioned ILOs.

2.4. Alignment of Actors

A fourth question to discuss is the alignment between objectives of different actors and the ones of the PhD program (Question 7). Nowadays, most of the PhD studies in many other countries, including Sweden, are project-funded so supervisors are under a continuous pressure for producing results that could enable them to secure more funding. Thus, supervisors and funding agencies are less willing to invest research funds in courses for PhD students that they perceived as superfluous or irrelevant with respect to the research they are conducting, since that time could be better invested in doing research. Some researchers can even be tempted to hire a postdoc instead of PhD students, since postdocs do not have to fulfill any coursework requirement and they could produce more in less time. Of course, this is a chicken-egg situation, since without PhDs there would not be postdocs. On the other hand, funding agencies and governments are usually interested in the impact of the research in the society. Bad spent time in non-relevant courses can be perceived for them as a waste of resources. Finally, PhD students can also perceive non-relevant courses as an artificially imposed burden that can be discouraging, making them more prone to desertion.

It is worthwhile to mention that with the current Swedish funding scheme, large desertion rates, as the ones reported for universities in many other countries (Lovitts, 2005), are basically unthinkable, since those can be thought of as an unaffordable luxury for Swedish researchers. Undoubtedly, aligning the individual interests of all actors to the ILOs of the PhD can be used to increase the success rate. Such an alignment must consider the coursework, so all actors can understand its relevance/irrelevance in the PhD education.

In light of the points discussed above, it does not seem coherent to require a large minimum number of credits for completion in research-oriented PhD programs. However, this

does not mean that courses should be eradicated from PhD programs. There are specific courses that can be made mandatory, since they can help to attain specific ILOs in the PhD students. This is actually the approach followed by the Faculty of Health Sciences at Linköping University where the absolute minimum number of credits is required, leaving other courses optional. As already mentioned, most departments of Swedish Universities require more coursework than the absolute minimum. Next section considers possible causes of this situation.

3. Beyond the Minimum Level of Coursework

This section revises some reasons that can have led most of the PhD programs in Sweden to impose larger coursework requirements than the minimum to their PhD students. Again, these reasons could also be applicable to universities in other countries.

3.1 Teaching Load

Reducing the number of required courses can have a large impact in the teaching load of professors. Currently, there is a strong pressure for academics to be involved in teaching in many countries. The idea is appealing, since the researchers can have a space for both spreading their findings and showing problems from an inquisitive perspective to the students. Also, involving PhD students in teaching can be thought of as a learning activity where they have to fully understand specific topics that are related to their own theses. As already mentioned, the Swedish authorities encourage such an involvement of PhD students in teaching activities (cf. ILO 8 of Subsection 2.3). Actually, modern universities are supposed to have a good synergy between research and teaching (Drennan and Clarke, 2009).

However, some departments where research activities surpass education ones are now suffering from an excess of teaching force. Currently, some staff are currently having hard time to find a course to teach in those departments, which can jeopardize their promotion opportunities in the future. This can create a pressure for increasing the number of courses in order to have the complete teaching force involved in teaching. If the coursework of PhD students is reduced, there is a risk of having even fewer courses to offer, which can make even more difficult for the staff to find a course to teach in those departments.

3.2 Homogenization

Another cause can be related with the homogenization of studies in Sweden. In general, changing procedures and practices in universities can take long time, since lots of people must agree on them. This is because changes might have large effects in the community, so the consequences are usually studied thoroughly. Especially, proposing a curricular change in a program in Sweden can have an impact in other universities, since the structure of the studies in a specific field of knowledge is relatively homogeneous throughout the country. Homogeneity has many advantages, since important aspects such as mobility, standardization, quality assurance, among many others, can be encouraged. However, homogeneity can put an external pressure on administrative staff for not changing anything in the curricula until similar programs and professional societies agree on such changes.

3.3 Supervision Style

Another reason for having large coursework requirements is related to make the PhD training as independent as possible from the supervisor's style of supervision. Delegating the complete research training of PhD students to their supervisors has risks. Research supervision is a new field of research, which in practice means that most supervisors use their own experience and

points of view to steer the supervision of their PhD students. Thus, for example, a PhD student can then be biased towards the supervisor's points of view, which can be negative in terms of research independence of the PhD students in the long run. Exposing students to different points of views should be encouraged, and one way to do it is through coursework. Of course, one of the roles of the supervisor is to decide with the student whether or not a course can help the student to perform his/her research and to develop research skills. PhD seminars are usually an excellent space for these objectives. Another supervision style-related problem is that the PhD student and his/her supervisor working relationship not always work well. Then, the PhD could have a starting point for developing the thesis by taking courses. In this case, coursework can help to provide a way to cover possible weaknesses in the supervision skills of supervisors. Arguably, all these style-related problems can be tackled by improving the supervision skills of the supervisors through pedagogy courses.

3.4 Quality Assurance

Quality assurance can also be related to the decision of having large coursework loads. Notice that this point is related to Questions 6 and 8 of Section 2. The thesis defense procedure has largely been formalized in the last years in many countries. Nowadays, PhD students have to follow strict procedures for being allowed to defend their thesis. This means in practice that it is becoming more and more difficult for a PhD student to obtain the degree with a bad quality thesis. With looser evaluation procedures, it could happen that a bad researcher can still obtain the PhD degree. Thus, difficult and demanding, although not related, courses can be act as a de facto mechanism to filter out bad students. However, filtering out students does not seem to be part of the ILOs of any PhD program. Courses should be used to strengthen specific areas that are needed for the research.

In addition, filtering out students does not make any sense, in the case of Sweden, since it is extremely difficult to dismiss a PhD student, due to strict regulations of PhD studies. Thus, improving the recruiting and thesis evaluation procedures and supervision seem more appropriate to improve the quality of the PhD studies (Maki and Borkowski, 2006) rather than filtering students out through coursework.

3.5 PhDs for the Industry

Having a heavy coursework in PhDs education could make more attractive a PhD for industry, since he/she might become an expert in some specific topics. However, while masters programs are usually designed for providing such a training, research-oriented PhDs aim at developing research skills. Thus, a PhD cannot be seen as an advanced master program, since both have different objectives, at least for this type of PhDs.

Related to this point, administration of some PhD programs could be interested in making the transition from a coursework-oriented to a research-oriented education as smooth as possible for the students. Actually, this point has to be seriously taken into account, since it can be a source of desertion (Lovitts, 2005). However, there are less expensive ways to accomplish this goal.

From the points discussed above, PhD programs are under different types of pressure for not reducing the minimum number of required credits. However, most of those sources of pressure are not related with the curricular design. This means, that in the short term, it would be difficult for the administration to reduce that number. Alternatively, coursework can be seen as a teaching and learning activity (TLA) (Biggs and Tang, 2011) as described in next section. Thus, coursework can be used as an additional tool to attain the ILOs in PhD education.

4. Coursework as a TLA

Supervisors, students and administration must be aware that there are different types of courses that could be valuable in PhD studies, each of them with different functions. This paper proposes to classify such courses into four categories: mandatory, seminars, supportive and “off-the-track” courses.

4.1 Mandatory Courses

PhD students have to take some mandatory core courses where students can acquire very specific skills that any PhD student should have (cf. Section 2). It is vital that supervisors are aware of the skills the students are supposed to acquire in such courses. High quality is a must for these courses since they can affect the learning process of all PhD students. Thus, supervisors must be active in quality control of these courses by giving feedback to the administration in order to improve the quality and their alignment with the ILOs of the PhD studies.

4.2 Seminars

Seminars are perfect for PhD studies, since the students can discuss their research with peers. Therefore, supervisors should encourage students to take relevant seminars. Supervisors should participate in the design or be part of such seminars, or at least they have to be sure that the seminar is aligned with the needs of the students. A continuous communication between the supervisor and the student with respect of what is happening in the seminars could be beneficial to improve its power as a TLA.

4.3 Supportive Courses

PhD students might need to take some supportive courses, which are courses from masters studies that can fill the gaps the students might have in a specific field that is relevant to the research topic. The experience and assessment skills of the supervisor are key for choosing the appropriate courses. It is worthwhile to notice that these courses might not be necessary for students that already have the required knowledge from earlier stages of their careers.

4.4 “Off-the-Track” Courses

Supervisors should encourage PhD students to attend some courses or modules that are related, but are beyond their own research. This type of coursework is very effective, as the researcher can tell from his own experience. Sometimes PhD students need to explore other areas just to check if techniques that have been applied elsewhere can or cannot be adapted to his/her own research. The student then has two options: to study the new topic him/herself and determine what is and what is not relevant for his/her thesis. The second option is to take a course or a module. The latter option is appealing since the student can acquire the knowledge quicker, since teacher shows the most important theories and PhD students can have an expert to whom they can address questions. Also, having contact with a different methodology for doing research could be beneficial for improving the research skills of the students. However, supervisors have to consider that the main objective of taking these courses is not that the student becomes an expert in those areas, but to identify relevant topics with respect to his/her thesis, and/or help the student to see his/her research problem from another perspective. Thus, the PhD student’s time can be optimized by allow them to skip the usually very time consuming

examination, which seems completely irrelevant and unnecessary regarding the ILOs of the PhD studies. For this type of coursework it is important that the supervisor foresees the advantages of these activities, so he/she can invest research funds in such kind of “incomplete” courses. Notice that this type of courses can be an answer to Question 9 of Section 2.

5. Discussion

The researcher has interviewed different supervisors and PhD students at Linköping University about the coursework load. Despite the fact PhD students are supposed to take courses, a common complaint is that only a few of the offered courses are usually appropriate for the specific needs of the PhD students. When available, sometimes the courses are not offered timely. Thus, it is not uncommon to see students taking courses that are not relevant for the PhD, but they have to take them because it is a requirement. Thus, most of the interviewed supervisors tend to see PhD studies as described in Figure 1:



Figure 1. Subtractive model of coursework in PhD studies

Since courses are seen as a regulation by most supervisors, they tend to think they can only be part of the learning process of their students when they are doing research. PhD students in such a situation can be in disadvantage with students from other countries that do not have such large coursework requirements, since the time dedicated to research of Swedish students would be largely limited. In the long run, that can jeopardize the quality of our PhD students’ dissertation, since they will have less time and opportunities to make significant contributions to the generation of new knowledge (cf. ILO 5 described in Section 2.3). As already mentioned, having coursework in PhD studies is not a bad idea at all. Actually, it is possible to have PhD students doing research 100% of their time, even with large coursework requirements. However, supervisors and administration must do a clever use of coursework. The best way to do it is by using it as an additional TLA that can also be used in the process of becoming an independent researcher, as described in Section 4. Thus, the PhD studies should be seen as shown in the Figure 2:

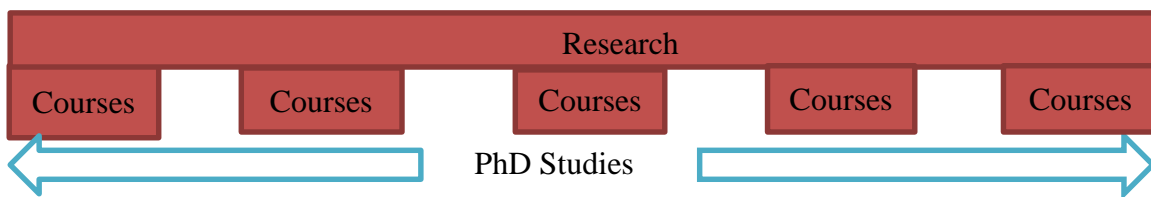


Figure 2. Supportive model of coursework in PhD studies

This means that the courses must be seen as a support to the process of supervision and not something that is taking away part of the PhD student’s time for doing research. Thus, instead of using a subtractive model of coursework (as in Figure 1), this model considers that courses can add value to the pedagogical process of supervision. Notice that courses in Figure 2 appear in red. This is because the supervisor must take active part of the processes that are occurring in those courses as already discussed in Section 4. Also notice that the work performed in the courses can be used in research, but again, a profound involvement of the

supervisors in the courses is necessary. One example of this would be the courses described in Section 4.4. It is clear that the proposed approach can be more time consuming from a supervisor's perspective, but it is more than worthwhile to put this extra effort for doing a better supervision with better outcomes.

Implementing the model of Figure 2 is not an easy task and it is necessary to have a strong support from the administration. Not only in Sweden but also in many other countries, PhD programs are linked to research schools, whose aim is to provide such a support. Apart from organizing seminars and inviting speakers, they usually organize courses and summer schools where the students have the opportunity to learn from experts and they can share their research with them and with international students, increasing in that way their research network. It is very important to involve supervisors in the decisions taken in such research schools. This is actually the natural way to go from the model of Figure 1 to the one of Figure 2.

Related to this point, ongoing research includes assessing the mechanisms that are currently provided by different research schools in Sweden for involving PhD supervisors in planning their activities. Reported successful experiences will be used to propose a good practices manual for helping moving PhD supervision from the model of Figure 1 to the model of Figure 2.

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