

Redesigning the course “Research Methods in Social and Clinical Pharmacy”

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Introduction: description of the course and profile of the students

The course “Research Methods in Social and Clinical Pharmacy” is an elective course placed in Block C of the “Cand.Pharm” degree program and the Master in Pharmaceutical Sciences degree program, line III. This course is compulsory for students who will be writing their master’s thesis at the Section of Social and Clinical Pharmacy at the Department of Pharmacy and therefore is linked to the development of their thesis project. The course was created with the idea of giving the students a deep understanding of the methods most commonly use in the field of social and clinical pharmacy and that most of them will be using during their master thesis. It is therefore quite relevant in this regard, as most students have only been briefly introduced to these methods in the compulsory course “Samfundsfarmaci”.

The methods taught are divided into two blocs: qualitative methods (individual and focus groups interviews, observations and document analysis) and quantitative methods (surveys, register-based studies, epidemiology and statistics). Due to the variety of methods and a stronger tradition within the section towards qualitative methods, the qualitative methods are taught more in depth. Also, the majority of the students writing their thesis at the section tend to choose qualitative methods for the development of their master thesis.

Students choosing to write their thesis in the Social and Clinical Pharmacy section are mainly interested in pharmacy practice, hospital pharmacy, patients’ perspective in medicine use, rational use of medicines, phar-

macy policy and more recently pharmacoepidemiology, pharmacovigilance and market access of pharmaceutical products. The majority of them plan to work either at a community pharmacy, the hospital or for the pharmaceutical industry when they graduate, and common for them is that they are not especially motivated to work in the laboratory with, for example the formulation or development of medicines.

The course has been offered for 5 years. It has been outsourced for a couple of years and since 2012 the organization, administration and design is again taken care of internally. In recent years, there has been an increase in the number of international students since the Master in Pharmaceutical Sciences started in 2012. Nowadays, around 25% of the students are international and 40% have a mother tongue other than Danish. In the year 2014-2015, 9 different mother tongues are spoken among the students. Although the majority of the students are pharmacists, the students come from other academic backgrounds like global health, biotechnology or chemistry.

Aim

The implementation of this assignment is part of the supervision sessions and the development of my teaching portfolio. This assignment is an attempt to redesign the course “Research methods in social and clinical pharmacy” with the intention of making it more aligned and therefore more effective regarding the development on skills and competencies of the students.

Challenges related to the learning objectives, teaching activities and dynamics of the course

The first challenge facing this course is that the master thesis supervisors expect the students to be sufficiently independent when it comes to working with the method they plan to use for their master thesis. What is happening today is that the majority of the students get an overview of a variety of methods, but do not really have a deep understanding of any of them. As it is assumed that the master thesis supervisor should not be using supervision time to “teach” and explain methods and methodological issues, it is expected that the course should cover all the methods and at the same time, go more in depth with the methods most commonly used by the students.

This is of course a great challenge taking into consideration the variety of methods and the length of the course. Just to give an example, each method is often taught in a one three-hour session, when in ideal circumstances it will take a week to work with it.

The second challenge is that it is expected that the students will work with their thesis topics throughout the course. This has proven difficult since the course begins in November, ends in January and the students begin working on their thesis in February, and not all students have a clear idea of their research topics prior to February. For example, for the current course only 1/3 of the students have a very clear idea of what they will be working with, whilst 1/3 have only a general idea and the final third are still waiting for some feedback from their supervisor or are still struggling to find the master research topic.

The third challenge has to do with the tendency towards surface learning of those methods that the students consider irrelevant for their master thesis. There is also a tendency to see this course as an “easy one” given that it is a passed/fail course. It is also my perception that, at this, the final stage of their studies, many of the students are very oriented towards finishing and finding a job.

The fourth challenge has to do with the quantitative part of the course. The section has an interest in introducing the students to a variety of relevant quantitative methods. These methods are those dealing with pharmacoepidemiology - the distribution among the population of diseases provoked by the intake of medicines - and with pharmacovigilance, the registration and reporting of adverse drug reaction and side effects. However, for a good understanding of these two methods, knowledge of statistics and statistical computer programs is needed.

The fifth challenge is related to a growing interest in the area of market access of pharmaceutical products. Pharmacoeconomic related methods are used in this area and students working within this field need to know, but it has not been covered by the course so far.

The sixth challenge is that around 25% of the students are writing their thesis in the area of clinical pharmacy, which in Denmark basically deals means hospital pharmacy. However, this area, although it shares methods with social pharmacy, has specificities that need to be addressed. Skills and knowledge of these specificities among the current teacher in staff are missing in this regard.

The last challenge has to do with the diversity of the students, especially in terms of cultural background and with the merging of two learning pro-

grams: “cand.pharma” and the master in pharmaceutical sciences. It is also my perception that there is very little interaction between the international and the Danish students. Although this is not in itself a problem, I believe that more interaction among students could definitively benefit them not only in social terms but also academically, as they all could gain from sharing knowledge of the different healthcare systems and how these system deal with social and clinical pharmacy issues.

Resigning the course: revision of objectives and adjustments of teaching activities

The following section presents the adjustments either proposed or implemented as part of the teaching training program assignment and supervision sessions. Table 8.1 describes the Intended learning Outcomes (ILOs), the Teaching and Learning Activities (TLAs) and the assessment tasks (ATs) of the course this year compared to the previous one and the pedagogical models or theoretical inspirations supporting the revisions introduced. The major revision has been aimed at aligning the ILOs with the TLs, making the objectives more realistic and less ambitious while at the same time including more teaching and learning activities.

Table 8.1. Adjustment of learning objectives, learning and teaching activities and assessment tasks

Objective (before)	Overall objective (revised 2014)	Pedagogical models or theoretical frameworks
to develop the participants' methodical and practical skills in phrasing research questions in social and clinical pharmacy and designing an evidence-based study using quantitative and/or qualitative research methods.	To contribute to the development of the participants' methodical and practical skills in phrasing research questions in social & clinical pharmacy and designing an evidence-based study using quantitative and/or qualitative research methods.	Learning goals in a university curriculum should be expressed in terms of the capabilities of learners on graduation. Bowden (2004)
Course outcome	Specific ILOs (1)	
After completing the study unit the students are expected to have gained a <u>thorough and practical knowledge</u> of how to phrase research questions in social and clinical pharmacy and choose the appropriate research design. Furthermore the students will <u>master the selection of, and the use of, both</u> qualitative and quantitative research methods within clinical pharmacy and social pharmacy projects. Such skills will have relevance for Master's thesis and future paid employment within the field of medicine.	By the end of the course the students: 1. will have gained <u>general knowledge</u> of the research methods most commonly used in social and clinical pharmacy (<i>knowledge</i>) 2. will be able (2) to transform a problem into a research question in the field of social and clinical pharmacy (<i>skills</i>) 3. will be able (2) to decide when to use qualitative and quantitative methods or both (<i>skills</i>) 4. will be able (2) to critically read a scientific study in social and clinical pharmacy (<i>skills</i>) 5. will be competent in at least one (3) qualitative and one quantitative research method chosen by them. These methods should be of relevance for their master thesis and in line with their future professional preferences (4) (<i>competence</i>)	(1) Biggs and Tang (2007) recommend including no more than five to six course ILOs, as the alignment otherwise becomes too complicated. (2) Biggs & Tang (2007) distinguishes declarative knowledge from functioning knowledge (p. 72). Declarative knowledge is knowledge about something or how to do something, while functioning knowledge is being able to do. (3) Strategic learning as a category of efficient learning is often a combination of both surface and deep learning. Marton et al. (1984) (4) These include teaching and learning of contents that related the profession (Biggs & Tang 2007, p. 81).
TLAs	TLAs (revised)	
6 hours of physical presence per week (max 12). The teacher (8 different ones) can decide whether to lecture or conduct group work. The teachers are suggested to develop assignments to be submitted by the	9 hours of physical presence per week (max 12). The teachers (8 different ones) are requested to max lecture 45 min (5). And to develop group work exercises (6). The students have to compulsory submitted 5 assignments (1 common	(5) Traditional lecturing is revisited. More interaction with students is requested and less time for lecturing is proposed. (Mazur 1997) (6) Yamane (2006, cf. Biggs and Tang, 2007, p. 141), found that groups formed by friends or voluntary

Table 8.2. Adjustment of learning objectives, learning and teaching activities and assessment tasks (cont.)

students, but it is up to them. Usually 2-3 assignments were requested to be submitted.	based on literature review, 2 qualitative and 2 quantitative) and they all have to be accepted in order to take the exam.	membership tend to use more time on off task activities than students are assigned to groups randomly.
	<p><i>Presentations from former master students</i> Visits of former master students presenting their thesis with focus on the design and the elaboration of the method section.(7)</p>	(7) The TLAs for functioning knowledge involve activities that allow the students to get their own experiences. Such activities are usually associated with verbs like solving, designing, managing, planning, performing etc. (Biggs & Tang 2007, p. 72).
	<p><i>Consultation hours (8)</i> As one of the coordinators of the course, I made myself available every Monday from 9-12 am so that students could have extra time for questions or more feedback. Students could either just show up or send a short email beforehand informing about the issue they would like to discuss, including issues related to their master thesis if needed.</p>	(8) The student should have the opportunity to enter into dialogue about the feedback and how to interpret it (Yorke 2003). Moreover Gibbs & Simpson (2002) argue that the most powerful influence on student achievement is feedback.
Formative assessment	Formative assessment (revised)	
Feed-back only to those who had to resubmit an assignment because of low quality. Plenary feedback sometimes provided in the classroom.	It is expected that working with different assignment and that having the possibility to work with their master thesis topic will motivate some of the students to move from a surface way of learning towards deeper learning (9). Moreover, the teacher in charge is requested to provide feedback to all the students. The feedback shall be provided for all 5 different assignments (11). Oral individual feedback is encouraged.	(9) Formative feedback and assessment takes place during teaching and learning and serves to improve both learning and teaching. Basically, the effectiveness of the teaching directly depends on the its ability to provide formative feedback (Biggs & Tang 2007, p. 163). (10) Harlem and James (1997) have the assumption that an important aim of education is to bring about learning with understanding. (11) The assessment tasks (ATs) should assess the students on their level of performance with respect to the ILOs and using the competences obtained in the TLAs (Biggs & Tang 2007).
Summative assessment	Summative assessment (revised)	
Written and oral exams based on case studies. All students have to answer one qualitative and one quantitative case study and present a five page report for each case. They have to present their cases orally. Furthermore, they have to be an opponent for another student and formulate three questions per case.	Written and oral exams based on case studies OR students' master thesis topic. All students have to answer one qualitative and one quantitative case study (one can be replaced by their master thesis topic) and present a five page report for each case. The have to present their cases orally. Furthermore, they have to be an opponent for another student.	

Adjustment of TLAs

The content of the course was only slightly revised. The revision was made after consulting the students' needs and preferences related to their master topic and previous experience working with research methods. Out of 28 students, only 4 did not provide feedback on this matter. Based on this feedback, specific research methods like participatory action research or realist review (methods taught the previous year) were not included.

Table 8.3. Revision of learning and teaching activities per themes

<i>Course themes</i>	<i>TLAs 2013</i>	<i>TLAs revised 2014</i>
Introduction to research methods	Lecture	Lecture Group work
Theory based research	Lecture	Lecture Group work
Transforming a problem into a research question	none	Group work
Systematic reviews	none	Lecture Assignment 1 2 ISU students presentations
Document analysis	Lecture	Lecture Group work
Interviews	Lecture Assignment 1	Lecture Assignment 2 Former master student presentation
Observations	Lecture Assignment 2	Lecture
Data analysis	Lecture Assignment 3	Lecture Assignment 3
Verifying the quality of qualitative data	Lecture	Lecture Group work
Introduction to epidemiology	Lecture	Lecture
Basic epidemiological estimates	Lecture Review questions	Lecture Review questions Group work
Observational study designs	Lecture Review questions	Lecture Review questions Group work Assignment 4 Former master student presentation
Introduction to pharmacoepidemiology	Lecture	Lecture
Introduction to bias, confounding and interaction in pharmacoepidemiology	Lecture	Lecture Group work Assignment 4
Questionnaires: design and analysis	none	Lecture Group work Assignment 5 Former master student presentation
Working with real life data	Lecture Group work	Lecture Group work
Clinical pharmacy – the model of improvement	Lecture Group work	Lecture Group work

Discussion: primary considerations regarding the main changes included.

According to the experiences of Biggs & Tang (2007) good and effective teaching may be achieved if courses are designed according to two principles (p. 50):

1. A constructivist learning theory and 2. Alignment between ILOs, the teaching/learning activities (TLAs) and the assessment tasks (ATs)

The constructivist theory explains that learners should use their own activity to construct their knowledge or other learning outcomes (what the student does is more important for the learning than what the teacher does).

With the inclusion of more specific ILOs phrased so that they are more oriented towards the achievement of knowledge, skills and terms and of more TLAs, I have tried to make the course in Research in Social and Clinical Pharmacy more effective for the students. Below, my consideration regarding the main challenges and main changes included

1. Focus on their master thesis topics

Although this course is conceived as a hands-on course where students, using their master topics learn to develop skills and become competent with different research methods, it turned out that many of the students still didn't have a clear idea of their thesis topics when the course started. This produced a sort of imbalance between those who know what they are writing about and those who are still waiting for inputs from their thesis supervisors. To overcome this problem, students were given the possibility throughout the course of either choosing their thesis topic or choosing a given case when working on assignments. Whether students with a clear idea about the topic of their research thesis benefited more from the course compared to those who had not yet have their topics defined their topic is unknown. A possible improvement to consider for next year is to require the different thesis supervisors to meet with the students prior to the course and discuss the master thesis topics more in detail. Another possible improvement to be introduced next year is to ask all teachers to adapt their teaching, group work and assignments using the students' master thesis topics as examples. This is in line with what Marzano (2004) who states

that there is evidence that students learn more effectively when they already know something about a subject area and when concepts in that area means something to them and to their particular background or culture.

2. More group work and discussion to encourage deep learning

This year less emphasis has been given to lectures by extending the class hours and by asking the different teachers to prepare group work and discussions sessions. It is worth noting that when more teachers are involved (the course actually has 8 teachers), there is a tendency that courses get a broad more superficial coverage, at the expense of deeper understanding, and it is more likely to lead to surface learning (Biggs & Tang 2007, p. 82), while effective teaching should rather eliminate those aspects which encourage surface approaches to learning, and instead set the stage for students to more readily use deep approaches to learning (p. 31). Therefore, a reduction in the number of teachers for the coming year should be contemplated.

3. More emphasis on formative vs. summative assessment

With the introduction of more compulsory assignments based on their master thesis topics, it is expected that learning will not remain at a surface level. The oral and written feedback provided to the students had as aim to help students develop their ability to use the relevant research methods and train their skills to transform a given problem into a research question. Since the master thesis project is an individual one, all assignments were designed to be worked on individually. This allows a more effective feedback given the students' needs. A possible improvement for next year is that not only the teachers but also the students could provide peer feedback. This will possibly make the formative assessment even richer as the students will be exposed to different cases and different ways of approaching social and clinical pharmacy problems.

Conclusion and further considerations

The course "research methods in social and clinical pharmacy" faces a variety of challenges and more adjustments need to be undertaken during the following years. The fact that this is a hands-on course seems to be a source

of motivation for those students who have decided to write their thesis in the field of social and clinical pharmacy, but the time available and the variety of methods is a challenge for the effectiveness of the course. With the revisions introduced this year, we have tried to make the course more aligned and more beneficial for the students, but further adjustments should be undertaken.

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All contributions to this volume can be found at:

http://www.ind.ku.dk/publikationer/up_projekter/2015-8/

The bibliography can be found at:

http://www.ind.ku.dk/publikationer/up_projekter/kapitler/2015_vol8_nr1-2_bibliography.pdf/