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Designing and Implementing a Quantitative Research Methods Module

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Problem:

Post-graduate research training remains an essential component of both PhD and Master’s students learning experiences. The Economic and Social Research Council (ESRC) expect that all social science students that are funded by them have to develop skills in Research design, Quantitative and Qualitative methods and personal development. This position is non-negotiable and as such all Research Training (RT) students will have to undertake courses in these areas. The compulsory nature of RT modules, combined with the technical and somewhat dry material has contributed to a high-level of unpopularity for RT courses. In particular there is considerable student resistance to the implementation of a quantitative techniques module which whilst extremely valuable in the employment market is still perceived as being a waste of time by some students.

When I was employed in the Department of International Politics in 2002 it was to teach the Data Collection and Data Analysis module PGM 0330. This module was extremely unpopular with the students and resulted in an enormous number of complaints which resulted in my appointment as a dedicated quantitative methods Research Training lecturer. It was against this backdrop that I had to develop the module that both fulfilled ESRC guidelines and met with the approval of the student body.

This paper shall analyse the tactical changes that were made to the module in response to the original course structure that I had to fit in with, an
understanding of student backgrounds and constraints placed upon the learning experience (see appendices E, F and G).

Student Backgrounds.
One of the most important factors to remember when teaching a university wide research training module is that the students have come equipped with differing levels of knowledge and different interests. The key therefore to develop the new quantitative lectures was to try to reflect upon the skills that the students had and develop a strategy that would improve their learning experience and develop an educational trajectory that would correlate with the learning outcomes that were expected by the ESRC.

Most of the students had very little training in quantitative methodologies, in some lectures students wouldn’t know the basics such as what the mean, median or mode was. Some students were clearly terrified by numbers and would go blank even when the simplest mathematical notation was used. It has to be remembered due to the very nature of having a university wide RT module we would get students from a variety of different departments, such as English, Information Studies, History, Business Studies, Geography, Television, Theatre and Film and International Politics. Some students had been taught very advanced level econometrics (such as Business) whereas others had no formal training in quantitative methods whatsoever (such as History) It became clear to me that as the module progressed I would have to slow down the content otherwise I would risk leaving huge (probably the majority) of students behind. Therefore reflecting upon the backgrounds of students I would have to take nothing for granted and start from first principals.
The corollary on starting from first principals was that the more advanced students in the School of Management and Business would be covering old ground rather than learning about new techniques. I will talk more about this problem in the constraints section of this report and the remedy I developed for this learning problem. Nevertheless it was felt that the prime focus of the course was to develop a module that brought all the students up to ESRC guidelines and attempted to make sure that no student was left behind.

Student backgrounds also affect the level of stimulation that the students will achieve in response to the quantitative lectures. In designing this module there was a considerable emphasis upon practical examples that clearly demonstrate the relevance of these techniques to the research plans that the students were engaged on. However, it was clear to me that whilst I had numerous international politics examples that I could rely upon, I was less able to draw upon examples from other disciplines. This is an ongoing problem which I am seeking to remedy by speaking to other lecturers and doing extra readings. This problem will be discussed more fully in the reflective section of the report.

So in summary student backgrounds affected course design in 4 ways.

1. It resulted in reduced mathematical notation. Concepts had to be explained to students without relying upon mathematics.
2. The course started from first principals. No knowledge was assumed for any of the students.
3. Resulted in a reflective exercise that was designed to improve the learning experience for more advanced students.
4. Examples from a variety of disciplines were used to demonstrate the relevance of quantitative methods.
Course Structure.

When my job began in September 2002 I had to fit in with the organisation of the course that had been developed in the previous year. This pre-arranged structure had several difficulties associated with it. The main problem was that the lectures were organised in three hour blocs. This was clearly far too long; the student learning experience was being undermined by making them sit through 3 hour long lectures. This too was compounded by the fact that the quantitative lectures and the SPSS computer labs were also three hours long. The timetable made no provision for a discussion of the theory in the lecture and then an application of the theory in the computer lab shortly afterwards. Generally the students would have to wait a week after the lectures before they could use the computer labs. This was clearly unacceptable, yet due to the constraint of the course already being organised it was necessary to make some superficial changes rather than whole scale reform.

Two tracks were therefore applied to the problem:

1. Short-term:
   a) The three hour lectures were divided into two one hour lectures with a break and a discussion section at the end of the three hour bloc.
   b) In the computer lab session, 30 minutes were taken up with refreshing them on the topic and then allowing getting them to do two one hour sessions with a break in the middle.

   Whilst these remedies were far from perfect, they did break up the lectures and they did allow the students to apply what they had learnt in the lectures. However, in terms of quantitative methods which are very technical two one hour lectures and a discussion are too much for the student.

2. Long-term:
a) Restructuring the module which was done the next year. All of the quantitative lectures were one hour long, which should help maintain student interest.

b) Place a one hour computer lab immediately after the quantitative lecture (after a short break). This will be in a different venue and should allow the students to refresh themselves and will be close enough to the theoretical lecture to allow the students to see how the data-analysis package interacts with issues raised in the lecture.

Constraints:
The Research training module has enormous constraints placed upon it in terms of student numbers and timetabling. These constraints impact upon me as a teacher and affects how the students negotiate their educational experience. I see these constraints being as:

1. Student Numbers.
The module in some ways has been a victim of its own success. The first year I was teaching on the module it had around 40 students and there were two lecturers. Myself and Dr. Jonathan Joseph who taught the qualitative methods. This allowed us to team-teach and also mark half of the assignments each. However, by the third year of teaching this module Dr. Joseph had left and I was in complete charge of the module and the module numbers had increased to 75. This module now had undergraduate numbers but was a Master’s course. This increase in student numbers and reduction in staff constrained the module in several respects. First, the marking load had increased markedly, resulting in my first-marking 75-3,000 word long essays which resulted in a considerable burden on my time. However, in terms of the student learning experience, whilst the lectures were relatively unaffected the computer labs were overwhelmed. Whilst one computer lab for 40
students is deal able with the help of a computer assistant. A computer lab with 75 students is far too large. In fact this was the most difficult thing for both me and the students to deal with. The computer lab was large and noisy so I had difficulty making myself hear. I was also swamped with questions at times, which made it difficult for the students who rightly expected more personal tuition at the postgraduate level. In the short-run this was a difficulty I had to deal with.

However, by analysing the situation I have suggested several remedies to the problem for future years. These remedies also link back to problems of dealing with students of different levels. In particular developing a module that will stimulate more advanced students.

a) The initial suggestion was to stream the quantitative dimension of the Data Collection and Data Analysis module into two (see appendix L), with one stream being taught myself to the less experienced students and another stream being taught by the School of Management and Business to the more advanced students. This appears to be a reasonable long-term plan in dealing with students that need to be gently induced into the world of statistics and those that have an urge to develop more advanced skills. This will also have a side benefit of reducing student numbers in the computer lab that I am teaching, as one set of students will be taught by SMB and one will be taught by me.

b) However, I still envisage that only a small group of students will do the advanced module, so I have suggested for next year that I have two computer sessions after the lecture and also employ a computer lab assistant to help. As such the students learning environment maybe more individually tailored to the students needs with even some minor level of streaming for basic and intermediate students in the computer labs.
Whilst student numbers place serious pressures on the RT modules I have helped alleviate them by suggesting strategies for improving the students learning experience.

Timetabling:
The next constraint upon course design is the university timetable, due to the disparate nature of the students’ backgrounds the timetable has to fit in with the departments involved in with the Research training programme. As such all RT teaching is to be done on a Monday and Tuesday morning. This coupled with student complaints about RT taking up too much of the year resulted in a change to the RT programme. RT was only to be taught during the first semester and part of the second semester. This meant that RT had to be taught all day Monday. This placed an enormous burden upon students and lecturer, on some days I would have to teach all day. Reflecting upon this it was clear that all day teaching undermined student attention and lecturer performance. This was unfortunate as some of the changes to RT such as the reducing the length of the quantitative lectures to one hour and placing computer labs after the lectures improved the learning environment.

The solution to this problem was simply to provide lots of breaks for both staff and student and to be sympathetic to student concerns. It was felt necessary to point out that these changes were made in response to student concerns and also to facilitate their research by reducing their course demands in the second semester.

Course Assessment
It was also important to develop a form of assessment that would accurately reflect the students learning outcomes, but did not place too much burden upon their heavy course load. As such it was decided in team meetings with the Director of Research Training- Diane Watt that I would set the student one rather than two assignments that dealt with combining quantitative and
qualitative techniques and also develop a computer based test that would assess their knowledge of statistics. The essay on combining methods was designed to allow the students to demonstrate that they were aware of the strengths and weaknesses of these different approaches and also recognise that quantitative and qualitative research is not mutually exclusive. The assessment therefore facilitate the student learning experience by encouraging them to critically reflect upon their own pre-conceived ideas. The statistics test is designed to allow the students to clearly demonstrate that they are able to apply the theories developed in the classroom to practical social science arena. The test was developed recognising that most of these students are not statisticians but applied consumers of the techniques. The test assesses whether they apply these techniques appropriately.

Conclusions
The aim of this report was to highlight some of the changes that were implemented in response to my concerns about the learning environment for RT students. This report highlighted some strategic course design issues that undertaken so as to increase efficiency in the classroom and make the learning experience more pleasurable. No real discussion was made of the tactical changes that were made in the class-room such as the use of PowerPoint or buzz groups, this paper simply demonstrates how system level constraints can affect the choices that I as a lecturer have to make. This paper should demonstrate that I have reflected upon both the needs of the students and how I could improve the course in response to the institutional framework in which I was working.

It is clear to me that teaching a compulsory research methods course is an extremely difficult task. I believe that I have improved the module by recognising that the majority of students do not have the necessary mathematical skills and need to be trained to understand how different statistical techniques work at a conceptual level. By assuming no prior knowledge I believe that I have helped the less able students gain a firmer