The PhD in construction management

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Will Hughes, Department of Construction Management & Engineering, University of Reading, UK

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Summary: *The PhD process is uncertain, idiosyncratic and vague. Research into the management of PhDs has proved very useful for supervisors and students. It is important for everyone involved in the process to be aware of what can be done to improve the likelihood of success for PhD studies. There are many ways of tackling a PhD and it is not possible to describe construction management as a generic type of study. Rather, construction management is a source of problems and data, whereas solutions and approaches need to be based within established academic disciplines. The clear definition of a research project is an essential prerequisite for success. Although PhDs are difficult, there are many things that can be done by departments, supervisors and students to ease the difficulties. In the long run, the development of an active and dynamic research community is dependent upon a steady flow of high quality PhDs. No-one benefits from an uncompleted or failed PhD.*

Introduction

There is a wide range of approaches to PhD work. A glance at a series of successfully completed theses reveals little consistency and few hints as to what constitutes a successful programme of work. This lack of consistency creates difficulties at both ends of the process—at the beginning it is difficult for students to define their topic, approach and purpose; at the end it is difficult for examiners of PhD theses who pass judgement on their adequacy. There have been some interesting studies about the PhD process (Rudd, 1975; Welsh, 1980; Phillips, 1983; Wright, 1992) and one of the purposes of this paper is to consider their relevance to PhDs in the general area of the fields of interest to ARCOM members. Another of the purposes of this paper is to alert the ARCOM research community to some of the literature that already exists concerning the PhD process. The basic questions explored are: What is it that qualifies for the award of a PhD? What does a construction management PhD look like? How can the chances of success be maximized?

Conversations with PhD students and supervisors reveal a common perception of how different our fields are from "other" fields. This frequently heard comment is interesting because it is usually made by someone comparing a field in which they are a specialist to a field in which they are not. Therefore, comments about the differences between construction and "manufacturing" (whatever that may mean) or construction and physics, must be treated warily. The fact is that all PhD students feel that their PhD is uniquely difficult. Whether or not such comparisons are true, the very fact that they are widely held beliefs leads to discontent with the research process in this field. Students complain about the lack of clear step-by-step guidance or the absence of a well-defined methodology. Issues of methodology will be

considered before turning to more general questions of guidance, supervision and management.

Methodological difficulties

In a new academic field it is necessary not only to undertake the research but also to invent a methodology. However, the presence of conventions in well-established fields should not be confused with the removal of all methodological difficulties. For example, in palaeontology the systematic description of species from the fossil record is a technique that is routine and fairly easy to replicate. But the use to which this tool is put is wide open. Knowledge is accumulated in a painstaking and exhaustive process (see, for example, Donovan, 1986). Arguments about which distinguishing features ought to be used can change the entire classification of a genus and all of its species. So, what looks to the casual observer like a simple exercise in applying a routine method is in fact often a challenging and complex intellectual exercise (although not necessarily). Thus, the presence of recognizable techniques can lull students and supervisors into a false sense of security. The lack of such conventions may actually be an advantage because it prompts searching questions at every stage of the process.

At the other end of the spectrum, some theses seem to exhibit little evidence of method, being merely a collection of observations and insights. If these are marshalled well and linked with persuasive argument that sheds light upon a new class of problem, the award of a PhD would be warranted. The aim of such work will be to show which theories and concepts are useful for dealing with a certain class of problems or endeavour.

In an evolving field, like construction management, it would seem that there must come a point where the methodology becomes more predictable and settled. Perhaps there should be a gradual move from the exploratory, concept-building type of work to the more routine application of recognizable techniques. Such an evolutionary view is implied by Betts and Lansley (1993) in their review of the first ten years of the journal *Construction Management and Economics*. Phillips and Pugh (1987) give helpful advice describing three basic types of research. First, exploratory research, which is involved in tackling a new problem, issue or topic. Here the research idea cannot be formulated very clearly at the outset. Second, testing-out research, which pursues the limits of previously proposed generalizations. This is a basic research activity and one that proceeds along easily recognizable lines. Third, problem-solving research, in which a problem from practice is identified and all intellectual resources are brought to bear upon the solution. Here, the problem has to be defined and the method of solution has to be discovered. As they point out, *the person working in this way may have to create and identify original problem solutions every step of the way*—a description that will sound familiar to many construction researchers. Clearly, it is not the root discipline of a study that causes PhDs in one field to be generally "easier" or "harder", but the type of research that is being undertaken. Testing-out research is more likely to take place in a structured environment with clear methodologies and measurement criteria. Indeed, this type of research when undertaken in laboratory conditions produces the kind of research environment which also provides a supportive social and collegial structure, in many ways an ideal situation. This is the most reliable way of acquiring the skills and learning the craft of research. Problem-solving and exploratory research are not only less structured and more difficult but also often involve isolation for the researcher.

To undertake testing-out research, by definition, builds upon the work of others. There is (inevitably) a small number of supervisors in the construction field who find this approach potentially embarrassing. A PhD that takes this approach is bound to challenge the earlier work of others, and may bolster and extend it. This requires a certain maturity on the part of the supervisor whose own work may seriously be challenged or whose peer's work may usefully be advanced. There is an occasional reticence to give that much credibility to other people's work. If this happens, then students will be influenced toward the more difficult type of PhD. A mature and confident approach to PhDs will involve developments to earlier methodologies, often the supervisor's, and some kind of replication of the field work.

A major methodological difficulty lies with the knee-jerk reaction of many people new to research who assume that research automatically involves surveys and/or interviews. It is important to dispel such myths at the earliest opportunity and to design the method to fit the problem. Generating original data will make it easier to develop original conclusions, but this is not necessarily a prerequisite. If data are needed then there are many techniques that can be used to collect them, including interviews, case studies, surveys, experimentation, observation, measurement, photography, questionnaires. Think about what it is you need to prove, then choose an appropriate technique. Similarly, data analysis should be thought about before the data are collected.

We are programmed to think about research as a process which is undertaken in the way that it is reported. Approximately speaking, theses and papers introduce the topic, describe the method, analyse the data and then conclude. The process of research often proceeds better if it is thought about in reverse. This means that after the research has been defined (see below) the researcher decides what kind of conclusions *might* be drawn. A clear idea of these will be very useful in deciding what kind of data are needed and what kind of analysis will be required. Armed with such a picture, the researcher can make a sensible decision about what kind of data collection techniques to use. Finally, some serious thought must be given to the likelihood of being given access to sensitive data and to key people (Buchanan, *et al*, 1988). No matter how well-designed the research, if the data subjects will not co-operate, or if it takes too long to collect the data, it will simply fail.

Guidelines for defining a research project

Before starting a PhD or, indeed, any project, two basic criteria must be met—worthiness and achievability. Some basic guidelines might help those who are trying to define a PhD research project. Whether an interested student is in search of a supervisor, or a supervisor with a project is in search of a student, the first task is for the two of them to agree the detailed specification of what will be done for the PhD. Kane (1985) makes the following observation:

> *The most difficult hurdle to overcome in doing research is not in learning the techniques or doing the actual work or even writing the report. The biggest obstacle, surprisingly, lies in figuring out what you want to know.* (p15)

Whilst a PhD is generally "in" an area, the act of describing precisely the topic under consideration goes much deeper than merely stating the general area. Kane (1985) describes a "research statement" and Howard and Sharp (1983) describe a "topic analysis". A research statement is a single sentence which accurately describes the topic of the research. Every word in this sentence is defined in terms that may be unique to the researcher but will be consistent throughout the work. To develop such a statement demands a very careful and pedantic examination of every verb, noun,

adverb and adjective. It may even require re-defining some words for the purposes of the project. Howard and Sharp's topic analysis is envisaged as a two or three page description of the hypothesis, or research objective, the previous work in the area, the value of the possible outcomes and the probable method or approach. They also talk about a "research proposal"; a document more detailed than a topic analysis. This will establish the need for the research; it will demonstrate that the student has (or can acquire) the necessary skills; it will place the research in the context of earlier work; it will identify the methods to be used for field-work as well as for data analysis; it will identify a tentative schedule for all of the remaining work. Some universities do not register students directly for a PhD, but for a Higher Degree. In order to transfer the registration to a PhD, a transfer report is required. Howard and Sharp's research proposal would usually suit this purpose admirably.

All of these things are needed before the real job of research can begin. Typically, a lot of work will be needed to develop these documents. It is useful to think about the PhD process as consisting of three trimesters, the first to define and contextualize the problem, the second to do the field work and the third to write the thesis. It is quite normal for the PhD student to be unsure about the precise nature of the research until the second year of a full time project, or the third year of a part time project.

The task of defining the research project, then, is one which will ultimately occupy up to twelve months of a full-time PhD. The first stage involves the development of a research statement, the second stage involves a more detailed topic analysis based upon the most significant previous works in the field and the third stage a fully fledged research proposal. Each of the items will form the basis for the next and each will probably be re-written in the light of subsequent work. Table 1 provides a typical list of the kinds of questions that need to be answered during this stage.

Table 1: Defining a research project

- **What is it about?** The title will indicate this, but an introduction will amplify aim of the work and its objectives. The aim is a broad policy statement about what you hope to achieve. The objectives are a detailed list of measurable accomplishments which will indicate real progress.
- **Why is this important?** You need to evaluate the significance of the problem so that the reason for studying it is made clear. What are the inadequacies and inconsistencies in the literature and in practice?
- **How will it be done?** The work will clearly be based upon a few key works of reference. What are they? What are they about, why are they significant? And how did the authors go about their work? This is different to the list of references which will appear at the end of the dissertation. We would want to know who are the most important writers, along with a few notes about the content and relevance of their work. This will help to place the work into its context. Ultimately, this section helps you to develop the basic research question (or hypothesis) which gives validity and direction to the subsequent empirical field work. In addition, you need to describe your research methodology. In particular, you must explain *how* you have chosen to collect the data, and what methods of analysis will be used. It is important to be clear about what is *data* and what is *background literature*. In considering the question of method, it will be useful to focus upon the question of what other research methods were considered and dismissed, and why were they inadequate? What is the basis of your analytical framework?
- **Where will the work be undertaken?** The work must be based within a particular culture, location or population. Data needs to come from somewhere and it is clearly important to recognize that the sources of data will impose limitations upon the kinds of generalizations that can be drawn from the work.
- **When will each part of the work be undertaken?** The tasks needed to achieve the objectives must be split into component parts and programmed within a reasonable time-scale. Suitable allowance must be given for all phases of the work; literature, data collection, data analysis, writing-up, typing, editing, binding, production of graphics etc. The programme needs to be revised at regular intervals.

One of the most effective techniques for removing obstacles at this stage is to think about the root discipline of the research. It is much easier if construction is thought of not as a discipline, but as an application or source of data. A researcher should decide whether he or she is engaged in economics, management, statistics, law, engineering, history or whatever. The work should be undertaken in a way that would be recognized as valid by someone from the root discipline. Such an approach will ensure that construction researchers will not only be informed by other disciplines but will ultimately be in a position to influence them and add to their knowledge, the ultimate test of quality in academic research.

Supervision

There are many potential difficulties with a PhD and one of the most serious worries of students is bad supervision (Haksever, *et al*, 1994). Ideally, supervisors need certain qualities, some personal others professional. On a personal level, supervisors should be communicative, approachable, accessible, sociable, patient and understanding. On a professional level they should have experience with relevant research techniques; knowledge of the particular literature; familiarity with the processes of PhD research; contacts with the leading academics and practitioners in the field; reasonable judgement about what constitutes a successful PhD; understanding of the skills needed to do research. Realistically, no supervisor will have all of these qualities. Every piece of research supervision is different. It is a two way relationship and the student should be able to suggest his or her own preferred pattern of supervision in terms of frequency and means of contact.

Students and supervisors select each other. Neither is compelled to accept the other, so to a certain extent it could be said that they each have to bear the consequences of their choice. Such a view is unreasonable in many cases. For example, a student who has a particular interest in a topic may find a supervisor with a grant for a PhD project. International students can rarely afford to travel to their country of study until after they have been accepted for a PhD and probably allocated to a supervisor whom they have never met. For a variety of reasons of this nature, it is often not plausible for a student to reject a supervisor on the personal criteria outlined above. Similarly, unless PhD students are interviewed by the potential supervisor, it is difficult to imagine how a student's application can be rejected on the grounds of incompatibility.

On a professional level, students might feel unqualified to judge their mentors. However, it is vital that the supervisor is a continuing contributor to the field. As Phillips and Pugh (1987) suggest, the potential student should ask about papers and books the supervisor has had published, about papers at international conferences and about what research grants are held. In addition, Howard and Sharp (1983) suggest that the potential student should ask how many previous PhD students have successfully completed with this supervisor.

A supervisor should be able to offer many types of help to a student: guidance in reading, guidance in methodology, guidance in process and guidance in skills acquisition. Any weaknesses in these areas must be compensated for by careful management of the process, as discussed below. Wright (1992:11) quotes from a USA study that showed several significant aspects of the learning environment: *conditions crucial to the optimal development of productive scholars and scientists are often neglected in graduate education. Among these conditions are cultivation of the imaginative capacity, encouragement of co-operative enquiry, discouragement of undue allegiance to a specific school of thought*. Not only does the supervisor need good interpersonal skills and professional academic experience, but also the right attitudes!

Writing

For many students, the writing-up of their work is the most daunting task. This puts them in good company because Hartley and Knapper (1984) found that most academics find it a struggle, never easy and rarely enjoyable. In many cases, writing-up takes place after the grant has expired. This leaves the student isolated and often without full access to the facilities they had when funded. The importance of writing cannot be over-emphasized. To quote Wright (1992) again, *students learn to write by writing regularly and by realizing that a PhD is about writing and not reading*. A systematic approach throughout the project will enable writing to proceed smoothly. Good record keeping at every step is essential. One of the biggest time-wasters is the pursuit of the full bibliographical citation for a reference that was not fully recorded. The re-discovery of a document is often more difficult than the first discovery.

Another technique to ease the writing stage is to ensure that the student has produced essays and papers throughout the study. In many cases these can be incorporated into the first draft of the thesis with some adjustment and development.

As the production of the draft proceeds, the supervisor should be commenting on draft chapters, helping the student to develop an acceptable standard of communication. Help is also needed with the overall layout and structure of the thesis. Whilst the supervisor should be able and willing to offer guidance, it is important that the student's words are not replaced by the supervisor's for two

reasons. First, it is expected that the thesis is the student's own, unaided work and second, the student is going to have to defend the work in the examination.

Examination

Examiners of theses tend to be (and ought to be) PhD holders who are experienced supervisors. Whilst the prospect of having to make an original contribution to our collective knowledge looms large and threatening, the scale of this contribution is often over-estimated by students and the other aspects of a PhD neglected. Clearly, a PhD is about the acquisition of skills, the development of an expertise and the contribution to knowledge. As Wright (1992) pointed out, *there has always been a tension between the PhD as training, learning and knowledge generation, but there seems to be no published document which attempts to resolve this uncertainty*. The uncertainty means that it is very difficult to be confident about the outcome of an examination. However, a student that can clearly demonstrate progress of all three types will surely succeed.

What examiners are looking for is a contribution to knowledge that has been undertaken in a planned way, using appropriate techniques and reported in a clear and professional manner. There are typical patterns for doing and reporting research work and these patterns vary from one field to another. It is vital that the student's work looks like a PhD and that the candidate sounds like someone who is accomplished in the field. In other words, the PhD process *is a socialization process in which students learn to act and think like their mentors* (Bon, 1993).

The examination tends to take place in three stages. First, the examiners will read the thesis, without consulting one another, and form a view as to its merits. This reading will prompt questions for the candidate which will probe the limits of his or her abilities. The second stage is the dreaded *viva voce*, an ordeal which can last anything from half an hour to a whole day, depending upon the feelings of the examiners. The final stage is the execution of any amendments insisted upon by the examiners as a condition for the award of the degree. For many examiners, the relationship between thesis and viva is that the thesis is a record of what was done and the viva is the examination.

The viva is nearly always an ordeal. In order, to be able to cope with this, the student needs practice. Students should seize every opportunity to have their work criticized so that they can defend it and, where necessary, improve it. Supervisors should leave their students in no doubt about the stress likely to be encountered. If they are not involved as an internal examiner, they should support their students by being available both before and after the viva. Finally, the supervisor had an obligation to help the student to make any amendments that may be necessary.

Managing the PhD process

There are three different sources of strategies for dealing with PhD work: departments, supervisors and students. Each should interact with the other. However, the absence of active and positive support or progress in any one of these areas need not be a cause for panic or despondency. Knowing what might be provided is the first step in filling the gaps. In an ideal world, researchers would not find themselves in departments that lack support studying under supervisors with no experience. The world is far from ideal and universities are constantly developing. Therefore, it is highly likely that most students will find that some levels of support are simply missing. It is also highly likely that some supervisors will find themselves

supervising students who are inadequate or unsuited to the task. For these reasons it is essential to develop a series of strategies for coping with situations that are not perfect. Obviously, the best supervisors working with the best students can easily cope without such mechanisms. But an increasingly large number of PhDs cannot be left simply to fend for themselves.

Wright (1992) cites the Robbins Report which gave evidence of *disquieting confirmation of a general impression that the universities do not take their responsibility for the organization of postgraduate study seriously enough*: she states further that isolation and loneliness are extremely problematic, especially in subjects outside a laboratory where a social structure goes with the territory. All of this points to a real need for departments to provide an increasing level of support for postgraduate researchers. The three sections that follow offer advice and useful hints to departments, supervisors and students for improving the situation. These sections are based upon the author's experience at the University of Reading.

Departmental strategies

A strong research-based department will have a clearly articulated policy for PhD research. Each department should seek to develop and constantly improve a policy for PhD research. Wright's (1992) proposed educational policy changes could improve not only the academic management of research, but also the quality of the process of doctoral study. These include the suggestion that departments should take more responsibility for improving collegiality and for providing funds to assist research students to learn more by attending conferences and seminars outside the university. There are many steps a department might take to improve the situation. As an example, developments at the University of Reading may be of interest.

Reading runs a university-wide PhD programme as a response to the requirements of ESRC. This involves introductory seminars that alert students to the nature of the PhD process and to the range of potential methods and sources of information. Such a general programme needs augmenting at the departmental level with classes specifically tailored to the needs of the discipline. In my own department, these involve training sessions in aspects such as time management, reviewing books, statistical methods, presentation skills and so on. These sessions are in addition to frequent PhD seminars where postgraduates present their work to an audience of staff and students.

A final example from my own department is the use of supervisory committees. These augment and complement the supervisor's support. Each student is assigned his or her own committee of four or five staff. Amongst other things, the committee receives formal annual presentations from students so that their progress can be monitored and a decision taken about whether they can progress. During the year, the student will be expected to submit essays and other pieces of work for criticism. Since the student has direct access to more members of staff, this technique also helps to overcome certain supervisory weaknesses. The increased interaction that follows from this arrangement goes some way to achieving the needs for collegiality.

Supervision strategies

A supervisor who wishes to improve the situation can try a variety of tactics. It is very important to get the student out among people, talking to other academics and to practitioners. This can help to make up for any gaps in the supervisor's own knowledge or experience. It also helps to ease the way into data collection. It can be

very useful to encourage the student to undertake a pilot study. This provides practice, generates confidence and helps to refine the methodology for the main study. Every opportunity should be taken to get the student to write research essays, book reviews, progress papers and so on. These should be directed to help the student's developing critical skills as well as providing practice in the craft of writing. The student needs to learn the value of managing time and will need help in preparing a programme for the entire study, identifying milestones and targets. As a supervisor you should know who the significant people are in the area of study. Offer guidance as to which works to read and try to introduce your student to some of these people. Help the student to decide which conferences, seminars or workshops should be attended and, if possible, ensure that funding is available. One useful way to overcome a student's disinclination to write for publication is to offer to do joint papers for conferences and journals. However, you should never insist that your name is automatically added to papers the student writes alone, even if you help to refine and polish it. Identify the skills that are needed for successful research and ensure that the student has the resources to acquire them. Finally, to avoid heartache and stress on both sides, discuss the student's expectations and try to reduce the gap between what might be expected and what will be provided.

Student strategies

Students themselves have a variety of techniques at their disposal. These are needed particularly when there is no formal programme, or when the programme is not going as expected. To a large extent, they consist of knowing what ought to be provided and then precipitating the support needed by prompting those who might be able to supply it. For example, a student who feels the need to develop better writing skills should write things for his or her supervisor and ask for comments. Students should routinely approach other members of staff in the department and see if they would be willing occasionally to comment on short pieces of written work: by the time I finished my own PhD I had a panel of seven people routinely reading and commenting on everything I wrote. Similar approaches can be used for the other skills that are required. Reading through some of the books about research (Kane, 1985; Howard and Sharp, 1983; Phillips and Pugh, 1987) will give a student a very useful introduction to these skills. Equipped with this, the student will know what questions to ask of his or her supervisor and what kind of additional support will be needed from other members of the department or other members of the wider research community. In dealing with the supervisor it might be wise for the student to note that many supervisors feel that they lack competence in methodology and in coping with unfamiliar problems (Howard and Sharp, 1983). If supervisors do not get students to set objectives, then students will be well advised to set some for themselves and ask the supervisor to comment on them. If the comments are no help, then someone else should be asked; another postgraduate or another member of staff. Another approach is to form study groups and self-help seminars with other postgraduates. There is often a tremendous reticence between postgraduates to share their experiences and problems. This may be because so many PhD students feel vulnerable and insecure. Knowing that these feelings are widespread should help students to approach others in a similar situation.

Basically, the student should develop an understanding of what the PhD process involves so that supervision gaps can be filled. Finally, students should explain their

expectations to the supervisor in order to reduce the gap between the expectations and the provision of supervision.

Developing a more effective research community

The problems outlined in this paper are sufficient to cause some postgraduates to withdraw from their studies altogether. One of the greatest problems is isolation and loneliness. There is a great potential here for ARCOM to continue with its excellent work in encouraging collegiality. In addition to the annual conference, the newsletter helps to remind us of what is going on outside our own institutions. Perhaps there is scope for developing a more participative approach for postgraduates in ARCOM.

The Reading Construction Research Forum (now the ARCOM Doctoral Forum) is another example of the kind of meeting that generates collegiality. This forum was specifically designed to meet the needs of part time PhD students who have difficulty fitting into the programmes of seminars and workshops that most universities arrange for their full time researchers. At these meetings, current and recently completed work is presented and discussed in great detail, with a focus on methodological issues.

At an international level, CIB caters for professional academics and research practitioners, but for PhD students there is very little. A more useful forum is the Co-operative Network for Building Researchers (CNBR) which is run from the Royal Melbourne Institute of Technology, Australia. This is an e-mail network that is remarkably successful as a method of making contact with other researchers. There would seem to be some potential for developing an international PhD support group, but an attempt last year by CNBR to launch a PhD discussion group was a surprising failure. Quite a few people joined, seemingly out of curiosity, but very few had the confidence to take part in any discussion or to offer ideas and suggestions to their peers. Perhaps progress in this direction will have to wait until there are examples of national discussion groups. The aim of such a group should be to describe the kind of skills that might be useful and to suggest useful ways of acquiring them.

Conclusions

For many people, doing a PhD is a painful and lonely process. The aim of alleviating this should not simply be philanthropy. A continuous flow of bright people through the PhD process is necessary for sustaining a growing and responsive research community. There are steps that can be taken at all levels to ensure that this happens.

At the general level of the research community, steps should be taken to provide a general level of support and a contact network for postgraduates, particularly within the UK. Peer group support is one of the most useful techniques for dealing with many problems identified in this paper. ARCOM is ideally placed to develop a more active role in this.

At the level of the department, selection procedures should aim to match supervisors, students and topics; funds should be made available to postgraduates for attendance at conferences and seminars; guidance and support should be given to supervisors; departments should insist on more frequent intermediate assessments of student progress; there should be a departmental programme of research seminars.

Supervisors should involve others in the process; they should guide the student's reading, at least in the early stages; intermediate targets should be set; the student and supervisor should be agree a programme; student expectations should be discussed; attendance at taught classes may be needed; regular and frequent contact should be

maintained; students should be made aware of any inadequacies in their work at the earliest opportunity; the supervisor should help to introduce the students to others working in the subject area.

Students can do a lot to help themselves. They should discuss their expectations with the supervisor; arrange a programme of meetings; report any difficulties at the earliest opportunity; ensure that progress is made and maintained; prompt the supervisor by asking questions about the work and by asking for written assessments of submitted work; ask who else might be approached about the work; read books about doing research and about writing; find ways to practice writing, arguing, questioning and defending, ensuring that some kind of feedback in involved. Above all, students should be in no doubt that the process is always difficult and lonely and that it requires single-mindedness and, at times, a selfish attitude to the work. The process involves peaks and troughs of despair and elation with long periods of tedious drudgery. There is a constant fear of the examination, and the thought that all of this work might be wasted at the whim of an external examiner. However, it is also true that the award of the PhD is the culmination of years of hard work and sacrifice; it is a personal achievement of tremendous significance; no-one can do it for you. As such, it is probably the single most satisfying and rewarding of qualifications.

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