

Advising and Supervising Doctoral Students

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Abstract

A major problem with the supervision of doctoral students is the lack of advisor experience. An advisor has done one dissertation under one advisor or supervisor and may have observed some other advisors, but models of supervision are rarely written down. Advice on advising is anecdotal and incomplete. This paper codifies some observations from being on well over a hundred doctoral dissertation committees and being the principal advisor for thirty or so doctoral dissertations. I use the terms “advising” and “supervising” to mean the same thing, i.e., providing guidance, advice, and quality assurance for a doctoral student doing a dissertation.

The process of building expertise in advising a doctoral student begins with understanding four underlying issues: **doctoral program assumptions, motivations for a doctorate, advising styles, and student need for advising**. The first issue is the underlying assumptions about a doctoral program: the two major assumptions are an entry-level doctorate or a mid-career doctorate. The second issue is the student or program motivation for a doctorate. These motivations range from recognition or prestige to a career requirement with a number of variations of these two extremes. The third issue is different advising styles. At the extremes, these range from a very strong master/apprentice model to a hands-off model. There are many variations between these extremes. Each advising style has advantages and disadvantages, depending on the student and the problems being studied. The fourth issue is differences in student need for advice and supervision. At the extremes, these needs range from need for very close direction and supervision to need only for general direction and supervision. With basic understanding of these issues, an advisor can begin to develop a preferred personal advising style and can make decisions about variations in advising to suit a particular student or problem.

Given an understanding of the four basic issues of program assumptions, student motivations, advising styles, and student needs, an advisor should be familiar with and apply some basic concepts about doctoral advising and some useful procedures. These concepts and procedures will help in achieving good results. Three basic concepts relate to the **definition of contribution required for an acceptable dissertation, advisor competence to supervise a given dissertation, and appropriate methodology**. The contribution concept defines the essence of a dissertation. Advisor competence is a quality assurance concept to ensure an advising process that provides quality in supervision and advice. The methodology concept relates to whether **a methodology is appropriate for the problem and powerful enough to yield a contribution to knowledge**.

Understanding underlying issues and concepts about advising are not sufficient for good advising. **An advisor needs to apply good advising procedures**. Good advising procedures will tend to result in good dissertations (assuming the student is receptive to good advising). Some

important advising procedures are a student career plan that defines the role of the dissertation in his or her career, topic analyses to consider alternative dissertations, a formal dissertation proposal, a dissertation project plan, a formal or informal dissertation proposal defense, and progress documentation. The value of a student career plan in defining the role of the dissertation is emphasized in this paper; the other procedures are only summarized because they are described in some detail in a short monograph on managing the doing of a doctoral dissertation, Gordon B. Davis and Clyde A. Parker, *Writing the Doctoral Dissertation: A Systematic Approach*, 2nd edition, Barrons Educational Series, 1997.

The Problem of Training Advisors

Terminology may vary in different countries but the underlying problems are the same. To avoid using multiple terms, I will use the following terms to apply to the dissertation advising function being performed and the objective:

- *Dissertation* and *thesis* are used interchangeably to refer to the doctoral dissertation or doctoral thesis produced and defended by a doctoral candidate. The dissertation results from significantly independent work by a doctoral candidate. It is a “contribution” to knowledge.
- *Doctoral candidate* historically referred to a person who had demonstrated a readiness to do a doctoral dissertation and was therefore admitted to candidacy (probably after some examination procedure). As will be explained, students in many doctoral programs may be considered doctoral candidates during preparatory work; making the distinction less important in many university systems, but from the standpoint of this article, the distinction is not important.
- *Advisor* is used to refer to the doctoral student advisor or supervisor. The function is assumed to be essentially the same. “Advising” to refer to the process of providing guidance, advice, and quality assurance for a doctoral student during two stages of a doctoral program: doing preparatory work prior to a dissertation and doing a dissertation.

A major problem with supervising doctoral students is the lack of advisor experience. An advisor will have done one dissertation under one advisor and may have observed some other advisors, but models of supervision are rarely written down. Advice is anecdotal and incomplete. As with many knowledge work processes, there is an implied assumption that completing a doctoral program and doctoral dissertation qualifies a professor to be a good advisor. In fact, some professors have good advising instincts and naturally do good advising. Others, however, must learn through a trial and error process.

The assumption of this paper is that professors can learn advising skills by following some systematic advising processes. This paper codifies some of my observations from being on well over a hundred doctoral dissertation committees and being the principal advisor for thirty or so doctoral dissertations. I summarize lessons I learned both by mistakes I have made or observed and by successes. Like all such codified experience, the lessons are a starting point for

building good advising skills rather than being a perfect recipe.

Four Underlying Issues Important to Advising Doctoral Students

Not all doctoral programs are the same. Not all dissertations are based on the same assumptions. A dissertation advisor may impose certain values and standards without considering alternatives. It is useful in building advising skills to understand four issues that underlie differences in doctoral programs. These are doctoral program assumptions, motivations for a doctorate, different advising styles, and differences in student needs for advice and supervision.

Underlying Issue One: Doctoral Program Assumptions

Discussions of advising often are not productive because the doctoral program assumptions are not surfaced. At the risk of oversimplifying, it may be useful to define two alternative assumptions for the purpose and conduct of a doctoral program. I term these: mid-career doctoral program and entry-level doctoral program.

- A mid-career doctoral program goes back to the historical development of doctoral programs in Europe. A person who had engaged in teaching or research and demonstrated good scholarly abilities, probably including publications, could seek a doctorate as a recognition of scholarly attainment. Given this general condition, the focus of the doctoral program is not on preparatory work but on the dissertation. Any preparatory work is based on individualized counseling to fill gaps in knowledge in order to achieve an acceptable dissertation. The doctoral candidate may not be in residence at the university. The process places significant emphasis on a final quality control with external examiners.
- An entry-level doctoral program rests on the implied assumption that the doctorate is a credential for beginning a career as a researcher or academic. This is the most common situation today. In most cases, the degree is a requirement for entry into an academic career. Students entering a doctoral program may have little or no experience in teaching or research. The doctoral program is designed to prepare them for a career. Therefore, there is a fairly structured set of courses on a range of research methods, important literature and examples of research in the field of study, and important literature and examples of research in one or more underlying disciplines that support research in the field of study. The advising and mentoring process usually includes strong advice to students on seminars to take, specified assignments that demonstrate progress in a doctoral program, and examinations or other evidence of readiness to proceed with a dissertation. The program for an individual doctoral candidate is therefore a combination of core subjects and experiences plus individually tailored learning. A typical supervisory arrangement consists of a committee process to evaluate readiness to do a dissertation and a committee of four or five faculty members to evaluate the dissertation. The committee is headed by an advisor who takes a significant leadership role. It includes three or four other faculty members with diverse

backgrounds and skills. The choices of committee members are based on ability to assess the dissertation proposal, give advice, and evaluate the results.

These two different assumptions explain many of the differences in doctoral programs. There is a world-wide trend to a entry-level doctoral programs, primarily because they fit the majority of students. However, there are students who fit best with a mid-career program. I have observed students who were entry level and entered mid-career programs; the results were in general somewhat unsatisfactory. On the other hand, I have advised some mid-career persons to not do an entry-level doctorate and to seek a mid-career program. Those who have followed this advice have found it worked very well.

The two assumptions do not hold perfectly in practice. I am familiar with a doctoral program that has all the external appearance of a mid-career program but many individual advisors essentially establish conditions that fit entry-level students.

A related issue is the length of time it takes to complete a doctorate. Ignoring preparatory activities, a typical dissertation takes the equivalent of 12 to 18 months of full-time work. The average time for United States and Canadian doctoral students in entry-level programs (including the dissertation) is between four and five years. In the United States, this time has been increasing steadily during the past 25 years. There are four reasons for this increase in time: first, the depth and quality of preparation have improved; second, students entering the job market are expected to have evidence of teaching ability; third, students entering the job market are expected to have demonstrated an ability to write and submit articles for publication; and fourth, dissertations must be completed before taking a position. The latter condition means effectively that students who are a few months behind schedule must wait many months before entering the job market.

Underlying Issue Two: Motivations for a Doctorate

The reasons for doing a doctorate are varied. They affect the design of doctoral programs in different fields and certainly influence the selection of topics, acceptable research methods, and advising processes. Even within doctoral programs in a given field or discipline, students may have different motivations. Without trying to look at all motivations, four examples illustrate this point:

- Requirement for a scholarly career. Under current and expected academic conditions in academic institutions, a doctorate involving good preparation for a scholarly career is a condition for employment. A well-constructed doctoral program provides preparation that enhances academic career potential.
- Requirement for career as a practitioner. There are many careers that require a doctorate as a condition of credentials to practice or provide significant economic incentives for those who have doctorates.

- Evidence of intellectual competence. Consultants and those in similar knowledge-work occupations may find their careers enhanced by doctorates because the degree provides evidence of intellectual ability.
- Evidence of scholarly achievement. Those who have been involved in research and related scholarly activities may wish to obtain a doctorate as evidence of their work. Although there are examples of great scholars who do not have doctorates, I have observed that many wish they had obtained the credential.

The first motivation of a scholarly career is the dominant basis for many doctoral programs. For the MIS doctoral program at the University of Minnesota, we clearly make that our objective. An entry-level program is very consistent with this motivation. Other doctoral programs seem to support consulting as a basis for doctoral work. Certain programs in the university have professional qualification as the basis for a doctorate, and it is reflected in the design of the programs. I have observed doctoral programs in departments where program objectives and student motivations are varied. One department prepared students for either scholarly careers or professional careers requiring a doctorate as a credential. The mixed objectives meant that they did not do a good job of either.

Underlying Issue Three: Advising Styles

For the purposes of discussion, it may be useful to identify five advising styles. These are illustrative, but I have known advisors I would classify in each of the five styles. The five styles are ordered from strong, detail supervision to hands-off laissez faire advising. Each style has strengths and weaknesses.

- **Strong master/apprentice style.** In this style, the advisor is the master. The student works as an apprentice on problems selected by the master (often on research grants obtained by the advisor). Assuming a competent master for dissertation advisor, the advantages are significant reduction in the time for student to formulate a problem, strong guidance and direction in doing the work, and development of specific skills for the type of problem being worked on with the master. Even assuming a competent master, there may be severe disadvantages. The student may be given strong direction but may not develop an ability to formulate research and conduct it independently. The research methods may be limited. The focus on the master's problem may becloud the apprentice student's understanding. The sciences, where the master/apprentice style is very prevalent, routinely expect graduates with doctorates to do post-doctorate appointments. In part, this may be a response to the narrow focus of master/apprentice doctoral training. Of course, the master/apprentice style may be very bad if the master is not a good researcher or is exploitive in his or her handling of doctoral students. On balance, the master/apprentice style fits best the condition of a relatively immature, inexperienced student who needs strong direction. It also fits with well-defined, funded streams of

research.

- **Collegial master/apprentice style.** Limited domain advising. This is a less restricted concept than strong master/apprentice. The advisor is willing to advise on problems that are within the scope of his or her research and methods within his or her skill set. The set is not restricted by advisor's current research activity or research funding. The problems may be selected by the students as long as they fit within the general domain of expertise. This style puts more responsibility on the student than the master/apprentice style, but the student dissertation must fit within the existing knowledge of the advisor.
- **Collegial development style.** Extended domain advising. This advising style includes not only the domain of the advisor's current or past research but is extended to areas in which the advisor has an interest and is willing to invest in becoming reasonably proficient. There is a joint learning experience; the advisor starts with more experience, but both are learning the details of the dissertation research area. This style fits an advisor who is willing to expand his or her research competence; it fits a student who is willing to engage in a joint learning experience. It fits very well for a dissertation that opens up a new or fairly new area of research.
- **Guidance and suggestion style.** General advising over a range of problem domains. Some advisors have good skills at problem identification and problem formulation over a range of problems and research methods. They conceptualize well and are good at "sense making." This style works best with students who are willing and able to take initiative and take responsibility for learning the research domain and the appropriate research methods. The student gets good general guidance and good evaluation of the dissertation but usually does not get detailed feedback and detailed mentoring of methods. It is not very good for immature students who need more detailed guidance.
- **Passive hands-off style.** In this laissez faire style, the advisor takes the role of a general quality control reader. The student must take the initiative to define a problem, decide on a research method, develop a research plan, and so forth. The advisor responds to student plans and initiatives with some suggestions but the responsibility is almost entirely with the student. Given a competent advisor who gives good suggestions in response to student initiatives and plans, the advantages are that the student develops independent skills at formulating problems and planning research. The disadvantages are that the student may meander from problem to problem and take too long to do a dissertation. Under these conditions, a student may not develop good skills and may drop out of the program. For fairly mature students with an ability to take initiative, this style may work well. It has significant danger with a dissertation project for which the student does not have the necessary background for doing a good dissertation or the advisor is unable to do reasonable quality review. For immature students, it is likely to be a disaster.

The two extremes of strong master/apprentice style and passive hands-off style have significant risks but may work well under appropriate conditions. The middle three styles are less

extreme. Advisors can develop styles that are not at the extremes, based on their preferences, the maturity of students they advise, the availability of funding, and so forth. Probably the extremes should be avoided, but one style does not fit all advisors and one style does not fit all students. For example, an advisor may use a collegial master/apprentice style with limited domains allowed with many students but change to a collegial development style with extended domain advising style for other students. For a very mature student who demonstrates good competence, an advisor who prefers a collegial master/apprentice style of detailed advising within restricted domains may be willing to change advising style to a guidance/suggestion style. In any situation, an advisor should identify his or her own strengths and weaknesses, identify both a preferred style but also alternative styles he or she can do, and evaluate his or her ability to advise different students.

One advantage from dissertation supervisor training or mentoring of new advisors is building more confidence in advisors, so that they can better adapt to the needs of the students and the conditions of the academic institution.

Underlying Issue Four: Different Student Needs for Advice and Supervision

There are significant differences in the maturity and confidence of doctoral students relative to the process of selecting a dissertation topic, selecting a research design and research method, and managing the process of research and write up. To illustrate the range of students needs for advice and supervision, three archetypes will be described.

- Immature, unconfident student. Although the student may have requisite tools and skills to do research, the ability to work independently is not well developed. The student looks to the advisor for a problem, strong mentoring, and strong, detailed supervision.
- Somewhat mature, somewhat confident student. Preparatory work leading to the dissertation has helped the student be somewhat confident, but the student still needs moderately detailed direction to get going and moderate supervision during the process.
- Very mature, confident student. Preparatory work and experience leading to the dissertation has prepared the student to be quite independent. Student recognizes need for guidance and supervision, but the need is at a fairly general level. The student can take general guidance and apply it well.

Understanding how students differ in their needs may help a potential advisor to not accept supervisor assignments that he or she cannot do well. It may help an advisor to modify a preferred advising style to fit the needs of a student.

Preferred Advising Style and Adapting to Variations in Students

I have observed students who were frustrated with a master/apprentice advising style because they were not given enough freedom to develop themselves; I have observed other students who had hands-off advisors who complained that they couldn't ever get any advice or direction. In these cases, other students were very happy with the advisors. This suggests an advisor can do two things to be more effective: one is to develop a preferred advising style and communicate this to prospective advisees; the second is to adapt somewhat to the different needs of students.

Advising styles an advisor is able to employ effectively may change during the course of an academic, advising career. Experience with different styles and different student needs may assist an advisor in drawing clear boundaries to discuss with potential advisees. One very good advisor says that she has a clear, detailed session with any potential advisee in which she explains her philosophy and approach to advising. For example, she believes a major part of the advisor's work is to help the student in formulating and writing a good dissertation proposal. She does not want to work with a student who wants to start dissertation work without a detailed proposal. A student who works with her understands the advising relationship and is expected to work within the guidelines provided.

The discussion of advising styles suggests that students need to understand preferred advising styles of potential advisors. Students can evaluate their maturity and level of skill. They can evaluate their need for close monitoring and supervision versus fairly loose monitoring. Such self-examination can lead to a useful dialog with potential advisors. It can lead to clarity relative to expectations by both student and advisor.

Basic Concepts for Dissertation Advising

There are a number of concepts that are important in dissertation advising. Three that are especially significant are the concepts of contribution of a doctoral dissertation, advisor competence to supervise, and dissertation research methodology.

Contribution Required for a Doctoral Dissertation

One of the important roles of an advisor is to work with the student to define what is required for the dissertation to meet university requirements. There are significant variations within a university and among universities on what is required for an acceptable dissertation. However, there are some reasonable general guidelines. Individual departments or fields of study may make the general guidelines more specific.

- **Contribution to knowledge.** The role of university research is to create knowledge. A

dissertation should contribute to this role. The contribution to knowledge may be modest or profound, but this is the important test of a dissertation. Some possible ways to think about contribution are given later in this section.

- **Demonstrates independent scholarly ability of student.** A student receiving a doctorate should have reasonable ability as a scholar. The dissertation should therefore demonstrate this ability. It should not be just the ability to do what an advisor says but ability to take initiative and be reasonably independent. For some research, the contribution to knowledge of the dissertation itself may be modest, but the research process demonstrated in the dissertation indicates development of a capable, independent scholar.
- **Demonstrates quality in use of appropriate research methods.** There is quality if accepted methods are used appropriately. Methodology may sometimes be used as a contribution to knowledge if new methods are applied and demonstrated to be useful.
- **Communicates the problem or objectives, process, results, and meaning of the research.** The dissertation should communicate clearly to a reader with an appropriate scholarly background. The reader should be able to assess the quality of the research by reading the dissertation.

It is simpler and more meaningful to discuss some general concepts that define contribution rather than making rules that measure contribution. Some general ideas are the following:

- **Based on significant question, problem, or hypothesis.** The dissertation should tackle an interesting problem (that is amenable to research). It should be an original work that explains, solves, or adds proof or disproof to the question, problem, or hypothesis. The focus of the contribution may be data analysis, interpretation, or design.
- **Based on meaningful concepts or theory.** Theory may come from other fields, but the data collection and analysis should be guided by theory.
- **Provides new or improved evidence.** Existing beliefs may be weakly supported by evidence or argument. There may be conflicting opinions and beliefs. The existing evidence may be contradictory. The dissertation makes a contribution if it adds evidence, helps resolve conflicting beliefs, or strengthen the reasoning either supporting or disproving beliefs.
- **Employs new or improved methodology to do analysis or interpretation.** Existing analysis may be incomplete. New or improved analysis includes improved or more complete data, comparative analysis, longitudinal analysis, or application of new or different analytical methods. The new or improved methodologies should be shown to add to knowledge.

- **Develops new or improved concepts or theories.** Concepts or theories for a problem may be weak. A dissertation that explains and supports a new or improved concept or theory makes a contribution.
- **Develops and demonstrates new or improved design of conceptual or physical artifact.** The contribution may be demonstrated by reasoning, proof of concept, proof of value added, and proof of acceptance and use.

An advisor should also provide practical guidance to the student in evaluating dissertation topics. Although the research should be needed and interesting, theory-based, and make a contribution to knowledge, it should also meet some feasibility and career criteria. Some of these are fit of topic to available research methods, time required to do the proposed dissertation, match with student capabilities and interests, attractive for funding (if relevant), and consistent with student career objectives. An important criterion is the symmetry of potential outcomes, so that there will be an expected contribution from the research if the data or design results are as expected or are unexpected.

Advisor Competence for a Specific Dissertation Topic

An advisor should give good advice, give good direction, and be able to judge the quality of work being performed for a dissertation. That means that advisors are constrained in the problems and methods they can supervise well. It may be useful to distinguish between operational competence and review competence. A master type advisor needs operational competence, especially with immature students. Some advisors have a broad perspective and are very good at review competence; given a dissertation proposal and research plan, they can do a very good job of evaluating the project and making good suggestions. Note again the need for matching advisor competence (operational and/or review) with the maturity level of the student.

An advisor does not always have to be an expert when presented with a proposal where his or her competence is not strong. An advisor who is collegial and open to learning new skills may be willing to invest heavily in order to work with a doctoral student. In one case I observed, a faculty member chose to invest in a new area of research in order to be a good, collegial advisor. The result was very good for the student and allowed the faculty member to mentor a number of students in the same area of research. The question in such cases is the commitment of the faculty member to invest.

Advisor competence may be an important factor in student selection of a research area and a dissertation topic. Unless a student has good skills and confidence, the tendency is to gravitate to the advisor who can provide adequate mentoring and quality assurance. In one case, a student did dissertation research in an area outside of her long term interest because of the lack of advisor competence in her department for the area of her interest.

The traditional mid-career doctorate typically has one advisor. This places significant responsibility on the advisor to either not advise on problems where his or her competence is insufficient or to make a strong commitment to build competence. Because the traditional mid-career doctorate places the quality control on external examiners after the dissertation is completed, an advisor with insufficient competence may lead a student to do a complete dissertation that will not be accepted.

The committee model common with entry-level doctoral programs provides a basis for good advising without relying on a single advisor. There are still conditions for success. The committee must have a good mix of appropriate skills and be willing to provide good advice and mentoring. The advisor must invest enough to make sure the committee structure provides the requisite guidance and advice. Another advantage of the committee structure is the ability to have a collegial contract (not a legal contract) based on a dissertation proposal. Weaknesses can be spotted early and appropriate advice given. This will be described in the advising procedures.

Dissertation Research Methodology

There are a number of alternative research methodologies that may be applied. Jenkins (at the 1985 Manchester Conference by IFIP 8.2) defined thirteen methodologies (ranging from strongest to weakest in terms of hypothesis testing):

- Math modeling
- Experimental simulation
- Laboratory experiment
- Free simulation
- Field experiment
- Adaptive experiment
- Field study
- Group feedback analysis
- Opinion research
- Participative research (action research)
- Case study
- Archival research
- Philosophical research

The thirteen methodologies focus on hypothesis testing. These fit both hypothesis testing and interpretive research. They do not include design science methodologies. In design science, the research builds an artifact (algorithm, computer program, analytical method, prototype, theory or set of concepts, etc.). The artifact is a contribution if it adds to knowledge. The issue with design science artifacts as contribution is how to evaluate them. In some fields, the artifacts may be evaluated in terms of simplicity and/or elegance of design; in other fields, the artifacts must be supported by evidence that they yield improved results, are deemed useful by those who apply them, etc.

Conceptually, the question of methodology is simple. The methodology should fit the

problem, so that a contribution is achieved. But problems may be amenable to different research approaches and different methodologies. The concept of methodology choice can involve several criteria. These are the role of methodology in achieving a contribution, methodology choice relative to a long term research career, fit with student skills and interests, and fit with advisor skills and interests.

- Methodology and contribution. The research methods should be powerful enough to support a contribution to knowledge.
- Methodology choice relative to a long term research career. If all things were equal, it would make sense for a student to use positivist, hypothesis testing methods early in a career in order to develop skill and familiarity with traditional methods of data collection and analysis. These skills support advising, reviewing, and evaluation in a research career. Interpretive methods tend to require more maturity and therefore are often best done at a second stage of research on a research stream. Of course, all things are not equal, so the objectives of learning both positivist and post positivist methods may need to be achieved in a different way.
- Fit with student skills and interests. Some methods depend on specialized skills or strong backgrounds in economics, mathematics, statistics, etc.
- Fit with advisor skills and interests. An advisor can usually develop adequate skill to evaluate almost any methodology, but to give expert advice may be difficult.

Useful Advising Procedures

The paper has focused on improving advisor understanding of the underlying issues and concepts for dissertation advising. Good conceptual understanding helps; good advising procedures are also required. This section will describe the use of a student career plan to provide focus and clarity for dissertation research. It also describes some useful resources that may help a student to become more independent and develop good research skills. The focus is on readily available resources on the web. Examples are from the field of information systems, but other fields have similar resources. Advising includes providing an environment in which the student learns from interaction with other scholars and other students. The last part of this section summarizes some useful procedures that are described in more detail elsewhere.

Use of Student Career Plan to Provide Clarity about Research Interests and Role of Dissertation

Most students have an interest in a broad field. As they investigate research in the broad field, they may find many topics of interest. They have difficulty in narrowing their focus. A second problem is selection of a dissertation topic without considering the implications of the topic for a

career. For students with a motivation that requires a dissertation but no further research, the failure to consider long-term implications is not a problem. For those who choose a research or scholarly career, failure to consider the dissertation as a part of a career plan may have serious consequences. My use of a career plan to provide clarity about research interests and the role of the dissertation in a scholarly, research career has emerged through experience in assisting students to make choices fairly early in their doctoral studies.

The basic reasoning that motivates this procedure is somewhat based on the typical tenure process in North American universities, but the reasoning can be generalized to a broad range of systems. The reasoning is:

- When a person with a new doctorate takes a university position, there is a period of essentially five years in which to demonstrate scholarly research abilities. Tenure decisions take place typically during the sixth year, but the record that is presented is work that has been done through the fifth year. Published work is given a higher priority than articles in review or work in progress. A faculty member with a new doctorate therefore needs to move briskly to establish a good research and publication record.
- If a person in a scholarly research track waits until the completion of the dissertation to decide on future research, it is difficult to complete sufficient research and have sufficient publications to have a good record for promotion.
- Given an entry level doctoral program of four to five years and time to promotion decision of five years, it makes sense to create a ten-year career plan to build research skills, build a network of colleagues, and build a record of presentations and publications.
- With a ten-year plan, the dissertation becomes a major milestone in the plan. It is one of several research projects that are related. Together, the projects demonstrate research ability and establish a record in a given research topic area. There is synergy in the projects. There is reuse of methods. Projects can build upon prior projects in the research stream.
- With a ten-year plan, a research can plan appropriate related study and development of appropriate, useful research skills. The investment is not just for the dissertation; it is for the research stream.

Students have difficulty thinking about a ten-year plan, but as they do three iterations of the plan, they become more focused and the plan makes sense to them. The biggest objection is that they may change their mind, and the plan will not fit. No problem. They create a new plan.

In working with students, they often name their interests very broadly or very narrowly. I try to get them to think of narrow interests as instances of a topic area or research stream. As they do so, they see an area of interest emerging. If they name a very broad interest, I ask them to identify some broad streams of research within it. The end point of the discussion and the

results needed for the ten-year plan are:

- Broad area of interest. An example might be information system development processes and procedures.
- A research stream that is a subset of the broad area of interest. Within system development processes and procedures, a research stream might be information requirements determination.
- A set of research topics with one defined as the dissertation. Within information requirements determination, a dissertation topic might be the effect of eliciting methods in achieving correct and complete requirements. Or perhaps even a more narrowly defined topic such as the effect of analyst domain expertise in eliciting correct and complete requirements.
- A plan for achieving appropriate preparation for the research stream and dissertation. This includes reading, seminars, small projects, research methods courses, etc.

In an introductory seminar taught during the first year of doctoral studies, the students prepare a ten-year plan. They do this with three iterations. They get detailed feedback and advice on how to distinguish between instances of research and streams of research. The results have been excellent. The students use the plan to guide them in selecting supporting fields, selecting projects in seminars, and writing papers.

Use Existing Resources for Doctoral Dissertation Research

In preparatory seminars or personal advising, students should be encouraged to identify resources that will help them be productive. There are two types of resources: the one is more general advice; the other is specific and practical.

Some examples of general knowledge and advice are:

- Re-envisioning the PhD is a website that resulted from a project to re-examine the PhD and to assemble best practices and best concepts. The site includes interesting promising practices and resources. **Website is:** <http://www.grad.washington.edu/envision/>
- ISWorld resources. Examples are a repository of experimental tasks, working papers, research ethics, endnotes, resources for doctoral students, etc.

Some examples of specific, practical advice are:

- Manual of style. Adopting a style for layout of papers (headings, footnotes, etc.) reduces effort required.

- System for making and filing notes (using a computer)
- End note systems (and available end note libraries for topics)

Providing Candidates with Opportunities to Interact with Established Scholars and Other Students

In addition to providing both general and specific sources of knowledge and advice, a doctoral student should be provided with opportunities to listen to research presentations by established scholars and other students. They should have an opportunity to present their papers and get comments on content, methods, result, and presentation. A regular workshop or colloquium in which research papers are presented is invaluable.

A valuable opportunity for student development is provided by doctoral consortia. These may be organized by conferences, scholarly organizations, sets of universities, etc. The basic idea is to have students present their work at various stages of development and get feedback from both senior researchers and other students.

Summary of Some Other Useful Advising Procedures to Promote Completion and Quality

An advisor can promote completion and quality for a dissertation by employing some simple methods. Some examples are:

- Topic analyses to promote early evaluation of ideas for dissertations
- Dissertation proposal
- Dissertation proposal defense (either formal or informal)
- Project time schedule and budget
- Agendas, summaries of meetings, memos on significant decisions, cover memos for chapters, etc.

These are described and illustrated in Davis and Parker, *Writing the Doctoral Dissertation*, Barrons Educational Series, Second Edition, 1997.

An advisor may be invaluable in helping students to maintain momentum and to overcome discouragement and delays. Prompt return of drafts with helpful comments, regular meetings, providing deadlines, having student turn in intermediate products for review, etc. are all important.

An advisor can help a student maintain perspective. Spouse and family should not be sacrificed for the sake of a dissertation. An advisor may help a student to block out dedicated times for spouse or family and to maintain some balance in his or her life. (Probably setting a good example helps also.)

Summary

References