# DOCTORAL SUPERVISION AT SYDNEY UNIVERSITY, HINDRANCE OR HELP?

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## Introduction

The time needed to finish a Ph.D. at many Australian universities has become a serious problem. In 1976 a committee on academic studies estimated the average time taken to finish a Ph.D. thesis at the University of Sydney to be 4.7 years and the information we present in this study suggests it may be increasing. Table 1, which sets out faculty details, shows that in only two faculties did students finish in under four years and that in some faculties they took over six and a half years.

**Table 1**
**Verbally Communicated Data from Report of Committee on Academic Studies of 1 July, 1976.**

| Faculty | Average Period for Completion of Ph.D. |
|---|---|
| 1. Law | 3 years |
| 2. Medicine (Scholarship Cut-off) | 3.9 years |
| 3. Agriculture | 4.3 years |
| 4. Veterinary Science | 4.4 years |
| 5. Dental Science | 4.5 years |
| 6. Engineering | 4.9 years |
| 7. Arts | 5 years |
| 8. Architecture | 5.6 years |
| 9. Economics | 6.6 years |
| 10. Science (not listed) | 4.5 years (estimated) |
| **Overall University Average =** | 4.7 years |

See also: Summary of Replies from the Faculties, dated 9 February, 1977.

A lengthy tenure for Ph.D. students has serious implications, both for those involved and society at large. Because they take such a long time to finish, students are threatened with severe financial hardship when their scholarships run out. The extra funding for equipment, support staff and stipends required by those granted a fourth year are an extra burden on government funds and ultimately the taxpayer. In addition, many students capable of taking a higher degree are refused scholarships because education funds are maintaining students for a fourth year. Finally, persons who through their high incomes would contribute largely to public revenue if employed are being kept an extra year on a low income provided from public monies.

This paper examines some of the reasons for the long time taken to finish Ph.D.s at the University of Sydney. Our findings are based on a questionnaire (see Appendix 1) sent to all full-time Ph.D. students in late 1977 to which there was a 25% response rate. We have assumed students and supervisors are able and willing to do the job in hand. This is a generous assumption on behalf of both parties. In 1974 the University of Sydney Professorial Board claimed supervisors too often underestimated their responsibilities.[1] It is also possible that some students are unsuited to or not trained properly for research. We feel it is unfair to brand all supervisors as careless, especially since most students were satisfied with them or criticized the system rather than supervisors themselves. Nor are there any grounds for claiming all students are incompetent and if there are faults in the system of training and selection, assessment of them is beyond our scope. Indeed, we agree with T. F. Neale's comments on the variety of styles of supervision. He has written:

> *My limited experience as a supervisor has taught me that it is a more difficult art than undertaking investigation on one's own behalf . . . It is a profoundly personal affair, probably interpreted in as many ways as there are supervisors; ranging from the Professor who calls his unfortunate students from their beds for a 3 a.m. lab consultation through those who demand a written report every week (each one a logical continuation from the last), to the supervisor whom C. P. Snow described in "The Search" who put his head in at the lab door each week, said "Things going well?", didn't listen to the answer, and retired.*[2]

Ignoring these two variables, our information points to two problem areas: first, the imposition of excessive standards, consciously or unconsciously, for ulterior motives; second, inadequate supervision. These difficulties can only be overcome by making it less advantageous for supervisors to keep students working at their theses for more than the time allowed and by preventing those who are unsatisfactory as supervisors from persisting in this behaviour.

## Results of Questionnaire

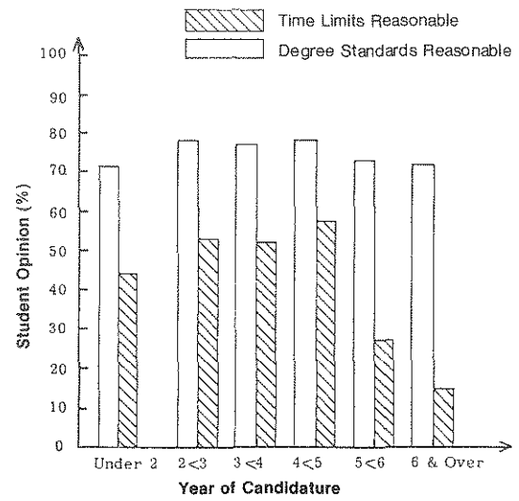
To secure the necessary data on the circumstances of post-graduates at this university, we circulated a questionnaire dealing with those matters thought relevant to the production of a thesis to Ph.D. students in late 1977: supervision, scholarships, standards and estimated completion time.[3] One hundred and nineteen, of whom 22 were from arts-oriented and the rest from scientific disciplines, returned the questionnaire substantially completed. Their stages in their degrees are set out in Table 2. The data was classified and summarized by members of the Sydney University Post-Graduates Representative Association (SUPRA). All care was taken to eliminate as much subjectivity as possible at this stage of analysis. Few students dealt with data from their own faculty and all classifications were checked by at least one other student.

**Table 2**
**Respondents to Questionnaire by Year of Degree**

| Years Enrolled | Number |
|---|---|
| Under 2 | 34 |
| 2 under 3 | 27 |
| 3 under 4 | 25 |
| 4 under 5 | 13 |
| 5 under 6 | 12 |
| 6 and over | 8 |

Although the response rate to the questionnaire was good, possible bias in the nature of respondents cannot be overlooked. When asking students about their work it is always possible that less able or dissatisfied students will reply disproportionately, thus suggesting a worse situation than is the case. The stringent requirement for selection as a Ph.D. candidate at the University of Sydney means poor quality students are unlikely. A more difficult question to dispose of is the possibility that dissatisfied students responded disproportionately. However, very few students expressed complete dissatisfaction either through comments or specific answers to questions. Moreover, it was the answers to factual questions rather than personal comment that revealed the position of most as unsatisfactory. A good illustration of this is to compare answers to Questions 11 and 12 on time limits and standards. Whilst nearly three quarters of all respondents thought standards reasonable, only 46% agreed with the present scholarship time limits. Now one would think that if degree standards were reasonable, all other things being equal, time limits would have to be reasonable. Conversely, if time limits were unreasonable, standards were too high. Figure 1 shows the inconsistency which occurred in all years. This, rather than direct statements, made it clear than something was wrong.

**Figure 1**
**Student Opinion on Degree Standards and Scholarship Time Limits**




Replies to the questionnaire and a consideration of the role of post-graduates in universities suggest one possible explanation for the time taken to finish Ph.D. theses is the demanding of excessively high standards in order to get the maximum out of post-graduates. If supervision is adequate, the student competent, but the degree still not finished in the appropriate time, it is possible that the standard set is unnecessarily high. Admittedly, this charge is hard to substantiate directly. Theses are usually assessed on whether they meet, not exceed, requirements. Moreover, it would be hard to get external examiners to admit that theses from another university were of a higher standard than those from their own. Nevertheless, the answers students gave to questions about the competence of and contact with supervisors, scholarship time limits and the time needed to finish degrees make inescapable the conclusion that the standard cannot be achieved in the allotted time.

Generally, students said their supervisors were competent and conscientious. Only 13% said their familiarity with the topic was poor. Most saw their

supervisor at least once a fortnight (67%) and were satisfied or more with suggestions and their relationship.[4] Over half the respondents said both they and their supervisors initiated discussions regarding research work.

Despite this happy picture the majority did not expect to finish, that is achieve the required standard, within the time set. Less than half thought scholarship time limits reasonable and under 40% expected to finish in under four years.[5] Students with under three years tenure expected to take less than four years, as they should, but in the third year there was a marked drop, with only 35% expecting to finish in four years. If we maintain our above assumption, that both students and supervision are competent, there can be no other conclusion but that standards are too high. Although most respondents did not draw this conclusion, a few noted that departments paid little attention to whether or not a proposed thesis could be finished in three to four years. This effectively raises the standard because it increases the volume and scope of research.

If one accepts that many supervisors may be demanding an excessively high standard, one must ask why. A consideration of the role of the research student in universities suggests they are too useful to be allowed to finish quickly. First, a large number of post-graduates can prove very useful in the staffing of departments and funding of research. Universities, and hence departments, are funded on the basis of Effective Full-Time Students (E.F.T.S.), which increase with the level the student is at. Table 3 shows that any full-time post-graduate has the weight of eight first year undergraduates.

**Table 3**

**Weighting of Students at Australian Universities for the Purpose of Funding**

| 3 Year Degree | # E.F.T.S. | 4 Year Degree | # E.F.T.S. |
|---|---|---|---|
| 1st Year | ¼ | 1st Year | ¼ |
| 2nd Year | ⅓ | 2nd Year | ⅓ |
| 3rd Year | ½ | 3rd Year | ½ |
| Honours | ¾ | 4th Year | ¾ |
| | | Honours | 1 |
| F/T Masters Degree | 2 | F/T Masters Degree | 2 |
| P/T Masters Degree | 1 | P/T Masters Degree | 1 |
| Ph.D. Candidate | 2 | Ph.D. Candidate | 2 |

This means a large number of advanced students can sharply increase the student population and funding entitlement of small departments. The importance of a large post-graduate population has led some departments to encourage research assistants and professional officers to enrol for part-time masters degrees. In addition, the number of post-graduate students is a factor in the awarding of research grants; one of the questions on an Australian Research Grants Committee form is how many students are involved in the proposed research. Thus a large number of post-graduates enables departments to get more funds for teaching and research, regardless of whether these are spent on post-graduates in proportion to their E.F.T.S. value.

Secondly, post-graduates are useful as a source of publications for senior academics. Much of the research at universities is done by post-graduate students. S. C. Hill has reported that some senior academics estimated that they do up to 95% of all research in chemistry schools.[6] However, when they publish any material it is usually with their supervisor, which enables him or her to add to the number of publications so necessary for promotion. It is not surprising, then, that 80% of the academics Hill interviewed admitted the absence of post-graduate students would have some impact on their research and 39% said it would have a 'severely detrimental' effect. Clearly the importance of postgraduate research means that the greater the body of work from students, the greater the number of publications for the supervisor. This has not gone unnoticed by Hill who said regarding chemistry students:

> *It has been my general impression in many areas that doctoral students are frequently assigned to a segment of a problem of interest to the major advisor and, hence, serve as little more than coolie labor.*[7]

Finally, post-graduates provide cheap teaching labour for many undergraduate courses. Many departments employ them as demonstrators or tutors and pay them by contact hour alone. This enables them to effect considerable economies. The estimated number of contact hours each year for full-time tutors and lecturers is 400 and their average salaries $11,450 and $16,950 respectively. However, if a large number of research students can be found to provide this number of contact hours at the current rate of $12.70 per hour it only costs the department $5,100. Thus a department can cut its costs by a half or even two-thirds if it has a large number of post-graduates who can perform the same tasks.

Thus there are many advantages in maintaining a large number of post-graduates which, with a fixed number of scholarships and full-time students, can only be increased by keeping older students longer. If a properly selected and supervised Ph.D. topic can be finished in less than four years, the only way to do this is to demand from students a larger contribution to their field than necessary. That supervisors take this attitude towards Ph.D. students is clear from other parts of the questionnaire. Only 13% of respondents claimed to be



under any pressure from their supervisors to finish and only a quarter (hardly an acceptable percentage) said their supervisors had in any way accelerated their progress towards their degrees.[8]

Although the majority of respondents gave evidence that supervision was competent and adequate, there were significant variations to this general situation which suggest the competence of supervision, if not supervisors, is less than it should be. The importance of supervision has been well expressed by Professor Birch:

> *As at present organised, the success or failure of a course . . . depends as much on the subject chosen and on the attitude of the supervisor as it does on the ability of the student. Subjects can be chosen which range from those in which there is virtually no risk of failure to obtain the degree . . . to those where the element of risk is so high that the student may fail despite high ability. If either topic is chosen, the advice of the supervisor is in my opinion bad, and is probably motivated by his interest in the research results . . .*[9]

A comparison of replies from students in arts-oriented (hereafter used to include Arts, Law and Economics students) and science-oriented disciplines showed the former were in a worse position regarding time taken to finish a degree. Whereas 45% of all post-graduates thought scholarship time limits reasonable, less than a third of arts students, three-quarters of whom had completed less than two years of study, were of the same opinion. As well, more arts students expected to take a longer time and lost hope of finishing on time earlier. Although there was little difference in the number of arts and science students expecting to finish in under four years, nearly half the arts students expected to take five years or more, whilst 85% of science students expected to finish in less than five years.[10]

Differences in the position of arts research students and their replies to certain parts of the questionnaire suggest that the reason they take a long time is inadequate supervision.

Although the same proportion of arts and science students thought their supervisors' familiarity with their topic good and expressed satisfaction or more with their relationship, the degree of supervision was less. Most students saw their supervisor at least once a fortnight but under a third of those in arts saw their supervisor this often, a third monthly and another third less frequently. Supervisors tended to take an inactive part in sustaining the relationship. Whilst nearly 57% of science respondents said both they and their supervisor initiated contact, less than half the arts respondents had supervisors who ever contacted them of their own accord.

Despite allegations to the contrary, relationships between arts students and their supervisors were less than they might have been. The lack of time spent with students and their comments on the nature of encounters they initiated suggest that, really, students who claimed they were satisfied with the relationship meant 'as satisfactory as can be expected under the circumstances'. The circumstances were that the supervisor was too busy to spend much time with them or take their problems seriously. Explanations for this situation were usually apologetic justifications on the grounds that 'he's a busy man and my work is one small detail'. but occasionally total frustration with the situation led to large-scale condemnations of the whole system of supervision, alleging departmental indifference to post-graduates and approval of taking a long time. One student neatly summarized the causes and effects of the situation as:

> *Too few supervisors directing too many students simultaneously. Too many interruptions during sessions with supervisors. . .*

Thus the quality as well as the quantity of supervision given to arts students appear inadequate in relation to standards set in scientific faculties and grossly inadequate in some cases.

There are good reasons for thinking that in the arts-oriented disciplines poor supervision rather than the insistence on high standards to get the best possible use out of post-graduates is responsible for the long time students take to finish their degrees. For a start, few thought standards were high. Whilst 12% of all students were of this opinion, this figure reflected the large number of Ph.D. candidates in science. 14% of science students thought standards too high but only one person from arts (4%) agreed. Then, research students have fewer uses in arts. Since there is less opportunity for demonstration work they are used less as cheap teaching. In addition, some departments refuse to employ their students in this capacity. Finally, the relationship between supervisors' careers and students' research is not as close, for although Ph.D. candidates do much research, joint publications are less. This may well be because in arts disciplines there is often less need to publish to secure promotion, or because the supervisors' field is fairly remote from the candidates'.

**Proposed Solutions**

Given the long time needed to finish doctorates at the University of Sydney we submit some suggestions which could rectify the problems we have discussed.

(1) Alteration of the weighting system, as set out in Table 4;

**Table 4**

**Proposed Alteration of Weighting System Used for Funding Australian Universities**

| Year of Candidature | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|
| Number of E.F.T.S. | 2 | 2 | 2 | 1 | 0 | −1 | −2 |

so that after four years of post-graduate work students are of decreasing value in raising departmental numbers. This would discourage their retention by exacting unnecessary standards or inadequate supervision.

(2) Creation of an Ombudsmen Panel, consisting of a senior and respected academic (preferably a former Dean or Vice-Chancellor), a senior member of the Commonwealth Department of Education and two doctoral candidates, one from the science and one from arts-oriented faculties.

(3) Most research students must submit a comprehensive annual report on the state of their work. At the end of the first year of candidature this could be sent out for external examination regarding suitability of topic and approach.

(4) Appointment of two co-supervisors, one from outside the candidate's department, and one external to the university, preferably from government or industry, who would be free of university influence and act on the candidate's behalf in time of difficulty or neglect.

(5) Institution of a confidential report system by the candidate on the supervisor(s) competence and adequacy. This report would be submitted to the Dean of the Faculty and the Ombudsmen Panel.

**References**


1. University of Sydney Professorial Board, *'Statement of Advice to Supervisors, Heads of Departments and Faculties,'* November, 1974, cl 3 & 4.
2. Neales, T.F., 'Some Comments on Becoming a Supervisor of Graduate Students.' *Vestes,* vol. 10, 1967, pp. 148-151.
3. Ibrahim, E.Z., McEwen, E.M., Pitblado, R., *"Report of SUPRA Sub-committee on Problems of Doctoral Supervision,"* April, 1978. See Appendix A. (Copies available free of charge from SUPRA, Box 62, The Holmes Building, University of Sydney, N.S.W., 2006.)
4. Ibid, see Appendix B, Questions 8 and 9.
5. Ibid, see Appendix B, Table 15.
6. Hill, S.C., Fenshaw, P.J., Howden, I.B., *Ph.D. Education in Australia — the making of Professional Scientists,* Australian Academy of Science, Science and Industry Forum, Report No. 7, Canberra, 1974.
7. Ibid, p. 22.
8. Ibrahim et al, op. cit., Appendix B, Questions 13 and 17.
9. Birch, S.C., "What is a Ph.D.?", *The Australian National University News,* April 1971, vol. 6, no. 1, pp. 8-10.
10. Ibrahim et al, op cit., see Table 5, p. 6.


**Appendix I**
**SUPRA Questionnaire**

1. What faculty are you in
2. How long have been enrolled for the degree
3. How was your topic selected
   (In conjunction with supervisor(s) — personal choice — closest available field to real interests — dictated by circumstances — chosen solely by supervisor)
4. Method by which supervisor was assigned
5. Familiarity of supervisor with topic or field
   (Supervisor considered expert — good familiarity — read about it overseas, etc.)
6. Frequency of contact with supervisor
   (Once a week — every day — once in a blue moon)
7. Who initiates the contact
8. Relevance of supervisor's suggestions
   (Suggestions are invariably useful — sometimes useful — impossible to implement in the given period, etc.)
9. Degree of satisfaction in contact
   (The supervisor is invariably of assistance — talks down to me — I am bad at communicating my problems, etc.)
10. Actual hours per week spent on topic as opposed to other pursuits
11. Do you think the present time limits for scholarships are reasonable
12. Do you think the standards set for the degree requirements are unreasonable
13. Are you under pressure to complete degree requirements
    (No pressure — supervisor exerts some pressure — economic difficulties make it imperative to submit thesis as soon as possible, etc.)
14. (If relevant) What is your estimate of the annual loss in income due to taking up a scholarship/degree
    (Nil — very little — $20,000, etc.)
15. What is your estimate of time needed to complete your degree requirements
16. Does your supervisor agree with your estimate
17. Has your supervisor significantly accelerated your progress towards your degree
18. Do you get any significant assistance from other members of academic staff
19. Any other relevant information, suggestions, criticisms



# THE SUPPLY OF AUSTRALIAN SCIENTISTS

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In a book published in 1963,[1] Joseph Gani examined "The Condition of Science" in Australian universities. Amongst the facts he assembled and examined at that time were the number of "Pure Science" graduates emerging annually from the universities. ("Pure Sciences" were judged to be physics, chemistry, mathematics, geology and the various biological sciences; professional courses such as engineering, medicine or agriculture were not included.) A summary of some of the results for the period 1919-1960 is given in Table 1. The figures show the growth in the number of graduates in science, in absolute terms and relative to the growing Australian population.

**Table 1.**

**Science Degrees in Australia (1919-1960)**

| Year | Australian Population (millions) | Total No. University Students | Total No. of Universities and University Colleges Offering Science Degrees | Total No. of First Science Degrees | No. of First Science Degrees/ Million Population |
|---|---|---|---|---|---|
| 1919 | 5.3 | 6,400 | 6 | 90 | 17 |
| 1924 | 5.9 | 7,300 | 6 | 125 | 21 |
| 1929 | 6.4 | 8,500 | 7 | 138 | 22 |
| 1934 | 6.7 | 10,200 | 7 | 147 | 22 |
| 1939 | 7.0 | 14,200 | 8 | 218 | 31 |
| 1948 | 7.7 | 32,500 | 9 | 561 | 73 |
| 1957 | 9.6 | 36,900 | 11 | 568 | 59 |
| 1960 | 10.3 | 53,800 | 12 | 896 | 87 |

Gani suggests that before 1939 the study of science in Australia was relatively unimportant, but that after 1939, due to the war needs, growth of secondary industry and the increasing role of science and technology, its study became more vitally important. He concludes that by 1960 the supply of scientists of all kinds in Australia was completely inadequate, falling well below the supply rate evident in the United Kingdom, or that needed by a growing nation such as our own. Similar conclusions to this were drawn by the Murray Committee[2] and again some years later by the Martin Committee.[3] Even in the United Kingdom, editorial[4] and governmental inquiry[5] findings were that many more trained scientists were needed. In both countries there was a call to strengthen and raise the standard of scientific and technological education to meet the growth in knowledge and increasing complexity of these subject areas. In Australia and in the United Kingdom governments responded by a massive injection of funds and initiatives aimed at a marked increase of graduate output, upgrading many institutions and establishing new ones.

Recent surveys of the graduation rates for a number of the "Pure Sciences" (chemistry,[6] physics,[7] geology[8] and the various biological sciences[9]) allow for an up-to-date reappraisal of supply and possible demand; mathematics is not included in this current examination. Table 2 gives figures from these surveys for each of the years 1968 to 1976, indicating the total number of science graduates in absolute terms and relative to the national population.