THE EXAMINATION OF POST-GRADUATE THESIS:
A DISCUSSION OF REQUIREMENTS FOR POST-GRADUATE THESIS IN THE DEPARTMENT OF COMPUTER SCIENCE, MONASH UNIVERSITY

My purpose is to outline some current problems relating to the examination of post-graduate theses at Monash University. The discussion, as well as being of general interest, may well be of value in other Graduate departments in Australia and to the maintenance of the standard of their post-graduate programmes compared to those of other Australian universities.

Introduction: Monash Regulations

As stated in the Introduction, the Monash MSc. thesis is a major piece of work. This, of course, is difficult to evaluate, but in my opinion the requirement to write and submit a thesis embodying the results of an investigation carried out by him, under supervision, showing independence of thought and demonstrating the candidate’s ability to carry out research in the field concerned.

Degree of Doctor of Philosophy Regulations

The Concise Oxford Dictionary gives as the definition of "original":

1. (a) first hand
2. not relative
3. novel in character or style
4. inventive
5. creative
6. thinking or acting for oneself

The question arises: "significant to whom and at what time?"

My belief is that, if the candidate can demonstrate:

(a) That he or she has thoroughly researched and evaluated all literature available up to the time of commencing to write up,
(b) That if at the time and place of the commencement to write up, the contribution was original as certified by the supervisor, then the advice of the supervisor as to which material was available to the candidate?

The criteria (a) and (b) above are not currently used at Monash and in my view should be.

Now I am not suggesting that the supervisor’s judgement should be final as to significance, but the significance of the thesis should continue to rest with the two external examiners. But the examiners should be guided by the supervisor’s indication that the candidate could not reasonably have had access to other material which would have improved that candidate’s knowledge of other researchers’ work.

The time of commencement of write up is the appropriate time since, after that time, it is unreasonable to expect that a candidate will commence new experimental work or derive material from other sources. Since write up commencement is such an important time it should be formally recorded by the supervisor, department and university. This criterion will help to reduce the number of extensions sought because of new work coming to hand after write up has commenced. Finally, is it reasonable for a person "written up" away from university to meet any other criterion than the one suggested? For equity, therefore, that timing should be applied to all.

Once there is a clear cut-off date for original work defined, there are still further definitions problems to be overcome. It is of interest to examine the wording of the current Ph.D. regulations of other Australian universities. There are variations in the wording which may or may not be intentional. These quotations (except where noted otherwise) are from the relevant universities’ regulations governing Ph.D. examinations.

Melbourne University (Computer Science Departmental Handbook)

"Significant original contribution to knowledge of significant originality and importance for the advancement of the subject.

The Australian National University;

"Examiners are invited to judge a thesis at the highest contemporary international standard for European and North American universities. The candidate must make a substantial contribution to knowledge of significant originality and importance for the advancement of the subject."

University of Newcastle:

"...significant contribution to the knowledge of the subject."

Flinders University:

"... containing a significant contribution to knowledge or scholarship."

University of Sydney:

"... a substantially original contribution to the subject concerned."

University of Western Australia:

"... an original and significant contribution to the knowledge of the subject."

University of New South Wales:

"... an original and significant contribution to the knowledge of the subject."

But note also the DSc. regulations for the University of Melbourne, which state inter alia, "the work must be original and must be a substantial contribution to the knowledge and understanding of a branch of Science."

Are we to believe that the wording “substantially original” is intended to mean the same as “substantial and original”? And are we to believe that the University of Melbourne’s regulations are one of the "subject concerned” and “understanding of a branch of science” all to be interpreted as equivalent, in the minds of examiners? None of the guidelines, except perhaps those of the Australian National University, indicates the meaning of the terms substantial, original, etc. and ANU suggests that the highest contemporary European and North American standards be used as a basis of judgment. But ANU regulations do not prescribe that both examiners should be from overseas; and if the examiners are not both from overseas how likely is it that they would have up-to-date knowledge of overseas standards since most of us are not able to travel to overseas conferences and to keep in touch with the people there except on very rare occasions? Nor are we in sufficiently frequent correspondence with people overseas to be aware of their current standards.

Without such regular contact is it possible for local examiners to have the same perspective or knowledge base as those overseas? How can we be aware of an appropriate interpretation for "highest contemporary standard”?

So the major criterion for assessing the degree (namely that of significance) is poorly defined. I believe that the definition of what is "significant" varies from university to university and not commonly agreed between academics in disparate universities.

Another factor which affects the assessment of originality is the question of whether, and at what time, reference material was available. Knowledge about the availability of reference material is a continuing source of problems for academic examiners, particularly those overseas. How can an examiner assess what reference material the candidate should be expected to read? Much depends upon the financial and information resources of the candidate and the department within which he was working. It is reasonable to expect that every department should be aware of the title of every Ph.D. or Master’s thesis worldwide relating to the topics of thesis in hand? If one only refers to the work in the open literature, most of which has its source in the U.S.A. or Europe, with publication and postage delays there is sometimes a delay of three or four years from the completion of a research report to its appearance.
in an Australian library. If reliance is placed upon only those works appearing in the open literature, it is not surprising that several people around the world should be investigating the same or closely related problems at overlapping times. Is it reasonable to expect that work done in Australia should be significant/original to overseas workers at any time during the (typically) four-year period outlined above, because such a time span could apply worldwide? By itself, the question is not at all the very forefront of the field. In my view, it is not, and the criterion should be "the work will be judged significant/original to overseas workers by other authors which might reasonably be expected to be available to the candidate at the time of commencing writing up.

At Monash we have had some particularly vexing cases where overseas examiners have criticised Australian Ph.D. material on the grounds that reference to work judged relevant by the examiner. In some of these cases on careful scrutiny by an independent reviewing panel the works (authored by the examiner) were found to be not relevant. On another occasion the examiner expected that the candidate should have assessed his or her work in the light of recent theses by the examiner's students. There is a moral here: that the supervisor should select examiners well in advance of the candidate's thesis and obtain copies of all relevant material from the examiner's department to prevent repetitions of such a situation.

One way to pre-empt these situations is, of course, for the supervisor to guide the student into obtaining theses and reports on all relevant topics from all possible sources. Literature searching, using INSPEC, Science Citations Index, etc., is a "must," and a supervisor should ensure that the student writes a formal thesis (with a proper "foreword") and have no less than five copies of his report/dissertation available. Most Ph.D. and Masters theses in the U.S.A. are listed in Dissertation Abstracts International. Usually copies of these theses can be obtained from the university concerned or from the University Microfilm Institute. Most Ph.D. and Masters theses in the U.S.A. are listed in Dissertation Abstracts International. Usually copies of these theses can be obtained from the university concerned or from the University Microfilm Institute. The candidate's ideas and insights for solving the problem proposed or written up during the period of the proposal should be maintained, if at all possible, in order to avoid repetition.

Some Insights into Expected Standards from Past Experience

After reviewing the reports of a range of overseas and local examiners, I saw that examiners expect that Ph.D. candidates in their theses, must relate the programming work to some theoretical contribution, showing how the principles developed in the program are more widely applicable. We should remember that the programming work will be judged on the relationship between writing programs and the expected work and the work expected in Computer Science Post-Graduate Theses.

Ph.D. & Masters Proposals

Over the years examiners and supervisors have agreed that the work done will have the appropriate significance or demonstrate the required independence of thought is to insist on the candidate writing a Research proposal and to have that proposal assessed before work is commenced. This is the recommendation of Lauer and leads to a situation where, although much preliminary work may have been done to familiarize the student with the field, experimental or implementation work is not commenced until some assessors, who will very probably be the final examiners, have agreed that the work proposed, if completed and written up successfully, will most likely lead to the awarding of the degree. Such a proposal should be written up after six months of study for a Masters candidate or one year of study for a Ph.D. candidate, and should ideally be submitted by the candidate to the expected examiners at an oral presentation of the proposal to the examiners.

The components of such a research proposal recommended by Lauer are:

- A statement of the problem and why it should be solved
- Reference to and comments upon relevant work by others on the same or similar problems
- The candidate's ideas and insights for solving the problem and any preliminary results he may have obtained
- A statement or characterisation of what kind of evidence is necessary
- A plan of action for the remainder of the study, and
- A rough outline of the thesis itself.

Following the completion of the written manuscript, the candidate would benefit greatly from once again making a formal oral presentation giving an overview of the work actually completed, highlighting the objectives and the conclusions drawn from the work.

Conclusions & Recommendations

The conclusions I draw from this brief survey (and not strictly following from the evidence presented) are:

(1) That there would be great benefit in defining more closely:

- The contents of a thesis.
- The criteria of thesis judgement both Ph.D. and M.Sc.
- The criterion of originality to be by comparison with works reasonably available to the candidate up to the time of commencement of writing up, and consequently:
- The formal recording of that time.

(2) That students and supervisors would both benefit from having available to them clearer specifications of their various roles.

(3) That a thesis proposal should be written and assessed before formal detailed experimental work be commenced.

(4) That the "four-year period" would do well to reach understandings as to the standards of thesis content and presentation expected by various universities, if the standards are to be consciously different, or on a common standard if this is deemed worth while.

Acknowledgements

Several members of the Monash Computer Science Department and Professor J. M. Sennett of the University of Sydney made valuable contributions to this work. Many Australian computer science departments assisted by providing their Post-Graduate Regulations and details of other material available to supervisors, examiners and students.

Copies of a more extensive paper including detailed suggestions on guidelines for students are available from the author.

References