11 PEER REVIEW BY PUBLICATION

11.1 Overview

It is unusual for a research supervisor to have a direct input into the examination process for postgraduate research programs – particularly in higher level programs such as Doctorates. Assessment of such programs is, rightly, left to the judgment of independent peers through assessment of a dissertation and, in some universities, through additional verbal defense of the work. It is also the case in most postgraduate research programs that a single examination process ultimately determines the outcome of that program and whether students:

- Pass outright
- Need to resubmit minor or major revisions to their work
- Fail the program outright.

For these reasons, a supervisor has an obligation to provide opportunities for a research student to have his/her research work independently assessed by peers, in stages – prior to any final examination. Such assessments may provide valuable insights into the strengths of the work, and any shortcomings that may need to be addressed before the work is presented for final examination.

Over and above the benefits of peer reviewed publication prior for the purposes of preliminary feedback/assessment, there is also the obvious need to publish as part of the normal, professional research process. To this end, having a research student submit his/her work for peer reviewed publication; interpret the reviewer assessments, and make the necessary

amendments, is an integral element of the learning process.

In the context of preparing a thesis/dissertation for final examination, it is also worthwhile for a research student to highlight published work or, at the very least, the peer reviewers comments on papers that have been submitted and accepted. This provides a useful indicator to examiners that a professional process has been followed, and various aspects of the research have been independently validated/verified outside the confines of the research group in which the work was conducted.

From the supervisor's perspective – and the university's perspective – publication of research work also provides a measurable research output which is generally used in formulaic assessments of university performance. However, it is important to drive the need for publication through what is in the best interests of the research student, rather than considerations of what is purely in the *numerical* best interests of the supervisor and the university.

With these points in mind, in this chapter, we examine the issues of:

- When to publish
- How often to publish
- Where to publish
- What to do if publication is not practical.

11.2 When to Publish

The obvious answer to the question of when to publish is that publication should only take place when the supervisor determines that sufficient research discovery has taken place, to the extent where findings may be of value to a broader community of peers.

This may appear to be a straightforward approach but it is complicated by the length of time that is normally taken from the time a research paper is submitted to a peer reviewed journal to the time it is accepted and subsequently published online or in hard copy form.

A supervisor needs to be aware of:

- The sorts of journals that may be targeted for publication of the research student's work
- The editorial policy of relevant journals
- Typical turnaround times for submitted manuscripts in relevant journals.

Online journals give the impression that the total time from submission to publication has been reduced, but there is still the necessary and significant bottleneck in the process that is brought about by the human peer review process.

At this point, a supervisor needs to consider the milestones and timelines developed by the research student for his/her project and determine how practical these are with respect to publication. Specifically, a supervisor needs to be aware of whether he/she intends to hold to a tight project schedule – regardless of the need to publish – or work on the principle that a research student needs to stay and work on a project until it is completed – with publications. And, while the latter approach may appear to be more altruistic, it may not be practical in some university environments where there are constraints placed on the duration of postgraduate research programs – as well as research students who want to complete and get on with their professional careers elsewhere.

Realistically, in the context of, say, a 36 month Doctoral research program, the first few months will be expended on literature review; development of a methodology and supporting design of experiments or other instruments of discovery. It may be over a year before any results emerge at all – perhaps 18 months before significant information has emerged, and analysis performed, such that there is an impetus for publication. The preparation time for the paper itself may also be several weeks, taking into account time for consultation with colleagues or other

relevant co-authors.

The publication process is sufficiently onerous that it needs to be factored into research student project management charts – especially because this helps focus the student's attention on the amount of work that needs to be performed and the relative urgency of getting the underlying basics completed.

A research student's research writing skills and English proficiency also need to be considered in relation to the time taken to prepare a paper for publication. A respected journal is unlikely to accept papers with poor writing and grammatical errors – even if they have some editorial staff to make minor improvements to accepted papers.

11.3 How Often to Publish

Supervisors can sometimes push their students to publish a large number of papers during the course of a postgraduate research program. In considering such an approach, it may be opportune to contemplate whether this is in the best interests of:

- The student
- Knowledge
- The supervisor and institution.

Each publication needs to represent a discrete and significant contribution to knowledge in its own right, if it is to have any real value to the broader peer community.

Supervisors also need to reflect on the motives for multiple publications. In particular, attempts to maximize the total number of publications from a single research program by cynical means, including:

- Dividing a single, discrete piece of research work into parts A, B, C, etc.
- Presenting the same work repeatedly with minor variations (e.g., a simulation published multiple times with variations to simulation input parameters)
- Publishing the same paper under different titles,

can be viewed as unethical and may also cause damage to the reputations of the authors and, in particular, the research student – who needs his/her reputation intact when presenting for final examination.

In a postgraduate research program, there may be natural and discrete elements of knowledge discovery that lend themselves to individual publications. If they do, then this presents a good opportunity for the research student to achieve multiple publications. However, if they do not, it is important that the supervisor does not attempt to artificially bolster the number of outputs arising from the research.

Finally, and referring back to Section 11.2, the preparation of each paper, the assessment of peer reviews, modifications and submissions of a final manuscript are all time consuming activities. It is therefore important that the supervisor ensures that each paper contributes strongly to the central theme of the research, and is not just a frivolous, peripheral attempt to improve research metrics for the sake of improving research metrics.

11.4 Where to Publish

11.4.1   General

A contentious issue in academia that has arisen with the advent of many thousands of international journals is where to publish research findings. For any given field, there may be numerous journals and conferences which may be suitable as a forum, so a decision needs to be made by the supervisor and the student.

In recent years, universities or national research bodies evaluating university performance have taken to the notion of ranking various journals. This means that, in any given field of endeavor, one publication forum may be ranked higher than another. A supervisor needs to be aware of any ranking schemes that are in place in his/her university; nationally, or internationally – and factor these into the decision-making process. Ultimately, however, the publication forum should be one that has:

- Direct and specific relevance to the field in which the research is being conducted
- An editorial/review team which is highly regarded and has strong connections to the research to be published
- An established track record of high quality publications in the field
- Is regularly cited as a scholarly source of information in the field
- Been used by highly regarded authors in the field.

An additional problem with modern day scholarly publishing is that it has become a large business, and there are numerous journals whose primary purpose is profit rather than knowledge dissemination. Some journals charge the authors a fee for publication and, in order to maximize profits, can publish large volumes of work having dubious value. However, the fact that a journal charges a fee for publication does not necessarily mean it is disreputable and, indeed, there are many highly reputable journals that do need to charge fees as part of their publication business model. The point is that a supervisor needs to be wary of each forum and evaluate it carefully in scholarly terms, before expending time and energy submitting papers to it.

In recent years, various groups have been assembled by scholars in order to make the process of journal selection more tractable. One of these is the *Think. Check. Submit.* consortium *(Thinkchecksubmit.org, 2015)* which provides a range of useful guidelines and organizational links for authors to use.

For those researchers who are intent on publishing their research in open access journals, there is the online *Directory of Open Access Journals (Doaj.org, 2015)* which provides listings and links to many thousands of online publication forums. There are also numerous publication support groups, including,

- The *Association of Learned and Professional Society Publishers (Alpsp.org, 2015)*
- The *Scholarly Publishing and Academic Resources Coalition (Sparc.arl.org, 2015)*

which can provide additional support for authors.

Selecting an inappropriate journal for publication purposes can waste significant amounts of time and resources and ultimately lead to a rejection of the work. The research supervisor and the student therefore need to examine a possible journal in terms of whether:

- The journal has actually been cited in the research paper being submitted – as an indicator of its relevance
- The authors who publish in that journal or work as reviewers have been cited in the paper being submitted
- The research work which is being submitted is a natural follow-on (or contradiction to) other work published in that journal
- The writing style and sentiments expressed fit in with the style of the journal.

A manuscript submission to a journal, which contains no citations to that specific journal, may be flagged by the editorial staff in terms of why it is being submitted at all, given that the authors haven't sourced any of their background material from that publication. Similarly, if a journal genuinely has noted, landmark researchers from a given field on their referee committee, then editorial staff may well question why those authors have not been cited. In other words, a journal may expect authors to demonstrate their interest in the field, and in the specific writings of that journal, in order to consider a manuscript submission for review.

Selection of a publication forum in many fields is therefore a non-trivial issue, and considerable thought needs to be given to the publication forum – and the manner in which a paper is written for that forum – not just in terms of writing style and subject field but also in terms of commitment to the particular school of thought embodied by that journal.

11.4.2   Online Preprint Servers

In recent years, internet technologies have enabled the emergence of online preprint servers for academic papers. Essentially, these are credible websites, operated by reputable universities or research establishments, which enable scholars to publish work online provided that it meets basic criteria relevant to the field. Once online, interested peers can provide immediate feedback on the published material. This provides a mechanism for resolving issues prior to expending time on a formal journal submission.

Some of the well established and utilized servers include:

- The *arXiv*, operated by Cornell University *(Arxiv.org, 2016)* and publishing information relating largely to physics
- The *bioRxiv*, operated by the Cold Spring Harbor Laboratory *(Biorxiv.org, 2016)* and publishing information relating to biology.

These sorts of servers have become valuable tools in many fields. Indeed, in physics many new discoveries are first announced on the *arXiv*, and open, online peer review starts immediately. The benefits of such a system include

- The speed of knowledge *being made public* in the true sense of the word *publication*, thereby allaying "scooping" fears
- The possibility to improve work quickly with rapid, extensive feedback.

The potential downside of online preprint servers is the accusation that a paper isn't peer reviewed in the traditional sense, even though in practice it may actually receive dozens or even hundreds of scholarly reviews - generally far more than the number of formal reviewers of a traditional paper.

It is evident, however, that preprint servers already play an important role in publication and this will inevitably become more prevalent. Authors should treat them exactly as they would a traditional paper submission, yet expect more thorough and more numerous reviews if the material they have published is controversial or a hot area of research discussion.

11.5 What To Do if Publication is Not Practical

One of the most important aspects of research, as conducted in a university, is that the results should be published and made available to the broader peer community. Each piece of new knowledge can therefore be made available globally in order to potentially contribute to significant outcomes for society. However, it is not always practical to publish the findings of postgraduate research programs in conventional scholarly journals. There may be a number of reasons for this, including:

(i) The significant results from the research emerge too late in relation to the time frames for refereeing and publishing in regular journals

(ii) The research is part of a research collaboration, and the collaboration agreement states that the results are not to be published for commercial reasons

(iii) The intellectual property (IP) for the research has been signed away as part of some commercial agreement, in exchange for royalties or other consideration

(iv) The research is to be commercialized by the student and/or the supervisor, and neither wishes it to become public until the intellectual property is protected.

If time limitations (i) are the only issue in relation to publication and peer review of the work, then one obvious solution is to look at putting work on a relevant preprint server and taking note of the feedback/reviews that emerge. From an examination process point of view, this may not receive the same level of kudos as a formal peer-reviewed publication but, nevertheless it does provide some independent validation/repudiation of the work.

The larger problem relates to scenarios (ii) – (iv) and how to create an alternative mechanism where the research student can have the various stages of his/her work reviewed by peers prior to final assessment. Clearly, no form of online or traditional publication is possible in such circumstances because it may breach contractual obligations associated with the research project.

One straightforward mechanism is that the supervisor should have the research student prepare a paper (or papers) in exactly the same way as if the research was to publish in a conventional journal. For the purposes of instilling discipline into the process, a good approach might be for the research student to write the paper/s according to the style guidelines of a specifically relevant journal in the field. The supervisor can then call upon independent colleagues in the field and have them review the paper/s in the same manner as they would a formal journal submission. The qualifier to this process is that those tasked with reviewing the paper/s need to sign confidentiality agreements in line with any constraints on the supervisor/student. Additionally, if there are any binding agreements in place in relation to disclosure of research, then formal dispensation needs to be sought prior to pursuing this approach.