

8 PLANNING THE POSTGRADUATE RESEARCH PROGRAM

8.1 Introduction

President Dwight Eisenhower often recited a statement which he had heard in the army in relation to planning – specifically that (*Eisenhower.archives.gov, 2015*):

"Plans are worthless. Planning is everything."

The army dictum is as relevant to modern postgraduate research as it was to the army decades (or perhaps centuries) ago. There is so much knowledge to be gained simply by going through the planning process, that what documents eventuate from it are neither here nor there.

There is one proviso to the dictum however – and that is that the planning process must be a genuine process – and not just a *ticket-punching* exercise. When planners put forward timeframes for elements within the plan, those timeframes need to be the best possible estimate of what is required – not unrealistically short, merely to impress – and not unrealistically long, in order to provide padding in the process.

Many academic purists become aghast at the idea of formally planning a postgraduate research program, and work on the assumption that *it will take as long as it takes* in order to make a significant contribution to knowledge. Laudable though this commitment may be from a purist perspective, the reality is that most postgraduate research programs are time-limited. Moreover, as an apprenticeship (prelude) for research or professional life

elsewhere, students naturally want to complete their studies as efficiently as possible in order to move on and make contributions (and an income) elsewhere.

There is also a case to be made that research students, like gases, will fill available space with activity and so, if they are allocated a month to complete a research task, it will take a month – if they are allocated two months, it will take two months. There need to be downward pressures applied to ensure that something which can be achieved in a month is achieved in a month. There are two kinds of pressures:

- Internal – self-motivation on the part of the student
- External – formal time boundaries imposed by the supervisor.

Many research students will not previously have worked in a high-pressure professional environment, where a deadline is a deadline – and there is no possibility of extension. Many students may not have had to dramatically increase their workload, and cut out recreational/personal activities in order to achieve a result. At an undergraduate level, and particularly because postgraduate students come from the top end of the cohort, it may be that research students have been able to breeze through their studies with minimal effort or sacrifice.

Sometimes, research students consider recreational and personal activities (*me time*) as an integral part of their natural work activity. Part of the lesson that has to be learned during postgraduate research is that in the professional world, none of these models may be valid. Importantly, this learning about deadlines needs to come about through project planning.

It can be particularly useful to get the postgraduate research student to develop his/her own research plan as part of an iterative/consultative process with the supervisor. This activity is best initiated during early meetings with the research student.

8.2 Understanding a Deadline

Most adults, and almost all professionals, would claim to understand the meaning of a deadline. The problem is that in an academic environment, where research problems and approaches can be abstract and nebulous, staff and students often don't genuinely believe in them. Planning has very little value when those formulating the plans – particularly the research supervisors – do so with a lackadaisical mindset:

"We'll just say one month for these experiments, and if they take longer, well they just take longer..."

This is where postgraduate research planning goes awry, or degenerates into little more than a worthless bureaucratic activity – producing a document in which neither party believes, and with which neither party intends to comply. In other words, a complete time-wasting exercise.

The mindset for genuine project planning has to be completely different:

"We'll say one month for these experiments. I'll check your progress after two weeks, and if the results are falling behind then you will need to work evenings and weekends. If we are still behind after the third week, then we'll have to look at hiring additional technical staff to support the work."

The difference between the former and the latter approach is stark. In the former approach, there is no real commitment on the part of the supervisor to ever meet the deadline. Any intelligent research student could decode the subtext of this into:

"Take as long as you need to do the experiments and just write down one month on the plan for the sake of putting down a notional time."

In the latter approach, the deadline is set in stone, and has the imprimatur and commitment of the supervisor. Workloads and additional resources are adjusted to ensure that it is met.

A supervisor needs to determine which approach he/she and the research student intend to pursue – if it is the former, then much time and energy can be saved by not planning the project at all. If it is the latter, then the supervisor needs to:

- (i) Ensure that timelines in the plan are feasible
- (ii) Monitor/oversight the student's execution of the plan
- (iii) Identify when/if a student is falling behind

- (iv) Consult with the student to ensure that he/she is actively increasing workload if falling behind
- (v) Be prepared to inject additional resources into the project if it becomes apparent that a student is working to maximum capacity and still falling behind schedule.

The key point here is that planning is about more than just creating a document – which superficially looks convincing – and then retrospectively accepting that it was too difficult and ambitious to achieve.

Planning requires:

- Genuine commitment and honesty on the part of the supervisor and the research student
- Real oversight (not just superficial glimpses) on the part of the supervisor
- Proactive correction of any lapsing elements of the schedule through additional workload or resources.

Academics in general don't like being constrained. Often, they will cite the complexities of their research work as reasons why rigid planning rules won't work – *too many unknowns*. However, this is a specious argument to the extent that any major project – be it,

- The development and manufacture of a new vehicle model
- Construction of a major highway or shopping mall
- Development of a new aircraft,

has far more unknown elements than a university research project. And yet, these elements can regularly be managed and projects and outcomes delivered *on time*. In a commercial sense, a failure to deliver on deadline can be a catastrophic professional outcome – and a costly one. The majority of postgraduate research students will ultimately end up in some form of commercial or government career, and it is therefore best to develop planning rigor as early as possible.

A research supervisor, asking a student to prepare a research plan, needs to make it clear that this is not just an esoteric exercise conducted to satisfy university bureaucracy. The research student needs to understand that he/she must believe in the deadlines and assiduously work towards achieving them – and the supervisor also needs to believe in them. Clearly, if a student suspects that a supervisor doesn't believe in deadlines then it is unlikely that the student will ever make great efforts to achieving them.

8.3 Basic Elements of a Postgraduate Research Program

The differences between postgraduate research programs, across disciplines, fields and institutions, can be significant. However, there are numerous, common elements to all postgraduate research. Some of the basic ones are shown in Table 8.1.

In the context of postgraduate research planning activities, it may be particularly helpful for a supervisor to compile a more detailed list of activities that relate specifically to his/her research field. When conducting initial meetings with the research student, the supervisor can call upon the compiled list in order to assist the student with his/her planning.

Invariably, some of the elements in the research program will have ill-defined start and end times but this should not diminish any attempt to ensure that reasonable efforts are made to estimate appropriate event durations and work towards achieving them.

In many institutions, the final assessment of the postgraduate research program is undertaken by peers, external to the university in which the research is conducted. The examination process then becomes one of the most ill-defined time durations in the overall planning process – albeit one which is outside the scope of the supervisor and student's capacity to change.

A supervisor (or even the university itself) has little practical influence over how long the examination process may take. Some institutions insist that external examiners complete their assessments within a limited timeframe but, realistically, they have little influence over what ultimately happens. The problem is that it is difficult to attract suitably qualified examiners, and each generally needs to be scrutinized by a university research committee before appointment. If an examiner is unable to fulfill his/her duties on time, it is often impractical to go through the process of selecting an alternative examiner and then repeating the process. The end result is that there may be considerable variability in the duration of the examination – and this may have a profound impact upon a research candidate's ability to move on to a new position.

In the context of planning, given an inability to control the examination process, it may be more practical to omit this from the research student's overall plan, notwithstanding the fact that the student needs to be aware of the idiosyncratic nature of the process.

<i>Element</i>	<i>Objective</i>	<i>Time Considerations</i>
Literature Review	To determine the state of knowledge in the field as presented by noted scholars/peers	Maximum effort at beginning of program, with ongoing background activity throughout the entire postgraduate project
Formal Determination / Establishment of Hypothesis	Based on a reading of scholarly literature/opinions, to identify knowledge gaps that can be tested as an open hypothesis which does not predispose the research to a particular outcome	First priority to be resolved as quickly as possible after extensive literature review
Preparation of Research Methodology	Development of a methodology in line with scholarly/peer approaches in the field	Active components of research program cannot commence until methodology is established
Design of experiments or instruments to test hypothesis	Development of systematic tools to determine whether the "null hypothesis" can be disproven	Formal experimentation is contingent on the completion of this design
Experimentation or conduct of investigation	To undertake the actual work required to test the stated hypothesis	Generally constitutes the bulk of the postgraduate research program in time
Systematic aggregation of results or information	To bring together the results gathered from experiments or other instruments in a concise, systematic format	Results are better aggregated and analyzed on a regular, ongoing basis or after completion of a milestone
Detailed analysis of results	To assess how detailed results either support or contradict the stated hypothesis	
Publication of results/findings in scholarly Literature	To subject research results to an external peer review as a first "impartial" test of the validity of the approach and outcomes	Preparation of research paper can take weeks of effort. Journal peer review process can take months
Publication of complete body of work in Dissertation	To completely document the research investigation from initial literature review through to self-assessment of strengths, limitations and scope for future research	Research dissertation should be under development from the beginning of the research program and ongoing throughout
Examination Process	To subject to the entire research investigation to external, independent peer review	Maximum length of examination process needs to be determined and factored into plans.

Table 8.1 – Basic Elements and Time Considerations in Postgraduate Research

8.4 The Planning Process

There are various project management software packages available to assist in the development of a postgraduate research plan. The reality, however, is that in the case of an individual research student, the critical path in the process is predominantly dependent upon that research student – as are the bulk of the activities therein. For these reasons, students can expend (waste) considerable time learning to use (yet another) software package which adds little value to the postgraduate planning process. Unless a supervisor believes that there are extra-curricula benefits to using a specialized package, then encouraging the use of a generic spreadsheet package to achieve a more efficacious outcome may be beneficial – and avoid time-wasting on technologies which are over-kill for a very basic postgraduate project plan.

It is often the case that research students seriously underestimate the amount of time that is actually available to undertake a postgraduate research program. In particular, the notion of having several years to complete an investigation is – from the perspective of a research student (who is often only 22 years of age) – an inordinately large amount of time. After all, it is around a seventh of a student's entire lifespan to that point.

The key point for the supervisor to get across to the research student during early meetings – and the planning process – is that, firstly, even though the research program may span several years, there is no real slack built into the process. Secondly, in order to get an insight into the tight time-frames associated with the program, the research student needs to learn to *backward-schedule* all his/her activities from the expected completion date of the project. For example, if the candidature duration is three years (to submission of final thesis), then:

- Week 156 of the candidature is the reference point from which all work is backward scheduled
- This may mean, for example, that the supervisor needs to complete his/her final review of the thesis by Week 152
- This may, in turn, mean that the student's complete draft needs to be completed by Week 146
- This may require all results to be analyzed by Week 138
- Actual experimentation/investigation may need to be completed by Week 130,

and so on.

When a research project of several years is divided into weeks, and

allowances are made for a supervisor's time to read and assess submissions, students can be genuinely taken aback – or even alarmed – by how little time is actually available to them to complete their investigation.

The other point that needs to be made to the student is that the tasks associated with postgraduate research are not always contiguous – many of the tasks overlap and some need to be performed simultaneously in order to enable the project to finish on time.

Even in the absence of a formal project management software tool, the basic mapping process is very straightforward. The horizontal axis of the management plan represents time and the vertical axis relates to specific activities that need to be performed. For postgraduate research programs, there is little value in resolving time into units of less than a week – so a three year program would have 156 time units in which activities need to be scheduled.

Figure 8.1 shows a very basic (sample) project management chart with broad activities listed over a 156 week period. In this simple plan the details of the investigative process and thesis development have been left open-ended because of the broad spectrum of possible activities that might take place in any given research program. A research student would need to develop his/her own chart with a higher level of resolution for these activities and milestones as they relate to issues, such as:

- Thesis development (e.g., which chapters will be completed and when)
- Design/development of specific apparatus/equipment
- Execution of the specific methodology (e.g., which experiments will be completed and when).

Again, however, it needs to be stated that there is little value in expending time on this activity unless both the supervisor and the research student view the milestone dates and activity durations as hard and fast. It is difficult enough for research students to meet milestone targets when they are viewed psychologically as immovable events. Where they are viewed as little more than moveable *guesstimates*, the planning process loses much, if not all, of its value.

Milestone dates should only be moved as an option of absolute last resort – when all other options of increasing resources to meet them have been expended – and not as a first option, or path of least resistance, just because meeting them is difficult.

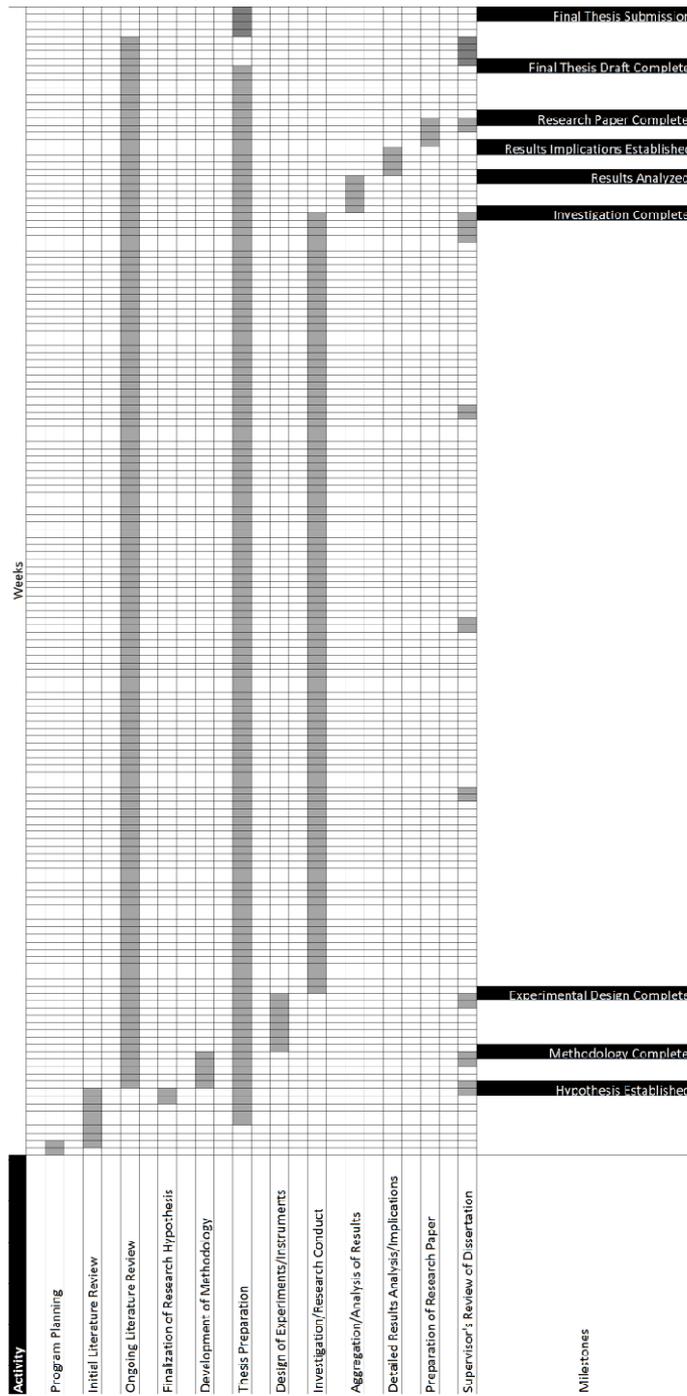


Figure 8.1 - Basic Elements of Project Management Chart

8.5 Using the Planning Process

Creating plans is one thing – actually using them is another matter entirely. If the project plan is to have genuine value for both the supervisor and the research student, then it should form the basis for discussions at all formal meetings. Specifically, a supervisor needs the student to explain:

- How he/she is performing relative to the plan
- If the student is falling behind and may not meet a deadline, what additional resources need to be deployed (including having the student working longer hours)?
- Do changes need to be made to the plan – *vis a vis* new activities or deletion of existing activities?
- Do plan changes also necessitate resourcing changes for the project (e.g., will development of additional apparatus require additional technical support)?

An obvious question that also needs to be asked is what needs to be done in the event that the plan is completely flawed from the beginning? The answer is that there really isn't sufficient scope in a postgraduate program to have such major structural flaws in the plan in the first instance. Planning a postgraduate program isn't like planning the development of a new passenger aircraft – involving thousands of staff; numerous partners and hundreds of variables. A postgraduate research plan has:

- An overall duration generally defined by the university
- A single entity (student) responsible for the bulk of all activities
- A single entity (supervisor) responsible for overall management
- Well-defined outcomes (e.g., thesis, research papers).

Of course there are always uncertainties with knowledge creation, and even accessing resources and so on, but these are not major structural issues within the plan. For these reasons, the planning process should be straightforward and so too should be its execution.