

Advice on How to Apply for a (Competitive) Research Grant

Who Should Read This Document?

This document is intended to assist all Macquarie University research grant applicants. It is written especially to guide both new researchers and established researchers who are writing external research grant applications for the first time. It is current as at March 2006.

The Benefits of Applying for Research Grants

The main reason to apply for research grants is to attract the funding resources necessary to support a valuable research project or set of projects, especially in terms of necessary personnel, equipment, travel, maintenance, and (sometimes) teaching workload relief. Everyone writing a competitive research grant application should approach it from the start in terms of producing the kind of high-quality research project and grant application that is needed to justify the investment of public or outside research funds in your research.

A research grant application should reflect the applicant's ability to:

- write clearly, concisely, and precisely,
- demonstrate both significance and innovation
- communicate research to both non-specialist and specialist readers
- display technical competence
- analyse material and interpret results
- manage the project in a way that delivers substantive outcomes.

Given the increasingly competitive research environment, applicants must make a very strong case for the need for financial support. This involves demonstrating innovation, significance, approach, method and national benefit clearly and systematically. Applicants often tend to treat national benefit in particular as self-evident. This is a mistake. Always think carefully about how you frame your research in a national context and ensure that the claims you make are reflected in the research project you have outlined. Applicants should also be aware that resubmission of unsuccessful grants is often an important part of the application process. While initially discouraging, the process of framing and revising projects also assists researchers to:

1. strategically plan their research over an extended period (usually 3-5 years);
2. have their ideas submitted to formal external peer review, which, with appropriate feedbacks, provides constructive guidance of research direction and future strategy;

General Advice to Applicants

Acknowledgement of the Assessment process

Grant applications are assessed by peer review, through a committee or panel, individual referees, a panel of readers, or a combination of these. Given this rigorous process of review and assessment, applicants must ensure that they submit well prepared and clearly conceived projects that propose to do significant research with demonstrable benefits for their respective areas of research. Budgets and methodology, in particular, need to be thoroughly outlined and realistically costed.

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Assessment can often be robust and confronting, but it is a necessary part of the process. This is important to acknowledge while preparing applications, but also when responding to assessors' comments and feedback.

One useful approach for grant applicants (especially inexperienced ones) to take in both writing and subsequently reviewing their own application is to try to put themselves in an assessor's place. An assessor must usually evaluate applications against specific criteria (as set out in the particular Scheme's guidelines and funding rules). An assessor is also charged with recommending the allocation of funds responsibly and accountably - this is especially true of publicly funded research schemes.

So, when reviewing your own (or a colleague's) application, you should ensure that the proposed project is demonstrably achievable within the specified timeframe, and that the project's budget is properly and fully justified. Given that under competitive schemes only one-in-three, to one-in-ten (for some fellowships) of the applications can be supported, ask yourself what is it about your application that will put yours into the top 10-33% of those assessed?

Another useful approach, especially in fields or departments without a developed grants culture, is for individual researchers and even their academic units to follow the practice of ensuring that an experienced grant winner from within the researcher's own academic unit, and who is independent of the particular project, always reads and provides feedback on a draft application. Experience has shown that this is one of the best ways to enhance the quality of an application, even for experienced grant applicants.

Preparation of a Typical Application

While the specific order and content of grant applications vary, most seek information about the applicants' past track-record and future plans in the form of the following questions:

1. What work do they intend to do?
2. What has been done on the topic already?
3. How do they intend to do the work?
4. Do the applicants possess a demonstrated capacity to undertake and complete the work, and to manage its resources?
5. Why is the work important?
6. What is innovative about the work?
7. What will be the outcomes of this work?
8. Who will benefit from or use the outcomes of this work?

This series of questions underlines the necessity of carefully reading and analysing the particular grant scheme instructions before writing an application. All applications need to be written to address the particular guidelines and conditions for each grant scheme.

Application forms and scheme guidelines vary, but generally what is required can be summarised under the following headings:

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- Details (résumés) of applicants (Who is it requesting support?)
- 100-Word Summary (in plain English why is the application important?)
- Aims (What do you intend to do?)
- Research Plan (How are you going to do it?) [NB This heading itself comprises important sub-components such as approach, methodology, milestones etc]
- Background and Preliminary Studies (What has been done on the topic already?)
- Significance (Why is the work important?)
- Innovation (How is proposed research or the approach to it original or new?)
- Budget (How much is it going to cost?)
- Budget Justification (Why is each of the budget items necessary for the meeting the aims and research plan and successful completion of the project in the time-frame specified?)
- Outcomes (What will be the results and outcomes of this work, and for whose benefit?)

It is important to address each of these sections accurately and concisely.

Applicant Details

Assessors of a grant application need to be convinced not only that the research project itself justifies the expenditure of a grant (for which they are accountable, directly or indirectly), but also that the researchers undertaking the work have the required expertise and experience to undertake and achieve the proposed research objectives.

The criteria used to determine this are twofold:

1. qualifications and other indicators of professional performance (positions held, honours awarded, peer assessment, etc);
2. track record – that is their history of successfully attracting research funding and their research output (publications).

These two aspects are sometimes dealt with in different sections of a grant application.

The 100-Word Summary

Many grant application forms and pro-forma now require applicants to provide a 100-word summary of the project. Typically these sections of an application form require the applicant to: “*in no more than 100 words of plain language, provide a summary of the project referring to its aims, significance and expected outcomes*”. The summaries are used for several purposes:

- To provide a précis of the intent and value of the proposed research.
- To provide a brief summary of anticipated outputs, outcomes and benefits.
- By the applicant to direct the Granting Agency’s attention to what type of assessor assesses the proposal.
- To assist assessors who might not be totally familiar with the field involved.
- To provide the Granting Agency with a ready plain-English explanation of the research project for media and promotion purposes (should the application be successful).

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Note that the ARC Discovery-Projects Scheme “Instructions to Applicants” guidelines identify these key points: *“Write the summary in no more than 750 characters (approx. 100 words) write it in clear, plain English using the minimum of terminology unique to the area of study. This summary may be used by the ARC in the selection process, and may be used for publicity purposes.”*

Project Aims

The ‘Aims’ section of a research grant application is where applicants define the objectives or goals of the research. Aims must be clearly and concisely written. For example, writing something like ‘This project aims to investigate and enhance existing knowledge of widget-making from theoretical and empirical perspectives’ says nothing of any real value about either the actual project or what its aims really are.

These aims vary depending on whether the research to be undertaken is Basic, Strategic, Applied or Developmental. The ARC defines these terms as follows:

Basic Research - Experimental or theoretical work undertaken primarily to acquire new knowledge of the underlying phenomena and observable facts, without working for long-term economic or social benefits and with no positive efforts being made to apply the results to practical problems or to transfer the results to sectors responsible for its application.

Strategic Research - Experimental or theoretical work undertaken with the expectation that it will produce a broad base of knowledge likely to form the background to the solution of recognised or expected current or future problems or possibilities.

Applied Research - Original investigation undertaken in order to acquire new knowledge but is directed primarily towards a specific, practical aim or objective.

Experimental Development - Systematic work, drawing on existing knowledge gained from research and/or practical experience, that is directed to producing new materials, products or devices, to installing new processes, systems and services, or to improving substantially those already produced or installed

In this spectrum, the more basic the proposed research, the more innovative the research would be expected to be (with the implication of high risk in terms of guaranteed outcomes). On the other hand, the more developmental (applied) the research, the lower would be the expected risk – with a high level of confidence of successful outcomes.

The purpose of the Grants Scheme should also be reflected in the project aims. Some Schemes are fairly narrow in defining the types or areas of research they will support. Others, while more general in scope, may still define Priority Areas.

It is very important to take these limitations into account when defining the aims of a project. It should be self evident that an application submitted to a scheme which already indicates that it does not fund the type or area of research outlined in the proposed application, will not be successful.

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Methodology/Techniques

This section is meant to describe the proposed logistics of the project – how the aims are to be met (methodology) and upon what timescale. This can be crucial – it is important to describe what can reasonably be achieved with the resources proposed and within the time indicated. Budgets should be realistic and achievable within the time frame of the proposed project. There should also be a clear and demonstrable connection between the budget and the application as a whole. This is also an important point in terms of the alignment of the different parts of the application and how they relate to and support each other, so that the overall cohesion and coherence of the application is apparent. Experience shows that this is particularly a problem where different people are involved in writing different parts of an application.

Depending on the scheme the Plan might need to include a time schedule with associated performance indicators (milestones) – again, it is important that the Plan is realistic in terms of the researchers' capacity and ability to meet these intermediary goals.

Background

The “Background” section can sometimes be confusing in that it can be interpreted as apparently referring to the applicant's own experience with the setting of the project. Rather, it is important that the applicant demonstrate a thorough understanding of the published literature – what has been done so far and what is currently known – upon which the aims and research plan are based, and how the research project will advance knowledge. Another common error is for researchers to use this section to write a background piece on the history and importance of the *area* of the research, as distinct from the background *to the project*.

Note that for the ARC Discovery-Projects Scheme in particular, the Guidelines for the “Background” section advise: “*Include information about recent international progress in the field of the research, and the relationship of this Proposal to work in the field generally.*”

Preliminary studies

It is often very helpful if an applicant can demonstrate that the proposed research is feasible, and that the cited researchers have the skill-base and experience to undertake and complete the project on time.

To justify such claims, the application should include information which:

- Demonstrates the feasibility of the proposed research, including pilot studies or background work performed already
- Outlines the qualifications and track record of the applicant(s). This should not just be a standard *curriculum vitae*. Rather, it should be customised for each application, pointing out clearly the relevance of each applicant's qualifications, training and relevant experience to that particular project.

In general, most successful applications demonstrate:

- A strong research publication record, relative to opportunity.
- An excellent record of attracting resources for support of research.

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- Other evidence of capacity and expertise to undertake the proposed research.
- A clear long-term research strategy (this is particularly important for staff seeking to reactivate their research track records after research career interruptions).

Significance

Significance can be interpreted in a number of ways and applicants should read the relevant scheme guidelines carefully, so as to be fully aware of any priority areas or strategic goals specified under the particular scheme.

In general applications should clearly demonstrate the following:

- The research is significant and addresses an important problem within the research area.
- The anticipated outcomes advance the knowledge base of the discipline and/or develop new insights, methodologies or technologies, and/or produce advances for relevant research users and beneficiaries (such as processes or therapies in practice, or new directions in policy, regulation, or organisational life).

Most Commonwealth Schemes now include a section where applicants are asked to describe how the proposed research is in the “National Benefit”. The ARC defines this as: “*the potential of the research project to result in economic and/or social benefits for Australia from the expected results and outcomes of the project, and/or the potential for the research to contribute to the National Research Priorities* (see: www.arc.gov.au/grant_programs/priority_areas.htm)”. This section is of vital importance. For ARC Discovery-Projects grant applications, 10% of the assessment scoring relies on how well the question is answered. Not adequately answering the question can easily make the difference between a successful and unsuccessful application.

Likewise, where a scheme requires a 100-word summary TO BE WRITTEN FOR THE NON-SPECIALIST READER, it is vital that this be written in jargon-free language that demonstrates the significance of the proposed research.

Impact and accessibility

While all schemes cite quality of research as one of the main criteria for support but, to varying degrees, success might also depend on the proposed Impact and Accessibility of the results of the research outlined in the application.

Until fairly recently, impact has been interpreted largely or even solely as a measure of the significance of the results of the work to the researchers’ peers – for university researchers this could be interpreted as “academic impact”. This can be measured by the perceived value to the academic and/or research community of publications arising from the work by way of such criteria as citation indices, professional awards, etc. Increasingly, other forms of research impact are also important, such as the public citation of an academic’s work in a governmental report or court judgment. Again, impact must always be assessed relative to the particular requirements of the grant scheme.

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Accessibility is a measure of the research in terms of its impact for the wider community – whether it will significantly influence policy or behaviour for example in the social, economic or environmental areas.

Researchers frequently underestimate the importance of the latter aspect of their applications. Researchers must remember that assessors need assistance to justify the expenditure of grant funds on a particular project. This is particularly relevant with publicly-funded research, where appropriations of government funds always have political overtones.

Innovation

An accepted definition of “innovative”; is: “*groundbreaking; being or producing something like nothing done or experienced before; ahead of the times*”. In research, “Innovation” can also be defined as: “*the process of developing, introducing and implementing new or significantly improved goods or services, or a new or significantly improved process*” [ABS]. The second of these definitions tends to apply more to the commercialisation of research. The first definition is the one usually referred to in grant applications.

In general applications should clearly demonstrate the following:

- That the research is novel and innovative.
- Details of any new methodologies or technologies to be developed.

Budget

The budget is frequently a cause of frustration to applicants. There are several key points which an applicant must address.

ζ **Do not artificially inflate your budget**

Many applicants assume that approval automatically results in at least a 10% cut to their budget and routinely inflate their figures by as much as 20% to compensate. However, peer-review means that the assessors are usually very aware of the true costs of the research, and it is helpful to make an accurate estimate of the amounts of consumables (particularly) that are required for the project.

ζ **Be thorough and accurate with your costings**

Rough estimates and wild guesses are very obvious! Specifying ‘Research assistants - \$X’ is obviously inadequate and nowhere near as good as specifying ‘X research assistants @ Level Y for Z hours per week for P weeks @ \$Q per hour + R% on-costs’. Attention should be given to the accuracy of the information provided, and equipment requests should be at current prices accompanied by a formal quotation from the supplier. Are there hidden costs that the applicant hasn't bothered to seek out?

In some areas or disciplines that are still developing their research cultures and research infrastructure, researchers might benefit from illustrative examples of the kinds of budget items that are realistically possible to support research. In some areas of the humanities and social sciences, for example, illustrative budget items might usefully be grouped as follows:

1. Personnel (eg project administrator, administrative assistant(s), word-processing and transcribing assistance, project research officer, research assistant(s),

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financial support for PhD student(s), outside technical expertise, web page and database designer/programmer)

2. Teaching relief (on some internal and external grants, and needs very specific reasons)
3. Equipment (eg laptop(s), interview equipment, dictating machine, research software, research database licences, specialist texts and subscriptions, web-based tools)
4. Travel (eg conference presentation attendance, field trips, site visits, organizing and flying out experts for workshops and conferences)
5. Other (eg cost of hosting and organizing workshops and conferences (including accommodation and catering), cost of producing particular research outputs for dissemination of research results (e.g. issues papers for external research audiences)).

Budget Justification

☞ *Explain why every item is needed*

All justifications of personnel and equipment should state concisely the need in terms of meeting the objectives of the proposal. Avoid budget inflation or throwing in a computer or two for good measure! These actions undermine your credibility in the view of the assessor.

No assessed Grants Scheme will support vague, general requests for assistance. It is essential that accurate costings and detailed justification for all proposed expenditure are given. Justification of a budget is not merely stating proposed expenditure. Researchers should provide details of the types of expenditure and an explanation as to why that particular expenditure is essential in relation to the aims and the research plan of the project. Without detailed justification, applications are not likely to be successful in gaining support.

Self-Assessment of Grant Applications

Ask yourself the following questions about specific sections of the expanded grant outline before you print the final copy.

Note that different schemes may have different terminologies for these sections and they may be in a different order. It is important to use the terminology and sequence related to the specific scheme.

i) Aims and Objectives:

- Are they logical? well-defined? reasonable? attainable?
- Is there a clear and obvious relationship between the project's aims and objectives and its outputs and outcomes.

ii) Methodology/Techniques:

- Design: - is it appropriate? valid? carefully-designed? straight-forward? well-organised? logical? clearly-designed?
- Approach (or perspective): - is it adequately articulated and justified?
- Methods: are they appropriate? carefully-documented? well-established? correspond to specific aims? (and note, do not overwhelm the reviewer with

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minute experimental details or unnecessary process-oriented detail - most will be prepared to believe you know how much of a particular reagent to add to a reaction mixture, or what kinds of standard research sources to check step-by-step in your literature search).

- Limitations: have they been recognised as to how they can influence analysis and interpretation of experimental results?
- Difficulties: can you show you are aware of them? Or at least considered them? How they can be circumvented?
- Alternatives: are logical and appropriate alternatives proposed?
- Sequence: is the research plan developed in a focused, step-wise approach?
- Have you demonstrated a clear understanding of order/sequence of experiments or stages of work?
- Analysis of data: is attention given to types of results expected empirically, experimentally, or conceptually?
- Interpretation of anticipated results: have you demonstrated awareness of underlying principles and associated complexities, contexts, and implications?
- Provide a summary Timetable for the important activities and milestones

iii) Relevant Literature (Background):

- Have you collected, reviewed critically and organised the data leading to the present proposal and the body of knowledge within which this project sits?
- Does background information justify the next step (this proposal)?
- Have you demonstrated a thorough understanding and balanced evaluation of the pertinent literature?

iv) Preliminary Studies (Feasibility):

- Have you demonstrated that methods, procedures, techniques and protocols are feasible, adequate and appropriate?
- Have you described qualifications, training and experience of the applicant(s) of particular relevance to *this* application?
- Have you described any preliminary experiments or seed projects that demonstrate that you are qualified to perform study? Or is there a need for a qualified collaborator?
- Is the proposed project demonstrably within your technical competence?

v) Significance:

- Will the work yield new conclusions of general value or practical significance?
- Will results fill a defined gap in knowledge?
- Will results facilitate development of new technique(s), experimental models, greater understanding, changes in behaviour, or anything else that affects how participants in the public, private, and community sectors act (such as new advances in thinking and new evidence to change government policy or regulation in a particular area)?
- If designated research priorities (such as the National Research Priorities) are cited in the Guidelines, have you addressed the question?

vi) Innovation

- Design – is it original?

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- Innovations: are innovative procedures employed to overcome anticipated technical difficulties? Are the innovative steps feasible? Do they have obvious and/or clearly described advantages over standard techniques?

vi) Outcomes

- What are the specific research outputs?
- What are the specific research outcomes?
- How will the outputs be disseminated and the outcomes produced?
- Who will benefit from and use the research outputs and outcomes and how?

One common mistake in many research applications is to confuse or misunderstand research outputs and research outcomes. A publication is a research output. Outputs lead to outcomes, and outcomes are usually linked to the benefits and uses of the research. So, if a research output like a publication can reasonably be expected to lead to a change in how the academic experts in a field view or understand something, that enhancement in knowledge and understanding is an outcome. Similarly, a research output like a public submission, report, or discussion paper might lead to a change in government policy, which would be an outcome of that output.

It is vital to revise and refine the draft proposal with the above questions in mind. When you can confidently answer the questions in the affirmative, you will have the basis of a competitive proposal.

Note: Always run the application through the spelling check programme, and make sure that all references in the body of the text are cited in the bibliography!

How does an Assessor/Reviewer See an Application?

Many reviewers assess the strength and weaknesses of grant proposals by answering the following fundamental questions about an application:

1. Are the aims readily apparent and reasonable?
2. Are the procedures/methods feasible, adequate and appropriate for the research proposed?
3. How is the proposal (a) significant, and (b) innovative in relation to its field?
4. Are the principal investigator(s) and the other staff qualified (and competent) to conduct the research, as judged by their track record(s)?
5. Are the facilities, equipment and other resources adequate for the proposed research programme?

You should review your application (or even better get a colleague to review it), with these points in mind.

Common Reasons for the Rejection of Proposals

A common reaction when an application has not been funded is for the applicant to assume that the grant proposal has not been understood or that it has been reviewed unfairly.

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However, while there are many reasons why applications are not funded, it is surprising how often applicants fail to recognise the following problems in their own work:

1. Artificial adaptation of purpose and significance of proposal to meet the objectives of the funding body.
2. Scheme Instructions not followed. For example, length, omission of requested information, and altered application format all negatively influence assessors.
3. Applicant(s) did not appear to have suitable track record
4. Applications contain one or more of the following problems:
 - lack of new or original ideas
 - diffuse, rambling, superficial research plan
 - lack of understanding of published work in the field
 - lack of background and experience in essential methodology
 - insufficiently articulated description of how the project relates to work in the field
 - uncertainty as to potential future directions
 - experimental or empirical approach based on questionable reasoning
 - lack of acceptable scientific or other rationale
 - attempt to conduct an unrealistically large amount of work
 - lack of experimental or empirical detail
 - uncritical experimental or other approach
 - where application involves extensive collaboration (national or international), insufficient detail on how collaboration will work and why it is important to realise the objectives of the proposal.

Conclusion

For a successful application there is no substitute for clear and concise writing. The application must be understood readily by reviewers who might come from a range of backgrounds. This is especially true of the Committee/Panel reviewers as compared with external expert assessors. It is the applicant's responsibility to present the proposal in the clearest manner possible, not the reviewer's to grapple with what the applicant is trying to say. In other words, write always with the criteria, needs, and perspectives of the grant-reviewing audience in mind, and not just from your own specialist and technical perspective.