

Good Research Practice

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Foreword



Foreword by Professor Nancy Rothwell, Vice-President for Research

The University of Manchester has an excellent reputation for research. It is our aim to build on this reputation and establish ourselves among the 25 strongest research universities in the world. Good research practice is fundamental to achieving this. It is about sharing ideas, opening up new and interesting avenues of research, supporting and rewarding the development of our academic and research staff and improving the efficiency and effectiveness of what we do so that our research is conducted to the very highest standard.

This guide - *Good Research Practice* - and its accompanying website, is fundamentally concerned with the sharing of information. It taps into the knowledge and experience of our top researchers, including those who sit on grant committees, are editors of journals or who manage large and complex research collaborations. It is also about sharing knowledge across disciplines and highlighting the good practice that takes place across the University.

The guide is intended for all those involved in research activities in this University, particularly those starting out on an academic career or about to manage their first research project or who are taking on responsibility for managing and mentoring staff and research students.

It provides advice about how to navigate the different stages of the research process successfully; from securing funding and managing a research project to disseminating the research results. It should be read in conjunction with the *Code of Good Research Conduct*, which sets out the formal principles upon which all research undertaken by staff and students of this University must be conducted, and the Good Research Practice website (www.manchester.ac.uk/goodresearchpractice) which contains additional complementary information such as advice about conducting fieldwork, details about health and safety regulations and the mechanisms for obtaining ethical approval and all the links to useful websites referred to in this guide.

The advice in this guide has been provided by academic and research staff at all levels from across the University who have kindly given their time to contribute. I hope that you find it useful in undertaking your own research and supporting the research activities of others.

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Funding your research



2.1 Introduction

Few academics have the freedom to conduct their research without some external financial support. Even those whose research does not require expensive equipment or extensive trips overseas need to pay for resources to release them from their teaching and administrative duties or to pay for students or post doctoral research staff in order to get their research done. Research can be funded from many different sources, the most obvious being the Research Councils, charities and the EU. However, it is important to be aware of all the sources available as funding schemes can be very competitive. Your School Research Administrator (or equivalent) will be able to advise you about the many different sources available.

Competition for research funding is fierce, so it is crucial that you develop the necessary skills for acquiring it. Approaches to obtaining funding will differ by discipline. For example, in the sciences, having some pilot data puts an applicant in a strong position, whereas in some humanities subjects research is almost certain to be funded if there is a book contract in place. It is important to prepare an excellent application in order to have any chance of securing funding. Funding is finite, however, and excellent applications still get turned down. It is important, therefore, that the amount of time you spend on a proposal is proportionate to the amount of money you are applying for and the likelihood of success. Set yourself a deadline for preparing your application and try to stick to it.

This chapter provides advice about seeking and obtaining funding for your research. The Good Research Practice website (www.manchester.ac.uk/goodresearchpractice) provides further information, including a check list for producing a grant application.

2.2 A Targeted Approach

2.2.1 Choose your funding scheme carefully

You need to identify the most appropriate funding scheme for your project. Find out the breadth of funding opportunities available to you by talking to your School Research Administrator (or equivalent), colleagues and personal contacts, searching the internet and utilising the ResearchResearch database. If you are new to research you could take advantage of special schemes and initiatives directed at new researchers. For some research areas, particularly in science and engineering, creating links with industry can be an excellent way of getting some initial research funded. Small grants that support overseas visits, for example, are very useful for building up relationships for future collaborative ventures, learning new skills or undertaking feasibility studies. These will help you with your endeavours to secure larger grants in the future.

Check the funding body websites for their funding rates (although this should not be the sole factor for deciding where to apply). If it is your first application you may have more success applying for a small amount of funding from a scheme with a higher success rate. Larger grants are difficult to obtain without a proven track record as an independent researcher.



2.2.2 Think very carefully about the subject of your research project

Your application for funding will only be successful if it is based on an excellent research idea that would have a substantial impact upon your field. You can identify priority areas in your field by reading the appropriate journals. One way of measuring the importance of your research is to determine which journal you would publish the results in. If you do not think the research will be of interest to the main journal in your field it is unlikely to be of interest to your chosen funder.

2.2.3 Consider collaboration

You may be able to strengthen your project by collaborating with others (see chapter 5 on Research Collaboration). For example, if your project is important to industry, an industrial contribution will give your project more credibility.

2.3 Ethical Research

You should think carefully about the ethical implications of your chosen project before seeking funding. In accordance with the University's *Code of Good Research Conduct*, you should consider your responsibilities to society, the environment, your profession, the University, the staff, students and participants that might be involved in the research and the organisation that might fund it. If your research would involve human participants or animals, the appropriate ethical approval should be obtained and Home Office legislation be adhered to. Further advice is available on the Good Research Practice website (www.manchester.ac.uk/goodresearchpractice).

2.4 Careful Background Preparation

You should never underestimate the amount of time it takes to prepare a grant application or negotiate a research contract with a research sponsor. You should allow yourself several months (good practice suggests at least 6 months) to allow for team building, internal review, administrative processing, re-writes and delivery.

2.4.1 Learn as much as you can about your chosen funding body.

"As a young researcher, I imagined that faceless bureaucrats in the research councils were treating my application with dispassionate disregard. I now know that they are (mostly) warm-hearted human beings who are quite happy for the phone to ring so that they can talk about funding and remits with a real live applicant. It certainly beats wading through the large piles of applications on their desk".

(Nigel Brown, *How to Get a Research Grant*, THES)

It is important to research your chosen funder, at the very least to look at their internet site and read their organisational strategy documents. You need to understand their current objectives and be assured that your application is in line with their focus area. Your mentor, line manager, School Research Administrator (or equivalent) and other colleagues can provide useful information. If you are applying for a research grant you could also telephone the appropriate programme manager to learn more about the funding body's priorities and whether your research project would be suitable for your chosen funding scheme. If the membership of the review panel is available, you can use this information to help focus your proposal. It is also a good idea to read some formerly successful grant applications for your chosen funding body (ask your School Research Administrator (or equivalent) about providing these).

2.4.2 Do some background research

Wherever possible, or appropriate, you should undertake some background research or a pilot study. Grant proposals that contain actual data/material showing that the proposed project is achievable are more likely to receive funding. If possible, a preliminary publication also helps.

Read some of the available literature on how to be successful at obtaining funding (www.manchester.ac.uk/goodresearchpractice provides examples) and/or attend a 'grantsmanship' workshop if offered by your School/Faculty.

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2.4.3 Have a pre-prepared dissemination strategy

Your chosen funding body will want assurance that your findings will be disseminated where they will have the greatest impact on the advancement of knowledge and/or influence on society or improvements to the environment or health care. Therefore you should give careful thought to your communication strategy (as described in chapter 6) which should be incorporated into your application.

2.5 Identify and Utilise the Help Available to You

Discuss your ideas with your line manager, mentor, research group and other colleagues in the same and relevant fields to help clarify and focus your ideas, and identify possible gaps in logic. When preparing an initial research proposal you should ask colleagues and contacts to comment on drafts at different stages of its production (bearing in mind the pressures on their time). Even when you are more experienced you should ask those who have reviewed grant applications or sat on funding panels to look at a late draft of your proposal – this may already be built into peer review procedures within your school. As well as asking experts in your field, it is useful to ask someone outside of your field to check that your application is understandable to a generalist. If you are applying for a studentship or fellowship and are required to attend an interview, you should seek advice from senior academics about probable interview questions and possibly even organise a practice interview.

You should speak to your School Research Administrator (or equivalent) at the earliest opportunity. S/he will be able to give advice about the sources of funding appropriate for your research and how to go about obtaining it. S/he can also advise about which colleagues to talk to, provide you with past grant applications and familiarise you with your local procedures for grant application approval and the drawing up of research contracts.

2.6 Optimising Your Grant Application

2.6.1 Take care over presentation and style

Read the application instructions very carefully and follow them exactly, make sure the application form is completed correctly, that you have followed the headings provided and paid due attention to the stated criteria for success. Adhere to the guidelines for presentation, including margin and font size, number of pages and of copies. Include an accurate table of contents and use headings and page numbers. Ask a colleague/friend to check your spelling and grammar and to make sure you have used plain language.

When preparing your grant application you need to bear in mind that referees and grants committees will probably have a considerable number of proposals to read and although referees are experts in the field, they may not be expert in the specifics of your research. You need, therefore, to make reading and understanding your proposal as easy as possible for them. Keep your proposal simple so that a generalist in your area of research can understand it. Do not be tempted to cram everything you would like to say into the space available. Choose your problem, articulate it clearly, accurately and thoroughly and do not deviate from it. Keep the number of main aims to a minimum (a maximum of 5 has been suggested). Keep sentences short and succinct. Use clear subheadings and highlight key points in bold type. Use diagrams and figures, where appropriate, as they are useful for putting your point across and help to break up text. Avoid abbreviations, acronyms and jargon that the non-expert may not understand.

Make the purpose of your project clear at the very beginning. Ensure the title of the project properly reflects the proposed research because it will set the first impression and help determine which review committee your proposal will be forwarded to and the reviewers to be used. The abstract or summary is crucial. If a referee does not understand your proposal after reading the abstract s/he is not likely to give it a good score. The abstract should be specific and concise and not go into detail on aspects of the proposal that are further clarified later. Write the abstract when your proposal is finished.



Try to put your enthusiasm for the project into your writing, but be focused and do not get too carried away with the fine details of the research. You need to exude certainty; subjunctives like 'may', 'might' and 'could' should be avoided. Your proposal should be goal orientated, so think carefully about what you intend to achieve. Use the active rather than passive voice - if you do not come across as believing in the project, you will not convince the referees.

2.6.2 Convince the funding body that your research is important enough to fund

In order for your proposal to have any chance of success it must be based on research of the highest quality and originality. You need to articulate how exciting and novel your proposal is, emphasising what is 'revolutionary' about it. Highlight any practical outcome or commercial, social or medical benefits your project might have. It is a common mistake of those new to writing grant proposals to be over ambitious, so take care not to promise more than you are confident you can deliver.

You should demonstrate how your proposed research connects to existing research and how it will make an important contribution to forwarding this knowledge. It is very important to emphasise how the project maps onto the funding body's priorities and make it explicit that your objectives match with theirs.

If you are applying for a studentship or fellowship, you need to present yourself as someone the funder would want to invest in. You should include details about your career aspirations, expectations in research and training requirements. You should also sell the University and play to its strengths. Further advice is available at www.manchester.ac.uk/goodresearchpractice.

2.6.3 Demonstrate that you are an expert in your field

You need to demonstrate that you are the expert in your proposed research area and the right person to be funded to do the research. Provide appropriate background information and cite leaders in the field, showing that the proposed research is realistic and timely. If you are asked to recommend external reviewers, recommend people who are respected experts in the field and who also know your work well enough to provide a comprehensive reference. If you are asked to respond to comments and concerns raised by referees you should respond directly to the issues raised demonstrating your expert knowledge.

2.6.4 Convince the referees and grant committee that you will deliver what you promise

It is crucial to be able to show that you can deliver and have delivered in the past. Referees will be heavily influenced by your past performances, so make sure your projects are carefully managed and that you write up and publish your work promptly and in academic journals of the highest impact in your field.

You must request adequate resources for your project that are cost effective and link the resources to defined outcomes. The budget should be constructed in accordance both with the funder's and the University's financial and administrative regulations. You should always consult your School Research Administrator (or equivalent) about the budget construction process. You should think about all the requirements of the project including staff, students, travel and subsistence, conferences, equipment and consumables. Check any specialist computing equipment and software licence agreements with Manchester Computing. Check carefully what the funder will support. As there is now a requirement to show full economic costs you need to estimate the percentage of time that you will devote to the project over its duration. You can get advice about fec from your School Research Administrator (or equivalent).

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The grant committee will need to be convinced that every aspect of your proposal has been thought through. It is essential to provide a management plan including milestones and a timetable that allows for some slippage due to general delays in the research. You should also include contingency arrangements should something crucial to your project fail, such as an initial set of experiments. (Preliminary data helps to mitigate against such potential problems.) If possible, build in the opportunity for small successes along the way. Make sure you have made allowances in your timetable for any bureaucracy you will need to go through in order to commence your project, such as ethical approval. If your proposed research involves a collaboration you should give details about how the project will be steered, how deadlines will be met and decisions made. More advice about planning your project can be found in chapter 3 and research collaboration in chapter 5.

2.7 Do not be Discouraged

Do not be discouraged if your application is unsuccessful - competition for funding is fierce and even excellent proposals have to be turned down. However, try to learn from your experience and the experiences of others. Try to find out why your application failed by contacting the programme manager. Look at the Good Research Practice website (www.manchester.ac.uk/goodresearchpractice) which contains a list of most common reasons why an application fails. If you really believe in your project, analyse possible reasons for failure, refine your proposal and try again after 6 months.

Do not wait to secure funding but take up other opportunities to get involved in research – such as through collaboration. It is crucial to develop and maintain your reputation. Your school may be able to help with pockets of funding and colleagues may be able to involve you in their research or point you in the direction of other opportunities.

2.8 Building on Your Success

Securing research funding becomes easier as your reputation develops. It is important, therefore, to develop a positive reputation – one of excellent project management, successful dissemination, fairness towards collaborators and other contributors. If you get the opportunity to act as a reviewer or panel member this will help to give you an inside view of what funders are looking for. Always remember the help you received from others when you were starting out and be willing to help new researchers when you are successful.



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knowledge technologies and workflow systems to solve information management problems for life scientists and other scientific disciplines. She has successfully secured funding from the EU, the US and most UK funding agencies including EPSRC, BBSRC, MRC, the Department of Health and the DTI.

“My team has a whole programme of research covering both the technical aspects and the application of computer science. This approach enables us to apply to a wide range of funders. We also have very close strategic alliances with the BioHealth Informatics Group in the School, the University’s North West BioHealth Informatics Group and the Bioinformatics Group in the Faculty of Life Sciences. This enables us to fish in all the pots together.

“My approach has been not to think narrowly but to think big. The funding bodies want some risk, they want big impact proposals. The EU wants to know if your project will revolutionise an area and beat the US. UK funders want to know what impact the research will have on the research community. In my experience you are more likely to get the £3m high-impact collaborative project than a £200k project that you would have spent the same amount of time preparing.

“It is good to build relationships with programme managers – they are there to help you. If they ask you to do a review quickly, you do it. Funders have events (roadshows, project meetings etc) - go to them, make yourself known and be helpful. Learn what is coming up, what they are looking for. They will even look at a draft proposal for you.

“When anyone in my team is writing a proposal I make sure they look at the funder’s review form. You can get it from their website or someone you know is a reviewer. Reviewers are busy, so make it easy for them by matching what you have written against their criteria. They should be able to cut and paste details about your proposed research into their form.

“When you write a grant proposal you are ‘selling’. If you haven’t sold your proposal to the reviewer in the first page, you can forget it. It needs to slap them in the face – what is it about? What are you going to get as a result? What will the impact be on the research community?”

3

Managing your research project



3.1 Introduction

Research projects vary in size and complexity from the lone scholar to a multi-disciplinary collaboration involving researchers and sponsors from industry, the higher education sector and other research organisations from across the world. All research projects, irrespective of size and complexity, need careful management to ensure the integrity and quality of the research, the appropriate recording and storage of the research findings and the timely delivery of research outputs within the project budget.

Many research projects are a team effort involving research staff and/or students appointed to work on the project and sometimes internal or external collaborators. It is important that the principal investigator provides leadership for such a project, steering it in the right direction by, amongst other things, establishing effective communications and creating a supportive and enabling environment for the staff and students working on the project.

This chapter contains advice for those starting out on a research project from those who have extensive experience of managing them successfully.

3.2 Ensuring High Quality Research

Ensure that you and your research staff and students are aware of and follow the University's *Code of Good Research Conduct* and any other good practice guidelines pertinent to your area of research and that you all understand the consequences of research misconduct. Where appropriate, there should be clearly documented protocols for the conducting of research and standard operating procedures for items of equipment to ensure that data/material is obtained consistently and accurately.

3.3 Project Management

Funding bodies and other research sponsors require the timely delivery of quality research irrespective of circumstances. A good track record of managing projects helps to secure future funding. It is important, therefore, to be organised, keep an eye on deadlines, and to be prepared for any eventuality.

3.3.1 Be prepared

Where possible, build in a gap between the date funding is awarded and the project start date to allow for the recruitment of researchers and/or the purchase/setting up of equipment. Be aware of the bureaucracy you have to go through in order to do your research and make time allowances for this. Never underestimate how long it takes to get ethical approval (allow at least 2 months from the date the application is submitted to the ethics committee). Will you be required to obtain Criminal Records Bureau clearance? Home Office Work

Permit procedures can take several months. Advice about the procedures for all of these can be found at www.manchester.ac.uk/goodresearchpractice.

The cornerstone of good project management is to be prepared for all eventualities and have contingency arrangements in place should things go wrong. A particularly common problem is students or postdoctoral research staff leaving before a project is complete. Try to avoid this by making sure you appoint the right person in the first place and keeping them motivated and keen to see the project through. It cannot always be avoided, however, so it is crucial that you are fully aware of the progress of the project so that you can pick it up should a researcher leave. Regular team meetings and shared knowledge of responsibilities helps to ensure that if someone does leave it is transparent who needs to do what to fill the gap. You will need to re-write the project plan for the remainder of the project to ensure you can still deliver on time. Other common problems relate to equipment; delays in setting it up and periods of time when it does not work. Make sure you know where else your piece of equipment exists in case you need to utilise it. Allow time for extra experiments, if possible, as they rarely work first time!



Where the progress of your research has been affected by issues that you could not have foreseen at the time funding was awarded, the funder may consider allowing an extension to the duration of the project if you make an application. However, this should not be relied upon and other contingency arrangements should always be considered first.

3.3.2 Be organised

An effective approach to time management is crucial to any research project. Time management courses are generally available through the Staff Training and Development Unit. Fundamentally, time management is about careful planning and being organised. Nancy Rothwell suggests in her book, *Who Wants to be a Scientist? Choosing Science as a Career*, that an easy and effective way of managing your time is to keep a diary of everything you have to do and attend and review it regularly to check for deadlines. She also suggests designing an effective filing system for paper documents, electronic files, emails, addresses, contacts, etc because this saves time in the long run.

Take care to adhere to your research contract or the terms and conditions of the funding body concerned. Keep an eye on deadlines and adhere to the project deliverables. Set your own priorities and try to stick to them as closely as possible. Make sure you know, and everybody else knows, who is responsible for what. For example who is responsible for knowing when contracts are up for renewal. Who is responsible for sending invoices and checking payments have been received. You can check this with the Central Research Office.

As soon as possible into your project you should be thinking about future projects and making applications to secure funding for them.

3.3.3 Finish the project

Michael Faraday's famous advice to William Crookes: "Work. Finish. Publish." is just as valid today. Self motivation and discipline are crucial to getting to the end of your project. Careful preparation and effective time management will provide the discipline and keep you focused during those periods when your motivation wanes. It is crucial to recognise when your work is finished and it is time to publish.

3.4 Managing the Budget

On receipt of an award you should contact your School Research Administrator (or equivalent) to ensure that the budget is correct and the terms and conditions of the project are acceptable to the University. Try to keep a handle on your spending, reviewing it at least 6 months before the end of the project to make sure you have spent everything. You need to decide what authority your research staff and students will have to purchase consumables. It is important for you to know how much is being spent from your budget, but you do not want to hold up research or spend too much time approving insignificant expenditure. It may be most efficient to scrutinize expenditure regularly or assign a trusted member of your research team to act as nominated signatory.

3.5 Good Recruitment Practices

It can be critical to the success of a research project to bring together the best research staff and/or students for the work required. You need to be pro-active about recruiting these people. Get as much advice as possible from Human Resources and from your colleagues.

Prior to undergoing the recruitment process you must have attended the Equality and Diversity Course run by the Staff Training and Development Unit to ensure that you conduct the recruitment process in a fair and appropriate manner.

3.5.1 Target people you would like to apply

Avoid leaving recruitment to chance. You cannot guarantee that the most talented researchers will respond to your advertisement. Try to keep a look out for bright young students and researchers, both internal to your School and externally at conferences, even when you do not have a position to fill. When you do have a position to fill, ask colleagues and personal contacts if they can recommend anyone.

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Collaborating with academics overseas is an effective way of attracting good students and postdoctoral researchers. It increases the pool of students/researchers you appeal to and the opportunity for overseas travel can make the position more attractive to UK students/researchers. If recruiting from outside the EU you need to make allowances for the administrative complexity of arranging for a work permit and the time that this involves (it can take 6 months).

3.5.2 Deciding where to advertise

Before deciding where to advertise you should discuss the options with your research group leader, mentor, School Research Administrator (or equivalent) and your Human Resources Manager. They should give you advice about the most cost-effective places to advertise. The Human Resources Directorate will pay for the first advertisement. Publications and internet sites of particular relevance to your subject area can be effective, and free, places to advertise.

3.5.3 Producing your further particulars

Before producing a job description and further particulars for the vacant position you should speak to your School Research Administrator (or equivalent) and Human Resources Manager who will be able to advise you about content and format. They may even provide you with generic further particulars that you can adapt. It is important that the further particulars make it very clear what the student/researcher will be expected to do. The further particulars should not only describe the position to be filled but also sell the project, your school, faculty and the University, including its facilities.

3.5.4 Short-listing applications

Applications should be checked carefully and references always sought. At least one colleague should be involved in the short-listing process. You should ensure that the referee knows the candidate well and is in an appropriate position to judge his/her abilities as a researcher. Ask referees to respond to specific questions so that you get the information you require. A telephone conversation with referees can often be useful.

3.5.5 Conducting interviews

There must be formal and robust interviewing processes in place for all appointments. Do not conduct interviews on your own but ask some

colleagues to form an interview panel. The composition of the panel should be appropriate to the job. Good people to include are senior colleagues with more experience of interviewing, a chief technician (where appropriate) and an administrator who, as a non-academic, can provide a different perspective.

You may have to sell your position to the candidates, so as well as a formal interview it is advisable to have an informal discussion with each candidate. A well planned visit introducing them to their potential future colleagues and the research facilities, possibly with some social activities, could encourage them to accept your position.

3.6 People Management

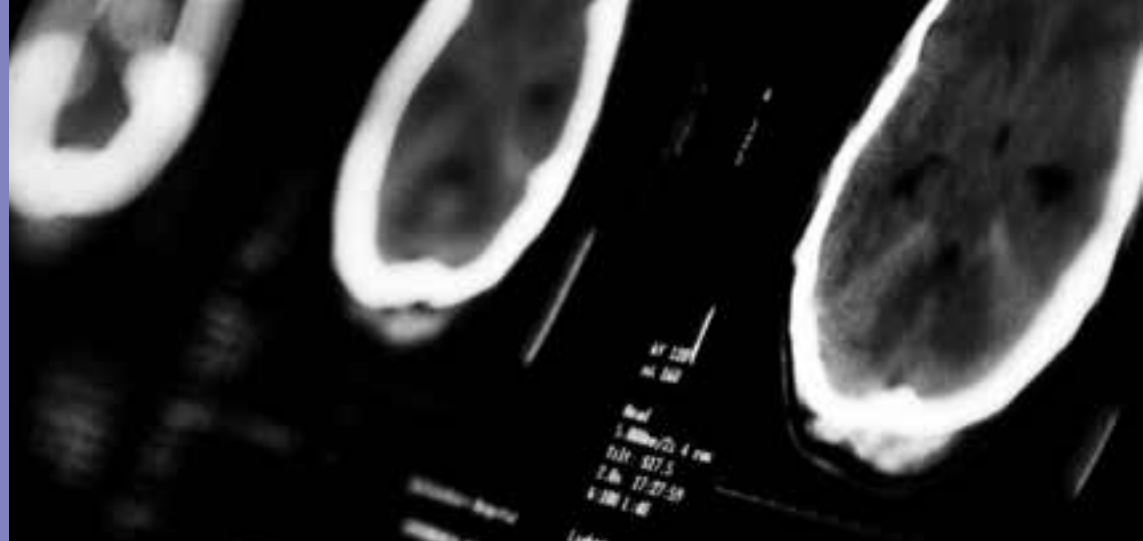
3.6.1 Getting started on your project

In the initial stages of a project you may want to drive the project forward with hands-on regular involvement and contact with your students and postdoctoral research staff. Over time, when you are confident that they can work on their own, you can reduce your contact.

Every new recruit should follow an induction programme that informs them of any ground rules, including expected working hours and holiday entitlement. They should be introduced to the people they will be working with and any equipment they will use. They should be provided with an overview of the School, Faculty and University structures and introduced to their colleagues, including academic staff, technicians, secretarial and administrative staff who can provide them with information and help them to settle in.

As well as the formal induction, you should spend time with any new researchers ensuring that they understand what the project is about, what is expected of them and what they should expect of you. It might be helpful to keep a file of these discussions to act as a reminder of agreed actions, deadlines and priorities. Be pro-active about bringing them up to speed with the project by, for example, preparing a list of references for them to explore in the first month or so of their appointment.

Where appropriate, you should ensure that they are familiar with any legal, regulatory and ethical requirements relating to the research, particularly if the research involves hazardous substances, human participants, animals or personal information, and that they know who to turn to for advice.



You should also ensure that they are aware of and follow the University's *Code of Good Research Conduct* and any good practice guidance pertinent to your area of research and that they understand the consequences of research misconduct. They must receive appropriate training to carry out their duties as effectively and safely as possible.

3.6.2 Management of research students and staff

If you are supervising a postgraduate student, you should familiarise yourself with the University's *Code of Practice for Postgraduate Research Degrees*.

Try to accommodate the different supervisory needs of those working on your project. Some will thrive with hands-off management whereas others will require closer guidance with regular deadlines. It is also important to recognise the different status of your research students and your research staff. You should, however, arrange regular one-on-one update meetings even with those who prefer to work on their own. Experienced supervisors who have contributed to this guide suggest that half an hour a week or an hour a fortnight would be appropriate, but this will vary by discipline.

You should know where the staff and students for whom you are responsible are during working hours. It is advisable to have mechanisms in place for them to report and record holiday and sickness absence. This is not only good management practice which helps to inculcate a positive working ethos but is crucial for safety purposes.

If your project involves people working together there is always potential for conflict. You should act as swiftly as possible to prevent small disagreements getting out of hand. If a situation becomes serious, speak to your Human Resources Manager for advice about how to approach the situation.

3.6.3 Motivating your research students and staff

You can motivate your students and research staff by increasing their level of responsibility as they become more experienced and confident. You should set standards and goals that are achievable and not so demanding that they cause stress and anxiety. Where you feel it is necessary, break things down into manageable pieces of work. Give them regular critical feedback on their work, including praise where praise is due.

Research students and staff will become frustrated and discouraged with their work at times, for example when experiments fail. It is part of your role to keep them focused and help them deal with these frustrations. You should continue to give the research direction during these periods of frustration and, where possible, should make the necessary arrangements for the project to continue. For example, if an experiment repeatedly fails it can be very dispiriting to be told to keep trying. As an alternative, you could get them to try something else related but more attainable before returning to the task in hand.

You should encourage your research students and staff to present their work as widely as possible at internal seminars and external conferences. Presenting a paper at a conference can be a highly motivating experience. As well as focusing their minds on their research and forcing them to articulate their results in a paper it also gives them the opportunity to meet world leaders in their field and discuss their work with other researchers. They may return invigorated by new ideas and with a renewed enthusiasm for your project.

Feedback from postdoctoral research staff indicates that it is important to them to feel involved in the whole research project and in the school, faculty and University. You should keep them informed of the progress of the project and any conferences that you have attended – especially if you have received feedback about research that they have been involved in. Make sure they are involved in local away days and seminar programmes and are kept informed of what is going on in the school, faculty and University in terms of research activity, support for career development and general interest.

Where students and research staff share a laboratory or similar facility, it is important to have rules and rotas for maintaining that facility. A lack of organisation in this area can cause conflict and result in demotivation. It is advisable, where possible, to have an identified person as laboratory/facility manager to organise and police these rules and rotas.

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3.6.4 Careers support and advice

You should encourage your research staff and students to develop skills, not only in their research area but also their broader personal, management and leadership skills. An employer satisfaction survey of graduate recruiters conducted in 2006 by the Careers and Employability Division ranked teamwork, self-management, communication, problem solving and adaptability as key skills they look for in employees. Skills development does not have to come from formal training programmes but can come from mentoring or shadowing arrangements. You should allow your research staff and students to take advantage of the careers support opportunities available to them.

If your researcher wishes to pursue an academic career you can help them to achieve the necessary requirements by, for example, presenting their work at conferences, becoming involved in teaching, involving them in grant applications or including them as co-applicant or named researcher where appropriate. You can introduce them to key people in your field of research and encourage them to foster useful relationships, nationally and internationally. You should encourage them to take an interest in the wider higher education agenda. Make them aware of future research opportunities and grants you are applying for. When a researcher has reached a certain level of experience they should be encouraged to apply for a fellowship. You should support and guide them through their application. Your School Research Administrator (or equivalent) can provide advice about possible fellowship opportunities.

3.7 Conducting Your Research Ethically

All research should be conducted honestly and with integrity in line with the University's *Code of Good Research Conduct*.

3.8 Foster a Productive Research Culture

It is the role of the principal investigator to create an environment in which all members of the research team are encouraged to develop their skills and in which the open exchange of ideas is fostered and good conduct in research is carefully observed. Regular team meetings help to engender a vibrant research culture. Each team member could provide updates on their work which helps to keep you informed of progress, ensures that your researchers regularly formulate their research into

structured arguments, encourages the sharing of ideas and helps generate new approaches to the research project. Some team meetings could focus on journal reviews, hot topics or novel technologies. Where you have only a few people working on a project you could join with other research teams working in similar fields so that your team members do not become isolated and are able to share ideas with colleagues.

You should promote your research activities as widely as possible. You could use video conferencing to draw key researchers together. Alternatively, you could form internal networks of individuals involved in a particular area of research. This network could promote itself to funding bodies.

3.9 Recording, Storing and Archiving Research Data/Materials

As leader of a research project, you are responsible for ensuring that there are clear protocols for the collection, recording, storage and archiving of research data/materials generated as part of your project. These protocols should fit within any professional guidance available, guidance from funding bodies, your school and the University's *Code of Good Research Conduct*.

3.10 Health and Safety

It is your responsibility to ensure that the research staff and students for whom you have responsibility are provided with an environment that is safe and healthy and all research is conducted within the requirements of health and safety legislation:

- That necessary risk assessments have been undertaken (Never assume that because your research is not lab-based or using hazardous substances that it would not require a risk assessment).
- That staff are adequately informed, trained and monitored regarding safe practices to ensure they do not endanger themselves, others or the environment.
- That your research complies with the Control of Substances Hazardous to Health regulations as appropriate.



Philip Withers is a Professor of Materials Science. His main interests lie in the application of advanced techniques to assess the structural integrity of engineering materials and components. He founded the Northern

Aerospace Technology Exploitation Centre to transfer research innovation from universities into the aerospace sector. He is Director of a Faraday project looking at powder processing which involves a consortium of 6 universities and 10/15 industrial links.

“When setting up and managing such a collaboration you must identify the responsibilities of each group and know, not only what their key skills are, but also how these complement each other and make sure that they then link together. For example, the group undertaking measurements must use criteria that fit with the group doing the modelling. Timing must be managed very carefully. You need to ensure that a hold up at one university does not lead to another university failing to meet its obligations. In our consortium every member has its own EPSRC form with its own deliverables. We have stipulated that projects must start and finish within a specified timescale. Each group is responsible for meeting its own obligations.

“Effective communication and management are essential to ensure deadlines are met. We have 3 monthly meetings of the academic collaborators and 6 monthly steering meetings involving the industrial collaborators. I bid for money to employ a part-time administrator to help with organising meetings etc. I also have a senior postdoctoral fellow who keeps an eye on all the project priorities, making sure that everybody meets their obligations.

“It is important to have agreements in place about such things as IP and authorship of papers before the grant applications are submitted. If potential IP is developed, we identify a university to exploit it. Anyone involved in its development would benefit from any royalties. Industrial collaborators are given first refusal to purchase the licence to exploit the IP. For paper authorship, we have a mechanism in place to circulate all draft papers to the collaborative groups. This not only ensures all the groups are content with authorship, but also that publications will not invalidate potential IP claims.

“We exploit our profile at conferences by branding our project ‘The Green State Project’ and using the same Power Point templates so that people can see the talks fit together. Collaborative projects can increase impact this way. Most importantly, working with other groups can be really great fun because the rate you develop ideas and get things done is invigorating. A great example is when a postdoc from one of our collaborative groups came here to do an experiment. We were able to take images that we have not been able to take before. This took two days!”

4

Protecting and exploiting your intellectual property



4.1 Introduction

The University of Manchester regards the creation of intellectual property as one of its major objectives and is committed to being, by 2015, an innovative institution, that values and encourages the transfer of knowledge and technology to influence and advance economic development regionally, nationally and internationally and that rewards and provides practical support to staff who engage in commercially significant innovation and/or create intellectual property. The University has developed policies (available on the Good Research Practice website at www.manchester.ac.uk/goodresearchpractice) that deal with the ownership, protection and commercialisation of intellectual property and know-how created by employees and students of the University as well as the interface with others who may fund or collaborate with the University in the creation of intellectual property and know-how.

For more detailed information you should read *Intellectual Property and Confidentiality – A Researcher's Guide* commissioned and produced by The University of Manchester Intellectual Property Ltd (UMIP) and Eversheds LLP. Further information and links to the UMIP website can be located on the Good Research Practice website (www.manchester.ac.uk/goodresearchpractice).

4.2 What is Intellectual Property?

The term intellectual property (IP) describes the right to own the intellectual ideas that you create. There are several different ways of determining ownership; some require your ideas to be registered to be effective, such as patents, rights in design or trade marks. Other forms of IP are protected automatically, such as copyright, database rights and some trade marks and designs.

4.3 Who Owns Your Intellectual Property?

If you are a member of staff of the University, any IP that you create through research activities in the course of your employment will automatically legally belong to the University as your employer. If the research is sponsored, or an agreement is arranged with a third party through collaborative research for example, ownership of IP should be agreed in writing. When you publish your research, you will generally sign the copyright over to the publisher (whilst retaining the moral rights in order to protect you from plagiarism of your work). Academic staff with honorary appointments at other institutions should have an agreement in place between the University and that other institution in relation to IP ownership.

If you are a student of the University, and not also an employee, you will own any IP that you create. However, when you register for the University you will be required to sign an intellectual property acknowledgement form alerting you to the possibility that you might be asked to assign formally your IP to the University. If you are sponsored by a third party you must agree that IP will initially belong to the University and then be determined in accordance with the terms of your agreement with the sponsoring outside body.

It is in your interest for the University to take ownership of your IP as the University is in a strong position to exploit it on your behalf. The University has generous arrangements for sharing any returns from the commercialisation of IP with the originators of that IP.

4.4 What Should be Protected?

The University uses UMIP to advise on and facilitate the protection of IP. You should disclose to UMIP all IP or materials that you have generated that have potential for profitable commercialisation. If you are in any doubt whether any ideas you have generated should be protected you should contact UMIP for advice.



The University and UMIP recognise that commercialisation of IP may not always be appropriate and sometimes it is in the best interest of knowledge transfer to place IP in the public domain. UMIP will discuss this with you where relevant.

4.5 How to Protect Intellectual Property

If UMIP considers that the IP you have created is potentially profitable, it will try to protect it by patenting or other means, generally at its own expense. There are important steps that you need to take, however, in order for UMIP to be able to protect your IP:

4.5.1 Careful records management

The key to protecting the IP that you create is careful records management as outlined in the University's *Code of Good Research Conduct*. It is crucial, particularly if you file for a patent in the US, to record as much detail as possible of the experiments/ideas generated. It is good practice to keep both the original and a copy of all notes, reports, drawings, lab books or anything else related to the invention/idea in a secure place. The University's *Code of Good Research Conduct* recommends that a "Supervisor/principal investigator should review the main written record of research evidence, countersign and date it on a regular basis to signify that the entered data are accurate and complete." However, if there is a strong likelihood that your research will lead to something potentially patentable in the US it is advisable to also have the written record of research evidence countersigned by an independent witness who must have read and understood the work described. More detailed advice is provided in *Keeping a Laboratory Notebook*, BTG, which can be found on the Good Research Practice website (www.manchester.ac.uk/goodresearchpractice).

4.5.2 Confidentiality and disclosure of information

If you disclose the key details of your invention/design/ideas at a conference, or even informally to friends, it may stop you getting IP protection. If you wish to disclose some elements of the research that relate to your invention you should discuss this with UMIP before proceeding. It may also need discussing with the research funder. Once a patent application has been filed you can publish openly, although bear in mind that if your application is rejected, confidentiality may be your only protection.

Colleagues employed by the same employer have an obligation to keep confidential any information that you disclose to them in confidence, this would not include students, visiting academics, secondees or consultants. If confidential information needs to be disclosed to a third party other than another employee of this University it is advisable to have a Confidential Disclosure Agreement or Non-Disclosure Agreement in place. For advice and support regarding CDAs or NDAs you should contact the Contracts Team in the Central Research Office or UMIP.

4

Protecting and exploiting your intellectual property



Curtis Dobson is a Research Fellow in the Faculty of Life Sciences. As a postdoctoral research associate he discovered a human protein region with direct and broad anti-infective activity and developed a range of

compounds relating to this region for use as anti-infective agents. Later generations of the compounds have ten-fold increased activity against HIV and represent a fifth approach to HIV therapy. Dr Dobson has driven the commercialisation of these technologies, and in 2004 established a new company, Ai2 Ltd, to take this forward. He is currently Director of Ai2. His work was voted North West Biotechnology Project of the Year for 2004 and Ai2 was judged North West Biotechnology Start-up of the Year in 2005 by the North West Development Agency organisation Bionow.

"I was working on a project investigating the potential role of viral infection on Alzheimer's disease when I discovered a technology that presented a potentially new approach to HIV therapy. Following advice from UVL (now UMIP) I had to keep everything confidential. None of the work could be published, which is difficult for an academic. They also advised me to keep very careful records of future research and ensure that they were witnessed. Patenting is a very expensive process so we didn't file for a patent until we knew that there was funding to develop the technology.

"It took nearly four years to get the funding to develop the technology. Eventually I secured internal funding from the Genetics Innovation Network. I was then able to explore the different possible applications of the technology and ascertain its potential value. For a project to have commercial value it must fulfil an unmet need and have the potential to make enough money for a blue chip or pharmaceutical company to be interested in it. We filed the patent in 2003; by 2005 I was able to publish my first paper from the research.

"My initial strategy was motivated by the highest profile application for the technology - HIV therapy. However, I found out that this market is crowded and very difficult to penetrate. This led me to investigate other applications for the technology, such as medical device coatings. I now understand that it is best to start with what is achievable and build on your finances and reputation before competing with established industry at a higher level.

"I set up a spin-out company because the technology has several potential applications in high value markets. In some areas of potential application it still requires development and the company is able to do this. Also we are able to get the technology working in practice much more quickly. We still have very strong links with the University, which owns the majority of the company, and I maintain my academic status, which I believe is very important. Both the company and the University benefit from this close relationship. The technology still needs academic research to back it up. The company helps to fund studentships and attract research funding to the University.

"You need to be personally interested in developing research in a commercial way. It is exciting because you become personally involved in taking an idea forward and taking the risks required to get it out into the real world. Initially I took a lot of advice from UVL/UMIP, but as the company grows we are getting more advice from other sources, including specialised external consultants and industry. It is important to have a strong management team from the start. We pay an experienced chairman to work for us one day a month. We are currently in the process of talking to venture capital companies; it is a good time to get investment in biotechnology companies."



5

Research collaboration



5.1 Introduction

The benefits of collaborative research have long been recognised and encouraged. Collaborating with experts in other fields than your own can open novel and interesting opportunities. The impact upon the research community can be so much greater as a result. Knowledge can advance at a faster pace through exposure to new perspectives and access to new or different expertise, data, support services, facilities, communities or financial resources.

5.2 Things to Consider when Embarking on a Research Collaboration

5.2.1 What type of collaboration?

Research collaboration can take many forms, from small collaborative projects with other researchers in your school or nationally within your field to international multi-disciplinary consortiums or research networks. Research collaborations need not be confined to other academic groups, but partnerships can be established with industry or government departments for example.

There are many ways to approach collaboration. You may have a project in mind and wish to strengthen an area of your project by collaborating with an expert in the appropriate field. By doing so you will not only strengthen your application but also eliminate a possible competitor. Alternatively you can foster strong relationships with academic, industrial or other relevant partners, developing networks or consortia that are able to respond to funding opportunities as they arise.

5.2.2 Identifying collaborators

Feedback suggests that it is easiest to collaborate with people you have an established relationship with. It is therefore important to build as many relationships as possible. However, you should not collaborate with people just because it is convenient to do so. You need to identify the expertise required for the project and seek to collaborate with the expert in that area. You can identify potential collaborators at conferences, functions, through introductions by colleagues or by contacting authors of papers you have found interesting. Keep the number of collaborators to a minimum; funding bodies will notice if any collaborators appear superfluous.

5.2.3 Arranging a collaborative agreement

As with any research project there must be a clear research plan and all participants must commit to the plan willingly. Every collaboration will bring with it different issues so it is important to recognise these issues, discuss them within the collaboration and with people who can help, in particular the Contracts Team in the Central Research Office, before entering into a collaborative agreement. The collaborative agreement is made between the institutions and not the individual researchers. It will cover such things as the ownership of the project, assigning responsibilities (who is doing what and when, who is contributing what and when), project management, funding, financial and payment arrangements, intellectual property (including use and exploitation of any results), warranties, liabilities, authorship of potential publications and confidentiality. A collaborative agreement should have a clause about withdrawal so that there is clarity about the ownership of elements of the project should a collaborator withdraw.

5.2.4 Securing funding

Collaboration opens greater opportunities to secure funding for your research. Some funding may only be available to collaborative projects, for example EU funding essentially requires collaboration within Europe. Industrial partnerships can bring funding opportunities by providing sponsorship for students or specific projects. Your chances of securing funding from the Research Councils and other funding bodies increase because the funders recognise the benefits of a collaborative approach.



Try to secure funding as quickly as possible, but after you have your collaborative agreement in place. When applying for funding as part of a collaboration, be careful not to under sell yourself, always ask for what you will need. Take advantage of multi site applications where money can be issued to the individual universities involved.

If you plan to collaborate within Europe you should consider applying for funding from the European Commission. Do not be put off by the perceived amount of administration involved, much of this is generic and can be dealt with by the Central Research Office.

5.2.5 Managing a research collaboration

You need to identify who is going to lead the collaboration. This would usually be the person who initiated the project but might be someone with a positive track record in this area. The leader will require effective chairmanship skills as s/he may need to chair and minute meetings and resolve conflicts. Alternatively the lead can be shared, with different institutions taking a lead on different projects within an overall programme.

Strong and effective communication links between collaborators are crucial, as are clear procedures for steering the project and making decisions. Regular meetings are essential. You may consider setting up a steering committee and/or taking advantage of video conferencing facilities. A multi-disciplinary collaboration may require more face-to-face communication to ensure that you understand what each other are doing.

The relationships within a collaboration can be very complex. Where possible it is advisable to employ a project manager to ensure the project runs to plan. You may need to adapt your working style to accommodate all the different styles of your collaborators. Without adapting you may have miscommunication.



Visiting Professor, **Philippe Laredo**, runs PRIME (Policies for Research and Innovation in the Move towards the European research area) which is a Sixth Framework Programme Network of Excellence (NoE) in

the specialist field of sciences and innovation policy studies. PRIME brings together 49 institutions, incorporating 60 research groups, 230 researchers and 120 PhD students from 16 European countries. The NoE is rooted in four disciplines; economics, management, political sciences and sociology with inputs also from geography and history.

"The proposal took half a year to prepare and ensure we produced a research agenda attractive to the Community. We had a strong and interesting research direction and good governance mechanisms to encourage lots of research groups to become involved, but also ensure that we would not become reliant on any specific group should it prove unproductive.

"Collaboration is key to introducing significant new knowledge, that is why through PRIME we have produced an environment that favours collaboration. PRIME enables the sharing of facilities, training and data sources and encourages research groups to break away from the pressure from policy makers to only consider the short-term picture.

"Collaboration is a process of trial and error. You start by collaborating with one, testing them and then you move onto larger collaborations. If one fails it does not mean that collaboration is not interesting. Through collaboration you learn to understand your assets, what you can bring to a collaboration to make it successful and what others can contribute."

6

Disseminating your research results



6.1 Introduction

"Optimising the presentation and impact of your findings can be as important as obtaining the data".
Professor Nancy Rothwell

In its *Code of Good Research Conduct* the University sets out an expectation that research outputs will be disseminated as widely and as publicly as possible, especially to those who will benefit directly from them. It is crucial to the advancement of knowledge and understanding that research is published where the academic community is most likely to learn about it. Where research may be of interest to the public, your profession and/or may help raise awareness of research in higher education, consideration should be given to communicating the findings more widely.

When research is disseminated, due recognition should be given to all stakeholders who have supported the research in accordance with the University's *Code of Good Research Conduct*.

This section of the guide provides advice about producing a communications plan. Guidance about getting published in a refereed journal is provided by Dianne Parker, Professor of Applied Social Psychology, and for getting a book published by Matthew Frost, Commissioning Editor for Humanities at Manchester University Press.

6.2 Producing a Communications Plan

At the outset of a research project, as part of your funding application, you should produce a communications plan. This plan may change as your project develops. The process of planning a communications programme is essentially the same as planning any other project. You will need to set targets, determine your strategic approach, implement it and monitor the results. Comprehensive details about producing a communications plan are available on the Good Research Practice website (www.manchester.ac.uk/goodresearchpractice). The principles, however, are as follows:

1. Determine what you want to achieve by setting clear objectives for communicating your research.
2. Define the widest audience for your research findings.
3. Determine what your key messages are – this may entail breaking down what might be complex findings into bite size chunks suitable for the different audiences.
4. Determine how best to reach the different audiences for the research at varying stages of the project. Your Faculty Public Engagement Officer can help advise you about this.
5. Monitor whether your plan worked.



Advice on Getting Published in a Refereed Journal

Dianne Parker is Professor of Applied Social Psychology in the School of Psychological Sciences. Her research focuses on human error and safety, with two

particular areas of emphasis: the role of errors and violations in accident/incident causation, and the application of models of social cognition to our understanding of rule-related behaviour. She has been Associate Editor for the *British Journal of Psychology* and is currently Associate Editor for *Transportation Research and Risk Management: an International Journal*.

"The dissemination of knowledge is the lifeblood of an academic. You need to publish everything you can as quickly as you can. As soon as you have analysed your results you need to decide where to publish them. For many disciplines the chief place would be a peer reviewed journal. Choosing a journal can be very difficult. For example, one of my research areas is traffic safety and driver behaviour.



"Often it is possible for me to write up the same data either for a mainstream psychology journal read primarily by academics or for an applied multi-disciplinary journal read by the road safety community which might include engineers, transport economists as well as psychologists. Now that I am more experienced I am generally able to compartmentalise my research so that I can publish in both, but for someone new to research it is wise to get advice from a supervisor, academic mentor or research group leader about the appropriate outlet for the results. You will then need to write up your study with that journal's audience in mind.

"It is important to familiarise yourself with the requirements of your chosen journal. Every journal publisher provides advice to authors, either in the journal itself or on their website. It will give clear guidance about the remit of the journal and rules for presentation. You need to get the people handling the manuscript on your side, so follow these rules exactly. Before you send your manuscript to the journal, try to persuade one or more colleagues to read it – the more senior the better. When you have taken account of their comments send it off. Make a note of the date you sent it and then wait. Be prepared for quite a long wait. Often journals now publish a target turnaround time of about 12 to 20 weeks to have papers reviewed. However they are relying on the goodwill of reviewers to achieve that target.

"Peer reviewing journal articles is part of academic life that is becoming increasingly squeezed. I personally get about 40 article review requests a year; and have to turn many down. As an Associate Editor my job is to read submitted manuscripts, to check that they are of an appropriate standard and subject matter for the journal. Lots get turned down because they are not within the journal's remit – so do your homework and don't waste their time and yours. If your manuscript is deemed suitable it will be sent to 2 or 3 expert reviewers. Each reviewer will read it carefully and usually make both a quantitative judgement, and detailed comments which will be returned to the Action Editor.

The Action Editor will pull the comments together and produce an overview letter, nearly always asking you to revise your manuscript on the basis of the reviewers' comments and then to resubmit. Sometimes the required revisions are minimal, but sometimes the reviewers suggest more or different analyses, or even more data collection.

"If you decide to pursue publication in this journal, you will need to revise your manuscript. When you re-submit you must also send a covering letter. It is important that this letter addresses each comment made by each reviewer and the Action Editor in a systematic and clear way. The best approach is to write "Reviewer A, point 1 – We have addressed this by...". Be clear where in the manuscript the changes have been made and provide page numbers for both the original and the revised manuscripts. Use the 'track changes' facility on your word processor so that it is clear what you have changed. If a reviewer's comment shows a lack of understanding, you need to handle this tactfully by apologising for your lack of clarity and making a slight tweak to the text. It is also perfectly ok to stand your ground if you have sound reasons for doing so and explain them clearly. If the reviews are contradictory, read the Action Editor's letter very carefully because he/she is likely to give you a steer regarding which points need particularly close attention. If you are new to research I suggest you take advice from colleagues about your response. Once you have responded to the reviewers' comments, resubmit and cross your fingers. Try to remember that even the most eminent researchers have had their work rejected from time to time. It is part of the process of professional development. Good luck!"

6

Disseminating your research results



6.4 Advice on Getting a Book Published

Matthew Frost
is Commissioning Editor for Humanities at Manchester University Press.

“If you have an idea for a book and think that there will be a reasonable audience for it, you need to choose your publisher carefully. Look at catalogues on their websites and books on your shelf to see who is publishing similar books in your field. Perhaps see who the editor is and approach him/her directly.

“Once you have chosen your preferred publisher you need to refer to their submission guidelines which can normally be found on their website or be supplied to you by an editor. You will usually be expected to provide a brief description and outline of the proposed book and include a number of key chapters. If the publisher is interested in your project they will commission outside reviewers to evaluate it. You may be asked to provide the names and details of reviewers whose opinions would be valuable. You should always receive the reviewers’ comments on your proposal and should be receptive to these comments. If you disagree with a reviewer’s comments argue your case – contest what the reviewer said, not the choice of reviewer.

“You shouldn’t assume that a PhD thesis can be turned into a book. Doing this properly involves a very large amount of work. It is often better to aim to use the thesis to develop a couple of articles or chapters in books.

“You need to understand that the process of getting published is a dialogue between you and the editor. You need to keep this amicable and avoid getting shirty. Be receptive to criticism and don’t be disheartened by rejection. Don’t be afraid to politely nudge the publisher along if necessary.

“If your book is commissioned, it is vitally important to set a realistic date for completion. Sustain your relationship with the publisher by, for example, offering to review other works for them. Don’t necessarily stick with the same publisher for subsequent books – choose the right publisher for the subject matter.

“Where conferences are being organised, it is worth approaching journal and book publishers at an early stage to discuss possibilities for an edited book or special journal edition based on the best submissions. In organising the conference, it is important to be very focused on the quality and originality of the written work not just on the esteem of the contributors. Publishers require collections to be edited strongly and have a sustained focus, not just to be a collection of vaguely related articles.”



7 Developing your academic career



7.1 Introduction

The academic career is a fulfilling and varied one. Those who choose to embark on it are enthusiastic for the freedom it offers them to pursue their passion for research. This section looks at how to get the most from an academic career and how to progress within it.

Few who embark on a research degree or postdoctoral research position will continue into a career in academia. The experience of being involved in a research project and/or completing a research degree will be a valuable one, however, especially if you make the most of the opportunities available and integrate effectively into your school and/or project team. The skills you learn will open up a vast array of opportunities and prepare you for a wide spectrum of careers.

7.2 Integrating into Your Project Team

If your research involves a team, you should familiarise yourself with the rules, regulations and protocols of that team and the facilities it uses. You need to understand that there is collective responsibility for meeting the requirements of a project and that you will need to take your own responsibilities seriously. This includes undertaking your fair share of housekeeping tasks where these are shared among your team.

It is important to get to know your colleagues and recognise their different ways of working. Socialising with them is a good way of breaking down barriers. Optimise your interactions with your supervisor/manager by finding out how s/he would prefer you to interact with him/her. Always be prepared for meetings, know exactly what you want to get out of them. Make sure you stick to deadlines.

In a successful research group, people will help each other. As a newcomer you will rely on the goodwill and support of others. It is important that you offer similar help and support when you are more experienced.

7.3 The Lone Scholar

As the lone scholar, you will not have a team of researchers in which to integrate. It is more important for you, therefore, to be self motivated and ensure that you do not become isolated in your research. Make the most of internal seminar programmes and any other such activities laid on by your school/faculty. See if you can group together with other researchers in a similar position to you.

7.4 Developing Your Research Profile

In the early years as a researcher, support and advice from your colleagues, supervisor, mentor or line manager will be crucial to guide you in the right direction and help you avoid the mistakes that others might have made. It is important not to be too inwardly-focused, but to share your ideas with colleagues, liaise with other research groups and link up with other faculties where possible.

Make yourself known to those successful in your field by, for example, introducing yourself at conferences. You can also exploit the networks of your colleagues or line manager and ask them to make introductions for you. If possible, it is a good idea to collaborate on research projects with those who are most successful in your field before attempting to bid as principal investigator on your own project.

An excellent way to advance from a role as postdoctoral researcher to a lecturer is to successfully secure a research fellowship. Guidance about securing a research fellowship is available on the Good Research Practice website (www.manchester.ac.uk/goodresearchpractice).



Publishing your research is an essential part of an academic career. Chapter 6 provides guidance about publishing your work. There are many books available about academic writing and it may be in your interest to read one of these. Before submitting a manuscript it is a good idea to seek honest evaluation of your draft from an expert in your field, someone in your broad field of interest and a friend or relative who you trust to check spelling and grammar. Also, a good way to get constructive feedback is to present your research at societies or conferences before presenting it for publication to a journal.

Take up training opportunities inside and outside the University to help develop the skills you need to be a successful academic, including management and leadership skills. It is worth attending presentations, even if they do not seem to be directly relevant to your area of research, especially if it is an eminent and talented speaker. This can help to broaden your understanding of the wider field, may reveal new techniques and approaches, promote new ideas and may also help to improve your own presentation skills.

Broaden your vision around your area of interest. Look at how you can move into new exciting areas of research, possibly through collaboration. Browse journals in and around your field and high impact journals such as Science and Nature to see how you could approach your research differently and to stimulate you into thinking differently. Do not think so broadly, however, that you become superficial. You must always remain an expert.

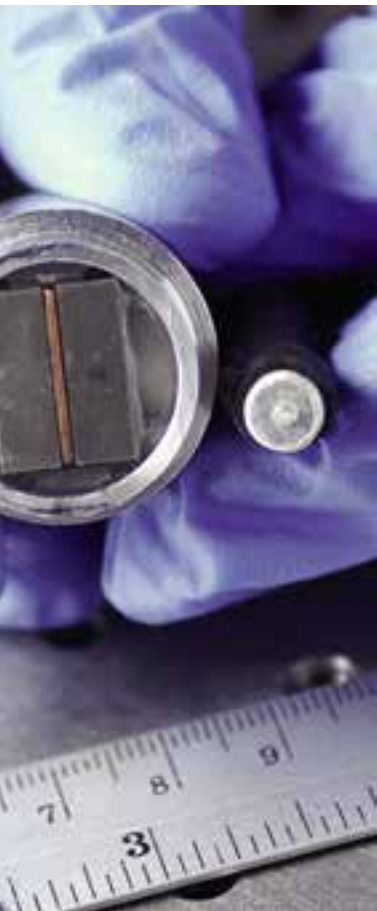
Try to be aware of the greater higher education picture, including the major drivers that influence whether you are successful or not. In particular you should be aware of the mechanisms for monitoring success in research, such as the need to secure funding for your research, publish it and gain esteem in your field.

7.5 Gaining Esteem

An academic will gain esteem amongst his/her peers through the quality of his/her research contribution. As an academic's career develops, there is an expectation that his/her reputation will increase. High esteem is inevitably biased towards more senior members of staff. However, more junior members of staff should be conscious of developing their research standing. The most obvious way to do so is through high quality research and its dissemination. Success, and the reputation that comes with it, generally rests on what you have published. However, esteem can also be enhanced by increasing your visibility by, for example:

- Presenting your research at international conferences.
- Disseminating your research as widely as possible and in as high impact journals as possible.
- Responding positively and quickly to any research related invitations (and those not research-related if you see a positive benefit).
- Getting involved in major international research collaborations.
- Responding quickly to requests to review journal articles or grant applications.
- Applying for prestigious fellowships or nomination for awards/prizes.
- Giving research colloquies at other Universities.

7 Developing your academic career



Qingming Li is a senior lecturer in the School of Mechanical Aerospace and Civil Engineering. After graduating from Peking University in 1987 with a BSc and MSc in mechanics, he worked as a lecturer in Taiyuan University of

Technology until 1994 when he came to the UK to study for his PhD at Liverpool University. Following two years as a research associate he took up a position as assistant professor at Nanyang Technological University, Singapore, before returning to the UK as a lecturer at UMIST in 2002.

“When I graduated it was not very difficult to get a job in China. I chose academia rather than engineering mainly because of my family influence. I grew up in the university environment, my father and uncle worked in a university, which had a very positive influence on me. I was involved in two exchange visits to Liverpool in 1990 and 92 then took the opportunity to do a PhD with an ORS scholarship. I didn’t find it too difficult to adapt to the new environment although I met some difficulties with English being my second language. I got used to the language with first hand experience. The academic language was ok because we read a lot of papers in English anyway. I benefited very much from my PhD supervisor, a leading scientist in my research field, for the development of my research and my attitudes towards scientific research and education.

“As a research associate I worked on an EU Framework 4 project involving 25 partners including aerospace companies and the Research Institutes. I gained a lot of experience from the project including management skills, writing project reports, networking and meeting deadlines. My supervisor was flexible, as long as I submitted my reports by the deadline I could do some in-depth researches. We published several academic papers as a result of this extra research. Some of the topics I developed then I continue today and I continue to have some partnerships with the people involved in that project.

“Towards the end of my research position I applied for several posts including lectureships. I was offered research associate positions in the UK, but chose to take an academic post in Singapore, where competition for funding was not as severe as in the UK because most came from the Government. I got 3 grants and had 3 good PhD students with masters degrees from China. We were able to get a lot of research done.

“Concerns about losing my competitive spirit and the greater freedom to pursue my research led me to return to the UK. But I spend much more time on research council funding applications. I have sent 3 proposals to EPSRC with no success, which however has not prevented me from doing my research. I also actively seek funding from elsewhere including industries and develop international collaborations. I have established my research group with 7 PhD students. Recently, I have been invited to give keynotes in several international conferences and in 2007 will co-chair an international conference in Beijing. I can feel the momentum for producing some good results. Hopefully, these will help me to attract more funding, especially from research councils.

“It is my belief that you should choose your research direction primarily because you are interested in it and you should pursue that direction insistently so that you become recognised internationally. I have several areas going at once and think of new directions that I am going to start. If I am interested in an area I think about my background, what I am good at, what expertise I will bring to the field. I consider the future of the subject as well; is it over its peak or is there 5/10 years worth of good research in it? Genuine collaboration is also important, but I must be able to contribute to the collaboration in a strong way.”





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