

# Research and Professional Development Planning at UCD

Research and Professional Development planning is an integral part of the Structured PhD programme at UCD. The purpose of such planning is to ensure that your work is clearly focused on achieving your research and professional goals. This will play a major part in informing the trajectory of your PhD research and in your training and development as a researcher. Your plan will also be a useful resource when it comes to writing up, and it will help you develop key skills which will be invaluable for both your current research and your future career prospects.

The following guidelines are designed to assist you in preparing your research and professional development plans. These plans will form the basis of discussions at your meetings with your supervisor and Doctoral Studies Panel (DSP)<sup>1</sup>. Reports based on these plans will be the primary input to your Transfer Assessment that will determine whether you progress from Stage 1 to Stage 2 of your doctoral studies.

**There are three main components to your Research and Professional Development plan:**

## Research Plan

The purpose of your Research Plan is to provide you with a clear research focus and a coherent research work programme. A well-structured research plan will enable you to review your progress and adjust your objectives as your research evolves. Revising and keeping your Research Plan up-to-date will also make it easy for you to produce progress reports, prepare presentations and publications, draft funding applications and write up your thesis. The attached guidelines have been tailored to your area and should be used in conjunction with input and advice from your supervisor in preparing your plan.

## Professional Development Plan

On leaving UCD with a PhD it will be expected that, in addition to having produced a body of original research, you will also have developed a set of skills that distinguish the professional from the novice. Employers, and others who you will interact with professionally in the future, will assume that you bring the skills of an independent professional to any work situation. It is therefore very important for you to develop, demonstrate and practice these skills during your doctoral programme. The attached guidelines are designed to enable you to identify the skills important for your research and career.

## Doctoral Studies Panel Meeting Record

Central to your programme are regular meetings with your supervisor and DSP to discuss your research, your professional development and your progress in achieving your goals. A mandatory outcome of the meetings with your DSP is a formal record of your research and professional plans and your progress to date. These records will also inform your transfer assessment. The formal record form for these meetings is at the back of this document and is also available as a writeable PDF. This must be completed following each DSP meeting, signed by all members of your DSP, including yourself, and returned to your School graduate administrator. There should be a minimum of three meetings of your DSP during your PhD. These should consider the following issues:

1. Skills and Training Needs Assessment (0-3 months) – what do I need to start and enhance my PhD?
2. Prepare for transfer assessment (12-15 months) – describe your thesis plan and work to date
3. Thesis preparation (30-40 months) – structure & content of thesis, publications, and discuss extern and viva

You can meet more often than this, twice a year would be a good guide. Feel free to call a meeting of your DSP, should the need arise.

There are many people who can help to support you throughout your PhD. In relation to your RPDP, you can get help from your supervisor, your Doctoral Studies Panel, your School Office, your Graduate School and the Graduate Support Unit. Contact information is indicated below.

### School of Chemical & Bioprocess Engineering

Aoife Carney [aoife.carney@ucd.ie](mailto:aoife.carney@ucd.ie)

### School of Mathematical Sciences

Nuria Garcia [nuria.garcia@ucd.ie](mailto:nuria.garcia@ucd.ie)

### School of Electrical, Electronic & Mechanical Engineering

Oran O'Rua [oran.rua@ucd.ie](mailto:oran.rua@ucd.ie)

### School of Geological Sciences

Sarah Procter [sarah.procter@ucd.ie](mailto:sarah.procter@ucd.ie)

### School of Physics

Marian Hanson [marian.hanson@ucd.ie](mailto:marian.hanson@ucd.ie)

### School of Computer Science & Informatics

Patricia Geoghegan-O'Sullivan [patricia.geoghegan@ucd.ie](mailto:patricia.geoghegan@ucd.ie)

### School of Architecture, Landscape & Civil Engineering

Andrew Griffiths [andrew.griffiths@ucd.ie](mailto:andrew.griffiths@ucd.ie)

Graduate School [gs.engscience@ucd.ie](mailto:gs.engscience@ucd.ie)

Graduate Support Unit [graduatestudies@ucd.ie](mailto:graduatestudies@ucd.ie)

<sup>1</sup> Your DSP, which will normally comprise your principal supervisor and two additional advisors, will provide advice and support during the course of your doctoral studies and will assist in monitoring your progress. For more details about your DSP, please contact your School.

# Writing a Research Plan

Every research project requires advanced planning, and the better the planning the more successful the project. Preparing a research plan is one of the most important tasks you will undertake as a PhD candidate. This brief document offers some basic guidelines for preparing a research plan and for using it as a roadmap during your graduate experience.

## What is a research plan?

At the start of your PhD you identify a research problem in your field which needs to be solved, or an issue in your field which has not hitherto been researched but which is clearly important and has scope for study. A research plan is a model or scheme which you design to help you organise your thoughts about your topic, schedule the specific jobs which you need to do, and visualise a finished product.

There is no such thing as an ideal research plan. Plans come in different shapes and sizes, but common to all is **structure** and **timeframe**: research is always planned in stages, each one linked to the next by a structure, and each designed with some idea of how long it will take.

There are two critical things to remember when you begin to design a research plan.

First, your supervisor is there to advise you. He or she will have experience of planning research, and, having agreed to supervise you in the first instance, will happily guide you as you gather your thoughts and formulate your plan. In consultation with your supervisor you should, within the first months of your PhD, be able to identify major tasks and work out the order in which they should be done. Members of your Doctoral Studies Panel will also be experienced in planning research, and will be happy to discuss your plan in your meetings, but most of the work will be done with your supervisor in advance of meeting the Panel.

Second, research plans change as research progresses. You will always find that the structure which you first envisaged needs modification, and that the timeframe you set will not work. The secrets of a successful research project are (a) the realisation that a research plan is always a work-in-progress, and (b) the ability to adjust a project's structure and timeframe without losing sight of its goals.

At the start of your studies, your emphasis will be primarily on devising, developing and implementing your research. As you progress, your focus will also encompass the publication of your research results and the preparation of your thesis. Your plan need not encompass all of the elements indicated below at all times, rather it will develop to incorporate them as your research progresses.

## Essential elements of a Research Plan

- Your research question or hypothesis,
- Background information on why your research question is important,
- A plan of how you intend to investigate your hypotheses and interpret your results,
- How you intend to write-up and publish your findings.

Keep in mind that your objectives should be specific, challenging and achievable within a defined time frame. It may be helpful to refer to the SMART framework, which is widely used as a means of describing objectives in a way that makes them more useful and easier to review. The SMART guidelines indicate that objectives should be:

**S**pecific  
specific and clear statements about what is to be achieved.

**M**easurable  
quantitative and/or qualitative (if objectives are not measurable then it is difficult to determine whether they have been achieved).

**A**chievable  
objectives need to be realistic, challenging and motivating.

**R**elevant  
relevant to the achievement of your research aims

**T**ime bound  
include a time-scale for in which to achieve your objective or goal.

## Writing a Research Plan: Some issues to bear in mind

When developing your Research Plan, it may be helpful to consider the following:

### Formulating your Research Question and Hypothesis

- What hypothesis(es) are you testing?
- What question(s) are you asking ?
- Why is this important ?

### Reviewing the Literature

- Are you familiar with the relevant literature in your area?
- Can you clearly explain how your research question builds on what is currently known?

**To test your research question or hypothesis, do you need to define more specific objectives? If so, what are these objectives?**

### Devising your investigative plan to test your hypothesis/meet your objectives

- What methodological/technological approaches will you use and why are they most appropriate?
- How will you collect your data (sources, documents, surveys, experiments, etc)?
- How will you organise and analyse your data?
- How will you interpret your data?

### Reviewing your findings

- How do your findings inform your original objective(s)?
- Do they prove or disprove your hypothesis?
- What new information do they provide you and/or your area of research?

### Drawing conclusions

- What conclusions can you draw from your work to date?

### What is your next step?

- Given your results and conclusions to date, what further work needs to be done to address your original hypothesis? Or do you want to change or adjust the direction of your research?
- Presenting and publishing your research
- Where do you intend to present the results of your work?
- Where do you intend to publish the results of your work?
- In each instance, are you familiar with what is required for presenting and/or publishing in the manner you plan?

### Writing up your thesis

- Have you prepared a thesis plan (you should do this as early as possible in your research programme)?
- Are you familiar with how best to present your work in thesis form and what the requirements are?
- What progress have you made in writing chapters of your thesis?
- When do you hope to have your first draft completed?
- When do you hope to submit?

You will also need to set a time frame to each of the aspects outlined above. Devising a realistic schedule for each step on the way is extremely important if you want to complete your PhD within the timeframe required.

# Guidelines for Professional Development

During the course of your doctoral studies in UCD, you will have opportunities to acquire new skills and to hone your existing skills. As a PhD graduate, your skill-set will need to include the advanced research and analytical techniques necessary for high-level research in your field and for the application of these skills in a broader context. This document offers brief guidelines for developing a plan for the acquisition of the skills you require for your research and further professional development. They should be applied in consultation with your supervisor and members of your DSP.

In general, 20% of PhD graduates pursue careers in academia and 80% develop careers in business, industry, the public and voluntary sectors. It is important to realise that a doctorate offers far more than a passport to a potential career in a particular field of scientific investigation. It greatly enlarges the menu of career tracks open to you.

**To possess a PhD in an Engineering, Mathematical and Physical Sciences discipline is to say to the world that you are a professional scientist who is an expert in your field of research and who can apply your professional skills to addressing scientific investigation and development in the broader context.**

It also says that you are intelligent, well-read, self-motivated and adaptable. As a PhD student, therefore, you should be aware of the 'transfer value' of the various skills that you will and can acquire. 'Transferable skills' both enhance the experience of learning and equip you to avail of a wide range of career and employment opportunities, including those in areas other than the specific field in which you received your PhD.

The Irish Universities' Association (IUA) has issued a Graduate Student Skills Statement ([www.iua.ie](http://www.iua.ie)) which describes the desired learning outcomes and skills that PhD students are expected to develop during their studies. It is a skill set which anyone you meet in your future professional life, including prospective employers, will assume you have, given your PhD qualification. Some of these skills will be developed through practical application to your research, whilst others can be learned through attending workshops and modules.

## What skills do I need?

### How skilled do I need to be?

The first step is to identify the relevant skills you require for effective research and for your proposed career path. Every discipline in the Engineering, Mathematical and Physical Sciences area has its own particular suite of skills, and many of these you will have acquired as a prerequisite to enrolling for a PhD programme in the first instance.

Nevertheless, it is useful to discuss with your supervisor what additional skills you will need – technical skills, statistical skills, analytical skills – for your research and professional development and to identify where you can acquire them.

As well as identifying the actual skills you need, you should also consider the level of competence you need to achieve in each skill. For example, your research may require an expert level of skill in one technology or methodology, but it may be sufficient to merely be familiar with others. It might be helpful for you to think of your skill development as going through a series of different levels of competence, as outlined below, and to identify which level you need to target:

- You are a **basic-level learner**, gaining an initial understanding of a new methodology, technique, area of knowledge or expertise;
- You are an **advanced learner**, still relying on expert advice for the appropriate application of a new methodology, technique, area of knowledge or expertise;
- You are an **independent user**, capable of applying a new methodology, technique, knowledge or expertise to your research independently;
- You are an **expert**, capable of further development of the methodology, technique, knowledge or expertise that was once new to you.

The chart following, which is mapped to the skill set identified by the IUA, may be useful in identifying the research and professional skills you need to develop. It is recommended that use this to devise your plan to attain the competencies you require in consultation with your supervisor, members of your DSP and/or other individuals who have an expertise in the skill in question. Several routes to addressing any gaps in your skill-set are open to you: applying the skill in your research, attending workshops and taking taught modules. Remember that you can attend modules and workshops outside your College.

It is also advisable that you return to this chart periodically and reflect on its content in the light of your own pathway to research success. Are there issues here which you have overlooked? Are you satisfied that you are as advanced as you need to be in your development as a researcher?

## Guidelines for Professional Development: Skills

### Research skills and awareness

- Have I good knowledge of advances and developments in my field?
- Can I demonstrate knowledge of research in related fields and disciplines?
- Do I comprehend and can I effectively employ appropriate research methodologies?
- Can I critically analyse and synthesise new and complex information from diverse sources?
- Can I formulate and apply solutions to research problems and effectively interpret research results?
- Can I exercise critical judgement and apply critical thinking to create new ways of understanding?
- Can I formulate and apply solutions to research problems and effectively interpret research results?
- Do I need to know health and safety procedures and their application in my research environment?
- Have I a broad awareness and knowledge of key relevant funding sources and grant application procedures?
- Do I appreciate basic principles of project and time management?

### Ethics and Social Understanding

- Do I understand, and apply in my research, principles of ethical conduct, including avoidance of plagiarism, allocation of credit and authorship, and definitions of research misconduct?
- Do I understand – do I need to understand – the relevance of research in society and the potential impact of research on individuals, groups or society?
- Are the guidelines for the ethical conduct of research involving people, human tissue and animals relevant to me?

### Communication Skills

- Have I effective writing and publishing skills?
- Do I effectively use and decide on appropriate forms and levels of communication?
- Can I communicate and explain research to diverse audiences, including both specialist and non-specialist?
- Do I teach, and do I support the learning of undergraduate students when involved in teaching and demonstrating?

### Personal Effectiveness/Development

- Do I operate in an independent and self-directed manner, showing initiative to accomplish clearly defined goals?
- Do I appreciate key rhetorical skills, including how to persuade others of a viewpoint's merits, demonstrating and communicating credible suggestions to achieve my aims?
- Do I appreciate the importance of initiating new projects, proactively reacting to newly identified needs or aiming to resolve persistent problems?
- Have I the ability to handle difficulties in research or other professional activities in an appropriate way?
- Do I critically reflect on experiences and act on such in a cycle of self-improvement?

### Team-working and Leadership

- Can I develop and maintain effective relationships with colleagues?
- Do I work well in a collaborative environment?
- What awareness have I of my own working style, that of others, and how we (or they) they interact?
- Do I understand how to acknowledge others' views, with a willingness to reflecting on them and critically appraise them?
- Do I understand leadership in team environments, recognising the strengths of team members and working effectively to achieve mutual goals?

### Career Management

- Can I demonstrate an awareness of transferable skills and their applicability to both academic and non-academic positions and how they are applied in different circumstances?
- Have I taken ownership of my own career management, forming a credible career plan?
- Can I initiate and sustain networks and relationships that may encourage opportunities for employment?
- Do I present myself and my skills, attributes, experiences and qualifications, through effective job applications, CVs and interviews?
- Do I understand the broadest possible range of their employment opportunities?

### Entrepreneurship and Innovation

- Is it necessary for me to understand the role of innovation and creativity in research?
- Can I demonstrate an awareness and understanding of intellectual property issues, appreciate and, where appropriate, contribute to knowledge exchange?
- Is it necessary for me to appreciate the skills required for the development of entrepreneurial enterprises in the public and private sectors?
- Do I need to understand different cultural environments, including the business world, and the contribution that knowledge transfer can make to society?

# Doctoral Studies Panel Meeting Record Report

PhD Student name:

Date of meeting:

Stage of Study:

1<sup>st</sup> meeting (skills and training)  2<sup>nd</sup> meeting (transfer assessment preparation)

3<sup>rd</sup> Meeting (thesis preparation)  other meeting

## Your Research

Please provide an update of your research progress (no more than 500 words). If this is your first meeting with your DSP, please provide a brief synopsis of your research plan.

## Doctoral Studies Panel Meeting Record Report (cont.)

Since your last DSP meeting, have you encountered any significant difficulties?

If yes, briefly outline these difficulties and indicate what proposals have been agreed at this current meeting to address them.

Have there been any substantive changes in the direction of your research since (a) you started your doctoral research or (b) your last Doctoral Studies Panel meeting?

If yes, briefly outline the reasons for this.

What is your plan of action between now and the next meeting to achieve your research objectives?

## Doctoral Studies Panel Meeting Record Report (cont.)

### Your professional development

With respect to the topics listed below, please comment as appropriate on

- a. your progress since the last Doctoral Studies Panel meeting
- b. your plans for future development.

#### 1. Research skills

*Indicate progress in the development of specific skills that you need for your research (e.g. technical skills, laboratory skills, statistical skills, analytical skills etc.)*



**2. Transferable skills**

- Ethics & Social Understanding
- Communications Skills
- Development towards professional independence
- Career-orientated skills
- Personal effectiveness/development
- Team-working & leadership
- Entrepreneurship and Innovation

*Indicate progress in the development of skills in the areas indicated above.*

We agree that this report is an accurate account of the meeting of the Doctoral Studies Panel.

Signature of PhD student		Date:	
Signature of principal supervisor		Date:	
Signature of DSP adviser 1		Date:	
Signature of DSP adviser 2		Date:	
(Signature of DSP adviser 3)		Date:	
Next meeting		Date:	

Please submit a signed copy of this report to the school office.