This guide sets out a range of generic skills, knowledge and behaviours that researchers may be expected to have, or to develop, throughout their research programme. Although it reflects many of the core activities of researchers, not all will be relevant immediately, and some are dependent on the stage of your PhD.

Your research project will undoubtedly require a mixture of the skills listed below, so do read the guide in conjunction with other documentation (e.g. project proposal, project logs, etc) that helps you understand what is asked of you in your research role.

The list is not exhaustive; its aim is to help you better understand and articulate the wide range of skills researchers have and use, particularly those beyond discipline specific skills.

This guide does NOT replace the University’s formal guidelines on conducting doctoral research, and conducting a research supervision relationship. It is intended as a support resource only.

1. CAREER MANAGEMENT

Career management includes being able to research, plan, and take informed decisions in relation to your career. This is relevant to all stages of your career, whether you are in the first years of your PhD, preparing for your next step on in academic research, or seeking new options after your PhD. Career management includes the ability to:

- Take ultimate responsibility for your career planning and direction, whilst understanding and capitalising on external opportunities.
- Understand your own unique work and career motivators, values and goals and using them to inform your choices.
- Undertake relevant and planned development opportunities (i.e. training courses, attending a conference, etc) for career development purposes.
- Understand how to research career options, plan, and present yourself effectively through CVs / resumes, applications and interviews.
- Research and understand the differing approaches to, and expectations in, academic career pathways in different countries and systems of higher education.
- Understand the nature of your own transferable skill set and how you can apply these in multiple career options.

2. RESEARCH SKILLS

This skill area covers the practical aspects of conducting valid, ethical and useable research. This includes your ability to:

- Evolve your understanding of your wider research and discipline area including trends, techniques, people and practices.
- Progress your own understanding of appropriate research methodologies.
- Collect, collate, critically analyse, synthesise, summarise, report and disseminate information. This includes searching literature techniques, and writing effective literature reviews.
- Use specialist software and research computing services appropriate to the type of research you are conducting, undertaking training in relevant packages where needed.
- Understand and abide by all relevant legislation and guidelines applicable to academic research in general and to your own discipline.
• Engage with researchers in other fields, if appropriate to your project.
• If you are considering staying in academia, you will need to be able to research, understand and capitalise on relevant funding streams in your discipline and related disciplines.
• Understand that expertise in research and knowledge-handling skills are vital in the wider ‘knowledge economy’, and are highly covetable and applicable in careers inside and outside academia.

3. PERSONAL AND INTERPERSONAL

How you handle yourself and how you interact with others is key to achieving results during your time at the University. This covers the following:

Yourself
• Manage yourself, your time, and your research programme effectively, managing priorities, and ensuring you keep a balance with your outside commitments e.g. family, leisure time, etc.
• Be self-aware and recognise your own needs, values, goals, and what motivates you.
• Be creative, flexible, and innovative in approaching your research, and tasks around your research.
• Manage and adapt to changing circumstances around you.

With others
• Develop and maintain relationships and wider networks (e.g. fellow doctoral researchers, other research colleagues in your area) to exchange information, develop your skills as a researcher, and build your reputation.
• Understand how your behaviour impacts on and influences others around you, including other researchers who may be in your team / department, and your supervisor.
• Communicate openly, directly and fairly with others.
• Negotiate successfully with others to reach constructive outcomes.
• Actively listen when seeking feedback (e.g. from other researchers and your supervisor), and give feedback to others sensitively and constructively (e.g. in seminars, conferences, etc).

4. COMMUNICATION AND DISSEMINATION

Effectively communicating the results of your research; this includes the ability to:

• Communicate your research through the final assessment stages: prepare and write up a good quality, well-structured doctoral thesis, which abides by the University guidelines, and successfully discuss and defend your research findings verbally during your viva.
• Demonstrate effective verbal presentation skills by presenting your research confidently, appropriately and persuasively to differing audiences e.g. in-house student seminars, external conferences, and in your first year board and viva.
• Construct coherent arguments, defend outcomes and listen and respond appropriately to feedback.
• Identify and capitalise on the multiple options for publication (both traditional and new media) and write appropriately for each vehicle.
• Support and contribute to the wider public understanding of your field through appropriate public engagement work (e.g. science fairs, writing articles for non-specialist audiences, school visits, etc) if possible.

5. MANAGEMENT SKILLS

This skill area covers managing the resources, processes and practices that enable you to get your research project done to plan, and on time. This includes your ability to:

Manage your relationships with others
• Effectively co-operate with others in your team to enhance consensus and collaboration.

• Manage and develop the relationship with your own research supervisor(s).

• Manage your supervision meetings by ensuring you have a clear purpose and agenda every time you meet, and agree and follow up the actions you agree.

Manage resources you need

• If appropriate to your role, use financial management principles to cost out work, budget and monitor spend.

• Get organised: manage the ‘things’ (supplies, space, information, etc) you need to do your research.

• Know risk areas and safety requirements in your research area and department, and follow safe working procedures at all times.

Apply and manage processes and practices

• Plan and prioritise measurable objectives and set realistic goals for yourself within achievable timescales. This will often be in conjunction with your supervisor, though you will also often be expected to self-manage how you plan your day-to-day research and tasks.

• Effectively plan, review and monitor the progress of your project, and develop alternative plans if needed.

• Learn about, and use, relevant project management techniques.

• Understand and apply relevant procedures and guidelines e.g. procedures concerning conducting ethical research, University guidelines on completing a PhD, etc.

6. TEACHING AND LEARNING

Teaching and learning encompasses the development of others. Many doctoral researchers aim to get some experience of this during their PhD, as it is very useful experience to have on a CV / resume. This skill area may cover the following:

• Prepare and deliver appropriate student learning opportunities: tutorial, small group discussions, and seminars.

• Develop key skills needed to deliver learning activities: public speaking skills, group facilitation skills, online learning facilitation skills and feedback skills to learners.

• Formally or informally supervising students one-to-one with their individual projects i.e. undergraduate or Masters dissertations.

• Knowledge of learning and teaching theory, e.g. learning styles and barriers to learning.

• Understand how to effectively support diverse groups of learners.

• Review and evaluate your students’ learning to help improve your own performance.

7. COMMERCIALISATION, KNOWLEDGE TRANSFER AND EXCHANGE

This area covers understanding how to capitalise on the commercial potential of your research and enhance the marketability of your own skills, knowledge and expertise. This includes the ability to:

• Use your research to influence and inform policy makers and policy decisions.

• Understand and identify aspects of your research that may have commercial potential, and use the appropriate support channels in the University (i.e. Edinburgh Research and Innovation) to protect and develop these.

• Have skills in, and knowledge of, entrepreneurship and business enterprise, including setting up your own business.

• Understand ‘knowledge transfer’ (KT) in the widest sense, how it relates to your discipline area, and identify and use appropriate KT vehicles and practices.