



What are the foundations of a good PhD?

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A PhD is a globally recognised postgraduate degree and typically the highest degree programme awarded by a University, with students usually required to expand the boundaries of knowledge by undertaking original research. The purpose of PhD programmes of study is to nurture, support and facilitate doctoral students to undertake independent research to expected academic and research standards, culminating in a substantial thesis and examined by viva voce. In this paper—the first of two linked Research Made Simple articles—we explore what the foundations of a high-quality PhD are, and how a Doctoral candidate can develop a study which is successful, original and impactful.

Foundations of a 'good' PhD study

Supervision and support

Central to the development and completion of a good PhD is the supervisory relationship between the student and supervisor. The supervisor guides the student by directing them to resources and training to ensure continuous learning, provides opportunity to engage with experts in the field, and facilitates the development of critical thinking through questioning and providing constructive criticism.¹

The support needs of students will be different, so a flexible yet quality assured approach to PhD research training is required. A good supervisory team (usually includes at least two postdoctoral academics) provide experienced guidance and mentorship and will offer students academic support, with regular meetings and timely feedback on written submissions, will assist the student to develop a peer network and help them access research communities relative to their field. Effective supervision has beneficial outcomes for students, including encouraging a positive work ethic and influencing engagement in a stimulating environ-

ment, allowing students to pursue their own ideas with educated encouragement. The quality of the supervisory relationship can impact greatly on the PhD experience and ultimately sets the student on the road to producing excellent Doctoral work.¹

An environment that promotes personal and professional development is further aided by positive peer interactions. If students feel part of a community and have contact with others also working on doctoral studies, there is the scope for peer compassion and understanding during both challenging and rewarding periods. Students who access personal and professional support and guidance through mentoring models during their studies are more likely to succeed. These models include one-to-one peer mentoring or activities for example journal discussion or methods learning groups. Often, groups of students naturally come together and give each other support and advice about research process expectations and challenges, and offer friendship, and guidance.² Given the usefulness of different types of mentoring models, all can create a supportive and collaborative environment within a PhD programme of study, to minimise working in isolation and enable students to achieve their greatest potential.

Characteristics of a good study: originality and theoretical underpinning

A PhD should make an original contribution to knowledge. Originality can be achieved through the study design, the nature or outcomes of the knowledge synthesis, or the implications for research and/or practice.³ Disciplinary variation, however, influences the assessment of originality. For example, originality in science, technology, engineering and mathematics subjects is often inferred if the work is published/publishable, in comparison to intellectual originality in

Table 1 Characteristics of theoretical and conceptual frameworks⁷

Characteristic	Theoretical framework	Conceptual framework
Development	Draws on literature reviewed/data collected/pre-existing theories	Draws on several concepts/theories and is further developed by researcher
Purpose/rationale	<ol style="list-style-type: none"> 1. Identify study variables/concepts 2. Directs methodological approach (methodology, target population and related sample, data collection and analysis methods) 3. Underpins data collection/interpretation 	<ol style="list-style-type: none"> 1. Identify study variables/concepts 2. Directs methodological approach (methodology, target population and related sample, data collection and analysis methods) 3. Underpins data collection/interpretation, where there is no existent dominant theoretical perspective 4. Informs future research
Status in thesis	Application of a whole or part of a theory	Synthesis of pertinent concepts
Related literature review process	Mostly deductive, hypothesis testing to verify/ascertain the 'power' of a theory for a given population/context	Mostly inductive, recognising not all issues can be studied effectively by drawing on one theory/approach Theories in whole or part may be used to position the research
Related methodological approach of study	Predominantly quantitative methods, using experimental designs, questionnaires and tests.	Qualitative or quantitative and increasingly mixed methods, using questionnaires, interview and observation methods
Generalisability/transferability of study outcomes	Application can often reach beyond thesis focus	Application is usually more limited to the thesis focus

Table 2 Relationship between research paradigms, perspectives, methodologies and methods.^{8,9}

	Ontological and Epistemological Decisions	Theoretical Perspective	Theoretical Perspective
Paradigm	Is there a reality? and how can we go about knowing/beginning to know this reality?	What philosophical/ Research position should we take?	What research techniques are best used to achieve the desired knowledge?
Positivism	There does exist a reality or a truth (realist) that we can access and measure if we use reliable and valid tools.	Positivism/ Post Positivism.	Quantitative; Experimental and Survey designs, using standardised questionnaires and statistical analyses.
Constructivist	There is no one single reality/truth. Instead realities are created between individuals. Our interpretation of experience/events enables us to discover underlying meanings.	Interpretivism; including Phenomenological (descriptive and interpretive Phenomenology), Hermeneutic and Symbolic Interactionist approaches.	Qualitative; interviews, focus groups, observation, Documentary/Narrative/ Multimedia Analyses (including Discourse Analyses and Feminist research), Thematic Analyses and inferred Phenomenological (eg, IPA), Grounded Theory and Ethnographic processes. Some Action Research, Complex intervention development and Implementation Science work could also draw on these methodology/methods.
Pragmatism	Reality is the product of different contexts. We understand/ access realities by reconstructing and interpreting them. In doing so, we can then solve problems and bring about change.	Pragmatism.	Usually involves a mixed method approach (drawing on both quantitative and qualitative methods as above) and often Action Research.
Subjectivism	Reality exists but is perceived differently, by different individuals/ groups.	Postmodernism Structuralism Post-structuralism.	Discursive approaches; Autoethnography, Documentary/Multimedia/Narrative Analyses
Critical	Reality is socially constructed, and related knowledge is influenced by societies and power relationships that exist within.	Marxism, Queer Theory, Feminism.	Critical Discursive approaches, Critical Ethnography, and Action Research. Including focus groups, open ended questionnaires, observations, and documentary analyses.

the social sciences.⁴ Although PhD originality assumes different nuances in different contexts, there is a general acceptance across disciplines that there should be evidence of the following within the thesis:

1. An interplay between old and new—any claims of originality are developed from existing knowledge and practices.
2. There are degrees of originality, relating to more than one aspect of the thesis.
3. Any claims for originality are accompanied by clear articulation of significance.

A good PhD should be also underpinned by theoretical and/or conceptual frameworks (that include philosophical and methodological models) that give clarity to the approach, structure and vision of the study.⁵ These theoretical and conceptual frameworks can explain why the study is pertinent and how the research addresses gaps in the literature.⁶ Table 1 provides a distinction of what construes theoretical and conceptual frameworks.

Theoretical/conceptual frameworks must align with the research question/aims, and the student must be able to articulate how conceptual/theoretical framework were chosen. Key points for consideration include:

1. Are the research questions/aim and objectives well defined?
2. What theory/theories/concepts are being operationalised?
3. How are the theories/concepts related?

4. Are the ontological and epistemological perspectives clearly conveyed and how do they relate to theories and concepts outlined?
5. What are the potential benefits and limitations of the theories and concepts outlined?
6. Are the ways the theories/concepts are outlined and being used original?

A PhD thesis (and demonstrable in viva) must be able to offer cohesion between the choice of research methods that stems from the conceptual/theoretical framework, the related ontological and epistemological decisions, the theoretical perspective and the chosen methodology (table 2). PhD students must be able to articulate the methodological decisions made and be critical of methods employed to answer their research questions.

Conclusion

In summary, we offer considerations of what the foundations of a good PhD should be. We have considered some of the key ingredients of quality PhD supervision, support and research processes and explored how these will contribute to the development of a study that leads to student success and which makes a valuable contribution to the evidence base. In the next paper, we will look in more detail at the assessment of the PhD through the submission of a thesis and an oral viva.

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